FACULTY OF SCIENCES

SYLLABUS
of
BACHELOR OF SCIENCE (MEDICAL)
(Semester III-VI)

(Under Continuous Evaluation System)

Session: 2023-24

The Heritage Institution
KANYA MAHA VIDYALAYA
JALANDHAR (AUTONOMOUS)

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

CURRICULUM AND SCHEME OF EXAMINATIONS OF THREE-YEAR DEGREE PROGRAM (2023-24)

Bachelor of Science (Medical) Semester - III								
Course Code		Course Name	Course Type	Marks				Examination time (in Hours)
				Total	Ext.		CA	
					L	P		
BSML-3421		Punjabi (Compulsory)	C	50	40	-	10	3
BSML-3031		[1]Basic Punjabi						
BSML-3431		[2]Punjab History & Culture						
BSML-3212		English (Compulsory)	C	50	40	-	10	3
BSMM-3483	(I)	**Zoology** (Evolution)	E	100	30	-	20	3
	(II)	**Zoology** (Biodiversity-III)			30	-		3
	(P)	**Zoology** (Practical–III - related to Evolution and Biodiversity-III)			-	20		3
BSMM-3343	(I)	**Microbiology** (Microbial Nutrition and Metabolism)	E	100	60	-	20	3
	(P)	**Microbiology** (Practical-Microbial Nutrition and Metabolism)			-	20		3
BSMM-3084	(I)	**Chemistry** (Organic Chemistry)	C	100	30	-	20	3
	(II)	**Chemistry** (Physical Chemistry)			30	-		3
	(P)	**Chemistry** (Practical)			-	20		3.5
BSMM-3075	(I)	**Botany** (Structure, Development and Reproduction in Flowering Plants-I)	E	100	30	-	20	3
	(II)	**Botany** (Structure, Development and Reproduction in Flowering Plants-II)			30	-		3
	(P)	**Botany** (Practical–I -Based on Papers- I and II)			-	20		3
BSMM-3255	(I)	**Food Science and quality control (Vocational)** (Food Processing and Packaging)	E	100	60	-	20	3
	(P)	**Food Science and quality control (Vocational)** (Practical-Related to Food Processing and Packaging)			-	20		3
AECE-3221		*Environmental studies	AECC**	100	60	20	20	3
SECP-3512/ SECG- 3531		**Personality Development Programme (Skill Based)/ Gender Sensitization Programme	AC	25	20	-	5	2
Total								

C-Compulsory E-Elective AC- Audit Course

[1]Special paper in lieu of Punjabi (Compulsory).

[2] Special paper in lieu of Punjabi (Compulsory) for those students who are not domicile of Punjab.

***Marks of these papers will not be added in total marks and only grades will be provided.**

**** Ability enhancement compulsory course**

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

CURRICULUM AND SCHEME OF EXAMINATIONS OF THREE-YEAR DEGREE PROGRAM (2023-24)

Bachelor of Science (Medical) Semester - IV								
Course Code		Course Name	Course Type	Marks				Examination time (in Hours)
				Total	Ext.		CA	
					L	P		
BSML-4421		Punjabi (Compulsory)	C	50	40	-	10	3
BSML-4031		[1]Basic Punjabi						
BSML-4431		[2]Punjab History & Culture						
BSML-4212		English (Compulsory)	C	50	40	-	10	3
BSMM-4483	(I)	**Zoology** (Biochemistry)	E	100	30	-	20	3
	(II)	**Zoology** (Animal Physiology)			30	-		3
	(P)	**Zoology** (PRACTICAL–IV - related to Biochemistry and Animal Physiology)			-	20		3
BSMM-4343	(I)	**Microbiology** (Microbial Ecology)	E	100	60	-	20	3
	(P)	**Microbiology** (PRACTICAL- Microbial Ecology)			-	20		3
BSMM-4084	(I)	**Chemistry** (Inorganic Chemistry)	C	100	30	-	20	3
	(II)	**Chemistry** (Organic Chemistry)			30	-		3
	(P)	**Chemistry** (Practical)			-	20		3.5
BSMM-4075	(I)	**Botany** (Diversity of seed Plants and their systematics -I)	E	100	30	-	20	3
	(II)	**Botany** (Diversity of seed Plants and their systematics -II)			30	-		3
	(P)	**Botany** (PRACTICAL–I - Based on Diversity of Microbes & Diversity of Cryptogams)			-	20		3
BSMM-4255	(I)	Food Science andQuality Control (Vocational) (Quality Assurance)	E	100	60		20	3
	(P)	**Food Science and quality control (Vocational)** (PRACTICAL- Quality Assurance)				20		3
SECS-4522		*Social Outreach	AC	25	20	-	5	2
Total								

C-Compulsory **E-Elective** **AC- Audit Course**

[1]Special paper in lieu of Punjabi (Compulsory).

[2] Special paper in lieu of Punjabi (Compulsory) for those students who are not domicile of Punjab.

***Marks of these papers will not be added in total marks and only grades will be provided.**

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

CURRICULUM AND SCHEME OF EXAMINATIONS OF THREE-YEAR DEGREE PROGRAM (2023-24)

Bachelor of Science (Medical) Semester - V								
Course Code		**Course Name**	**Course Type**	**Marks**				**Examination time (in Hours)**
				Total	**Ext.**		**CA**	
					L	**P**		
BSML-5421		Punjabi (Compulsory)	C	50	40	-	10	3
BSML-5031		[1]Basic Punjabi						
BSML-5431		[2]Punjab History & Culture						
BSML-5212		English (Compulsory)	C	50	40	-	10	3
BSMM-5483	(I)	**Zoology** (Developmental Biology)	E	100	30	-	20	3
	(II)	**Zoology** (Genetics)			30	-		3
	(P)	**Zoology** (PRACTICAL–V - Related To Developmental Biology &Genetics)			-	20		3
BSMM-5343	(I)	**Microbiology (**Applied Microbiology-1)	E	100	60	-	20	3
	(P)	**Microbiology** (PRACTICAL- Applied Microbiology-1)			-	20		3
BSMM-5084	(I)	**Chemistry** (Inorganic Chemistry)	C	100	30	-	20	3
	(II)	**Chemistry** (Physical Chemistry)			30	-		3
	(P)	**Chemistry** (Practical)			-	20		3.5
BSMM-5075	(I)	**Botany** (Plant Physiology)	E	100	30	-	20	3
	(II)	**Botany** (Biochemistry & Biotechnology)			30	-		3
	(P)	**Botany** (PRACTICAL–I - Based on Paper-I and Paper-II)			-	20		3
BSMM-5255	(I)	Food Science andQuality Control (Vocational) (Food Analysis)	E	100	60	-	20	3
	(P)	**Food Science and quality control (Vocational)** (PRACTICAL- Food Analysis)			-	20		3
SECJ-5551		*Job Readiness course	AC	2 credit	-	-	-	-
SECI-5541		**Innovation, Entrepreneurship and Venture Development	AC	2 credit	-	-	-	-
Total								

C-Compulsory **E-Elective** **AC- Audit Course**

[1]Special paper in lieu of Punjabi (Compulsory).

[2] Special paper in lieu of Punjabi (Compulsory) for those students who are not domicile of Punjab.

***Marks of these papers will not be added in total marks and only grades will be provided.**

****** Ability enhancement compulsory course**

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

CURRICULUM AND SCHEME OF EXAMINATIONS OF THREE-YEAR DEGREE PROGRAM (2023-24)

Bachelor of Science (Medical) Semester - VI								
Course Code		**Course Name**	**Course Type**	**Marks**				**Examination time (in Hours)**
				Total	**Ext.**		**CA**	
					L	**P**		
BSML-6421		Punjabi (Compulsory)	C	50	40	-	10	3
BSML-6031		[1]Basic Punjabi						
BSML-6431		[2]Punjab History & Culture						
BSML-6212		English (Compulsory)	C	50	40	-	10	3
BSMM-6483	(I)	**Zoology** (Medical Zoology)	E	100	30	-	20	3
	(II)	**Zoology** (Medical Laboratory Technology)			30	-		3
	(P)	**Zoology** (PRACTICAL–VI - Related to Medical Zoology &Medical Laboratory Technology)			-	20		3
BSMM-6343	(I)	**Microbiology (**Applied Microbiology-II)	E	100	60	-	20	3
	(P)	**Microbiology** (Practical- Applied Microbiology-II)			-	20		3
BSMM-6084	(I)	**Chemistry** (Molecular Spectroscopy)	C	100	30	-	20	3
	(II)	**Chemistry** (Physical Chemistry)			30	-		3
	(P)	**Chemistry** (Practical)			-	20		3.5
BSMM-6075	(I)	**Botany** (Ecology)	E	100	30	-	20	3
	(II)	**Botany** (Economic Botany)			30	-		3
	(P)	**Botany** (Practical–I -Based on Paper -I and Paper-II)			-	20		3
BSMM-6255	(I)	Food Science andQuality Control (Vocational) (Food plant layoutand management)	E	100	60	-	20	3
	(P)	**Food Science and quality control (Vocational)** (Practical- Food plant layoutand management)			-	20		3
Total								

C-Compulsory **E-Elective** **AC- Audit Course**

[1]Special paper in lieu of Punjabi (Compulsory).

[2] Special paper in lieu of Punjabi (Compulsory) for those students who are not domicile of Punjab.

Bachelor of Science (Medical)

Programme Outcomes:

Students of all undergraduate general degree Programmes at the time of graduation will be able to

PO1. Take informed actions after identifying the assumptions that frame our thinking and actions, checking out the degree to which these assumptions are accurate and valid, and looking at our ideas and decisions (intellectual, organizational, and personal) from different perspectives.

PO2. Speak, read, write and listen clearly in person and through electronic media in English and in one Indian language, and make meaning of the world by connecting people, ideas, books, media and technology.

PO3: Work and communicate effectively in inter-disciplinary environment, either independently or in a team, and demonstrate leadership qualities. Elicit views of others, mediate disagreements and help reach conclusions in group settings.

PO4. Demonstrate empathetic social concern and equity centred national development, and the ability to act with an informed awareness of issues and participate in civic life through volunteering.

PO5. Recognize different value systems including your own, understand the moral dimensions of your decisions, and accept responsibility for them.

PO6. Understand the issues of environmental contexts and sustainable development.

PO7. Recognize the need to engage in lifelong learning through continuing education and research.

Programme Specific Outcomes:

Upon successful completion of this course, students will be able to:

PSO1. Acquire knowledge on basic, important concepts in the field of biology such as diversity, physiology, Evolution, Genetics, Developmental Biology and Comparative Anatomy and can be applied to various fields of Biotechnology.

PSO 2. Describe the diversity, ecological and evolutionary importance of animal life ranging from the single celled protozoan to the highly complex vertebrates. They will also learn to describe the various aspects of morphology, physiology and embryology in nonchordate and chordate life forms.

PSO3. Apply appropriate techniques and modern instruments for animal physiology, biochemical estimations, cellular activities of animals and other medical laboratory technologies with an understanding of the application.

PSO4. Acquaint the students about the Botany, importance of nature, classification, morphology, biology, structure, life cycle and economic importance of microorganisms and Plants.

PSO5. Understand Botanical Nomenclature, Classification, plant diversity, conservation, phylogenetic, relationships and development.

PSO6. Understand role of plant sciences in the pursuit of many applied sciences like Agriculture, Horticulture, Sericulture, Forestry, Biotechnology and many more.

PSO7. Demonstrate knowledge to help acquire, articulate, retain, and employ practical skills relevant to Food Chemistry and Nutrition, Food Plant Hygiene and Sanitation, Food Processing and Packaging, Quality Assurance, Food analysis, Food Plant Layout and Management. Students will demonstrate engagement in the Food Science discipline through involvement in research or internship activities.

PSO8. Demonstrate knowledge to help acquire, articulate, retain, and employ practical skills relevant to Fundamentals of Microbiology, Basics of Food Microbiology, Microbial Nutrition and Metabolism, Microbial Ecology, Applied Microbiology. Students will demonstrate engagement in the Microbiology discipline through involvement in research or internship activities.

PSO9. Demonstrate knowledge of chemistry and apply this knowledge toanalyse a variety of chemical phenomena and will be able to interpret and analyse quantitative data.

PSO10. Understand theoretical concepts of instruments that are commonly used in most chemistry fields as well as interpret and use data generated in instrumental physical and chemical analyses.

PSO11. To train students in multidisciplinary and interdisciplinary areas in chemical sciences.

They will also be able to employ critical thinking and scientific inquiry in the performance, design, interpretation and documentation of laboratory experiments, at a level suitable to succeed at an entry-level position in industry or a chemistry postgraduate program.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER III (SESSION: 2023-24)
PUNJABI
Course Title: Punjabi (Compulsory)

Course Code- BSML -3421

COURSE OUTCOMES

CO1: 'ਚੋਣਵੇ ਪੰਜਾਬੀ ਨਿਬੰਧ' ਨੂੰ ਪੜ੍ਹਾਉਣ ਦਾ ਮਨੋਰਥ ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਵਾਰਤਕ ਪ੍ਰਤੀ ਦਿਲਚਸਪੀ, ਸੂਝ ਨੂੰ ਪੈਦਾ ਕਰਨਾ ਹੈ।

CO2: 'ਸਮਾਂ ਮੰਗ ਕਰਦਾ ਹੈ' ਇਕਾਂਗੀ ਸੰਗ੍ਰਹਿ ਨੂੰ ਸਿਲੇਬਸ ਵਿਚ ਸ਼ਾਮਿਲ ਕਰ ਕੇ ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਇਕਾਂਗੀ ਪੜ੍ਹਣ ਦੀ ਰੁਚੀ ਨੂੰ ਪੈਦਾ ਕਰਨਾ ਹੈ ਅਤੇ ਇਸ ਸਾਹਿਤ ਰੂਪ ਨਾਲ ਜੋੜਣਾ ਹੈ।

CO3: ਸੰਖੇਪ ਰਚਨਾ ਕਰਨ ਨਾਲ ਵਿਦਿਆਰਥੀ ਆਪਣੀ ਗੱਲ ਨੂੰ ਸੰਖੇਪ ਵਿਚ ਕਹਿਣ ਦੀ ਜਾਚ ਸਿੱਖਣਗੇ ਅਤੇ ਇਹ ਦਿਮਾਗੀ ਕਸਰਤ ਵਿਚ ਸਹਾਈ ਹੋਵੇਗੀ।ਲੇਖ ਰਚਨਾ ਦਾ ਮਨੋਰਥ ਵਿਦਿਆਰਥੀਆਂ ਦੀ ਬੁੱਧੀ ਨੂੰ ਤੀਖਣ ਕਰਦਿਆਂ ਉਨਾਂ ਦੀ ਲਿਖਣ ਪ੍ਰਤਿਭਾ ਨੂੰ ਉਜਾਗਰ ਕਰਨਾ ਹੈ।

CO4: ਮੂਲ ਵਿਆਕਰਣਕ ਇਕਾਈਆਂ : ਪਰਿਭਾਸ਼ਾ ਅਤੇ ਵੰਨਗੀਆਂ (ਭਾਵੰਸ਼, ਸ਼ਬਦ, ਵਾਕੰਸ਼, ਉਪਵਾਕ ਅਤੇ ਵਾਕ)ਨੂੰ ਪੜ੍ਹਾਉਣ ਦਾ ਮਨੋਰਥ ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਭਾਸ਼ਾ ਦੀ ਅਮੀਰੀ ਅਤੇ ਬਾਰੀਕੀਆਂ ਨੂੰ ਸਮਝਣ ਲਈ ਵੱਖਰੇ -ਵੱਖਰੇ ਸਿਧਾਂਤਾਂ ਦਾ ਵਿਕਾਸ ਕਰਨਾ ਹੈ।

BACHELOR OF SCIENCE (MEDICAL) SEMESTER III (SESSION: 2023-24)
PUNJABI
Course Title: Punjabi (Compulsory)

Course Code- BSML -3421

ਸਮਾਂ : 3 ਘੰਟੇ **Maximum Marks: 50**

Theory: 40

CA: 10

ਪਾਠਕ੍ਰਮ ਅਤੇ ਪਾਠ ਪੁਸਤਕਾਂ

ਯੂਨਿਟ-I

ਚੋਣਵੇ ਪੰਜਾਬੀ ਨਿਬੰਧ (ਜੋਗਿੰਦਰ ਸਿੰਘ ਪੁਆਰ,ਪਰਮਜੀਤ ਸਿੰਘ ਸਿੱਧੂ), ਪੰਜਾਬੀ ਯੂਨੀਵਰਸਿਟੀ,ਪਟਿਆਲਾ।

ਘਰ ਦਾ ਪਿਆਰ, ਉਮਰ ਲੰਮੀ ਹੋ ਸਕਦੀ ਹੈ,ਅੱਥਰੂ, ਪੁਰਾਣਾ ਪੰਜਾਬ, ਇੰਗਲੈਂਡ ਦਾ ਸੋਗੀ ਸੋਮਵਾਰ,ਖਿਡਾਰੀਆਂ ਦੇ ਵਹਿਮ।

(ਪਾਠ ਕ੍ਰਮ ਦਾ ਹਿੱਸਾ ਹਨ)

(ਵਿਸ਼ਾ ਵਸਤੂ/ਸਾਰ /ਕਲਾ ਪੱਖ) ੪ ਅੰਕ

ਯੂਨਿਟ-II

ਸਮਾਂ ਮੰਗ ਕਰਦਾ ਹੈ (ਇਕਾਂਗੀ ਸੰਗ੍ਰਹਿ) (ਸੰਪਾ. ਕੇਵਲ ਧਾਲੀਵਾਲ) ਚੇਤਨਾ ਪ੍ਰਕਾਸ਼ਨ,ਲੁਧਿਆਣਾ।

(ਵਿਸ਼ਾ ਵਸਤੂ /ਸਾਰ / ਪਾਤਰ ਚਿਤਰਨ) ੪ ਅੰਕ

ਯੂਨਿਟ-III

(ੳ) ਸੰਖੇਪ ਰਚਨਾ (ਪ੍ਰੈਸੀ)

(ਅ) ਲੇਖ ਰਚਨਾ ੪ ਅੰਕ

ਯੂਨਿਟ-IV

ਮੂਲ ਵਿਆਕਰਣਕ ਇਕਾਈਆਂ : ਪਰਿਭਾਸ਼ਾ ਅਤੇ ਵੰਨਗੀਆਂ (ਭਾਵੰਸ਼, ਸ਼ਬਦ, ਵਾਕੰਸ਼, ਉਪਵਾਕ ਅਤੇ ਵਾਕ)

੪ ਅੰਕ

ਅੰਕ ਵੰਡ ਅਤੇ ਪਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ

1. ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਦੇ ਚਾਰ ਸੈਕਸ਼ਨ ਹੋਣਗੇ।ਸੈਕਸ਼ਨ A-D ਤੱਕ ਦੇ ਪ੍ਰਸ਼ਨ ਯੂਨਿਟ I-IV ਵਿਚੋਂ ਪੁੱਛੇ ਜਾਣਗੇ। ਹਰ ਸੈਕਸ਼ਨ ਵਿਚ ਦੋ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ।

2. ਵਿਦਿਆਰਥੀ ਨੇ ਕੁਲ ਪੰਜ ਪ੍ਰਸ਼ਨ ਕਰਨੇ ਹਨ। ਹਰ ਸੈਕਸ਼ਨ ਵਿਚੋਂ ਇਕ ਪ੍ਰਸ਼ਨ ਕਰਨਾ ਲਾਜ਼ਮੀ ਹੈ। ਪੰਜਵਾਂ ਪ੍ਰਸ਼ਨ ਕਿਸੇ ਵੀ ਸੈਕਸ਼ਨ ਵਿਚੋਂ ਕੀਤਾ ਜਾ ਸਕਦਾ ਹੈ।

3. ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ 08 ਅੰਕ ਹਨ।

4. ਪੇਪਰ ਸੈੱਟ ਕਰਨ ਵਾਲਾ ਜੇਕਰ ਚਾਹੇ ਤਾਂ ਪ੍ਰਸ਼ਨਾਂ ਦੀ ਵੰਡ ਅੱਗੋ ਵੱਧ ਤੋਂ ਵੱਧ ਚਾਰ ਉਪ ਪ੍ਰਸ਼ਨਾਂ ਵਿਚ ਕਰ ਸਕਦਾ ਹੈ।

BACHELOR OF SCIENCE (MEDICAL) SEMESTER III (SESSION: 2023-24)
PUNJABI
Course Title: Basic Punjabi (In lieu of Punjabi Compulsory)

Course Code- BSML -3031

Course outcomes

CO1: ਸੰਖੇਪ ਰਚਨਾ ਕਰਨ ਨਾਲ ਵਿਦਿਆਰਥੀ ਆਪਣੀ ਗੱਲ ਨੂੰ ਸੰਖੇਪ ਵਿਚ ਕਹਿਣ ਦੀ ਜਾਚ ਸਿੱਖਣਗੇ ਅਤੇ ਇਹ ਦਿਮਾਗੀ ਕਸਰਤ ਵਿਚ ਸਹਾਈ ਹੋਵੇਗੀ।ਪੈਰ੍ਹਾ ਪੜ੍ਹ ਕੇ ਪ੍ਰਸ਼ਨਾਂ ਦੇ ਉਤਰ ਦੇਣ ਦਾ ਮਨਰੋਥ ਵਿਦਿਆਰਥੀਆਂ ਦੀ ਬੁੱਧੀ ਨੂੰ ਤੀਖਣ ਕਰਦਿਆਂ ਉਨਾਂ ਦੀ ਲਿਖਣ ਪ੍ਰਤਿਭਾ ਨੂੰ ਉਜਾਗਰ ਕਰਨਾ ਹੈ।

CO2: ਕਵਿਤਾ ਭਾਗ ਨੂੰ ਪੜ੍ਹਾਉਣ ਦਾ ਮਨੋਰਥ ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਕਵਿਤਾ ਪ੍ਰਤੀ ਦਿਲਚਸਪੀ, ਸੂਝ ਨੂੰ ਪੈਦਾ ਕਰਨਾ ਹੈ ਤਾਂ ਕਿ ਉਹ ਆਧੁਨਿਕ ਦੌਰ ਵਿਚ ਚੱਲ ਰਹੀਆਂ ਕਾਵਿ ਧਾਰਾਵਾਂ ਅਤੇ ਕਵੀਆਂ ਬਾਰੇ ਗਿਆਨ ਹਾਸਿਲ ਕਰ ਸਕਣ।

CO3: ਕਹਾਣੀ ਭਾਗ ਨੂੰ ਪੜ੍ਹਾਉਣ ਦਾ ਮਨੋਰਥ ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਕਹਾਣੀ ਪ੍ਰਤੀ ਦਿਲਚਸਪੀ, ਸੂਝ ਨੂੰ ਪੈਦਾ ਕਰਨਾ ਹੈ ਤਾਂ ਕਿ ਉਹ ਆਧੁਨਿਕ ਦੌਰ ਵਿਚ ਚੱਲ ਰਹੀਆਂ ਕਾਵਿ ਧਾਰਾਵਾਂ ਅਤੇ ਕਵੀਆਂ ਬਾਰੇ ਗਿਆਨ ਹਾਸਿਲ ਕਰ ਸਕਣ।

CO4: ਨਿਬੰਧ ਨੂੰ ਪੜ੍ਹਾਉਣ ਦਾ ਮਨੋਰਥ ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਪੜ੍ਹਣ ਦੀ ਰੁਚੀ ਨੂੰ ਪੈਦਾ ਕਰਨਾ ਹੈ ਅਤੇ ਮੁੱਲਵਾਨ ਇਤਿਹਾਸ ਤੋਂਜਾਣੂ ਕਰਵਾਉਣਾ ਹੈ।

BACHELOR OF SCIENCE (MEDICAL) SEMESTER III (SESSION: 2023-24)
BASIC PUNJABI
Course Title: Basic Punjabi (In lieu of Punjabi Compulsory)

Course Code- BSML -3031

ਸਮਾਂ: 3 ਘੰਟੇ

Maximum Marks: 50
Theory: 40
CA: 10

ਪਾਠਕ੍ਰਮ

ਯੂਨਿਟ-I

ਪੈਰ੍ਹਾ ਪੜ੍ਹ ਕੇ ਪ੍ਰਸ਼ਨਾਂ ਦੇ ਉਤਰ

ਸੰਖੇਪ ਰਚਨਾ 08 ਅੰਕ

ਯੂਨਿਟ-II

ਕਵਿਤਾਵਾਂ

(ਓ) ਸਮਾਂ (ਭਾਈ ਵੀਰ ਸਿੰਘ)

(ਅ) ਖੈਰ ਪੰਜਾਬੀ ਦੀ (ਫ਼ੀਰੋਜ਼ਦੀਨ ਸ਼ਰਫ਼)

(ਏ) ਖ਼ਨਗਾਹੀ ਦੀਵਾ ਬਾਲਦੀਏ (ਪ੍ਰੋ.ਮੋਹਨ ਸਿੰਘ)

(ਸ) ਰੁੱਖ (ਸ਼ਿਵ ਕੁਮਾਰ)

(ਪ੍ਰਸੰਗ ਸਹਿਤ ਵਿਆਖਿਆ,ਸਾਰ) 08 ਅੰਕ

ਯੂਨਿਟ-III

ਕਹਾਣੀਆਂ

(ਓ) ਭੂਆ (ਨਾਨਕ ਸਿੰਘ)

(ਅ) ਪੇਮੀ ਦੇ ਨਿਆਣੇ (ਪ੍ਰਿੰ. ਸੰਤ ਸਿੰਘ ਸੇਖੋਂ)

(ਏ) ਕੁਲਫ਼ੀ (ਸੁਜਾਨ ਸਿੰਘ)

(ਸ) ਧਰਤੀ ਹੇਠਲਾ ਬੌਲਦ(ਕੁਲਵੰਤ ਸਿੰਘ ਵਿਰਕ)

(ਵਿਸ਼ਾ ਵਸਤੂ, ਸਾਰ) 08 ਅੰਕ

ਯੂਨਿਟ-IV

ਨਿਬੰਧ

(ਓ) ਘਰ ਦਾ ਪਿਆਰ (ਤੇਜਾ ਸਿੰਘ)

(ਅ) ਮਾਂ (ਗੁਰਬਖ਼ਸ਼ ਸਿੰਘ)

(ਏ) ਭਾਈ ਮਰਦਾਨਾ ਜੀ (ਹਰਪਾਲ ਸਿੰਘ ਪੰਨੂ)

(ਸ) ਮਨੁੱਖ ਕੁਦਰਤ ਦੀ ਨੇਕ ਔਲਾਦ ਨਹੀਂ (ਸੁਰਿੰਦਰ ਮੰਡ)

(ਵਿਸ਼ਾ ਵਸਤੂ,ਸਾਰ) 08 ਅੰਕ

ਅੰਕ ਵੰਡ ਅਤੇ ਪਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ

1. ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਦੇ ਚਾਰ ਸੈਕਸ਼ਨ ਹੋਣਗੇ।ਸੈਕਸ਼ਨ A-D ਤੱਕ ਦੇ ਪ੍ਰਸ਼ਨ ਯੂਨਿਟ I-IV ਵਿਚੋਂ ਪੁੱਛੇ ਜਾਣਗੇ। ਹਰ ਸੈਕਸ਼ਨ ਵਿਚ ਦੋ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ।
2. ਵਿਦਿਆਰਥੀ ਨੇ ਕੁੱਲ ਪੰਜ ਪ੍ਰਸ਼ਨ ਕਰਨੇ ਹਨ। ਹਰ ਸੈਕਸ਼ਨ ਵਿਚੋਂ ਇਕ ਪ੍ਰਸ਼ਨ ਕਰਨਾ ਲਾਜ਼ਮੀ ਹੈ।ਪੰਜਵਾਂ ਪ੍ਰਸ਼ਨ ਕਿਸੇ ਵੀ ਸੈਕਸ਼ਨ ਵਿਚੋਂ ਕੀਤਾ ਜਾ ਸਕਦਾ ਹੈ।
3. ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ 08 ਅੰਕ ਹਨ।
4. ਪੇਪਰ ਸੈੱਟ ਕਰਨ ਵਾਲਾ ਜੇਕਰ ਚਾਹੇ ਤਾਂ ਪ੍ਰਸ਼ਨਾਂ ਦੀ ਵੰਡ ਅੱਗੋਂ ਵੱਧ ਤੋਂ ਵੱਧ ਚਾਰ ਉਪ ਪ੍ਰਸ਼ਨਾਂ ਵਿਚ ਕਰ ਸਕਦਾ ਹੈ।

BACHELOR OF SCIENCE (MEDICAL) SEMESTER III (SESSION: 2023-24)
PUNJAB HISTORY AND CULTURE
Course Title: Punjab History and Culture (From 1000-1605 A. D.)
(Special paper in lieu of Punjabi Compulsory)
(For those students who are not domicile of Punjab)
Course Code- BSML-3431

After completing the paper the students will have a thorough insight into the origin of Sikh faith and its major institutions in Punjab. They will be able to

CO 1: Understand the society and culture of Medieval Punjab.

CO 2: Understand the growth of various sects during the Bhakti Movement in Punjab.

CO 3: Comprehend and analyse the teachings of Guru Nanak Dev and its relevance today

CO 4: Make a comparison between the philosophy and teachings of first five Sikh Gurus and their relevance in the present scenario and also to understand and analyse the institutions started by Sikh Gurus and their implications till date

BACHELOR OF SCIENCE (MEDICAL) SEMESTER III (SESSION: 2023-24)
PUNJAB HISTORY AND CULTURE
Course Title: Punjab History and Culture (From 1000-1605 A. D.)
(Special paper in lieu of Punjabi Compulsory)
(For those students who are not domicile of Punjab)
Course Code- BSML-3431

Examination Time: 3 Hours **Max. Marks: 50**
Theory: 40
CA: 10

Instructions for the Paper Setters

1. Question paper shall consist of four Units

2. Examiner shall set 8 questions in all by selecting **Two Questions** of equal marks from each Unit.

3. Candidates shall attempt **5 questions** in **600 words**, by at least selecting **One Question** from each Unit and the **5th question** may be attempted from any of the **four Units**.

4. Each question will carry 8 marks

.

Unit -I

1. Society and Culture of Punjab during Turko-Afghan Rule

2. The Punjab under the Mughals

Unit-II:

3. Bhakti Movement and Impact on Society of Punjab

4. Sufism in Punjab

Unit-III:

5.Guru Nanak: Early Life and Teachings

6. Concept of Sangat and Pangat

Unit-IV:

7. Contribution of Guru Angad Dev, Guru Amar Das and Guru Ram Das

8. Guru Arjun Dev and Compilation of Adi Granth

Suggested Readings:

- Chopra, P. N., Puri, B.N., &Das. M.N. (1974). A Social, Cultural and Economic History of India, Vol. II. New Delhi : Macmillan India.
- Grewal, J.S. (1994) The Sikhs of the Punjab, Cambridge University Press, New Delhi.
- Singh, Fauja (1972), A History of the Sikhs, Vol. II, I. Patiala: Punjabi University.
- Singh, Khushwant (2011). A History of Sikhs- Vol. I (1469-1839), New Delhi, Oxford University Press.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER III (SESSION: 2023-24)

ENGLISH
Course Title: English (Compulsory)
Course Code: BSML -3212

COURSE OUTCOMES

After passing this course, the students will be able to:

CO 1: Comprehend the basics of grammatical rules governing relative clauses, adjectives, adverbs, conjunctions and prepositions through the study of "English Grammar in Use" by Raymond Murphy

CO 2: Develop skills to write an essay on a given topic and enhance their vocabulary through the study of "The Students' Companion" by Wilfred D. Best

CO 3: Enhance their reading and analysing power of texts through guided reading through the study of "Making Connections" by Kenneth J. Pakenham

CO 4: Develop an understanding of the poems taught, relate to the socio-cultural background of England and be able to answer questions regarding tone, style and central idea through the study of the poems in the prescribes text "Moments in Time"

BACHELOR OF SCIENCE (MEDICAL) SEMESTER III (SESSION: 2023-24)
ENGLISH
Course Title: English (Compulsory)
Course Code: BSML -3212

Max. Marks: 50
Examination Time: 3 Hrs **Theory: 40**
CA: 10

Instructions for the Examiner:

(The paper setters should avoid questions of theoretical nature from *Making Connections*.)

Section A: One question with sub-parts will be set from Unit I of the syllabus. Fifteen sentences will be set and the students would be required to attempt any ten. Each sentence will carry one mark. **(10×1=10)**

Section B: Two questions will be set from Unit II of the syllabus. The students would be required to attempt one essay out of the given two topics carrying six marks (word limit 300 words). The second question will be based on vocabulary. The students would be required to write single words for phrases and sentences choosing any four out of six and each carrying one mark. **(1×6 + 4×1=10)**

Section C: The students would be required to attempt two questions (with sub parts) based on exercises as given before and after reading essays in the prescribed text book *Making Connections*. **(2×5=10)**

Section D: This section will be divided into two parts. In part one, three questions based on Central idea, theme, tone and style etc. of the poems from the prescribed textbook, *Moments In Time* from Unit IV of the syllabus will be set. The students would be required to attempt any two, each carrying three marks (100 words each). **(2×3=6)**

Part two will have one question (with internal choice) requiring students to explain a stanza with reference to context carrying four marks (word limit 200 words). The stanzas for explanation will be taken from the prescribed textbook, *Moments in Time* from Unit IV in the syllabus. **(1×4=4)**

Unit I

English Grammar in Use, 4th Edition by Raymond Murphy, CUP (Units 92-120)

Unit II

Essay Writing and *The Students' Companion* by Wilfred D. Best (Section 1: Single words for phrases and sentences: Words denoting Numbers and words denoting Places)

Unit III

Making Connections by Kenneth J. Pakenham, 2nd Edn. CUP: Unit-II

Unit IV

Moments in Time: Poems at Sr. No. 1-6

Texts Prescribed:

1. *English Grammar in Use* (Fourth Edition) by Raymond Murphy, CUP
2. *The Students' Companion* by Wilfred D. Best
3. *Making Connections* by Kenneth J. Pakenham, 2nd Edn. CUP
4. *Moments in Time: An Anthology of Poems*, GNDU, Amritsar

BACHELOR OF SCIENCE (MEDICAL) SEMESTER III (SESSION: 2023-24)
ZOOLOGY
Course Title: Evolution
Course Code: BSMM-3483 (I)
(THEORY)

Course Outcome

After passing this course the student will be able to:

CO1: Understand concept of evolution and identify the contributions of various Evolutionists.

CO2: Know about origin of life and concept of speciation.

CO3: Gain knowledge about fossils and its significance as well as evolution of man.

CO4: Understand ecological adaptations in fishes, reptiles, birds and mammals.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER III (SESSION: 2023-24)
ZOOLOGY
Course Title: Evolution
Course Code: BSMM-3483(I)
(THEORY)

Max. Time: 3 Hrs. **Max Marks: 30**

Instructions for the Paper Setter

Eight questions of equal marks (6 marks each) are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

Unit I

Introduction to evolution
Evidences of organic evolution

Theories of organic evolution

Unit II

Origin of life
Concept of micro, macro and mega-evolution
Concept of Species
Speciation

Unit III

Fossils, its types and significance
Evolutionary rate
Origin & Extinction of reptiles
Evolution of man (in Brief)

Unit IV

Migration & Parental Care in Pisces
Flight adaptation & Bird migration
Adaptive radiations like scales & fins in fish, poison apparatus in snakes and dentition in Mammals.

Suggested Readings:

1. Avers, C. J.(1989). Evolution Process and Pattern in Evolution, New York Oxford Oxford university press.
2. Bhamarah, H.S.(1993), Juneka K., Cytogenetics & Evolution, Anmol Publication Pvt. Ltd.
3. Brookfield, A. P. (1986). Modern aspects of Evolution. Nelson Thornes publishers
4. Colbert. E.H. (2002), Evolution of Vertebrates, cbspd publishers

5. Freeman, S. and Herron, Jon C. (2007). Evolutionary analysis, Pearson Prentice Hall, New Jersey.
6. Futuyma, D. J. (1998), Evolutionary Biology, Sinauer Assoc. Inc. Pub. USA.
7. Meglitsch, P. A. (1991), Invertebrate Zoology (3rd ed), Oxford University Press.
8. Wen-Hsiung Li (1997), Molecular Evolution, Sinauer associatesInc.Pub. USA.
9. Rastogi, V.B(2003) Organic evolution, Medtech publishers
10. Strickberger, M.N(2000) Evolution , Jones and Bartlett publishers.
11. Tomar, B.S. and S.P.Singh (2000)Evolutionary Biology, Rastogi publishers.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER III (SESSION: 2023-24)
ZOOLOGY
Course Title: Biodiversity-III (Chordates)
Course Code: BSMM-3483 (II)
(THEORY)

Course Outcomes

After passing this course the student will be able to:

CO1: Understand general body plan of Herdmania and external characters of Amphioxus.

CO2: Understand external characters and affinities of Petromyzon as well as body systems of Labeo.

CO3: Understand body plan and various systems of Frog and Uromastix.

CO4: Understand body systems of Pigeon and Rat.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER III (SESSION: 2023-24)
ZOOLOGY
Course Title: Biodiversity-III (Chordates)
Course Code: BSMM-3483 (II)
(THEORY)

Max. Time: 3 Hrs. **Max Marks: 30**

Instructions for the Paper Setter

Eight questions of equal marks (6 marks each) are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

Unit I

Brief Introduction to Protochordata

Urochordata: Type study- *Herdmania*
Cephalochordata: External features and affinities of *Amphioxus*

Unit II

Cyclostomata: External Characters of *Petromyzon*

Affinities of Cyclostomata

Pisces: Type study-*Labeo*

Unit III

Amphibia: Type study-Frog

Reptilia: Type study-*Uromastix*

Unit IV

Aves: Type study-Pigeon
Mammals: Type study-Rat

Suggested Reading Material.

1. Dhami, P.S. &Dhami J.K. (1998), Vertebrates, R. Chand & Co., New Delhi.
2. Hildebrand, M. and Goslow. Jr. G.E. (2001), Analysis of Vertebrates Structure, John Wiley, N. Y.
3. Jollie, M. (1968), Chordate Morphology, Reinhold, New York.
4. Kardong, K. V. (1995), Vertebrates – Comparative Anatomy, Function, Evolution. W.B.C. Pub. , Oxford.

5. Kent, G. C. and Carr, R. K. (2001), Comparative Anatomy of the Vertebrates (9th ed), McGraw Hill Higher Education, New York.
6. Linzey, D. (2001), Vertebrate Biology, McGraw Hill Publishing Company, New York.
7. Pough, F. H., Heiser, J. B. and McFarland, W. N. (1990), Vertebrate Life (3rd ed), Macmillan Pub. Co., New York.
8. Young, J. Z. (1982), The Life of Vertebrates, New York.
9. Parker, T.J. and Haswell, W.A (1981) Text Book of Zoology, Vol. II (Vertebrates), ELBS and Macmillian Press Ltd.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER III (SESSION: 2023-24)
ZOOLOGY
Course Title: Practical-III (Related to Evolution and Biodiversity-III)
Course Code: BSMM-3483 (P)
(PRACTICAL)

Course Outcomes

After passing this course the student will be able to:

CO1: Familiarize organ systems.

CO2: Know about Biodiversity belonging to different Taxa.

CO3: Aware about economically important specimens (preserved).

CO4: Understanding of evolutionary phenomena.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER III (SESSION: 2023-24)
ZOOLOGY
Course Title: Practical-III (Related to Evolution and Biodiversity-III)

Course Code: BSMM-3483 (P)
(PRACTICAL)

Time: 3 hrs. **Marks: 20**

Instructions for the Practical Examiners: Question paper is to set on the spot jointly by the Internal and External Examiners. Two copies of the same should be submitted for the record to COE Office, Kanya Maha Vidyalaya, Jalandhar

Guidelines for conduct of Practical Examination:

1.	Draw a labelled sketch of the system of the given animal & explain it to the Examiner.	3
2.	Identify and classify the specimens upto order level. Write a short note on habitat, special features, feeding, habits and economic importance of the specimens.	8
3.	Idendify and write a note on the evolutionary phenomenon in the given specimen.	2
4.	Identify the slides/specimens, give two reasons for identification.	3
5.	Viva-voce & Practical file.	4

I. Classification up to order level, except in case of Pisces and Aves where classification up to subclass level, habits, habitat, external characters and economic importance (if any) of the following animals is required:

Urochordata : *Herdmania, Molgula, Pyrosoma, Doliolum, Salpa&Oikopleura.*

Cephalochordata: *Amphioxus.* Study of the following prepared slides:

T.S. *Amphioxus* through various regions, Pharynx of *Amphioxus*

Cyclostomata : *Myxine, Petromyzon & Ammocoetes*Larva.

Chondrichthyes : *Zygaena* (hammer head shark), *Pristis* (saw fish), *Narcine (electric ray), Trygon, Rhinobatus and Chimaera* (rabbit fish).

Actinoptergii :*Polypterus, Acipenser, Lepidosteus, Muraena, Mystus, Catla, Hippocampus, Syngnathus, Exocoetus, Anabas, Diodon, Tetradon, Echeneis and Solea.*

Dipneusti (**Dipnoi**) : *Protopterus*(African lung fish)

Amphibia : *Uraeotyphlus, Necturus, Amphiuma, Amblystoma*and its Axolotl Larva, *Triton, Salamandra, Hyla, Rhacophorus*

Reptilia : *Hemidactylus, Calotes, Draco, Varanus, Phrynosoma, Chamaeleon, Typhlops, Python, Eryx, Ptyas, Bungarus, Naja, Hydrus, Vipera, Crocodilus, Gavialis, Chelone*(turtle) and *Testudo* (tortoise), Differences in nonpoisonous and poisonous snakes.

Aves : *Casuarius, Ardea, Anas, Milvus, Pavo, Eudynamics, Tyto* and *Alcedo.*

Mammalia : *Ornithorhynchus, Echidna, Didelphis, Macropus, Loris, Macaca, Manis, Hystrix, Funambulus, Panthera, Canis, Herpestes, Capra, Pteropus.*

II. Study of the following systems with the help of charts/models/videos:

Herdmania **:** General anatomy

Labeo : Digestive and reproductive systems, heart, afferent and branchial arteries, cranial nerves and internal ear.

Pigeon : Digestive, arterial, venous and urino-genital systems.

WhiteRat : Digestive, arterial, venous and urino-genital systems.

Study of permanent slides of whole mount of Pharynx of *Herdmania*and *Amphioxus.*

Cycloid scales of *Labeo,* blood smear of mammal, Histology of rat/rabbit (compound tissues)

Demonstration of evolutionary phenomena like homology, analogy, mimicry, crypsis.

Note:- Some changes can be made in the practical depending on the availability of material.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER III (SESSION: 2023-24)
MICROBIOLOGY
Course Title: Microbial Nutrition and Metabolism
Course Code: BSMM-3343
(THEORY)

Course Outcomes:

After passing this course the student will be able to:

CO1: Understand the nutritional requirements for growth of microorganisms and types of microorganisms on the basis of nutrition.

CO2: Understand the transport of nutrients across the cell membrane.

CO3: Learn about the metabolic pathways and electron transport chain of bacteria.

CO4: Learn about the enzyme kinetics and biosynthesis of nucleic acids.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER III (SESSION: 2023-24)
MICROBIOLOGY
Course Title: Microbial Nutrition and Metabolism
Course Code: BSMM-3343
(THEORY)

Examination Time: 3 Hours **Max. Marks: 100**

Theory Marks: 60

Practical Marks: 20

CA: 20

Instructions for the Paper Setter: Eight questions of equal marks (12 marks each) are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

UNIT–I

Nutrition, requirements for growth of microorganisms, nutrients and accessory constituents, medium designing. Nutritional types of microorganisms (photolithotrophs, photoorganotrophs, chemolithotrophs and chemoorganotrophs)

UNIT–II

Transport of nutrients across the cell membrane, diffusion, passive transport, active transport, and group translocation for the transport of nutrients across the membrane.

UNIT–III

Bioenergetics; Laws of thermodynamics, entropy, enthalpy and free energy of reaction standard, oxidative phosphorylation, electron transport, respiratory chains of bacteria, energy metabolism in aerobic and anaerobic microorganisms, pathways for breakdown of glucose (glycolysis, Kreb's cycle fermentation, pentose phosphate pathways), gluconeogenesis, metabolism of starch & cellulose by bacteria.

UNIT–IV

Assimilation of nitrogen, biosynthesis of nucleic acids, for synthesis of purine and pyrimidine nucleotides. Enzymes, kinetics, Michaelis Menten equation and allosteric enzymes.

Books Recommended:

1. Pelczar, M.I., Chan, E.C.S. and Krieg, N.R. 2011, 5th edition, Microbiology. Tata McGraw

HillPublishing Co., Ltd., New Delhi.

2. Stanier, R.Y., Ingraham, J.L., Wheelis, M.L. and Painter, P.R. 2005, 5th edition, General Microbiology, MacMillan Education Ltd. Publisher.
3. Powar, C.B. and Dagniwala, H.F. 2012, General Microbiology, Volume I and II, HimalayaPublishing House, Delhi.
4. Sharma, P.D. 2010, Microbiology, Rastogi Publications, Meerut. 142.
5. Bacterial physiology and metabolism by Byung Hong Kim and Geoffrey Michael Gadd. (Online available)

BACHELOR OF SCIENCE (MEDICAL) SEMESTER III (SESSION: 2023-24)
MICROBIOLOGY
Course Title: Microbial Nutrition and Metabolism (Practical)
Course Code: BSMM-3343
(PRACTICAL)

COURSE OUTCOMES

After passing the course student will be able to:

CO1: Analyze the growth of bacteria by different techniques

CO2: Identify the fermenting and non-fermenting bacteria

CO3: Demonstrate Sthe effect of various concentrations of Carbon and Nitrogen on bacteria

CO4: Demonstrate the effect of various parameters such as temperature, pH, salt and metal on growth of bacteria

BACHELOR OF SCIENCE (MEDICAL) SEMESTER III (SESSION: 2023-24)
MICROBIOLOGY
Course Title: Microbial Nutrition and Metabolism (Practical)
Course Code: BSMM-3343
(PRACTICAL)

Time: 3 hrs **Marks: 20**

Instructions for the practical examiner: Question paper is to be set on the spot jointly bythe Internal and External Examiners. Two copies of the same may be submitted for the record to COE Office, Kanya Maha Vidyalaya, Jalandhar.

LIST OF PRACTICALS

1. Isolation and enumeration of total bacteria from soil by pour plating and spreadplating.
2. Comparison of growth on complex medium and defined or minimal medium.
3. Distinction between fermenting and non-fermenting microorganisms.
4. Effects of various concentrations of carbon source on bacterial growth.
5. Effects of various concentrations of nitrogen source on bacterial growth.
6. Effect of temperature on bacterial growth.
7. Effect of pH on bacterial growth.
8. Effect of salt on bacterial growth.
9. Effect of metals on bacterial growth.
10. Effect of dye on bacterial growth.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER III (SESSION: 2023-24)
CHEMISTRY
Course Title: Organic Chemistry
Course Code: BSMM-3084 (I)
(THEORY)

Course outcomes:

Students will be able to

CO1: To resolve the different enantiomers and differentiate between dextrorotatory-leavorotatory chiral and achiral compounds, understand the concept of isomerism, axial and equatorial bonds.

CO2: Understand the methods of formation, chemical reactions, acidic character of alcohols

CO3: Preparation of understand structure and bonding phenols, acidic character of phenols

CO4: Compare reactivity of aliphatic and aromatic aldehydes and ketones, to understand the various reactions given by carbonyl compounds

BACHELOR OF SCIENCE (MEDICAL) SEMESTER III (SESSION: 2023-24)
CHEMISTRY
Course Title: Organic Chemistry
Course Code: BSMM-3084 (I)
(THEORY)

Time: 3 Hrs. **Max. Marks: 30**

Instructions for the Paper Setter

Eight questions of equal marks (6 each) are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions,selecting at least one question from each section. The fifth question may be attempted from any Section.

Unit I

Stereochemistry of Organic Compounds

Concept of isomerism,types of isomerism, Optical isomerism, elements of symmetry, molecular chirality, enantiomers, stereogeniccentre, optical activity, properties of enantiomers, chiral and achiral molecules with two stereogeniccentres, diastereomers, threo and erythrodiasteremers, meso compounds, resolution of enantiomers, inversion, retention and racemization. Relative and absolute configuration, sequence rules, D and L and R and S systems of nomenclature. Geometric isomerism–determination of configuration of geometric isomers. E and Z system of nomenclature. Conformational isomerism–conformational analysis of ethane and n–butane; conformation of cyclohexane, axial and equatorial bonds, conformation of mono substituted cyclohexane derivatives. Newman projection and Sawhorse formulae, Fischer and flying wedge formulae. Difference between configuration and conformation.

Unit–II

Alcohols

Classification and nomenclature.Monohydric alcohols—nomenclature, Acidic nature, Reactions of alcohols, Dihydric alcohols—nomenclature, methods of formation, chemical reactions of vicinal glycols, oxidative cleavage [$Pb(OAc)_4$] and [HIO_4] and pinacol-pinacolone rearrangement.

Unit–III

Phenols

Nomenclature, structure and bonding, preparation of phenols, physical properties and acidic character, Comparative acidic strengths of alcohols and phenols, resonance stabilization of phenoxide ion.Reactions of phenols—electrophilic aromatic substitution, acylation and carboxylation.Mechanisms of Fries rearrangement, Claisen rearrangement, Gatterman synthesis, Reimer Tiemann reaction.

Unit–IV

Aldehydes and Ketones

Nomenclature and structure of the carbonyl group. Synthesis of aldehydes and ketones with particular reference to the synthesis of aldehydes from acid chlorides, synthesis of aldehydes and ketones using 1,3-dithianes, synthesis of ketones from nitriles and from carboxylic acids. Physical properties.Mechanism of nucleophilic additions to carbonyl group with particular emphasis on benzoin, aldol, Perkin and Knoevenagel condensations.Condensation with ammoniaand its derivatives. Witting reaction,Mannich reaction.Use of acetals as protecting group.Oxidation of aldehydes, Baeyer-Villiger oxidation of Ketones, Cannizzaro reaction.MPV, Clemmensen, Wolff-Kishner, $LiAlH_4$ and $NaBH_4$ reductions. Halogenation of enolizable ketones. Halogenation of enoliable ketones

Books suggested:

1. Morrison, R.T., Boyd, R.N., Organic Chemistry; 6th edition, Pubs: Prentice-Hall, 1992.
2. Wade Jr., L.G., Singh, M.S., Organic Chemistry; 6th edition, Pubs: Pearson Education, 2008.
3. Mukherji, S.M., Singh, S.P., Kapoor, R.P., Organic Chemistry; Pubs: Wiley Eastern Limited, 1985, Vol. I, II, III.
4. Solomons, T.W., Fryhle, C.B., Organic Chemistry; 9th edition, Pubs: Wiley India, 2007.
5. Carey, F.A., Organic Chemistry; 4th edition, Pubs: McGraw-Hill, 2000.
6. Streitwieser, A., Clayton, Jr., Heathcock, H., Introduction to Organic Chemistry; 3rd edition, Pubs:Macmillan Publishing Company, 1989.
7. University General Chemistry, C.N.R. Rao, Macmillan.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER III (SESSION: 2023-24)
CHEMISTRY
Course Title: Physical Chemistry
Course Code: BSMM-3084 (II)
(THEORY)

Course outcomes:

Students will be able to

CO1: Understand and evaluate thermodynamic property of any system and its applications to various systems, acquire the knowledge of phase equilibria of various systems

CO2: Demonstrate the carnot cycle, understand the concept of Entropy

CO3: Understand the concept of Residual entropy, demonstrate Clausius-Clapeyron equation, CO4: understand concept of spontaneity of a reaction in terms of free energy change.

CO4: Understand and demonstrate the concept of phase equilibria of one component system, two component system

BACHELOR OF SCIENCE (MEDICAL) SEMESTER III (SESSION: 2023-24)
CHEMISTRY
Course Title: Physical Chemistry
Course Code: BSMM-3084 (II)
(THEORY)

Time: 3 Hrs. **Max. Marks: 30**

Instructions for the Paper Setter

Eight questions of equal marks (6 each) are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions,selecting at least one question from each section. The fifth question may be attempted from any Section.

Unit–I

Thermodynamics-I

Definition of thermodynamic terms: System, surroundings etc. Types of systems, intensive and extensive properties. State and path functions and their differentials. Thermodynamic process. Concept of heat and work.

First Law of Thermodynamics:

Statement, definition of internal energy and enthalpy. Heat capacity, heat capacities at constant volume and pressure and their relationship. Joule's law-Joule-Thomson coefficient and inversion temperature, Calculation of w,q,dUanddH for the expansion of ideal gases under isothermal and adiabatic conditions for reversible process.

Thermochemistry:

Standard state, standard enthalpy of formation-Hess's Law of heat summation and its applications. Heat of reaction at constant pressure and at constant volume. Enthalpy of neutralization. Bond dissociation energy and its calculation from thermo-chemical data, temperature dependence of enthalpy. Kirchhoff's equation.

Unit–II

Thermodynamics-II

Second Law of Thermodynamics: Need for the law, different statements of the law, Carnot cycle and its efficiency, Carnot theorem. Thermodynamic scale of temperature.

Concept of Entropy: Entropy as a state function, entropy as a function of V and T, entropy as a function of P and T, entropy change in physical change, Clausius inequality, entropy as a criteria of spontaneity and equilibrium. Entropy change in ideal gases and mixing of gases.

Unit–III

Thermodynamics-III

Third Law of Thermodynamics: Nernst heat theorem, statement and concept of residual entropy, evaluation of absolute entropy from heat capacity data. Gibbs and Helmholtz

functions; Gibbs function (G) and Helmholtz function (A) as thermodynamic quantities, A and G as criteria for thermodynamic equilibrium and spontaneity, their advantage over entropy change, Variation of G and A with P,V and T.

Chemical Equilibrium

Equilibrium constant and free energy. Thermodynamic derivation of law of mass action. Determination of K_p, K_c, K_a and their relationship, Clausius-Clapeyron equation, applications.

Unit–IV

Introduction to Phase Equilibrium

Statement and meaning of the terms-phase, component and degree of freedom, derivation of Gibbs phase rule, phase equilibria of one component system-water, CO_2 and S systems. Phase equilibria of two component systems-solid-liquid equilibria, simple eutectic-Bi-Cd, Pb-Ag systems, desilverisation of lead. Solid solutions-compound formation with congruent melting point (Mg-Zn) and incongruent melting point, (NaCl-H_2O), $FeCl_3$-H_2O) and $CuSO_4$-H_2O) system. Freezing mixtures, acetone-dry ice. Non-ideal system-azeotropes-HCl-H_2O and ethanol-water system. Partially miscible liquids Phenol-water, trines-thylamin-water, Nicotine-water System. Lower and upper consulate temperature, Effect of impurity on consolute temperature, immiscible liquids, steam distillation. Nernst distribution law-thermodynamic derivation and applications.

Books suggested:

1. Atkins, P., Paula, J.de, Atkins Physical Chemistry; 8th edition, Pubs: Oxford University Press, 2008.
2. Puri, B.R., Sharma, L.R., Pathania, M.S., Principles of Physical Chemistry; 43rd edition Pubs: Vishal Publishing Co., 2008.
3. Barrow, G.M., Physical Chemistry; 6th edition, Pubs: McGraw Hill Inc, 1996.
4. Rao, C.N.R., University General Chemistry; Pubs: Macmillan India, 1985.
5. Berry, R.S., Rice, S.A., Ross, J., Physical Chemistry; 2nd edition, Pubs: Oxford University Press, 2000.
6. Albert, R.A., Silbey, R.J., Physical Chemistry; 1st edition, Pubs: John Wiley and Sons Inc., 1992.
7. Dogra, S.K., Dogra, S., Physical Chemistry Through Problems; Pubs:Wiley Eastern Limited, 1991.
8. Levine, I.N., Physical Chemistry; 5th edition, Pubs: Tata McGraw Hill Publishing Co. Ltd., 2002.
9. Moore, W. J., Basic Physical Chemistry; Pubs: Prentice Hall of India Pvt. Ltd, 1983.
10. Metz, C.R., Theory and Problems of Physical Chemistry; Schaum's outline series, 2nd edition, Pubs: McGraw-Hall Book company, 1989.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER III (SESSION: 2023-24)
CHEMISTRY
Course Title: Chemistry Practical
Course Code: BSMM-3084 (P)
(PRACTICAL)

Course outcomes:

Students will be able to

CO1: Understand and master the technique of volumetric analysis, analyze an acidic and alkali content in different samples,

CO2: To analyze calcium content in various samples permanganometricall, understand the concept of hardness of water and its analysis by EDTA method

CO3: Understand and master the technique of gravimetric analysis

CO4: To understand the concept of TLC and its applications

BACHELOR OF SCIENCE (MEDICAL) SEMESTER III (SESSION: 2023-24)
CHEMISTRY
Course Title: Chemistry Practical
Course Code: BSMM-3084 (P)
(PRACTICAL)

Duration: 3½ Hrs. **Max. Marks: 20**

Instruction for practical examiner: Question paper is to be set on the spot jointly by the Internal and External Examiners. Two copies of the same should be submitted for the record to COE office, Kanya Maha Vidyalaya, Jalandhar.

Quantitative Analysis

Volumetric Analysis

a. Determination of acetic acid in commercial vinegar using NaOH.

b. Determination of alkali content-antacid tablet using HCI.

c. Estimation of calcium content in chalk as calcium oxalate by permanganometry.

d. Estimation of hardness of water by EDTA.

e. Estimation of ferrous and ferric by dichromate method.

f. Estimation of copper using sodiumthiosulphate.

Gravimetric Analysis

Analysis of Cu as CuSCN and Ni as Ni (dimethylgloxime)

Organic Chemistry Laboratory Techniques

Thin Layer Chromatography

Determination of R_f values and identification of organic compounds.

(a). Separation of green leaf pigments (spinach leaves may be used).

(b). Preparation and separation of 2, 4. dinitrophenylhydrazones of acetone, 2-butone, 2-Butanone, hexan-2 and 3-one using toluene and light petroleum (40 : 60).

(c). Separation of a mixture of dyes using cyclohexane and ethyl acetate (8.5:1.5).

Practical Examination

1) Volumetry / Gravimetry	11
2) Thin Layer chromatography	04
3) Viva-Voce	03
4) Note Book	02

Books suggested:

1. Vogel's Textbook of Quantitative Inorganic Analysis (revised), J. Bassett, R.C. Denney, G.H. Jeffery and J. Mandham, ELBS.
2. Standard Methods of Chemical. Analysis, W.W. Scott: The Technical Press.
3. Experimental Inorganic Chemistry, W.G. Palmer, Cambridge.
4. Laboratory Manual in Organic Chemistry, R.K. Bansal, Wiley Eastern.
5. Vogel's Textbook of Practical Organic Chemistry, B.S. Furniss, A.J. Hannaford, V. Rogers, P.W.G. Smith and A.R. Tatchell, ELBS.
6. Experiments in General Chemistry, C.N.R. Rao and U.C. Aggarwal, East-West Press.
7. Experimental Organic Chemistry, Vol. I and II, P.R. Singh, D.S. Gupta and K.S. Bajpai, Tata McGraw Hill

BACHELOR OF SCIENCE (MEDICAL) SEMESTER III (SESSION: 2023-24)
BOTANY
Course Title: Structure, Development and Reproduction in Flowering Plants-I
Course Code: BSMM-3075 (I)
(THEORY)

Course outcome: -

After passing this course the student will be able to:

CO1: Understanding of basic body plan of a flowering plant, Diversity in plant form branching pattern and canopy architecture trees.

CO2: Understanding of shoot apical meristem and its histological organization. Cambium and its function and formation of secondary xylem.

CO3: Understanding of wood in relation to water and minerals, growth rings and structure of secondary phloem and periderm.

CO4: Understanding of origin, development, arrangement and diversity in size and shape of leaf, internal structure in relation to photosynthesis and water loss, senescence and abscission.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER III (SESSION: 2023-24)
BOTANY
Course Title: Structure, Development and Reproduction in Flowering Plants-I
Course Code: BSMM-3075 (I)
(THEORY)

Time: 3 Hrs **Max. Marks: 30**

Instructions for the Paper Setters:

Eight questions of equal marks (6 marks each) are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

Unit I

The basic body plan of a flowering plant-modular type of growth. Diversity in plant form in annuals, biennials and perennials; trees-largest and longest-lived, branching pattern; monopodial and sympodial growth; canopy architecture.

Unit II

The Shoot System: The shoot apical meristem and its histological organization; meristematic and permanent tissue, formation of internodes. Cambium and its functions; formation of secondary xylem.

Unit III

A general account of wood structure in relation to conduction of water and minerals; characteristics of growth rings, sapwood and heart wood; role of woody skeleton; secondary phloem-structure function relationships; periderm.

Unit IV

Leaf: Origin, development, arrangement and diversity in size and shape; internal structure in relation to photosynthesis and water loss; adaptations to water stress; senescence and abscission.

Suggested Readings:

- Beck, C.B. (2010). An Introduction to Plant Structure and Development: Plant anatomy for the Twenty First Century (2nd Edition). Cambridge University Press, UK.
- Cutler, D. F., Botha, T. and Stevenson, D. M. (2008). Plant Anatomy: An Applied Approach. Blackwell Publishing, Oxford, UK.
- Dickison, W.C. (2000). Integrative Plant Anatomy. Academic Press, California, USA.

- Mauseth, J.D. (1988). Plant Anatomy, The Benjamin/Cummings Publishing Company Inc., Menlo Park, California, USA.
- Raven, P.H., Evert, R.F. and Eichhorn, S.E. (2012). Biology of Plants, 8th edition. W.H. Freeman and Co., Worth Publishers, New York.
- Rudall, P. J. (2010). Anatomy of Flowering Plants: An Introduction to Structure and Development (3rd Edition). Cambridge University Press, UK.
- Thomas, P. (2014) Trees: Their Natural History, Cambridge University Press, Cambridge.
- Srivastava, H.N. (2018) Diversity of Seed Plants and Their Systematics, Vol. III, Pradeep's Publication.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER III (SESSION: 2023-24)
BOTANY
Course Title: Structure, Development and Reproduction in Flowering Plants-II
Course Code: BSMM-3075 (II)
(THEORY)

Course outcome: -

After passing this course the student will be able to:

CO1: Recognize the major groups of vascular plants and their phylogenetic relationships.

CO2: Know the structure and development of monocot and dicot embryos.

CO3: Understand different means of vegetative reproduction.

CO4: Understand physiology of seed germination.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER III (SESSION: 2023-24)
BOTANY
Course Title: Structure, Development and Reproduction in Flowering Plants-II
Course Code: BSMM-3075 (II)
(THEORY)

Time: 3 Hrs **Max Marks. 30**

Instructions for the Paper Setters:

Eight questions of equal marks (6 marks each) are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

Unit I

The Root System: The root apical meristem; differentiation of primary and secondary tissues and their roles; structural modification for storage, respiration, reproduction and for interaction with microbes.

Unit II

Vegetative Reproduction: various methods of vegetative propagation. Detailed study and types of grafting and budding, economic aspects. Flower: A modified shoot; structure, development and varieties of flower; functions

Unit III

Structure of anther and pistil; the male and female gametophytes; types of pollination; attractions and reward for pollinators; (sucking and foraging types); pollen-pistil interaction self-incompatibility.

Unit IV

Double fertilization: formation of seed endosperm and embryo: fruit development and maturation Significance of Seed: Suspended animation; ecological adaptation; unit of genetic recombination with reference to reshuffling of genes and replenishment; dispersal strategies.

Suggested readings:

- Bhojwani, S.S., Bhatnagar, S.P. and Dantu P.K. (2015). The Embryology of Angiosperms, 6th edition. Vikas Publishing House, Delhi.
- Hartmann, H.T. and Kestler, D.E. (2010). Plant Propagation: Principles and Practices, 8th edition, Prentice Hall of India Pvt. Ltd., New Delhi.
- Mauseth, J.D. (1988). Plant Anatomy, The Benjamin/Cummings Publishing Company Inc., Menlo Park, California, USA.
- Peau, K. (2006). Anatomy of Seed Plants, 3rd edition. John Wiley & Sons, New York.

- Pegeri, K. and Vander Pijl (2013). The Principles of Pollination Biology, Pergamon Press, Oxford.
- Raven, P.H., Evert, R.F. and Eichhorn, S.E. (2014). Biology of Plants, 8th edition. W.H. Freeman and Co., Worth Publishers, New York.
- Srivastava, H.N. (2018) Diversity of Seed Plants and Their Systematics, Vol. III, Pradeep's Publication.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER III (SESSION: 2023-24)
BOTANY
Course Title: Practical- Structure, Development and Reproduction in Flowering Plants- I & II
Course Code: BSMM-3075 (P)
(PRACTICAL)

Course outcome: -

After passing this course the student will be able to:

CO1: Develop knowledge about the role of herbarium techniques in plant identification.

CO2: Understand different life forms exhibited by flowering plants.

CO3: Understand anatomy of different plant parts using free hand razor technique.

CO4: Examine flower and their mode of pollination.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER III (SESSION: 2023-24)
BOTANY
Course Title: Practical- Structure, Development and Reproduction in Flowering Plants- I & II
Course Code: BSMM-3075 (P)
(PRACTICAL)

TIME: 3 Hours **Practical: 20**

Instructions for the paper setter: question paper is to be set on the spot jointly by the Internal and External Examiners. Two copies of the same may be submitted for the record to COE Office, Kanya Maha Vidyalaya, Jalandhar.

Suggested Laboratory Exercises

1. Study of any commonly occurring dicotyledonous plant (for example *Solanum nigrum* or Kalanchoe) to the body plan, organography and modular type of growth.
2. Life forms exhibited by flowering plants (by a visit to a forest or a garden, Study of tree like habit in cycads, bamboo, banana, traveller's tree (*Revenala madagascariensis*) and Yucca and comparison with true trees as exemplified by conifers and dicotyledons.
3. L.S. Shoot tip to study the cytohistological zonation and origin of leaf primordia.
4. Monopodial and sympodial types of branching in stems (especially rhizomes).
5. Anatomy of primary and secondary growth in monocots and dicots using free hand razor technique (*Solanum*, *Boerhavia*, *Helianthus*, *Mirabilis*, *Nyctanthus*, *Draceana*, Maize) hand sections (or prepared slides). Structure of secondary phloem and xylem. Growth rings in wood, microscopic study of wood in T.S., T.L.S. and R.L.S.
6. Field study of diversity in leaf shape, size, thickness, surface properties. Internal structure of leaf. Structure and development of stomata (using epidermal peels of leaf).
7. Anatomy of the root. Primary and secondary structure.
8. Examination of a wide range of flowers available in the locality and methods of their pollination.
9. Structure of anther, microsporogenesis (using slides) and pollen grains (using whole mounts). Pollen viability using in vitro pollen germination.
10. Structure of ovule and embryo sac development using serial sections from permanent slides.
11. Nuclear and cellular endosperm. Embryo development in monocots and dicots (using permanent slides/dissections).
12. Simple experiments to show vegetative propagation (leaf cuttings in *Bryophyllum*, *Sansevieria*, *Begonia*; stem cuttings in rose, *Salix*, money plant, Sugarcane and *Bougainvillea*).
13. Germination of non-dormant and dormant seeds.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER III (SESSION: 2023-24)
FOOD SCIENCE AND QUALITY CONTROL (VOCATIONAL)
Course Title: Food Processing and Packaging
Course Code: BSMM-3255
(THEORY)

Course Outcomes:

After passing this course the student will be able to:

CO1: Learn about the methods of food preservation and processing of fats, oils and sugar.

CO2: Learn about the processing of salt, tea, coffee, chocolate and cocoa powder, extrudedfoods and role of enzymes in food processing.

CO3: Learn about spices and flavors, food additives and manufacturing of fermented products.

CO4: Understand types of packaging materials, their properties and machinery.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER III (SESSION: 2023-24)
FOOD SCIENCE AND QUALITY CONTROL (VOCATIONAL)
Course Title: Food Processing and Packaging
Course Code: BSMM-3255
(THEORY)

Examination Time: 3 Hours

Max. Marks: 100
Theory Marks: 60
CA: 20

Instructions for the Paper Setter: Eight questions of equal marks (12 marks each) are to be set,two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

UNIT-I

Physical principles underlying food processing operations including thermal processing,ionizing radiation, refrigeration, freezing, dehydration.
Chemical preservation in food processing.
Fats and Oils: Types and sources of fats and oils (animal and vegetable), processing, uses,storage and nutritional aspects.
Sugar and Sugar Products: Different forms of sugar (sugar, jaggery, honey syrup), manufacture, selection, storage and use.

UNIT-II

Salt: preparation of brine and pickling.
Processing of: Tea, coffee, chocolate and cocoa powder.
Extruded foods.
Enzymes: Definition, factors affecting enzyme activity, role of enzymes in food processing.

UNIT-III

Fermentation technology, manufacturing of fermented products: Wine, vinegar, beer,yoghurt, etc.
Spices and flavors.
Food additives, classes of food additives, role in food processing.

UNIT-IV

Definition and functions of Packaging

Types of packaging materials: metal, glass, wood, paper and plastics and their importance

Types of packages and their evaluation: bottle, pouch, tetra-pack and cans

Packaging machinery

Shelf life testing

Books Recommended

1. Post Harvest Technology of Cereals, Pulses and Oilseeds, 2019, 3rdEdition,Amalendu Chakraverty.
2. Technology of Cereals, 1994, 4th Edition, Norman Leslie Kent and A.D. Evers.
3. Preservation of Fruits & Vegetables, 2009, GirdhariLal, G.S Siddappa and G.L Tandon.
4. Principles of Food Packaging, 1980, 2nd Edition, Stanley Sacharow and Roger C. Griffin.
5. Chemistry of food additives and preservatives, 2012, 1st Edition, Titus A.M. Msagati.
6. Food Preservation, 2nd Edition, M. ShafiurRahman. **(Online available)** http://www.cold.org.gr/library/downloads/Docs/Handbook%20of%20Food%20Preservatio n.PDF
7. Food Packaging – Principles and practice, 3rd Edition, 2012, Gordon L. Robertson. **(Onlineavailable)** **https://es.1lib.in/book/2353881/49b558?dsource=recommend**

BACHELOR OF SCIENCE (MEDICAL) SEMESTER III (SESSION: 2023-24)
FOOD SCIENCE AND QUALITY CONTROL (VOCATIONAL)
Course Title: Food Processing and Packaging
Course Code: BSMM-3255 (P)
(PRACTICAL)

Course Outcomes:

After passing the course student will be able to:

CO1: Ability to identify various food packaging materials.

CO2: Assessing the physical characteristics of cereals and assessment of gluten quality in wheat flour.

CO3: Understanding of blanching as food processing technique and its importance in food preservation and quality.

CO4: Conducting strength tests on packaging materials to assess their durability.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER III (SESSION: 2023-24)
FOOD SCIENCE AND QUALITY CONTROL (VOCATIONAL)
Course Title: Food Processing and Packaging
Course Code: BSMM-3255 (P)
(PRACTICAL)

Time: 3 hours **Max. Marks: 20**

Instructions for the practical examiner: Question paper is to be set on the spot jointly by the Internal and External Examiners. Two copies of the same may be submitted for the record to COE Office, Kanya Maha Vidyalaya, Jalandhar.

List of Practicals:

1. Determination of physical characteristics of cereals.
2. Milling of wheat into flour.
3. Determination of wet and dry gluten contents.
4. Identification of packaging materials.
5. To estimate the shelf life of packaged food.
6. To determine the strength of different packaging material.
7. To find out the tin coating weight.
8. To find out the uniformity and amount of wax on wax paper.
9. To check the chemical resistance of packaging materials.
10. To check the adequacy of blanching.
11. Visit to various industries dealing with food packaging material like, paper board and metal.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER IV (SESSION: 2023-24)
ENVIRONMENTAL STUDIES
Course Title: Environmental Studies (Compulsory)
Course Code- AECE -3221

COURSE OUTCOMES:

After passing this course students will be able to:

CO1: Understand the concept and need of environmental education.

CO2: Understand the role of an individual in conservation of natural resources.

CO3: Learn about role of major Eco system and their conservation.

CO4: Develop desirable attitude,value and respect for protection of Biodiversity.

CO5: Learn about the control measure of pollution and solid waste management.

CO6: Understand the role of different agencies in the protection of environment.

CO7: Knowledge regarding welfare programmes and Human rights.

CO8: Knowledge about the applied value of environmental studies.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER IV (SESSION: 2023-24)

ENVIRONMENTAL STUDIES

Course Title: ENVIRONMENTAL STUDIES (Compulsory)

Course Code- AECE -3221

Time: 3 Hrs. **Max. Marks: 100**

Theory: 60

Project Report: 20

CA: 20

Instructions for the Paper Setter:

The question paper should carry 60 marks.

The structure of the question paper being:

Part-A, Short answer pattern – 20 marks

Attempt any five questions out of seven. Each question carries 4 marks. Answer to each question should not exceed 2 pages

Part-B, Essay type with inbuilt choice – 40 marks

Attempt any five questions out of eight. Each question carries 8 marks. Answer to each question should not exceed 5 pages.

Unit 1

The multidisciplinary nature of environmental studies

Definition, scope and importance, Need for public awareness

Unit 2

Natural Resources: Renewable and non-renewable resources:

Natural resources and associated problems.

(a) Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people.

(b) Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems.

(c) Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies.

(d) Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.

(e) Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources, case studies.

(f) Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification.

- Role of an individual in conservation of natural resources.
- Equitable use of resources for sustainable lifestyles.

Unit 3

Ecosystems

- Concept of an ecosystem
- Structure and function of an ecosystem
- Producers, consumers and decomposers
- Energy flow in the ecosystem
- Ecological succession
- Food chains, food webs and ecological pyramids
- Introduction, types, characteristic features, structure and function of the following ecosystem: Forest ecosystem, Grassland ecosystem, Desert ecosystem, Aquatic ecosystems (ponds, streams, lakes, rivers, ocean estuaries)

Unit 4

Biodiversity and its conservation

- Introduction – Definition: genetic, species and ecosystem diversity
- Biogeographical classification of India
- Value of biodiversity: consumptive use, productive use, social, ethical aesthetic and option values
- Biodiversity at global, national and local levels
- India as a mega-diversity nation
- Hot-spots of biodiversity
- Threats to biodiversity: habitat loss, poaching of wildlife, man wildlife conflicts
- Endangered and endemic species of India
- Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity

Unit 5

Environmental Pollution

Definition

- Causes, effects and control measures of Air pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution, Thermal pollution, Nuclear pollution
- Solid waste management: Causes, effects and control measures of urban and industrial wastes.
- Role of an individual in prevention of pollution
- Pollution case studies
- Disaster management: floods, earthquake, cyclone and landslides

Unit 6

Social Issues and the Environment

- From unsustainable to sustainable development
- Urban problems and related to energy
- Water conservation, rain water harvesting, watershed management
- Resettlement and rehabilitation of people; its problems and concerns. Case studies.
- Environmental ethics: Issues and possible solutions
- Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case studies.
- Wasteland reclamation

- Consumerism and waste products
- Environmental Protection Act, 1986
- Air (Prevention and Control of Pollution) Act, 1981
- Water (Prevention and control of Pollution) Act, 1974
- Wildlife Protection Act
- Forest Conservation Act

- Issues involved in enforcement of environmental legislation
- Public awareness

Unit 7

Human Population and the Environment

- Population growth, variation among nations
- Population explosion – Family Welfare Programmes
- Environment and human health
- Human Rights
- Value Education
- HIV / AIDS
- Women and Child Welfare
- Role of Information Technology in Environment and Human Health
- Case Studies

Unit 8

Field Work

- Visit to a local area to document environmental assets river/forest/grassland/hill/mountain
- Visit to a local polluted site – Urban / Rural / Industrial / Agricultural
- Study of common plants, insects, birds
- Study of simple ecosystems-pond, river, hill slopes, etc

References:

1. Bharucha, E. 2005. Textbook of Environmental Studies, Universities Press, Hyderabad.
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3. Heywood, V.H. & Waston, R.T. 1995. Global Biodiversity Assessment, Cambridge House, Delhi.
4. Joseph, K. & Nagendran, R. 2004. Essentials of Environmental Studies, Pearson Education (Singapore) Pte. Ltd., Delhi.
5. Kaushik, A. & Kaushik, C.P. 2004. Perspective in Environmental Studies, New Age International (P) Ltd, New Delhi.
6. Rajagopalan, R. 2011. Environmental Studies from Crisis to Cure. Oxford University Press, New Delhi.

7. Sharma, J. P., Sharma. N.K. & Yadav, N.S. 2005. Comprehensive Environmental Studies, Laxmi Publications, New Delhi.

8. Sharma, P. D. 2009. Ecology and Environment, Rastogi Publications, Meerut.

9. State of India's Environment 2018 by Centre for Sciences and Environment, New Delhi

10. Subramanian, V. 2002. A Text Book in Environmental Sciences, Narosa Publishing House, New Delhi

BACHELOR OF SCIENCE (MEDICAL) SEMESTER IV (SESSION: 2023-24)
PUNJABI
Course Title: Punjabi (Compulsory)

Course Code- BSML -4421

COURSE OUTCOMES

CO1: ‘ਪਗਡੰਡੀਆਂ’ (ਸਵੈਜੀਵਨੀ) ਨੂੰ ਪੜ੍ਹਾਉਣ ਦਾ ਮਨੋਰਥ ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਸਵੈ ਜੀਵਨੀ ਸਾਹਿਤ ਰੂਪ ਪ੍ਰਤੀ ਦਿਲਚਸਪੀ, ਸੂਝ ਨੂੰ ਪੈਦਾ ਕਰਨਾ ਹੈ।

CO2: ‘ਫ਼ਾਸਲੇ’ (ਨਾਟਕ) ਨੂੰ ਸਿਲੇਬਸ ਵਿਚ ਸ਼ਾਮਿਲ ਕਰ ਕੇ ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਨਾਟਕ ਨੂੰ ਪੜ੍ਹਣ ਦੀ ਰੁਚੀ ਨੂੰ ਪੈਦਾ ਕਰਨਾ ਹੈ ਅਤੇ ਨਾਟਕ ਜਗਤ ਨਾਲ ਜੋੜਣਾ ਹੈ।

CO3: ਦਫ਼ਤਰੀ ਚਿੱਠੀ ਪੱਤਰ ਅਤੇ ਅਖ਼ਬਾਰ ਵਿਚ ਇਸ਼ਤਿਹਾਰ ਲਿਖਣਾ ਸਿਖਾਉਣ ਦਾ ਮਨੋਰਥ ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਇਸ ਕਲਾ ਵਿਚ ਨਿਪੁੰਨ ਕਰਨਾ ਹੈ।

CO4: ਸ਼ਬਦ ਜੋੜਾਂ ਦੇ ਨਿਯਮ ਨੂੰ ਸਿਲੇਬਸ ਵਿਚ ਸ਼ਾਮਿਲ ਕਰਨ ਦਾ ਮਕਸਦ ਵਿਦਿਆਰਥੀਆਂ ਦੁਆਰਾ ਲਿਖ਼ਤ ਵਿਚ ਕੀਤੀਆਂ ਜਾਣ ਵਾਲੀਆਂ ਗਲਤੀਆਂ ਨੂੰ ਸੁਧਾਰਨਾ ਹੈ। ਗੁਰਮੁਖੀ ਲਿਪੀ ਦੀਆਂ ਵਿਸ਼ੇਸ਼ਤਾਵਾਂ ਨੂੰ ਪੜ੍ਹਾਉਣ ਦਾ ਮਨੋਰਥ ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦੀ ਅਮੀਰੀ ਦਾ ਅਤੇ ਬਾਰੀਕੀਆਂ ਨੂੰ ਸਮਝਣ ਲਈ ਵੱਖਰੇ -ਵੱਖਰੇ ਸਿਧਾਂਤਾਂ ਦਾ ਵਿਕਾਸ ਕਰਨਾ ਹੈ।

BACHELOR OF SCIENCE (MEDICAL) SEMESTER IV (SESSION: 2023-24)

PUNJABI

Course Title: Punjabi (Compulsory)

Course Code- BSML -4421

ਸਮਾਂ : 3 ਘੰਟੇ **Maximum Marks: 50**

Theory: 40

CA: 10

ਪਾਠਕ੍ਰਮ ਅਤੇ ਪਾਠ ਪੁਸਤਕਾਂ

ਯੂਨਿਟ-I

ਪਗਡੰਡੀਆਂ (ਸਵੈਜੀਵਨੀ) : ਡਾ.ਬਚਿੰਤ ਕੌਰ

(ਸਾਰ /ਵਿਸ਼ਾ ਵਸਤੂ / ਆਤਮ ਬਿੰਬ) 8
ਅੰਕ

ਯੂਨਿਟ-II

ਫ਼ਾਸਲੇ (ਨਾਟਕ) :ਜਤਿੰਦਰ ਬਰਾੜ,

(ਵਿਸ਼ਾ ਵਸਤੂ/ਸਾਰ /ਨਾਟ ਜੁਗਤਾਂ) 8
ਅੰਕ

ਯੂਨਿਟ-III

(ੳ) ਦਫ਼ਤਰੀ ਚਿੱਠੀ ਪੱਤਰ

(ਅ) ਅਖ਼ਬਾਰ ਵਿਚ ਇਸ਼ਤਿਹਾਰ 8
ਅੰਕ

ਯੂਨਿਟ-IV

ਵਿਆਕਰਣ

(ੳ) ਸ਼ਬਦ ਜੋੜਾਂ ਦੇ ਨਿਯਮ

(ਅ) ਗੁਰਮੁਖੀ ਲਿਪੀ ਦੀਆਂ ਵਿਸ਼ੇਸ਼ਤਾਵਾਂ 8
ਅੰਕ

ਅੰਕ ਵੰਡ ਅਤੇ ਪਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ

1. ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਦੇ ਚਾਰ ਸੈਕਸ਼ਨ ਹੋਣਗੇ।ਸੈਕਸ਼ਨ A-D ਤੱਕ ਦੇ ਪ੍ਰਸ਼ਨ ਯੂਨਿਟ I-IV ਵਿਚੋਂ ਪੁੱਛੇ ਜਾਣਗੇ। ਹਰ ਸੈਕਸ਼ਨ ਵਿਚ ਦੋ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ।
2. ਵਿਦਿਆਰਥੀ ਨੇ ਕੁਲ ਪੰਜ ਪ੍ਰਸ਼ਨ ਕਰਨੇ ਹਨ। ਹਰ ਸੈਕਸ਼ਨ ਵਿਚੋਂ ਇਕ ਪ੍ਰਸ਼ਨ ਲਾਜ਼ਮੀ ਹੈ। ਪੰਜਵਾਂ ਪ੍ਰਸ਼ਨ ਕਿਸੇ ਵੀ ਸੈਕਸ਼ਨ ਵਿਚੋਂ ਕੀਤਾ ਜਾ ਸਕਦਾ ਹੈ।
3. ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ 08 ਅੰਕ ਹਨ।
4. ਪੇਪਰ ਸੈੱਟ ਕਰਨ ਵਾਲਾ ਜੇਕਰ ਚਾਹੇ ਤਾਂ ਪ੍ਰਸ਼ਨਾਂ ਦੀ ਵੰਡ ਅੱਗੋਂ ਵੱਧ ਤੋਂ ਵੱਧ ਚਾਰ ਉਪ ਪ੍ਰਸ਼ਨਾਂ ਵਿਚ ਕਰ ਸਕਦਾ ਹੈ।

BACHELOR OF SCIENCE (MEDICAL) SEMESTER IV (SESSION: 2023-24)
BASIC PUNJABI
Course Title: Basic Punjabi (In lieu of Punjabi Compulsory)
Course Code- BSML -4031

Course outcomes

CO1: ਮੁੱਢਲੀ ਪੰਜਾਬੀ ਦੇ ਵਿਦਿਆਰਥੀ 'ਆਤਮ ਅਨਾਤਮ' (ਕਵਿਤਾ ਭਾਗ) ਦੇ ਨਾਮਵਰ ਕਵੀਆਂ ਮੋਹਨ ਸਿੰਘ,ਜਗਤਾਰ,ਸੁਰਜੀਤ ਪਾਤਰ,ਪਾਸ਼ ਦੀਆਂ ਰਚਨਾਵਾਂ ਦੀ ਪ੍ਰਸੰਗ ਸਹਿਤ ਵਿਆਖਿਆ ਤੋਂ ਜਾਣੂ ਹੋਣਗੇ।

CO2: ਮੁੱਢਲੀ ਪੰਜਾਬੀ ਦੇ ਵਿਦਿਆਰਥੀ 'ਆਤਮ ਅਨਾਤਮ' (ਕਵਿਤਾ ਭਾਗ) ਦੇ ਵੱਖੋ ਵੱਖਰੀਆਂ ਧਾਰਾਵਾਂ ਨਾਲ ਸਬੰਧਤ ਮੋਹਨ ਸਿੰਘ,ਜਗਤਾਰ,ਸੁਰਜੀਤ ਪਾਤਰ,ਪਾਸ਼ ਦੀਆਂ ਰਚਨਾਵਾਂ ਦੇ ਸਾਰ ਤੋਂ ਜਾਣੂ ਹੋਣਗੇ।

CO3: ਮੁੱਢਲੀ ਪੰਜਾਬੀ ਦੇ ਵਿਦਿਆਰਥੀ 'ਆਤਮ ਅਨਾਤਮ' (ਕਵਿਤਾ ਭਾਗ) ਦੇ ਵੱਖੋ ਵੱਖਰੀਆਂ ਧਾਰਾਵਾਂ ਨਾਲ ਸਬੰਧਤ ਮੋਹਨ ਸਿੰਘ,ਜਗਤਾਰ,ਸੁਰਜੀਤ ਪਾਤਰ,ਪਾਸ਼ ਕਵੀਆਂ ਦੇ ਜੀਵਨ ਅਤੇ ਰਚਨਾ ਤੋਂ ਜਾਣੂ ਹੋਣਗੇ।

CO4: ਲੇਖ ਰਚਨਾ ਦਾ ਮਨੋਰਥ ਵਿਦਿਆਰਥੀਆਂ ਦੀ ਬੁੱਧੀ ਨੂੰ ਤੀਖਣ ਕਰਦਿਆਂ ਉਨਾਂ ਦੀ ਲਿਖਣ ਪ੍ਰਤਿਭਾ ਨੂੰ ਉਜਾਗਰ ਕਰਨਾ ਹੈ।ਸ਼ਬਦ ਜੋੜਾਂ ਦੇ ਨਿਯਮ ਨੂੰ ਸਿਲੇਬਸ ਵਿਚ ਸ਼ਾਮਿਲ ਕਰਨ ਦਾ ਮਕਸਦ ਵਿਦਿਆਰਥੀਆਂ ਦੁਆਰਾ ਲਿਖ਼ਤ ਵਿਚ ਕੀਤੀਆਂ ਜਾਣ ਵਾਲੀਆਂ ਗਲਤੀਆਂ ਨੂੰ ਸੁਧਾਰਨਾ ਹੈ।

BACHELOR OF SCIENCE (MEDICAL) SEMESTER IV (SESSION: 2023-24)
PUNJABI
Course Title: Basic Punjabi (In lieu of Punjabi Compulsory)
Course Code- BSML -4031

ਸਮਾਂ: 3 ਘੰਟੇ

Maximum Marks : 50
Theory : 40
CA: 10

ਪਾਠਕ੍ਰਮ

ਯੂਨਿਟ-I

ਆਤਮ ਅਨਾਤਮ (ਕਵਿਤਾ ਭਾਗ)(ਸੰਪਾਦਕ ਡਾ. ਸੁਹਿੰਦਰ ਬੀਰ ਅਤੇ ਡਾ.ਵਰਿਆਮ ਸਿੰਘ ਸੰਧੂ

ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ, ਅੰਮ੍ਰਿਤਸਰ।

ਮੋਹਨ ਸਿੰਘ,ਜਗਤਾਰ,ਸੁਰਜੀਤ ਪਾਤਰ,ਪਾਸ਼ ਸਿਲੇਬਸ ਦਾ ਹਿੱਸਾ ਹਨ।

ਪ੍ਰਸੰਗ ਸਹਿਤ ਵਿਆਖਿਆ

08 ਅੰਕ

ਯੂਨਿਟ-II

ਆਤਮ ਅਨਾਤਮ (ਕਵਿਤਾ ਭਾਗ)(ਸੰਪਾਦਕ ਡਾ. ਸੁਹਿੰਦਰ ਬੀਰ ਅਤੇ ਡਾ.ਵਰਿਆਮ ਸਿੰਘ ਸੰਧੂ

ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ, ਅੰਮ੍ਰਿਤਸਰ।

ਮੋਹਨ ਸਿੰਘ,ਜਗਤਾਰ,ਸੁਰਜੀਤ ਪਾਤਰ,ਪਾਸ਼ ਸਿਲੇਬਸ ਦਾ ਹਿੱਸਾ ਹਨ।(ਸਾਰ)

08 ਅੰਕ

ਯੂਨਿਟ-III

ਆਤਮ ਅਨਾਤਮ (ਕਵਿਤਾ ਭਾਗ)(ਸੰਪਾਦਕ ਡਾ. ਸੁਹਿੰਦਰ ਬੀਰ ਅਤੇ ਡਾ.ਵਰਿਆਮ ਸਿੰਘ ਸੰਧੂ

ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ, ਅੰਮ੍ਰਿਤਸਰ।

ਮੋਹਨ ਸਿੰਘ,ਜਗਤਾਰ,ਸੁਰਜੀਤ ਪਾਤਰ,ਪਾਸ਼ ਸਿਲੇਬਸ ਦਾ ਹਿੱਸਾ ਹਨ।

(ਕਵੀਆਂ ਦੇ ਜੀਵਨ ਅਤੇ ਰਚਨਾ ਬਾਰੇ ਮੁੱਢਲੀ ਜਾਣਕਾਰੀ)

08 ਅੰਕ

ਯੂਨਿਟ-IV

ਲੇਖ ਰਚਨਾ

ਅਸ਼ੁੱਧ ਸ਼ਬਦ ਜੋੜਾਂ ਨੂੰ ਸ਼ੁੱਧ ਕਰਕੇ ਲਿਖਣਾ 08 ਅੰਕ

ਅੰਕ ਵੰਡ ਅਤੇ ਪਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ

1. ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਦੇ ਚਾਰ ਸੈਕਸ਼ਨ ਹੋਣਗੇ।ਸੈਕਸ਼ਨ A-D ਤੱਕ ਦੇ ਪ੍ਰਸ਼ਨ ਯੂਨਿਟ I-IV ਵਿਚੋਂ ਪੁੱਛੇ ਜਾਣਗੇ। ਹਰ ਸੈਕਸ਼ਨ ਵਿਚ ਦੋ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ।

2. ਵਿਦਿਆਰਥੀ ਨੇ ਕੁੱਲ ਪੰਜ ਪ੍ਰਸ਼ਨ ਕਰਨੇ ਹਨ। ਹਰ ਸੈਕਸ਼ਨ ਵਿਚੋਂ ਇਕ ਪ੍ਰਸ਼ਨ ਲਾਜ਼ਮੀ ਹੈ। ਪੰਜਵਾਂ ਪ੍ਰਸ਼ਨ ਕਿਸੇ ਵੀ ਸੈਕਸ਼ਨ ਵਿਚੋਂ ਕੀਤਾ ਜਾ ਸਕਦਾ ਹੈ।

3. ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ 08 ਅੰਕ ਹਨ।

4. ਪੇਪਰ ਸੈੱਟ ਕਰਨ ਵਾਲਾ ਜੇਕਰ ਚਾਹੇ ਤਾਂ ਪ੍ਰਸ਼ਨਾਂ ਦੀ ਵੰਡ ਅੱਗੋਂ ਵੱਧ ਤੋਂ ਵੱਧ ਚਾਰ ਉਪ ਪ੍ਰਸ਼ਨਾਂ ਵਿਚ ਕਰ ਸਕਦਾ ਹੈ।

BACHELOR OF SCIENCE (MEDICAL) SEMESTER IV (SESSION: 2023-24)
PUNJAB HISTORY AND CULTURE
Course Title: Punjab History and Culture (Special paper in lieu of Punjabi Compulsory)
(For those students who are not domicile of Punjab)
Course Code- BSML -4431

After completing the paper the students will have a thorough insight into the origin of Sikh faith and its major institutions in Punjab

CO 1: understand the adoption of new policy by Guru Hargobind and martyrdom of Guru Tegh Bahadur

CO 2: To understand the factors leading to the establishment of Khalsa Panth and its impact

CO 3: Have deep insight into the conflict with Mughals and the rise of Banda Singh Bahadur and aftermath.

CO 4: Understand the administration under Maharaja Ranjit Singh, also the fairs, festivals and folk music of Punjab.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER IV (SESSION: 2023-24)
PUNJAB HISTORY AND CULTURE
Course Title: Punjab History and Culture (Special paper in lieu of Punjabi Compulsory)
(For those students who are not domicile of Punjab)
Course Code- BSML -4431

Examination Time: 3 Hours **Max. Marks: 50**
Theory: 40
CA: 10

Instructions for the Paper Setters

1. **Question paper shall consist of four Units**
2. **Examiner shall set 8 questions in all by selecting Two Questions of equal marks from each Unit.**
3. **Candidates shall attempt 5 questions in 600 words, by at least selecting One Question from each Unit and the 5th question may be attempted from any of the four Units.**
4. **Each question will carry 8 marks**

UNIT I

1. Transformation of Sikhism under Guru Hargobind.
2. Martydom of Guru Teg Bahadur

UNIT II

3. Creation of Khalsa
4. Khalsa and its impact on the Punjab

UNIT III

5. Banda Bahadur and his achievements
6. Rise of Misls.

UNIT IV

7. Maharaja Ranjit Singh:- Civil, Military and Land Revenue Administration.
8. Fair, Festivals and Folk Music in the Punjab during the medieval period (Jarag, Baisakhi and Diwali)

Suggested Readings

- Chopra P.N., Puri, B.N., & Das, M.N.(1974), A Social, Cultural & Economic History of India. Vol.II, Macmillan India Limited, New Delhi.
- Grewal, J.S. (1994). The Sikhs of the Punjab, Cambridge University Press, New Delhi.
- Singh, Fauja (1972). A History of the Sikhs, Vol. III, Patiala: Punjabi University.
- Singh, Kushwant (2011). A History of the Sikhs- Vol. I (1469-1839). New Delhi:
- Singh, Kirpal (1990). History and Culture of the Punjab-Part II (Medieval Period).

BACHELOR OF SCIENCE (MEDICAL) SEMESTER IV (SESSION: 2023-24)
ENGLISH
Course Title: English (Compulsory)
Course Code- BSML -4212

COURSE OUTCOMES

After passing this course, the students will be able to:

CO 1: Comprehend the basics of grammatical rules governing prepositions and phrasal verbs through the study of "English Grammar in Use" by Raymond Murphy

CO 2: Develop skills to write an essay on a given topic and enhance their vocabulary through the study of "The Students' Companion" by Wilfred D. Best

CO 3: Enhance their reading and analysing power of texts through guided reading through the study of "Making Connections" by Kenneth J. Pakenham

CO 4: Develop an understanding of the poems taught, relate to the socio-cultural background of England and be able to answer questions regarding tone, style and central idea through the study of the poems in the prescribed text "Moments in Time"

BACHELOR OF SCIENCE (MEDICAL) SEMESTER IV (SESSION: 2023-24)
ENGLISH
Course Title: English (Compulsory)
Course Code- BSML -4212

Max. Marks: 50
Examination Time: 3 Hrs **Theory: 40**
CA: 10

Instructions for the Examiner:
The paper setters should avoid questions of theoretical nature from *Making Connections*.
Section A: One question with sub-parts will be set from Unit I of the syllabus. Fifteen sentences will be set and the students would be required to attempt any ten. Each sentence will carry one mark. **(10×1=10)**

Section B: Two questions will be set from Unit II of the syllabus. The students would be required to attempt one essay out of the given two topics carrying six marks (word limit 300 words). The second question will be based on vocabulary. The students would be required to write single words for phrases and sentences choosing any four out of six and each carrying one mark. **(1×6 + 4×1=10)**

Section C: The students would be required to attempt two questions (with sub parts) based on exercises as given before and after reading essays in the prescribed text book *Making Connections.* **(2×5=10)**

Section D: This section will be divided into two parts. In part one, three questions based on central idea, theme, tone and style etc. of the poems from the prescribed textbook, *Moments In Time* from Unit IV of the syllabus will be set. The students would be required to attempt any two, each carrying three marks (100 words each). **(2×3=6)**
Part two will have one question (with internal choice) requiring students to explain a stanza with reference to context carrying four marks (word limit 200 words). The stanzas for explanation will be taken from the prescribed textbook, *Moments in Time* from Unit IV in the syllabus. **(1×4=4)**

Unit I

English Grammar in Use, 4th Edition by Raymond Murphy, CUP (Units 121-145)

Unit II

Essay Writing and *The Students' Companion* by Wilfred D. Best (Section 1: Single words for phrases and sentences: Words pertaining to Government, words pertaining to Marriage, Opposites and Negatives)

Unit III

Making Connections by Kenneth J. Pakenham, 2nd Edn. CUP: Unit-IV

Unit IV

Moments in Time: Poems at Sr. No. 7-12

Texts Prescribed:

1. *English Grammar in Use* (Fourth Edition) by Raymond Murphy, CUP
2. *The Students' Companion* by Wilfred D. Best
3. *Making Connections* by Kenneth J. Pakenham, 2nd Edn. CUP
4. *Moments in Time: An Anthology of Poems*, GNDU, Amritsar

BACHELOR OF SCIENCE (MEDICAL) SEMESTER IV (SESSION: 2023-24)
ZOOLOGY

Course Title: Biochemistry

Course Code: BSMM-4483 (I)

(THEORY)

Course Outcome

After passing this course the student will be able to:

CO1: Understand the structure and functions of biologically important molecules.

CO2: Understand about enzymes, coenzymes and lipid metabolism.

CO3: Understand various processes of carbohydrate metabolism.

CO4: Gain knowledge about protein metabolism.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER IV (SESSION: 2023-24)
ZOOLOGY

Course Title: Biochemistry

Course Code: BSMM-4483 (I)

(THEORY)

Max. Time: 3 Hrs. **Max Marks: 30**

Instructions for the Paper Setter

Eight questions of equal marks (6 marks each) are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

Unit I

Biochemistry and its scope
Classification and functions of:
- Carbohydrates
- Proteins
- Lipids
- Nucleic acids

Unit II

Enzymes:
- Nature and their classification
- Coenzymes.

Lipid Metabolism:
- B-Oxidation of fatty acid
- Ketosis

Unit III

Carbohydrate Metabolism:
- Glycolysis
- Tricarboxylic acid cycle
- Hexose monophosphate shunt
- Glycogenesis
- Glycogenolysis
- Gluconeogenesis
- Oxidative Phosphorylation

Unit IV

Protein Metabolism:
- Metabolism of amino acids
- Oxidative deamination

Transamination
Decarboxylation
Hydrolysis of proteins
Ornithine cycle

Suggested Reading Material:-

1. Conn, E.E., Stump. P.K. Bruening, S. and Doi R.H. (2006), Outlines of Biochemistry (5th ed), John Wiley and Sons Inc., New York.
2. Fischer, J. and Arriold, J.R.P. (2001). Instant notes in Chemistry for Biologists, Viva Books Pvt. Ltd.
3. Harper, H.A. (2018): Harper's Biochemistry (31st ed).
4. Holde, K.E.V., Johnson, W.C. and Shing, P. (2005). Principles of Physical Biochemistry Prentice Hall, Inc., USA.
5. Lehninger, A (2017). Principles of Biochemistry, (7th ed).
6. Morris, H. Best, L.R., Pattison, S., Arerna, S. (2013). Introduction to General Organic Biochemistry, (11th ed), Wadsworth Group.
7. Robert, K., Murray, Mayes Daryl, K. Granner, Victor, W., Woodwell (1990), Harper's Biochemistry, 22nd Edition, Prentice Hall International Inc.
8. Sheehan, D (2013). Physical Biochemistry: Principles and Applications – John Wiley & Sons Ltd., England.
9. Stryer, L. (2019). Biochemistry (9th ed), San Francisco W.H. Freeman.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER IV (SESSION: 2023-24)
ZOOLOGY

Course Title: Animal Physiology

Course Code: BSMM-4483 (II)

(THEORY)

Course Outcomes

After passing this course the student will be able to:

CO1: Understand mechanism of digestion and respiration.

CO2: Have knowledge about composition of blood, blood groups, cardiac cycle and urine formation.

CO3: Understand mechanism of skeletal muscle contraction and neural integration.

CO4: Understand physiology of behavior and endocrine system.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER IV (SESSION: 2023-24)
ZOOLOGY

Course Title: Animal Physiology

Course Code: BSMM-4483 (II)

(THEORY)

Max. Time: 3 Hrs. **Max Marks: 30**

Instructions for the Paper Setter

Eight questions of equal marks (6 marks each) are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

Unit I

Digestion : Digestion of dietary constituents, regulation of digestive processes and absorption. Extra and intra cellular digestion, enzymatic digestion and symbiotic digestion.

Respiration : Transport of O_2 and CO_2, Oxygen dissociation curve of haemoglobin, Bohr effect, chloride (-) shift, Haldane effect and control of breathing.

Unit II

Heart : Origin and regulation of heart beat, cardiac cycle, electrocardiogram, cardiac output, Blood pressure and micro-circulation.

Blood : Composition and functions of blood and lymph. Blood clotting. Blood groups including Rh factor, haemopoiesis

Excretion : Urine formation and osmoregulation.

Unit III

Muscles : Ultrastructure, chemical and physical basis of skeletal muscle contraction.

Neural Integration: Structure of neuron, resting membrane potential, Origin and propagation of impulse along the axon, synapse and myoneural function.

Unit IV

Physiology of Behavior: Taxes and reflexes, instinctive and motivate learning and reasoning

Endocrine : Structure and physiology of thyroid, parathyroid, adrenal, hypothalamus, pituitary, pancreas and gonads.

Suggested Reading Material:

1. Guyton, and Hall, (2015), Text Book of Medical Physiology, 15th Edition, Elsevier.
2. Hill, R. W., Wyse, G. K. and Anderson, N. 3 edi (2012), Animal physiology, Sinauer Associate, INC. Pub. Saunderland, Massachusettes, USA.

3. Hoar, W. S. (1984), General and Comparative Physiology, Prentice Hall of India Pvt. Limited, New Delhi, India.
4. Prosser, C.L.4th Edi (1991), Comparative Animal Physiology, Satish Book Enterprise Books seller & Publishers, Agra.
5. Purves, W. K., Oriane, G. H., Space, H. C. and Salava, D. (2001), Life – The Science of Biology (6th ed), Sinauer Assoc. Inc., USA.
6. Randall, D., Burggren, K.L. and French, K. (2002), Eckert Animal Physiology: Mechanisms and Adaptations, W.H. Freeman and Company, New York.
7. Taneja, S.K.(1997), Biochemistry & Animal Physiology, Trueman Book Co.
8. Willmer, P. Stone, G. and Johnston, I (2000). Environmental Physiology of Animals, Blackwell Science.
9. Withers, P.C. (1992), Comparative Animal Physiology, Saunder College Publishing, New York.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER IV (SESSION: 2023-24)
ZOOLOGY

Course Title: Practical- IV (Related to Biochemistry and Animal Physiology)

Course Code: BSMM-4483 (P)

(PRACTICAL)

Course Outcomes

CO1: Learn clinical procedures for blood & urine analysis.

CO2: Develop skill in simple biochemical laboratory procedures.

CO3: Skill in observing and to some extent in analysing various Biological Data.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–IV (SESSION 2023-24)
ZOOLOGY

Course Title: Practical -IV (Related to Biochemistry and Animal Physiology)

Course Code: BSMM-4483 (P)

(PRACTICAL)

Time: 3hrs. **Marks: 20**

Instructions for the Practical Examiners: Question paper is to set on the spot jointly by the Internal and External Examiners. Two copies of the same should be submitted for the record to COE Office, Kanya Maha Vidyalaya, Jalandhar

1. Study of the skeleton of *Scoliodon, Rana*, *Varanus, Gallus* and *Oryctolagus*.
2. Identification of food stuffs: starch, glucose, proteins and fats in solution.
3. Demonstration of osmosis and diffusion.
4. Demonstrate the presence of amylase in saliva, denaturation by pH and temperature.
5. Determination of coagulation and bleeding time of blood in man/rat/rabbit.
6. Determination of blood groups of human blood sample.
7. Recording of blood pressure of man.
8. Analysis of urine for urea, chloride, glucose and uric acid.
9. Estimation of haemoglobin content.
10. Field study: Visit to a fossil Park/Lab/ Science City and submit a report / Familiarity with the local vertebrate fauna.

Guidelines for conduct of Practical Examination:

1.	Identify the given bones, make labeled sketches of their respective–views	8
2.	Write down the steps and determine the constituents in the given sample.	3
3.	Write the procedure and perform the given physiology experiment.	3
4.	Report on visit to a fossil park/lab/Science City/study of local vertebrate fauna.	2
5.	Viva-voce & Practical file.	4

Note:- Some changes can be made in the practical depending on the availability of material.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–IV (SESSION 2023-24)

MICROBIOLOGY

Course Title: Microbiology Ecology

Course Code: BSMM-4343

(THEORY)

Course Outcomes:

After passing this course the student will be able to:

CO1: Understand the Diversity of various microbial habitats.

CO2: Understand the various microbial interactions and competition for survival in nature.

CO3: Understand the role of microorganisms in geochemical cycles, concept of microbial toxins, biofertilizers and bioinsecticides.

CO4: Understand the effluent treatment, bioremediation and bioleaching.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–IV (SESSION 2023-25)

MICROBIOLOGY

Course Title: Microbiology Ecology

Course Code: BSMM-4343

(THEORY)

Time: 3 Hrs. **Max Marks: 100**

Theory Marks: 60

Practical Marks: 20

CA: 20

Instructions for the Paper Setters: Eight questions of equal marks are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

UNIT–I

Diversity of microbial habitats: Environmental selecting factors: - physical, chemical and biological types of microbial habitats: - atmospheric, aquatic and terrestrial environments.

UNIT–II

Microbial interactions, antagonism, commensalism, symbiosis, parasitism miscellaneous associations in nature. Competition for survival in nature (for nutrients, space, oxygen).

UNIT–III

Role of microorganisms in geochemical cycles: Carbon cycle, nitrogen cycle, phosphorus cycle and sulphur cycle, microbial toxins in the environment: Types of Microbial toxins, ecological consequences of microbial toxins as insecticidal agents, bioinsecticides, biofertilizers.

UNIT–IV

Concept of BOD and COD, Sewage and effluent treatment by primary, secondary and tertiary methods. Role of microbes in bioremediation of persistent pollutants and bioleachingof metals.

Books Recommended: (Edition of books updated)

a. Edmonds, P., 1978, Microbiology: An Environmental Perspective, MacMillan Publishing Co., Inc., New York.

b. Powar C.B. and Danginwala, H.F., 2017, General Microbiology, Volume II, 2nd ed. Himalaya Publishing House, New Delhi.

c. Sharma, P.D., 2010, Microbiology, Rastogi Publication, Meerut.

d. Pleczar, M.J., Chan, E.C.S. and Krieg N.R., 2011 (reprint), Microbiology, 2nd ed. Tata McGraw Hill Publishing Co., Ltd., New Delhi.
e. Patel, A.H., 2011, Industrial Microbiology, 2nded. Macmillan India Ltd., Delhi.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–IV (SESSION 2023-24)

MICROBIOLOGY

Course Title: Microbiology Ecology

Course Code: BSMM-4343 (P)

(PRACTICAL)

COURSE OUTCOMES

After passing the course student will be able to:

CO1: Learn to isolate bacteria from air and soil

CO2: Determination of BOD and COD of water samples

CO3: Analyze the quality of water by MPN

CO4: Identify rhizobia in root nodules

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–IV (SESSION 2023-24)

MICROBIOLOGY

Course Title: Microbiology Ecology

Course Code: BSMM-4343 (P)

(PRACTICAL)

Time: 3 hrs **Marks: 20**

Instructions for the practical examiner: Question paper is to be set on the spot jointly by the Internal and External Examiners. Two copies of the same may be submitted for the recordto COE Office, Kanya Maha Vidyalaya, Jalandhar.

LIST OF PRACTICALS

1. Isolation and enumeration of fungi from air and soil by pour plating and spread plating.
2. Determination of dissolved oxygen content (DO) of the given water sample byTitrimetric method.
3. Determination of COD of the given water sample by Titrimetric method.
4. To conduct bacteriological examination of water sample by MPN method.
5. To isolate symbiotic nitrogen bacteria from root nodules.
6. To perform crowded plate method for studying microbial interactions.
7. Determination of B.O.D.
8. Lethal effect of Ultra violet light on bacterial growth.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–IV (SESSION 2023-24)

CHEMISTRY

Course Title: Inorganic Chemistry

Course Code: BSMM-4084 (I)

(THEORY)

Course outcomes:

Students will be able to

CO1: Understand the key features of coordination compounds viz. Nomenclature, Isomerism and electronic configurations of coordination compounds, have general knowledge of Chelates, Postulates of VBT

CO2: Understand the properties and reactions of non-aqueous solvents.

CO3: Write both reduction and oxidation half reactions for a simple redox reaction, Frost and understand the Latimer Pourbaix diagram.

CO4: Understand the positions, electronic configurations, relative stability, preparation, properties, structures and characteristics of the f-block elements in the periodic table and understand the role of metal ions and other inorganic elements in biological systems

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–IV (SESSION 2023-25)

CHEMISTRY

Course Title: Inorganic Chemistry

Course Code: BSMM-4084 (I)

(THEORY)

Time: 3 Hrs. **Max. Marks: 30**

Note: Instructions for the Paper Setter

Eight questions of equal marks (6 each) are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

Unit–I

Coordination Compounds **(10 Hrs)**

Werner's coordination theory and its experimental verification, effective atomic number concept, chelates, nomenclature of coordination compounds, isomerism in coordination compounds, valence bond theory of transition metal complexes

Non-Aqueous Solvents **(5 Hrs)**

Physical properties of a solvent, types of solvents and their general characteristics, reactions in non-aqueous solvents with reference to liquid NH_3 and liquid SO_2.

Unit–II

Oxidation and Reduction **(8 Hrs)**

Use of redox potential data-analysis of redox cycle, redox stability in water, Frost, Latimer and Pourbaix diagrams

Chemistry of Lanthanide Elements **(7 Hrs)**

Electronic structure, oxidation states and ionic radii and lanthanide contraction. Electronic absorption and magnetic properties of lanthanides

Unit–III

Chemistry of Actinides **(5 Hrs)**

General features and chemistry of actinides, similarities between the later actinides and the later lanthanides. Electronic and magnetic properties of actinides and their general comparison with the lanthanide elements

Unit–IV

Bioinorganic Chemistry **(10 Hrs)**

Essential and trace elements in biological processes, metalloporphyrins and special reference to haemoglobin and myoglobin. Biological role of alkali and alkaline earth metal ions with special reference to Ca^{2+}

Books Suggested:

1. Cotton, F.A., Wilkinson, G., Gaus, P.L., Basic Inorganic Chemistry; 3rd edition, Pubs: John Wiley Sons. 1995.
2. Lee, J.D., Concise Inorganic Chemistry; 4th edition, Pubs: Chapman Hall Ltd., 1991.
3. Shriver, D.E., Alkins, P.W., Langford, C.H., Inorganic Chemistry; 4th edition, Oxford Publisher: Oxford University Press, 2006.
4. Douglas, B. McDamiel, D., Alexander, J., Concepts and Models of Inorganic Chemistry; 3rd edition, Pubs: John Wiley and Sons Inc., 1994.
5. Porterfield, W.W., Wesley, A., Inorganic Chemistry; Pubs: Addison-Wesley Publishing Company, 1984.
6. Miessler, G.L., Larr, D.A., Inorganic Chemistry; 3rd edition, Pubs: Pearson Education Inc., 2004.
7. Jolly, W.L., Modern Inorganic Chemistry; 2nd edition, Pubs: McGraw-Hill Publishing Company Limited, 1991.
8. Purcell, K.F., Kotz, J.C., Inorganic Chemistry; Pubs: W.B. Saunders Company, 1977.
9. Puri, B.R., Sharma, L.R., Kalia, K.C., Principles of Inorganic Chemistry; 30th edition, Pubs: Milestones Publisher, 2006-07.
10. Inorganic Chemistry, W.W. Porterfield Addison-Wesley.
11. Inorganic Chemistry, A.G. Sharpe, ELBS.
12. University General Chemistry, C.N.R. Rao, Macmillan.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–IV (SESSION 2023-24)

CHEMISTRY

Course Title: Organic Chemistry

Course Code: BSMM-4084 (II)

(THEORY)

Course outcomes:

Students will be able to

CO1: Understand structure and bonding in carboxylic acids and carboxylic acid derivatives, Compare the acidity of alcohols,phenols and acids

CO2: Understand preparations and reactions of ethers and epoxides, understand cleavages in ethers, the ring opening reactions of epoxides

CO3: Understand preparation and reactions of nitroalkanes and nitroarenes, differentiate between primary, secondary and tertiary amines, basicity of amines

CO4: Understand nomenclature, structural features, methods of formation and chemical reactions of Organomagnesium, Organolithium, Organozinc and Organocopper compounds and to know the various methods of synthesis and compare electrophilic substitution, basicity, reactions of pyrrole, furan, thiophene and nucleophilic substitution reactions of pyridine.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–IV (SESSION 2023-24)

CHEMISTRY

Course Title: Organic Chemistry

Course Code: BSMM-4084 (II)

(THEORY)

Time: 3 Hrs. **Max. Marks: 30**

Note: Instructions for the Paper Setter

Eight questions of equal marks (6 each) are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

Unit–I

Carboxylic Acids (8 Hrs)

Nomenclature, structure and bonding, physical properties, acidity of carboxylic acids, effects of substituents on acid strength. Reactions of carboxylic acids. Hell-Volhard-Zelinskyreaction. Synthesis of acid chlorides, esters and amides. Reduction of carboxylic acids. Mechanism of decarboxylation.

Carboxylic Acids Derivatives (7 Hrs)

Structure and nomenclature of acid chlorides, esters, amides and acid anhydrides, Relative stability and reactivity of acyl derivatives. Physical properties, interconversion of acid derivatives by nucleophilic acyl substitution. Preparation of carboxylic acid derivatives, chemical reactions. Mechanisms of esterification and hydrolysis (acidic and basic).

Unit–II

Ethers and Epoxides (5 Hrs)

Nomenclature of ethers and methods of their formation, physical properties. Chemical reaction- cleavage and autoxidatio n, Ziesel'smethod. Synthesis of epoxides. Acid and base-catalyzed ring opening of epoxides, orientation of epoxide ring opening, reactions of Grignard and organolithium reagents with epoxides.

Unit-III

Organic Compounds of Nitrogen (10 Hrs)

Preparation of nitroalkanes and nitroarenes. Chemical reactions of nitroalkanes, Mechanisms of nucleophilc substitution in nitroarenes and their reduction in acidic, neutral and alkaline media. Reactivity, Structure and nomenclature of amines, Methods of preparation of amines by

Reductive amination of aldehydic and ketonic compounds, Gabriel-phthalimide reaction and Hoffmann bromamide reaction. Physicalproperties. Stereochemistry of amines. separation of a mixture of primary, secondary and tertiary amines. Structural features affecting basicity of amines. Amine salts as phase-transfer catalysts.

Unit–IV

Organometallic Compounds (7 Hrs)

Organomagnesium Compounds: The Grignard reagents formation, structure and chemical reactions. Organolithium Compounds: Formation and chemical reactions. Organozinc and Organo copper Compounds: Nomenclature, structural features, Methods of formation and chemical reactions.

Heterocyclic Compounds (8 Hrs)

Introduction: Molecular orbital picture and aromatic characteristics of pyrrole, furan, thiophene and pyridine. Methods of synthesis and chemical reactions with particular emphasis on the mechanism of electrophilic substitution. Mechanism of nucleophilic substitution reactions in pyridine derivatives. Comparison of basicity of pyridine, piperidine and pyrrole.

Book Suggested:

1. Morrison, R.T., Boyd, R.N., Organic Chemistry; 6th edition, Pubs: Prentice-Hall, 1992.
2. Wade Jr., L.G., Singh, M.S., Organic Chemistry; 6th edition, Pubs: Pearson Education, 2008.
3. Mukherji, S.M., Singh, S.P., Kapoor, R.P., Organic Chemistry; Pubs: Wiley Eastern Limited, 1985, Vol.I, II, III.
4. Solomons, T.W., Fryhle, C.B., Organic Chemistry; 9th edition, Pubs: Wiley India, 2007.
5. Carey, F.A., Organic Chemistry; 4th edition, Pubs: McGraw-Hill, 2000.
6. Streitwieser, A., Clayton, Jr., Heathcock, H., Introduction to Organic Chemistry; 3rd edition, Pubs: Macmillan Publishing Company, 1989.
7. Introduction to Organic Chemistry, Sireitwieser, Heathcock and Kosover, Macmilan.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–IV (SESSION 2023-24)

CHEMISTRY

Course Title: Chemistry Practical

Course Code: BSMM-4084 (P)

(PRACTICAL)

Course outcomes:

Students will be able to analyze the given organic compound through

CO1: Understand the basics of Qualitative analysis

CO2: Detection of elements (N, S and halogens) in organic compounds.

CO3: Detection of functional groups (phenolic, carboxylic, carbonyl, esters, carbohydrates, amines, amides, nitro and anilide) in simple organic compounds

CO4: Preparation of their derivatives

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–IV (SESSION 2023-24)

CHEMISTRY

Course Title: Chemistry Practical

Course Code: BSMM-4084 (P)

(PRACTICAL)

Duration: 3½ hrs. **Max. Marks: 20**

Instruction for practical examiner: Question paper is to be set on the spot jointly by the Internal and External Examiners. Two copies of the same should be submitted for the record to COE office, Kanya Maha Vidyalaya, Jalandhar.

Qualitative Analysis

Detection of elements: N, S and halogens

Detection of functional groups: phenolic, carboxylic, carbonyl, esters, carbohydrates, amines, amides, nitro and anilide in simple organic compounds and preparing their derivatives.

Practical Examination

1) Detection of Elements, functional group and derivative preparation	15
2) Viva-Voce	03
3) Note Book	02

Book Suggested:

1. Experimental Organic Chemistry, Vol. I and II, P.R. Singh, D.S. Gupta and K.S. Bajpai, Tata McGraw Hill.
2. Laboratory Manual in Organic Chemistry, R.K. Bansal, Wiley Eastern.
3. Vogel's Textbook of Practical Organic Chemistry, B.S. Furniss, A.J. Hannaford, V. Rogers, P.W.G. Smith and A.R. Tatchell, ELBS.
4. Experiments in General Chemistry, C.N.R. Rao and U.C. Aggarwal, East-West Press.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–IV (SESSION 2023-24)

BOTANY

Course Title: Diversity of Seed Plants and Their Systematics-I
Course Code: BSMM-4075 (I)

(THEORY)

Course outcome: -

After passing this course the student will develop:

CO1: Understanding of characters of seed plants, origin and evolution of seed habit, angiosperms and gymnosperms

CO2: Understanding of general characters of gymnosperms, their classification and evolution including fossil and living gymnosperms.

CO3: Understanding of morphology of vegetative and reproductive parts of *Pinus* and *Cycas*

CO4: Understanding of morphology of vegetative and reproductive parts of *Ephedra* and *Ginkgo*

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–IV (SESSION 2023-24)

BOTANY

Course Title: Diversity of Seed Plants and Their Systematics-I
Course Code: BSMM-4075 (I)

(THEORY)

Time: 3Hrs **Max. Marks: 30**

Instructions for the Paper Setters:
Eight questions of equal marks (6 marks each) are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

Unit–I

Characteristics of seed plants; Evolution of the seed habit; Distinguishing features of angiosperms and gymnosperms. Angiosperms: Origin and evolution. Some examples of primitive angiosperms.

Unit–II

General features of gymnosperms and their classification; evolution and diversity of Gymnosperms including fossil and living gymnosperms; Geological time scale and fossilization.

Unit–III

Morphology of vegetative and reproductive parts; Anatomy of root, Stem and leaf; reproduction and life cycle of *Pinus*, *Cycas*.

Unit–IV

Morphology of vegetative and reproductive parts; Anatomy of root, Stem and leaf; reproduction of life cycle of *Ephedra* and *Ginkgo*.

Suggested Readings: -

1. Bhatnagar, S.P. and Moitra, A. (1996). Gymnosperms, New Age International Limited, New Delhi.
2. Gifford, E.M. and Foster, A.S. (1988). Morphology and Evolution of Vascular Plants, W.H. Freeman& Company, New York.
3. Pellant, C. (1994). Fossils, Dragon's World, Great Britain
4. Sporne, K.R. (1965). The Morphology of Gymnosperms, Hutchinson & Co. (Publishers) Ltd., London.
5. Taylor, T. N., Taylor, E. L. and Krings, M. (2008). Paleobotany: The Biology and Evolution of Fossil Plants (2nd Edition). Elsevier Inc. Netherlands.
6. Vashistha, P. C. (2016). Botany for degree students. S. Chand and Company, New Delhi.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–IV (SESSION 2023-24)
BOTANY
Course Title: Diversity of Seed Plants and Their Systematics-II
Course Code: BSMM-4075 (II)
(THEORY)

Course outcome: -

After passing this course the student will develop:

CO1: Plant description, describe the morphological and reproductive stretch of plant and also identify the different families.

CO2: Understanding of Botanical Nomenclature, classification of angiosperms and Salient features of the systems proposed by Bentham and Hooker, Engler and Prantl

CO3: Understanding diversity of flowering plants in families like Ranuculaceae, Brassicaceae, Rutaceae, Fabaceae, Apiaceae, Acanthaceae.

CO4: Understanding diversity of flowering plants in families like Apocynaceae, sclepiadaceae, Solanaceae, Lamiaceae, Chenopodiaceae, Euphorbiaceae, Liliaceae, Orchidaceae and Poaceae.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–IV (SESSION 2023-24)

BOTANY

Course Title: Diversity of Seed Plants and Their Systematics-II

Course Code: BSMM-4075 (II)

(THEORY)

Time: 3Hrs **Max. Marks: 30**

Instructions for the Paper Setters:

Eight questions of equal marks (6 marks each) are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

Unit–I

Angiosperm taxonomy; Brief history, Aims and fundamental components (alpha-taxonomy, Omega-taxonomy, Holotaxonomy); Identification, keys. Taxonomic literature. Botanical nomenclature: Taxonomic ranks; Type concept; Principle of priority.

Unit–II

Major contribution of cytology, Phytochemistry and taximetrics to taxonomy. Classification of angiosperms; Salient features of the systems proposed by Bentham and Hooker, Engler and Prantl

Unit–III

Diversity of flowering plants as illustrated by members of the families Ranuculaceae, Brassicaceae, Rutaceae, Fabaceae, Apiaceae, Acanthaceae.

Unit–IV

Diversity of flowering plants as illustrated by members of the families Apocynaceae, Asclepiadaceae, Solanaceae, Lamiaceae, Chenopodiaceae, Euphorbiaceae, Liliaceae, Orchidaceae and Poaceae.

Suggested Readings: -

1. Bendre, A. (2007). Practical Botany, Rastogi Publications, Meerut.
2. Davis, P.H. and Heywood, V.H. (1963). Principles of Angiosperm Taxonomy, Oliver and Boyd, London.
3. Gifford, E.M. and Foster, A.S. (1988). Morphology and Evolution of Vascular Plants, W.H. Freeman & Company, New York.
4. Jeffrey, C. (1982). An Introduction to Plant Taxonomy, Cambridge University Press, Cambridge, London.
5. Jones, S.B., Jr. and Luchsinger, A.E. (1986). Plant Systematics (2nd edition). McGraw- Hill Book Co., New York.
6. Radford, A.E. (1986). Fundamental of Plant Systematics, Harper and Row, New York

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–IV (SESSION 2023-24)
BOTANY
Course Title: Practical- Diversity of Seed Plants and Their Systematics-I & II
Course Code: BSMM-4075 (P)
(PRACTICAL)

Course outcome: -

After passing this course the student will able to:

CO1: Identify different plants from different families through their vegetative and reproductive characters.

CO2: Understanding different types of placentation system.

CO3: study the identification keys in taxonomy.

CO4: Understand anatomy of gymnosperm.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–IV (SESSION 2023-24)
BOTANY
Course Title: Practical- Diversity of Seed Plants and Their Systematics-I & II
Course Code: BSMM-4075 (P)
(PRACTICAL)

TIME: 3Hours **Practical: 20**

Instructions for the paper setter: question paper is to be set on the spot jointly by the Internal and External Examiners. Two copies of the same may be submitted for the record to COE Office, Kanya Maha Vidyalaya, Jalandhar.

Suggested Laboratory Exercises

1. Angiosperms The following species are suitable for study.
2. This list is only indicative. Teachers may select plants available in their locality. Teachers may select plants/material available in their locality/institution.

1. Ranunculaceae: *Ranunculus, Delphinium*
2. Brassicaceae: *Brassica, Alyssum, Iberis, Coronopus.*
3. Malvaceae*: Hibiscus, Abutilon.*
4. Rutaceae: *Murraya, Citrus*.
5. Fabaceae: Faboideae: *Lathyrus, Cajanus, Melilotus, Trigonella,* Caesalpinioideae*: Cassia, Caesalpinia*, Mimosoideae: *Prosopis, Mimosa, Acacia*.
6. Apiaceae: *Coriandrum. Foeniculum, Anethum*.
7. Acanthaceae: *Adhatoda, Peristrophe*.
8. Apocynaceae: *Vinca, Thevetia, Nerium.*
9. Asclepiadaceae: *Calotropis*.
10. Solanaceae: *Solanum, Withania, Datura*.
11. Euphorbiaceae: *Euphorbia, Phyllanthus*.
12. Lamiaceae: *Ocimum, Salvia*.
13. Chenopodiaceae: *Chenopodium, Beta*.
14. Liliaceae: *Asphodelus, Asparagus*.
15. Poaceae: *Avena, Triticum, Hordeum, Poa, Sorghum*.

The Students should be made familiar with the use of identification keys including use of computers in taxonomy. The teachers should prevent students from collecting plants from the wild and submitting them for the practical examination. Instead, the student should be asked to prepare field reports.

Gymnosperms

Cycas

(i) Habit, armour of leaf bases on the stem (if specimen is not available show Photography), very young leaf (circinate vernation) and old foliage leaves, scale leaf, bulbils, male cone (specimen); Microsporophyll, megasporophyll mature seed.

(ii) Study through permanent slides—normal root (T.S.), stem (T.S.) (if sections are not available show photographs), ovule (L.S.). (iii) Study through hand sections or dissections-coralloid root (T.S.), rachis (T.S.), leaflet (V.S.), microsporophyll (V.S.), pollen grains (W.M.).

Pinus

(i) Habit, long and dwarf shoot showing cataphylls and scale leaves, T.S. wood showing growth rings, male cone, 1st year, 2nd year and 3rd year female cones, winged seeds.

(ii) Study through permanent slides-root (T.S.), female cone (L.S.) ovule (L.S.), embryo (W.M.) showing polycotyledonous condition.

(iii) Study through hand sections or dissections-young stem (T.S.), old stem (wood) (T.L.S. and R.L.S.), needle (T.S. male cone (L.S.), male cone (T.S.), Pollen grains (W.M.).

Ephedra

(i) Habit and structure of whole and female cones.

(ii) Permanent slides-female cone (L.S.).

(iii) Hand sections/dissections-node (L.S.), internode (T.S.), macerated stem to see vessel structure; epidermal peel mount of vegetative parts to study stomata, male cone (T.S. and L.S.), Pollen grains.

Ginkgo

(i) Habit and structure of whole plant.

(ii) Permanent slides-male and female reproductive parts.

(iii) Pollen grains

Suggested Readings:

1. Angiosperm Phylogeny Group (2003). An update of the Angiosperm Phylogeny Group Classification for the orders and families of the flowering plants: APG

2. Botanical Journal of the Linnaean Society 141: 399-436. 2. Cronquist, A. (1981). An Integrated System of Classification of Flowering Plants. Columbia University Press, New York.

3. Simpson, M.C. (2006). Plant Systematics. Elsevier, Amsterdam

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–IV (SESSION 2023-24)
FOOD SCIENCE AND QUALITY CONTROL (VOCATIONAL)
Course Title: Quality Assurance
Course Code: BSMM-4255 (P)
(THEORY)

Course Outcomes:

After passing this course the student will be able to:

CO1: Understand the quality control in food industry and quality attributes.

CO2: Learn about quality assessment methods in different food industries.

CO3: Understand the sampling techniques and sensory evaluation of food.

CO4: Understand the concept of HACCP, GMP and food laws and regulations.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–IV (SESSION 2023-24)
FOOD SCIENCE AND QUALITY CONTROL (VOCATIONAL)
Course Title: Quality Assurance
Course Code: BSMM-4255 (P)
(THEORY)

Examination Time: 3 Hrs

Max. Marks: 100
Theory Marks: 60
Practical Marks: 20
CA: 20

Instructions for the Paper Setter: Eight questions of equal marks (12 marks each) are to be set,two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

UNIT-I

1. Objectives, importance and functions of quality control
2. Quality attributes
3. Quality control in food industry-methods of evaluation and control of the various aspects of quality of raw materials, manufacturing process and the testing of finished products.

UNIT-II

4. Methods of quality assessment of food materials: fruits, vegetables, cereals, dairyproducts, meat, egg and processed products.
5. Color: Definition, importance, different color measuring instruments used in food industries.
6. Texture: Definition, importance, different texture analyzing instruments used in food industries to analyze texture.

UNIT-III

7. Sampling, specifications of raw materials and finished products
8. Sensory evaluation.

UNIT-IV

9. Concept of HACCP and GMP.
10. Food Laws and Regulations- FSSAI, AGMARK, FPO, PFA, MFPO, BIS, ISO.

Recommended Books:

1. Quality Control for Food Industry by A. Kramer and B.A. Twigg
2. Handbook of analysis and quality control for fruits and vegetable products by S.Ranganna
3. Food Science by N.N. Potter (Online Available) https://hostnezt.com/cssfiles/gsa/Food%20Science%205th%20Ed%20By%20Norman%2 0Potter.pdf

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–IV (SESSION 2023-24)
FOOD SCIENCE AND QUALITY CONTROL (VOCATIONAL)
Course Title: Quality Assurance
Course Code: BSMM-4255 (P)
(PRACTICAL)

Course Outcomes:

After passing the course student will be able to:

CO1: Familiarity with various platform tests used for assessing milk quality.

CO2: Understanding of food adulteration through various chemical and physical tests.

CO3: Understanding of the canning process and its importance in preserving fruits and vegetables.

CO4: Understanding of the concept of food quality and the importance of various chemical and physical tests in assessing it.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–IV (SESSION 2023-24)
FOOD SCIENCE AND QUALITY CONTROL (VOCATIONAL)
Course Title: Quality Assurance
Course Code: BSMM-4255 (P)
(PRACTICAL)

Time: 3 hrs **Max. Marks: 20**

Instructions for the practical examiner: Question paper is to be set on the spot jointly by the Internal and External Examiners. Two copies of the same may be submitted for the record to COE office, Kanya Maha Vidyalaya, Jalandhar.

List of Practicals:

1. Determination of acidity and pH of milk.
2. Platform tests for determining the quality of milk.
3. Determination of cooking quality of rice.
4. Determination of iodine value of oil/fat.
5. Determination of saponification value of oil/fat.
6. Determination of reducing and non-reducing sugars.
7. Determination of interior and exterior quality of eggs.
8. Determination of alcoholic acidity of flour.
9. Adulterants in milk, cereals, oils and fats and their detection.
10. Cut out analysis of canned fruits and vegetables.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–V (SESSION 2023-24)

PUNJABI

Course Title: Punjabi (Compulsory)

Course Code: BSML -5421

COURSE OUTCOMES

CO1: ਚੋਣਵੀਆਂ ਪੰਜਾਬੀ ਕਹਾਣੀਆਂ ਨੂੰ ਪੜ੍ਹਾਉਣ ਦਾ ਮਨੋਰਥ ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਕਹਾਣੀਆਂ ਪ੍ਰਤੀ ਦਿਲਚਸਪੀ, ਸੂਝ ਨੂੰ ਪੈਦਾ ਕਰਨਾ ਹੈ।

CO2: ਨਾਵਲ 'ਏਹੁ ਹਮਾਰਾ ਜੀਵਣਾ' (ਦਲੀਪ ਕੌਰ ਟਿਵਾਣਾ) ਨੂੰ ਸਿਲੇਬਸ ਵਿਚ ਸ਼ਾਮਿਲ ਕਰ ਕੇ ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਨਾਵਲ ਪੜ੍ਹਣ ਦੀ ਰੁਚੀ ਨੂੰ ਪੈਦਾ ਕਰਨਾ ਹੈ ਅਤੇ ਇਸ ਸਾਹਿਤ ਰੂਪ ਨਾਲ ਜੋੜਣਾ ਹੈ।

CO3: ਪੈਰ੍ਹਾ ਰਚਨਾ ਕਰਨ ਨਾਲ ਵਿਦਿਆਰਥੀ ਆਪਣੀ ਗੱਲ ਨੂੰ ਕਹਿਣ ਦੀ ਜਾਚ ਸਿੱਖਣਗੇ ਅਤੇ ਇਹ ਦਿਮਾਗੀ ਕਸਰਤ ਵਿਚ ਸਹਾਈ ਹੋਵੇਗੀ। ਸਰਲ ਅੰਗਰੇਜ਼ੀ ਪੈਰ੍ਹੇ ਦਾ ਪੰਜਾਬੀ ਵਿਚ ਅਨੁਵਾਦ ਦਾ ਮਨੋਰਥ ਵਿਦਿਆਰਥੀਆਂ ਦੀ ਬੁੱਧੀ ਨੂੰ ਤੀਖਣ ਕਰਦਿਆਂ ਉਨਾਂ ਦੀ ਲਿਖਣ ਪ੍ਰਤਿਭਾ ਨੂੰ ਉਜਾਗਰ ਕਰਨਾ ਹੈ।

CO4: ਵਾਕਾਤਮਕ ਜੁਗਤਾਂ : ਮੇਲ ਤੇ ਅਧਿਕਾਰ ਨੂੰ ਪੜ੍ਹਾਉਣ ਦਾ ਮਨੋਰਥ ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਭਾਸ਼ਾ ਦੀ ਅਮੀਰੀ ਅਤੇ ਬਾਰੀਕੀਆਂ ਨੂੰ ਸਮਝਣ ਲਈ ਵੱਖਰੇ ਵੱਖਰੇ ਸਿਧਾਂਤਾਂ ਦਾ ਵਿਕਾਸ ਕਰਨਾ ਹੈ।

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–V (SESSION 2023-24)
PUNJABI
PUNJABI (COMPULSORY)
Course Code: BSML -5421

Time: 3 Hours **Maximum Marks: 50**
Theory: 40
CA: 10

ਪਾਠ ਕ੍ਰਮ ਅਤੇ ਪਾਠ ਪੁਸਤਕਾਂ

ਯੂਨਿਟ I

ਚੋਣਵੀਆਂ ਪੰਜਾਬੀ ਕਹਾਣੀਆਂ
(ਸੰਪਾ.ਡਾ.ਰਮਿੰਦਰ ਕੌਰ, ਪਬਲੀਕੇਸ਼ਨ ਬਿਊਰੋ, ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ, ਅੰਮ੍ਰਿਤਸਰ, 2018)

ਲੇਖਕ	ਕਹਾਣੀ	ਕਹਾਣੀ ਸੰਗ੍ਰਹਿ
ਅਜੀਤ ਕੌਰ	ਨਿਊ ਯੀਅਰ	ਮੌਤ ਅਲੀ ਬਾਬੇ ਦੀ
ਜਿੰਦਰ	ਸੌਰੀ	ਜਖ਼ਮ
ਸੁਖਜੀਤ	ਹਜ਼ਾਰ ਕਹਾਣੀਆਂ ਦਾ ਬਾਪ	ਮੈ ਇੰਜੁਆਏ ਕਰਦੀ ਹਾਂ
ਜ਼ਤਿੰਦਰ ਹਾਂਸ	ਰਾਹੂ ਕੇਤੂ	ਈਸ਼ਵਰ ਦਾ ਜਨਮ
ਪ੍ਰੇਮ ਪ੍ਰਕਾਸ਼	ਅਰਜਨ ਛੇੜ ਗਡੀਰਨਾ	ਕੁਝ ਅਣਕਿਹਾ ਵੀ
ਚੰਦਨ ਨੇਗੀ	ਹਰਖ ਸੋਗ	ਹਰਖ ਸੋਗ
ਜਸਵਿੰਦਰ ਸਿੰਘ	ਖੂਹ ਖਾਤੇ	ਖੂਹ ਖਾਤੇ
ਗੁਰਦੇਵ ਸਿੰਘ ਰੁਪਾਣਾ	ਸ਼ੀਸ਼ਾ	ਸ਼ੀਸ਼ਾ ਅਤੇ ਹੋਰ ਕਹਾਣੀਆਂ

(ਵਿਸ਼ਾ-ਵਸਤੂ/ਸਾਰ ਪਾਤਰ ਚਿਤਰਨ) ੪ ਅੰਕ

ਯੂਨਿਟ II

ਨਾਵਲ : ਏਹੁ ਹਮਾਰਾ ਜੀਵਣਾ(ਦਲੀਪ ਕੌਰ ਟਿਵਾਣਾ)
(ਵਿਸ਼ਾ-ਵਸਤੂ/ਸਾਰ ਬਿਰਤਾਂਤਕ ਜੁਗਤਾਂ) ੪ ਅੰਕ

ਯੂਨਿਟ III

ਲਗਪਗ 200 ਸ਼ਬਦਾਂ ਵਿਚ ਪੈਰ੍ਹਾ ਰਚਨਾ

ਸਰਲ ਅੰਗਰੇਜ਼ੀ ਪੈਰ੍ਹੇ ਦਾ ਪੰਜਾਬੀ ਵਿਚ ਅਨੁਵਾਦ ੪ ਅੰਕ

ਯੂਨਿਟ -IV

ਵਿਆਕਰਣ :
(ੳ) ਨਾਂਵ ਵਾਕੰਸ਼
(ਅ) ਮੇਲ ਤੇ ਅਧਿਕਾਰ ੪ ਅੰਕ

ਅੰਕ ਵੰਡ ਅਤੇ ਪਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ

1. ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਦੇ ਚਾਰ ਸੈਕਸ਼ਨ ਹੋਣਗੇ।ਸੈਕਸ਼ਨ ਂ੍ਹ ਤੱਕ ਦੇ ਪ੍ਰਸ਼ਨ ਯੂਨਿਟ I-IV ਵਿਚੋਂ ਪੁੱਛੇ ਜਾਣਗੇ। ਹਰ ਸੈਕਸ਼ਨ ਵਿਚ ਦੋ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ।
2. ਵਿਦਿਆਰਥੀ ਨੇ ਕੁਲ ਪੰਜ ਪ੍ਰਸ਼ਨ ਕਰਨੇ ਹਨ। ਹਰ ਸੈਕਸ਼ਨ ਵਿਚੋਂ ਇਕ ਪ੍ਰਸ਼ਨ ਕਰਨਾ ਲਾਜ਼ਮੀ ਹੈ। ਪੰਜਵਾਂ ਪ੍ਰਸ਼ਨ ਕਿਸੇ ਵੀ ਸੈਕਸ਼ਨ ਵਿਚੋਂ ਕੀਤਾ ਜਾ ਸਕਦਾ ਹੈ।
3. ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ 08 ਅੰਕ ਹਨ।
4. ਪੇਪਰ ਸੈੱਟ ਕਰਨ ਵਾਲਾ ਜੇਕਰ ਚਾਹੇ ਤਾਂ ਪ੍ਰਸ਼ਨਾਂ ਦੀ ਵੰਡ ਅੱਗੋਂ ਵੱਧ ਤੋਂ ਵੱਧ ਚਾਰ ਉਪ ਪ੍ਰਸ਼ਨਾਂ ਵਿਚ ਕਰ ਸਕਦਾ ਹੈ।

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–V (SESSION 2023-24)
BASIC PUNJABI
Course Title: Basic Punjabi (In lieu of Punjabi Compulsory)
Course Code: BSML -5031

COURSE OUTCOMES

CO1: ਵਿਦਿਆਰਥੀ ਸਾਹਿਤ ਅਤੇ ਲੋਕ ਸਾਹਿਤ,ਲੋਕ ਕਾਵਿ,ਲੋਕ ਵਾਰਤਕ ਬਿਰਤਾਂਤ ਦੀ (ਮੁੱਢਲੀ ਜਾਣ ਪਛਾਣ) ਬਾਰੇ ਜਾਣ ਸਕਣਗੇ।

CO2: ਵਿਦਿਆਰਥੀ ਸੁਹਾਗ,ਘੋੜੀਆਂ, ਸਿੱਠਣੀਆਂ ਦੀ (ਮੁੱਢਲੀ ਜਾਣ ਪਛਾਣ) ਬਾਰੇ ਜਾਣ ਸਕਣਗੇ।

CO3: ਵਿਦਿਆਰਥੀ ਗਿੱਧਾ (ਮੁੱਢਲੀ ਜਾਣ ਪਛਾਣ),ਭੰਗੜਾ (ਮੁੱਢਲੀ ਜਾਣ ਪਛਾਣ),ਝੂਮਰ (ਮੁੱਢਲੀ ਜਾਣ ਪਛਾਣ) ਬਾਰੇ ਜਾਣ ਸਕਣਗੇ।

CO4: ਵਿਦਿਆਰਥੀ ਲੋਕ ਖੇਡਾਂ (ਮੁੱਢਲੀ ਜਾਣ ਪਛਾਣ),ਲੋਕ ਤਮਾਸ਼ੇ (ਮੁੱਢਲੀ ਜਾਣ ਪਛਾਣ),ਲੋਕ ਕਲਾਵਾਂ (ਮੁੱਢਲੀ ਜਾਣ ਪਛਾਣ) ਦਾ ਵਿਹਾਰਕ ਅਧਿਐਨ ਕਰ ਸਕਣ ਦੇ ਸਮਰੱਥ ਹੋ ਸਕਣਗੇ।

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–V (SESSION 2023-24)

BASIC PUNJABI

Course Title: Basic Punjabi (In lieu of Punjabi Compulsory)

Course Code- BSML -5031

ਪਾਠਕ੍ਰਮ

ਯੂਨਿਟ I

ਸਾਹਿਤ ਅਤੇ ਲੋਕ ਸਾਹਿਤ (ਮੁੱਢਲੀ ਜਾਣ ਪਛਾਣ)
ਲੋਕ ਕਾਵਿ (ਮੁੱਢਲੀ ਜਾਣ ਪਛਾਣ)
ਲੋਕ ਵਾਰਤਕ ਬਿਰਤਾਂਤ (ਮੁੱਢਲੀ ਜਾਣ ਪਛਾਣ) 08 ਅੰਕ

ਯੂਨਿਟ II

ਸੁਹਾਗ (ਮੁੱਢਲੀ ਜਾਣ ਪਛਾਣ)
ਘੋੜੀਆਂ (ਮੁੱਢਲੀ ਜਾਣ ਪਛਾਣ)
ਸਿੱਠਣੀਆਂ (ਮੁੱਢਲੀ ਜਾਣ ਪਛਾਣ) 08 ਅੰਕ

ਯੂਨਿਟ III

ਗਿੱਧਾ (ਮੁੱਢਲੀ ਜਾਣ ਪਛਾਣ)
ਭੰਗੜਾ (ਮੁੱਢਲੀ ਜਾਣ ਪਛਾਣ)
ਝੂਮਰ (ਮੁੱਢਲੀ ਜਾਣ ਪਛਾਣ) 08 ਅੰਕ

ਯੂਨਿਟ IV

ਲੋਕ ਖੇਡਾਂ (ਮੁੱਢਲੀ ਜਾਣ ਪਛਾਣ)
ਲੋਕ ਤਮਾਸ਼ੇ (ਮੁੱਢਲੀ ਜਾਣ ਪਛਾਣ)
ਲੋਕ ਕਲਾਵਾਂ (ਮੁੱਢਲੀ ਜਾਣ ਪਛਾਣ) 08 ਅੰਕ

ਅੰਕ ਵੰਡ ਅਤੇ ਪਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ

1. ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਦੇ ਚਾਰ ਸੈਕਸ਼ਨ ਹੋਣਗੇ। ਸੈਕਸ਼ਨ ੍ਹ ਤੱਕ ਦੇ ਪ੍ਰਸ਼ਨ ਯੂਨਿਟ I-IV ਵਿਚੋਂ ਪੁੱਛੇ ਜਾਣਗੇ। ਹਰ ਸੈਕਸ਼ਨ ਵਿਚ ਦੋ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ।
2. ਵਿਦਿਆਰਥੀ ਨੇ ਕੁਲ ਪੰਜ ਪ੍ਰਸ਼ਨ ਕਰਨੇ ਹਨ। ਹਰ ਸੈਕਸ਼ਨ ਵਿਚੋਂ ਇਕ ਪ੍ਰਸ਼ਨ ਕਰਨਾ ਲਾਜ਼ਮੀ ਹੈ। ਪੰਜਵਾਂ ਪ੍ਰਸ਼ਨ ਕਿਸੇ ਵੀ ਸੈਕਸ਼ਨ ਵਿਚੋਂ ਕੀਤਾ ਜਾ ਸਕਦਾ ਹੈ।
3. ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ 08 ਅੰਕ ਹਨ।
4. ਪੇਪਰ ਸੈੱਟ ਕਰਨ ਵਾਲਾ ਜੇਕਰ ਚਾਹੇ ਤਾਂ ਪ੍ਰਸ਼ਨਾਂ ਦੀ ਵੰਡ ਅੱਗੋਂ ਵੱਧ ਤੋਂ ਵੱਧ ਚਾਰ ਉਪ ਪ੍ਰਸ਼ਨਾਂ ਵਿਚ ਕਰ ਸਕਦਾ ਹੈ।

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–V (SESSION 2023-24)
PUNJAB HISTORY AND CULTURE
Course Title: Punjab History and Culture (From 1849-1947 A.D)
(Special paper in lieu of Punjabi Compulsory)
(For those students who are not domicile of Punjab)
Course Code: BSML-5431

COURSE OUTCOMES:-

After completing the course students will be able to understand:

CO 1: The causes that led to war between the British and Sikhs that led to the annexation of the Punjab and how the region was put under the control of Board of Administration

CO 2: Various agrarian, industrial and educational policies introduced by the British in Punjab.

CO 3: Analyse and evaluate the socio-religious reforms movements of Punjab.

CO 4: Factors that led to Gurudwara reform movement and various other freedom struggle movements in which the Punjab played a prominent role

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–V (SESSION 2023-24)
PUNJAB HISTORY AND CULTURE
Course Title: Punjab History and Culture (From 1849-1947 A.D)
(Special paper in lieu of Punjabi Compulsory)
(For those students who are not domicile of Punjab)
Course Code: BSML-5431

Examination Time: 3 Hours **Max. Marks: 50**
Theory: 40
CA: 10

Instructions for the Paper Setters

1. Question paper shall consist of four Units
2. Examiner shall set 8 questions in **600 words** by selecting **Two Questions** of equal marks from each Unit.
3. Candidates shall attempt **5 questions** in all, by at least selecting **One Question** from each Unit and the **5th question** may be attempted from any of the **four Units**.
4. Each question will carry 8 marks

Unit- I

1. First Anglo-Sikh War.
2. Annexation of Punjab and Board of Administration

Unit-II

3. British Policy towards agriculture and industry
4. Spread of modern education

Unit-III

5. Socio- religious reform movements: Namdhari, Singh Sabha, AryaSamaj and Ad Dharm
6. Gadhar Movement

Unit-IV

7. Gurdwara Reform Movement
8. Contribution to freedom struggle: Jallianwala Bagh tragedy; Non-cooperation and Quit India Movement.

Suggested Readings

- Chopra, P.N.& Das, M.N. (1974), *A Social, Cultural & Economic History of India.* Vol.III, Macmillan India, 1974.
- Grewal, J.S., *The Sikhs of the Punjab*, New Cambridge House, New Delhi, 2005.

- Mittal, S.C, *Freedom Movement in the Punjab (1905-29),* Concept Publishing Company Delhi, 1977.
- Rai, Satya. M (1978), *Heroic Tradition in the Punjab (1900-1947*). Punjabi University, Patiala, 1978.
- Saini B. S, *The Social & Economic History of the Punjab 1901-1939,* EssEss Publications, Delhi, 1975.
- Singh, Fauja, *Freedom Struggle in the Punjab*, Publication Bureau, Punjabi University, Patiala, 1974.
- Singh, Fauja, *History and Culture of the Punjab*, Part II, Publication Bureau, Punjabi University, Patiala, 1987.
- Singh,Kushwant , *A History of the Sikhs*. Vol. II (1839-1998), Oxford University Press, Delhi, 1991.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–V (SESSION 2023-24)
ENGLISH
Course Tilte: English (Compulsory)
Course Code: BSML -5212

COURSE OUTCOMES

After passing this course, the students will be able to:

CO 1: Analyze and appreciate the dramatic technique, plot development and art of characterisation in the prescribed play, "All My Sons" by Arthur Miller

CO 2: Widen their knowledge about various literary devices used in poetry such as tone, style, imagery, figures of speech, symbolism etc. thorough the study of prescribed poems from the text "Poems of Nature and Culture"

CO 3: Develop the knowledge, skills and capabilities for effective business writing such as formal letter writing, job application and resume writing

CO 4: Will develop skills for writing job application and suitable resume along with.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–V (SESSION 2023-24)
ENGLISH
ENGLISH (COMPULSORY)
Course Code: BSML -5212

Max. Marks: 50
Examination Time: 3 Hrs **Theory: 40**
CA: 10

Instructions for the Examiner:

Section A: Three questions from the play *All My Sons* from Unit I and three questions from *Poems of Nature and Culture* from Unit II requiring very short answers will be set. The students would be required to answer any five, each carrying two marks (50 words each). **(5×2=10)**

Section B: Four questions requiring brief descriptive answers based on character, tone, plot and theme(s) in the play *All My Sons* from Unit I will be set and the students would be required to attempt any two, each carrying five marks (250 words each). **(2×5= 10)**

Section C: Four questions based on the central idea, theme, tone or style etc. of the prescribed poems from the textbook, *Poems of Nature and Culture* from Unit II will be set for the students to attempt any two of these, each carrying five marks (250 words each). The questions can also be set based on stanzas with reference to context. **(2×5= 10)**

Section D: Two questions with internal choice will be set based on unit 3 (formal letter) and unit 4 (Job application and Resume Writing) each carrying five marks. **(2×5=10)**

Unit I

All My Sons by Arthur Miller

Unit II

Poems of Nature and Culture:

William Wordsworth: The World is Too Much with Us

Gordon Lord Byron: She Walks in Beauty

P.B. Shelly: Ozymandias

Alfred Lord Tennyson: In Memoriam

Mathew Arnold: Dover Beach

Wilfred Owen: Strange Meeting

Robert Graves: The Portrait

W.H. Auden: The Unknown Citizen

Ted Hughes: The Thought-Fox

Sylvia Plath: Mirror

Rabindranath Tagore: False Religion

Nissim Ezekiel: Night of Scorpion

Unit III

Formal letter,

Unit IV

Job Application and Resume Writing

Texts Prescribed:

1. *All My Sons* by Arthur Miller
2. *Poems of Nature and Culture,* Guru Nanak Dev University, Amritsar
3. *Oxford Guide to Effective Writing and Speaking* by John Seely.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–V (SESSION 2023-24)
ZOOLOGY
Course Title: Developmental Biology
Course Code: BSMM-5483 (I)
(THEORY)

Course Outcome

After successfully completing this course, students will be able to:

CO1: Understand the key events in earlyembryological developmentlike gametogenesis, fertilization and parthenogenesis.

CO2: Explain the process of cleavage, gastrulation, determination and differentiation.

CO3: Elaborate the development of frog, its metamorphosis and chick up to three germ layers.

CO4: Describe the development of rabbit, formation of foetal membranes and placenta.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–V (SESSION 2023-24)
ZOOLOGY
Course Title: Developmental Biology
Course Code: BSMM-5483 (I)
(THEORY)

Examination Time: 3 Hrs. **Max Marks: 30**

Instructions for the Paper Setter

Eight questions of equal marks (6 marks each) are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

UNIT-I

Gametogenesis with particular reference to differentiation of spermatozoa, vitellogenesis; role of follicle/subtesticular cells in gametogenesis

Egg maturation; egg membranes; polarity of egg

Parthenogenesis

Fertilization

UNIT-II

Cleavage and its patterns

Gastrulation

Determination and differentiation

Tissue interactions, basic concepts of organizers and inductors and their role

Embryonic development of Herdmania

UNIT-III

Development upto three germinal layers and their fate in frog and chick

Fate maps of chick and frog embryos

Metamorphosis in Frog

UNIT-IV

Embryonic development of Rabbit

Foetal membranes, their formation and role

Mammalian placenta–its formation, types and functions

Suggested Readings:

1. Balinsky, B.I. (2007), An Introduction to Embryology, Saunders, Philadelphia.
2. Bellairs, R. (1971), Development Processes in Higher Vertebrates, University of MiamiPress, Miami.
3. Berrill. N.J. (1971), Developmental Biology. McGraw Hill, New Delhi.
4. Gilbert, F. (2017), Developmental Biology, Sinaur.
5. Goel, S.C. (1984), Principles and Animal Developmental Biology, Himalaya, Bombay.
6. Karp. G. &Berrill, M.J. (1981), Development. McGraw Hill, New Delhi.
7. Pritchard, D.J. (1986), Foundation of Development Genetics, Taylor and Francis, London.
8. Saunders, J.W. (1982), Developmental Biology, Patterns, Principles, Problems, MacMillan,New York.
9. Waddigton CH. (1966), Principles of Development and Differentiation, MacMillan, NewYork.
10. Miller, W.A. (1997), Developmental Biology Springer Verlag, New York.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–V (SESSION 2023-24)
ZOOLOGY
Course Title: Genetics
Course Code: BSMM-5483 (II)
(THEORY)

Course Outcomes

After passing this course the student will be able to:

CO1: Comprehensive and detailed understanding of genetic methodology and how quantification of heritable traits in families and populations provides insight into cellular and molecular mechanisms. Understanding the role of genetic mechanisms like linkage, crossing over and multiple alleles.

CO2. Understand structure of nucleic acid, process of replication and translation, genetic code.

CO3: Understanding of how genetic concepts of mutations, regulation of gene expression and extranuclear inheritance.

CO4: Evolutionary and quantitative genetics including: the basis of genetic variation; heritability; Hardy-Weinberg Equilibrium and key concepts in population and how it affects broad societal issues including health and disease, food and natural resources, environmental sustainability, etc.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–V (SESSION 2023-24)
ZOOLOGY
Course Title: Genetics
Course Code: BSMM-5483 (II)
(THEORY)

Examination Time: 3 Hrs. **Max Marks: 30**

Instructions for the Paper Setter

Eight questions of equal marks (6 marks each) are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

UNIT-I

Modification of Mendelian Ratios: Non-allelic gene interaction, Modified F2 ratios. (9:7; 9:3:4; 12:3:1; 13:3; 15:1; 9:6:1), Gene modifications due to incomplete dominance; lethal Factors (2:1); Pleiotropic genes.

Multiple Alleles: Blood group inheritance, eye colour in *Drosophila,* pseudoallelism.

Multiple Factors: Qualitative and quantitative characters, inheritance of quantitative traits (skin
colour in man).

Linkage: Linkage, sex-linked characters

Crossing Over and Recombination: crossing over, frequency of crossing over, cytological basis of crossing over, synaptonemal complex. Recombination in Fungi (Tetrad analysis).

UNIT-II

Gene and Genetic Code: Structure of nucleic acids **(DNA & RNA).**

Replication & transcription of DNA

Expression of gene (Protein synthesis in Prokaryotes and Eukaryotes).

Genetic code: Properties of genetic code, codon assignment, wobble hypothesis, split and overlapping Genes.

UNIT-III

Mutations: Spontaneous and induced mutations, physical and chemical mutagen. Detection of mutations in Maize and *Drosophila.* Inborn errors of metabolism in man (Phenylketonuria, Alcaptonuria, Albinism). Somatic mutations and carcinogenesis.

Regulation of gene expressions in prokaryotes (Operon model) in eukaryotes.

Extranuclear inheritance: Chloroplast with special reference to *Mirabilis jalapa*and kappa particles in *Paramecium.*

UNIT-IV

Population genetics: Equilibrium of gene frequencies and Hardy-Weinberg law.

Genetic recombination in bacteria (conjugation, transduction and transformation) and in plasmids.

Applied Genetics: Recombination DNA, Genetic cloning and its applications in medicine and agriculture, DNA finger printing.

Suggested Readings:

1. Klug ,Cummings, Spencer, Palladino, Killian(twelth edition),Concepts of Genetics
2. Gardener, E.J., Simmons, M.J. &Sunstad, Principles of Genetics, (8th ed), D.P. John Wiley & Sons, New York.
3. Benjamin A. Pierce ,Genetics: a conceptual approach(6^{th} edition)
4. P.S Verma and V.K Aggarwal ,Genetics(9^{th} edition) S.Chand publications.
5. Veer BalaRastogi, Genetics (4^{th} edition) ,Knrn publications.
6. Prof P. K. Gupta(5^{th} revised edition 2018-19), ,Genetics Rastogi publications.
7. C. B Powar (2018) ,Cell Biology Himalayan publishing house.
8. Miglani, G.S(2000),Basic Genetics ,Narosa publishing house, New Delhi.
9. Weaver, R.F. and Hedrick, P.W. (1992), Genetics, Wm. C. Brown Publishers Dubuque.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–V (SESSION 2023-24)
ZOOLOGY
Course Title: PRACTICAL–V (Related to Developmental Biology and Genetics)
Course Code: BSMM-5483 (P)

Course Outcomes

CO1: Understanding of development patterns of frog, chick and Larva of *Herdmania*.

CO2: Knowledge of process of gametogenesis.

CO3: Understanding of pedigree analysis and preparation of family charts.

CO4: Understanding of inheritance of morphogenetic human characters and finger tip patterns.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–V (SESSION 2023-24)
ZOOLOGY
Course Title: PRACTICAL–V (Related to Developmental Biology and Genetics)
Course Code: BSMM-5483 (P)

Examination Time: 3 Hrs. **Marks: 20**

Instructions for the Practical Examiners: Question paper is to set on the spot jointly by the Internal and External Examiners. Two copies of the same should be submitted for the record to COE Office, Kanya MahaVidyalaya, Jalandhar.

Guideslines for Conduct of Practical Examination:-

1.	Two Numericals based on Mendel/Hardy Weinberg Law.	6
2.	Perform the experiment for Dermatoglyphics/ Random mating/ Pod Length.	**3**
3.	Identification of given spots/slides.	**3**
4.	Make a pedigree chart from the given data.	**2**
5.	Chart/Assignment.	**2**
6.	Viva-voce and practical file.	**4**

1. Demonstrate the Law of segregation and independent assortment (use of coloured beads capsulesetc.).
2. Numericals for Segregation, Independent assortment,Epistasis&Hardy-Weinberg Law.
3. Demonstration of segregation in preserved material (Maize).
4. Demonstration of cytoplasmic inheritance in snails.
5. Inheritance of human characteristics.
6. Comparison of variance in respect of pod length and number of seeds/pods.
7. Calculation of gene frequencies and random mating (Coloured beads, capsules).
8. Pedigree analysis
9. Dermatoglyphics: Palm print and Finger tip patterns.
10. Study of the following permanent slides :
    - Polytene Chromosomes of *Chironomus.*
    - Stages of gametogenesis, structure of egg and sperm of a mammal.
    - Larva of *Herdmania.*

- Developmental stages offrog-upto tadpole, chick-upto 96 hr.

11. Preparationof slide for Barr body from cheek cells.
12. **Assignment**: Preparation of charts showing developmental stages of any vertebrate.

Note:- Some changes can be made in the practicals depending on the availability of material.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–V (SESSION 2023-24)

MICROBIOLOGY

Course Title: Applied Microbiology-I

Course Code: BSMM-5343

(THEORY)

Course Outcomes:

After passing this course the student will be able to:

CO1: Understand the history and scope of industrial microbiology and preservation ofstock cultures.

CO2: Understand the screening of microorganisms and composition and characteristics of fermentation media.

CO3: Learn about the fermenter and types of industrial fermentation.

CO4: Understand the downstream processing, fermentation economics and patent.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–V (SESSION 2023-24)

MICROBIOLOGY

Course Title: Applied Microbiology-I

Course Code: BSMM-5343

(THEORY)

Examination Time: 3 Hours

Max. Marks: 100
Theory Marks: 60
Practical Marks: 20
CA: 20

Instructions for the Paper Setter: Eight questions of equal marks (12 marks each) are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

UNIT- I

Microorganisms in Industry: Historical development, definition and scope of industrial microbiology; contribution of Louis Pasteur in fermentation; sources of industrial microorganisms and their essential characteristics, natural habitats, cultural collections and preservation of stock cultures.

UNIT- II

Screening of Microorganisms: Isolation of industrially important microorganisms, primary and secondary screening methods for isolating useful Yeast, Bacteria and Fungi. Fermentation media, composition of production media, characteristics of an ideal production medium, raw materials.

UNIT- III

Fermentation and Fermentation processes: Fermentation as biological activity, Types of industrial fermentations (submerged, solid state and continuous fermentation). Design of fermenter (body construction, aeration, agitation and control of septic conditions), Basics of batch culture, fedbatch culture and continuous culture.

UNIT-IV

Downstream Processing: Recovery and Purification of Fermentation Products; General principles of separation of fermentation products, solid particles, foam separation, separation by filtration, centrifugation, cell disruption, liquid - liquid chromatography, ion exchange chromatography. Fermentation economics; planning, fermentation designing, process designing, market potential and recovery costs for the industrial set up.

Patent: Introduction, composition, subject matter, characteristics, protection of rights of inventor, cost).

Books Recommended:

1. Casida, L.E. 2016, 2nd Edition.*Industrial Microbiology*. Wiley Eastern Ltd., New Delhi.
2. Stanbury, P.F. Whittaker, A. and Hall S.J. 2016, 3rd Edition. Principles of fermentation Technology. Elsevier Science Ltd., U.K.
3. Patel, A.H. 2011, 2nd Edition. *Industrial Microbiology,* Macmillan India Ltd., Delhi.
4. Trevan M.D., Saffey, S., Goulding, K.H. and Stanberry, P. 2007. *Biotechnology: The Biological Principles,* Tata McGraw Hill Publishing Co. Ltd., New Delhi.
5. Freifelder, D. 2006, 2nd Edition. Microbial Genetics. Jones and Barttett Publishers Inc., Boston.
6. Applied Microbiology by Corinne Whitby and Torben Lund Skovhus. **(Online available)**
7. Applied Microbiology by Perlman. **(Online available)**

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–V (SESSION 2023-24)
MICROBIOLOGY
Course Title: Applied Microbiology-I
Course Code: BSMM-5343
(PRACTICAL)

COURSE OUTCOMES

After passing the course student will be able to:

CO1: Isolation of microorganisms from different samples

CO2: Demonstrate the isolation of amylase and protease producing microorganisms

CO3: Understand the protein estimation by Lowery method

CO4: Knowledge about the different methods for preservation of microorganisms

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–V (SESSION 2023-24)
MICROBIOLOGY
Course Title: Applied Microbiology-I
Course Code: BSMM-5343
(PRACTICAL)

Time: 3 Hrs. **Marks: 20**

Instructions for the practical examiner: Question paper is to be set on the spot jointly bythe Internal and External Examiners. Two copies of the same may be submitted for the record to COE Office, Kanya Maha Vidyalaya, Jalandhar.

List of Practicals:

1. Isolation of microorganisms from (a) soil (b) fruits.
2. Screening of industrially important Amylase producing microorganisms.
3. Screening of industrially important Protease producing microorganisms
4. Protein estimation by Lowry method.
5. Preservation of industrially important microorganisms by various methods
    (a) Storage in 10% glycerol
    (b) Storage in mineral oil.
6. Determination of % viability of yeast cells by haemocytometer.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–V (SESSION 2023-24)

CHEMISTRY

Course Title: Chemistry (Inorganic Chemistry)

Course Code: BSMM -5084 (I)

(THEORY)

Course outcomes

Students will be able to:

CO1: Use Crystal Field Theory to understand the structure, hybridisation, geometry and predict the colour of the complexes.

CO2: To describe the magnetic properties of coordination compounds.

CO3: Describe the stability of metal complexes by the use of formation constants and to calculate thermodynamic parameters from them.

CO4: To draw Orgel diagrams for d^1 to d^{10} systems and predict the possible transitions and to calculate number of microstate and ground state term symbols and understand preparations, properties and applications of alkyls aryls of lithium and aluminium, bonding in metal-ethylenic complexes, mechanism of homogeneous hydrogenation.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–V (SESSION 2023-24)

CHEMISTRY

Course Title: Chemistry (Inorganic Chemistry)

Course Code: BSMM -5084(I)

(THEORY)

Time: 3 Hrs. **Max. Marks: 30**

Instructions for the Paper Setters:

Eight questions of equal marks (6 each) are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

Unit-I

1.Metal-ligand Bonding in Transition Metal Complexes

Limitations of valence bond theory, an elementary idea of crystal-field theory, crystal field splitting in octahedral, tetrahedral and square planar complexes, factors affecting the crystal-field parameters.

Unit-II

2. Magnetic Properties of Transition Metal Complexes

Types of magnetic behaviour, methods of determining magnetic susceptibility, spin-only formula. L-S coupling, correlation of μ_s and μ_{eff} values, orbital contribution to magnetic moments, application of magnetic moment data for characterization of 3d-metal complexes.

3. Thermodynamic and Kinetic Aspects of Metal Complexes

A brief outline of thermodynamic stability of metal complexes and factors affecting the stability, substitution reactions of square planar complexes.

Unit-III

4. Electronic Spectra of Transition Metal Complexes

Term Symbols for $p^2$and d^2 systems, spectroscopic ground states for d^1-d^{10} electronic configurations. Types of electronic transitions, selection rules for d-d transitions, spectroscopic ground states, Orgel diagram for d^1-d^5.

Unit-IV

5. Organometallic Compounds

Definition, nomenclature and classification of organometallic compounds. EAN rule, preparation, properties, and applications of alkyls aryls of lithium and aluminium, bonding in metal-ethylenic complexes, Mechanism of homogeneous hydrogenation reactions.

Books Suggested:

1. Cotton, F.A., Wilkinson, G., Gaus, P.L., Basic Inorganic Chemistry; 3rd edition, Pubs: John Wiley Sons. 1995.
2. Lee, J.D., Concise Inorganic Chemistry; 4th edition, Pubs: Chapman Hall Ltd., 1991.
3. Shriver, D.E., Alkins, P.W., Langford, C.H., Inorganic Chemistry; 4th edition, Oxford Publisher: Oxford University Press, 2006.
4. Porterfield, W.W., Wesley, A., Inorganic Chemistry; Pubs: Addison-Wesley Publishing Company, 1984.
5. Miessler, G.L., Larr, D.A., Inorganic Chemistry; 3rd edition, Pubs: Pearson Education Inc., 2004.
6. Puri, B.R., Sharma, L.R., Kalia, K.C., Principles of Inorganic Chemistry; 30th edition, Pubs:
   Milestones Publisher, 2006-07.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–V (SESSION 2023-24)

CHEMISTRY

Course Title: Chemistry (Physical Chemistry)

Course Code: BSMM -5084 (II)

(THEORY)

Course outcomes:

Students will be able to:

CO1: Understand conductance and its types, applications of conductivity measurements, conductometric titrations, transport numbers

CO2: Acquire knowledge about electrodes, reversible and irreversible cells, concentration cells, E.M.F, potentiometric titrations

CO3: Understand radioactivity, laws of radioactive decay, nuclear reactions, applications of radioactivity

CO4: Characterize the molecules with the help of various spectroscopic techniques such as vibrational, rotational, raman and electronic spectroscopy

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–V (SESSION 2023-24)
CHEMISTRY
Course Title: Physical Chemistry
Course Code: BSMM -5084(II)
(THEORY)

Time: 3 Hrs. **Max. Marks: 30**

Instructions for the Paper Setters:

Eight questions of equal marks (6 each) are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

Unit-I

1. Electrochemistry-I

Electrical transport-conduction in metals and in electrolyte solutions, specific conductance and equivalent conductance, measurement of equivalent conductance, variation of equivalent and specific conductance with dilution, migration of ions and Kohlrausch law, Arrhenius theory of electrolyte dissociation and its limitations, weak and strong electrolytes, Ostwald's dilution law, its uses and limitations. Debye-Huckel-Onsager's equation for strong electrolytes (elementary treatment only). Transport number, definition and determination by Hittorf method and moving boundary method. Applications of conductivity measurements: determination of degree of dissociation, determination of K_a of acids, determination of solubility product of a sparingly soluble salt, conductometric titrations.

Unit-II

2. Electrochemistry – II

Types of reversible electrodes-gas metal ion, metal ion, metal insoluble salt-anion and redox electrodes. Electrode reactions. Nernst equation, derivation of cell E.M.F. and single electrode potential, standard hydrogen electrode, reference electrodes, standard electrode potential, sign conventions, electrochemical series and its significance. Electrolytic and Galvanic cells - reversible and irreverisible cells, conventional representation of electrochemical cells.

EMF of a cell and its measurements. Computation of cell. EMF, Calculation of thermodynamic quantities of cell reactions (ΔG, ΔH and K), polarization, over potential and hydrogen overvoltage. Concentration cells with and without transport, liquid junction potential, application of concentration cells, valency of ions, solubility product and activity coefficient, potentiometric titrations.Definition of pH and pK_a, determination of pH using hydrogen, quinhydrone and glass electrodes by potentiometric methods. Buffers-mechanism of buffer action, Henderson-Hazel equation, Hydrolysis of salts. Corrosion-types, theories and methods of combating it.

Unit-III

3. Nuclear Chemistry

Introduction: Radioactivity, Nuclear Structure, Size of Nucleus, Mass Defects and Binding Energy, Nuclear Stability, Nuclear Forces, Nuclear Spin and Moments of Nuclei, Nuclear Models, Nuclear Decay Processes, The Laws of Radioactive Decay, Soddy-Fajans Group Displacement Law, Rate of Nuclear Decay and Half Life Time (Kinetics of Radioactive Decay), Induced

Nuclear Reactions, Types of Nuclear Processes, High Energy Nuclear Reactions, Nuclear Reaction Cross-Section, Artificial radioactivity, Detection and Measurement of Radioactivity, Nuclear Fission, Nuclear Fusion, Applications of Radioactivity.

Unit-IV

4. Spectroscopy

Introduction: Electromagnetic radiation, regions of the spectrum, basic features of different spectrometers, statement of the Born-Oppenheimer approximation, degrees of freedom.

5. Rotational Spectrum

Diatomic molecules. Energy levels of a rigid rotor (semiclassical principles), selection rules, spectral intensity, distribution using population distribution (Maxwell-Boltzmann distribution) determination of bond length, qualitative description of non-rigid rotor, isotope effect.

6. Vibrational Spectrum

Infrared spectrum: Energy levels of simple harmonic oscillator, selection rules, pure vibrational spectrum, intensity, determination of force constant and qualitative relation of force constant and bond energies, effect of anharmonic motion and isotope on the spectrum, idea of vibrational frequencies of different functional groups.

Raman Spectrum: Concept of polarizability, pure rotational and pure vibrational Raman spectra of diatomic molecules, selection rules.

7. Electronic Spectrum

Concept of potential energy curves for bonding and antibonding molecular orbitals, qualitative description of selection rules and Franck-Condon principle. Qualitative description of s, p, and n M.O., their energy levels and the respective transitions.

Books Suggested: -

1. Atkins, P., Paula, J.de, Atkins Physical Chemistry; 8th edition, Pubs: Oxford University Press, 2008.
2. Puri, B.R., Sharma, L.R., Pathania, M.S., Principles of Physical Chemistry; 43rd edition, Pubs:Vishal Publishing Co., 2008.
3. Barrow, G.M., Physical Chemistry; 6th edition, Pubs: McGraw Hill Companies Inc, 1996.
4. Berry, R.S., Rice, S.A., Ross, J., Physical Chemistry; 2nd edition, Pubs: Oxford University Press, 2000.
5. Albert, R.A., Silbey, R.J., Physical Chemistry; 1st edition, Pubs: John Wiley and Sons Inc., 1992.
6. Levine, I.N., Physical Chemistry; 5th edition, Pubs: Tata McGraw Hill Publishing Co. Ltd, 2002.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–V (SESSION 2023-24)

CHEMISTRY

Course Title: Chemistry Practical

Course Code: BSMM/BSNM-5084(P)

(PRACTICAL)

Course outcomes:

Students will be able to

CO1: Synthesize and analyse the coordination compounds and to determine the end point of various conductometric titrations

CO2: Know the principle and working of Abbe's Refractometer and to determine the composition of unknown mixture of two liquids by refractive index measurements.

CO3: Learn the technique of Rast's methods and learn phenomenon of adsorption of acetic acid and oxalic acid on charcoal

CO4: Learn distribution coefficient of of iodine between CCl_4 and water

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–V (SESSION 2023-24)
CHEMISTRY
Course Title: Chemistry Practical
Course Code: BSMM -5084 (P)
(PRACTICAL)

Duration: 3½ Hrs. **Max. Marks: 20**

Instruction for practical examiner: Question paper is to be set on the spot jointly by the Internal and External Examiners. Two copies of the same should be submitted for the record to COE office, Kanya Maha Vidyalaya, Jalandhar.

(I) Synthesis and Analysis

(a) Preparation of Sodium trioxalatoferrate (III)
(b) Preparation of Ni-DMG Complex
(c) Preparation of Copper tetrammine complex
(d) Preparation of cis-bisoxalatodiaquachromate (III) ion

(II) Physical Chemistry
(a) Conductometric Titrations
(i) Determine the end point of the following titrations by the conductometric methods.
Strong acid-Strong base
Strong acid-Weak base
Weak acid-Strong base
Weak acid-Weak base
(ii) Determine the composition of a mixture of acetic acid and the hydrochloric acid by conductometric titration.
(b) (i) Molecular Weight Determination of acetanilide, napthalane, using camphor as solvent **(Rast's methods).**
(ii) To determine the molecular weight of a polymer by viscosity measurements. **(c) Adsorption** (i)To study the adsorption of acetic acid oxalic/acid from aqueous solutions by charcoal.
(d) Phase Equilibria (i) To determine the distribution coefficient of iodine between CCl_4 and water.
(e) Refractometry
(i) Determination of refractive index of a liquid by Abbe refractometer, and hence the specific and molar refraction.
(ii) To determine the composition of unknown mixture of two liquids by refractive index measurements.
Practical Examination
1) Inorganic Synthesis 07
2) Physical experiment 08
3) Viva- Voce 03
4) Note Book 02

Books Suggested: -

1. Experimental Inorganic Chemistry, W.G. Palmer, Cambridge.
2. Handbook of preparative Inorganic Chemistry, Vol. I and II, Brauer, Academic Press.
3. Inorganic Synthesis, McGraw Hill.
4. Experiments in General Chemistry, C.N.R. Rao and U.C. Aggarwal, East-West Press
5. Experiments in Physical Chemistry, R.C. Das and B. Behra, Tata McGraw Hill.
6. Advanced Practical Physical Chemistry, J.B. Yadav, Goel Publishing House.
7. Advanced Experimental Chemistry, Vol. I, Physical, J.N. Guru and R. Kapoor, S. Chand and Co.
8. Selected Experiments in Physical Chemistry, N.G. Mukherjee, J.N. Ghosh and Sons.
9. Experiments Physical Chemistry, J.C. Ghosh, Bharati Bhavan.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER-V (SESSION 2023-24)
BOTANY
Course Title: Plant Physiology
Course Code: BSMM-5075 (I)
(THEORY)

Course outcome: -
After passing this course the student will be able to:

CO1: Understand the plant cells in relation to water and mineral nutrition.

CO2: Learn about the movement of sap & absorption of water and growth in plant.

CO3: Understand the process of photosynthesis in higher plants with particular emphasis on light and dark reactions, C3 and C4 pathways.

CO4: Understand the growth regulator in higher plants.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER-V (SESSION 2023-24)
BOTANY
Course Title: Plant Physiology
Course Code: BSMM-5075 (I)
(THEORY)

Examination Time: 3Hrs **Max. Marks: 30**

Instructions for the Paper Setters:
Eight questions of equal marks (6 marks each) are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

Unit-I

Plant-Water Relation: Importance of water to plant life, physical properties of water, (imbibition) diffusion and osmosis, absorption, transport of water and transpiration, physiology of stomata.
Mineral Nutrition: Essential macro-and micro-elements and their role, mineral uptake, deficiency and toxicity symptoms (hydroponics).

Unit-II

Transport of Organic Substances: Mechanism of phloem transport, source-sink relationship, factors affecting translocation.

Growth and Development: Definitions, phases of growth and development, kinetics of growth, seed dormancy, seed germination and factors of their regulation, plant movements, the concept of photoperiodism, physiology of flowering, florigen concept, biological clocks, physiology of senescence, fruit ripening.

Unit-III

Photosynthesis: Significance, historical aspects, photosynthetic pigments, action and absorption spectra and enhancement effects, concept of two photosystems, z-scheme, photophosphorylation, Calvin cycle, C4 pathway, CAM plants, photorespiration.

Unit-IV

Plant growth regulators - auxins, gibberellins, cytokinins, abscissic acid and ethylene, history of their discovery, biosynthesis and mechanism of action, general account of salicylic acid, jasmonates and brassinosteroids, photomorphogenesis, phytochromes and cryptochromes, their discovery, physiological role and mechanism of action.

Suggested Readings: -

1. Bhatia, K.N. (2019). Plant Physiology I and II. Trueman Book Company. New Delhi
2. Hopkins, W.G. and Huner, A. (2008). Introduction to Plant Physiology (4th Edition). JohnWiley and Sons. U.S.A.
3. Jain, V.K. (2017). Fundamentals of Plant Physiology. S. Chand Publishing. New Delhi.
4. Mandavia, C., Patel, S. V., Mandavia, M. K., Golakiya, B. A. and Chovatia, V. P. (2009). Glimpses in Plant Physiology. International Book Distributing Co., Lucknow, India.
5. Mohr, H. and Schopfer, P. (1995). Plant Physiology. Springer-Verlag, Berlin, Germany.
6. Pandey, S.N. and Sinha, B. K. (2005). Plant Physiology. Vikas Publishing. New Delhi.
7. Salisbury, F.B. and Ross, C.W. 2006. Plant Physiology (4th Edition). Wadsworth PublishingCo., California, USA.
8. Srivastava, H. N. (2019). Plant Physiology, Biochemistry and Biotechnology. Pradeep Publications, Jalandhar.
9. Taiz, L. and Zeiger, E. (2010). Plant Physiology (5th Edition). Sinauer Associates Inc. USA.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER-V (SESSION 2023-24)
BOTANY
Course Title: Biochemistry & Biotechnology
Course Code: BSMM-5075 (II)
(THEORY)

Course outcome: -
After passing this course the student will be able to:

CO1: Understand the properties and function of enzymes, and process of carbohydrate metabolism.

CO2: Understand the Properties of nitrogen metabolism & lipid metabolism and its significance in plants

CO3: Understand the fundamentals of Recombinant DNA Technology. Know about the Genetic Engineering.

CO4: Understand the principle and basic protocols for Plant Tissue Culture.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER-V (SESSION 2023-24)
BOTANY
Course Title: Biochemistry & Biotechnology
Course Code: BSMM-5075 (II)
(THEORY)

Examination Time: 3Hrs **Max. Marks: 30**

Instructions for the Paper Setters:
Eight questions of equal marks (6 marks each) are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

Unit-I

Basics of Enzymology: Discovery and nomenclature, characteristics of enzymes, concept of holoenzyme, apoenzyme, coenzymes and cofactors regulation of enzyme activity, mechanism of action.

Respiration: ATP-the biological energy currency, aerobic and anaerobic respiration, Kreb's cycle, electron transport mechanism (chemiosmotic theory), redox potential, oxidative phosphorylation, pentose phosphate pathway.

Unit-II

Nitrogen and Lipid Metabolism: Biology of nitrogen fixation, importance of nitrate reductase and its regulation, ammonium assimilation, structure and function of lipids, fatty acid biosynthesis, β-oxidation, saturated and unsaturated fatty acids, storage and mobilization of fatty acids.

Unit-III

Genetic Engineering: Tools and techniques of recombinant DNA technology, cloning vectors, genomic and cDNA library, transposable elements, techniques of gene mapping.

Unit-IV

Biotechnology: Functional definition, basic aspects of plant tissue culture, cellular totipotency, differentiation and morphogenesis, biology of Agrobacterium, vectors for gene delivery and marker genes, salient achievements in crop biotechnology.

Suggested Readings: -

1. Bhojwani, S.S. (1996). Plant Tissue Culture: Applications and Limitations. Elsevier Science Publishers, New York, USA.

2. Dennis, D.T., Turpin, D.H. Lefebvre, D.D. and Layzell (eds.) (1997**).** Plant Metabolism (2nd Edition). Longman, Essex, England.
3. Galston, A.W. (1994). Life Processes in Plants. Scientific American Library, Springer-Verlag, New York, USA.
4. Glick, B.R., Pasternak, J.J. (2010). Molecular Biotechnology- Principles and Applications of recombinant DNA. ASM Press, Washington.
5. Lea, P.J. and Leegood, R.C. (1999). Plant Biochemistry and Molecular Biology. John Wiley Sons, Chelichester, England.
6. Old, R.W. and Primrose, S.B. (2006). Principles of Gene Manipulation, Blackwell Scientific Publishers, Oxford, UK.
7. Snustad, D.P. and Simmons, M.J. (2010). Principles of Genetics (5th Edition). John Wiley and Sons Inc., U.S.A.
8. Stewart, C.N. Jr. (2008). Plant Biotechnology & Genetics: Principles, Techniques And Applications. John Wiley & Sons Inc. U.S.A.
9. Vasil, I.K. and Thorpe, T.A. (2012). Plant Cell and Tissue Culture. Kluwer Academic Publishers, The Netherlands

BACHELOR OF SCIENCE (MEDICAL) SEMESTER-V (SESSION 2023-24)
BOTANY
PRACTICAL – Plant physiology, Biochemistry &Biotechnology (I &II)
Course Code: BSMM-5075 (P)
(PRACTICAL)

Course outcome: -
After passing this course the student will be able:

CO 1: Determine the osmotic potential of cell sap by plasmolytic method.

CO2: Determine the Diffusion Pressure Deficit (DPD) of plant cells.

CO3: Determine the effect of time period on the rate of imbibition in different types of seeds.

CO4: Determine the relation between absorption and transpiration.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER-V (SESSION 2023-24)
BOTANY
Course Title: Plant physiology, Biochemistry & Biotechnology (I &II)
Course Code: BSMM-5075 (P)
(PRACTICAL)

TIME: 3 Hours **Practical: 20**

Instructions for the paper setter: question paper is to be set on the spot jointly by the Internal and External Examiners. Two copies of the same may be submitted for the record to COE Office, Kanya Maha Vidyalaya, Jalandhar.

Suggested Laboratory Exercises

1. To study the permeability of plasma membrane using different**:** concentrations of organic solvents.
2. To study the effects of temperature on permeability of plasma membrane.
3. To prepare the standard curve of protein and determine the protein content in unknown samples.
4. To study the enzyme activity of catalase and peroxidase as influenced by pH and temperature.
5. Separation of chloroplast pigments by solvent method.
6. Determining the osmotic potential of vacuolar sap by plasmolytic method.
7. Determining the water potential of any tuber.
8. Separation of amino acids in a mixture by paper chromatography and their identification by comparison with standards.
9. Bioassay of auxin, cytokinin, GA, ABA and ethylene using appropriate plant material.
10. Demonstration of the technique of micropropagation by using different explants, e.g. axillary buds, shoot meristems.
11. Demonstration of the technique of another pollen culture.
12. Demonstrate the ascent of sap using a dye.
13. Demonstration of root and shoot formation from the apical and basal portion of stem segments in liquid medium containing different hormones.
14. Demonstrate the transpiration pull by mercury method.
15. Demonstration of osmosis by potato osmoscope.
16. Comparison of loss of water from two surfaces of leaf by $CoCl_2$ method/four leaf method.
17. Demonstration of imbibition by plaster of peris method.
18. Demonstration that O_2 is evolved during photosynthesis.
19. Separation of pigments by paper chromatography/TLC method.
20. Demonstration of phototropism movements.

21. Demonstration the measurements of growth by arc auxanometer.
22. Requirements for setting up the tissue culture laboratory.
23. Preparation of nutrient medium.
24. Sterilization of glassware and plant material.
25. Preparation of explant for aseptic manipulation.

Suggested Readings (For Laboratory Exercises)

1. Bajracharya D. (1999). Experiments in Plant Physiology-A Laboratory Manual. Narosa Publishing House, New Delhi.
2. Devi, P. 2000. Principles and Methods of Plant Molecular Biology, Biochemistry and Genetics. Agrobios, Jodhpur, India.
3. Dixon, R.A. (Ed.) 1994. Plant Cell Culture: A Practical Approach, IRL Press, Oxford.
4. Kochhar, S. L. and Gujral, S. K. (2016). Comprehensive Practical Plant Physiology. Macmillan Publishers India Ltd., Delhi.
5. Moore, T.C. 2012. Research Experiences in Plant Physiology: A Laboratory annual. Springer-Verlag. Berlin.
6. Plummer, D.T. (2001). An Introduction to Practical Biochemistry (3rd Edition). Tata McGraw-Hill Publishing Co. Ltd. New Delhi.
7. Roberts, J. and Tuckar, G.A. (Eds.) 2000. Plant Hormone Protocols. Human Press, NewJersey, USA.
8. Scott, R.P.W. 1995. Techniques and Practices of Chromatography. Marcel Dekker, Inc., NewYork.
9. Smith, R.H. 2000. Plant Tissue Culture: Techniques and Experiments. Academic Press,NewYork.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–V (SESSION 2023-24)
FOOD SCIENCE AND QUALITY CONTROL (VOCATIONAL)
Course Title: Food Science and Quality Control (Vocational) (FOOD ANALYSIS)
Course Code: BSMM-5255
(THEORY)

Course Outcomes: After passing this course the student will be able to:

CO1: Understand the food composition and proximate analysis of food components.

CO2: Learn the analysis of micronutrients.

CO3: Understand the physical methods of food analysis including food rheology, refractometryand polarimetry.

CO4: Learn different chromatography techniques.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–V (SESSION 2023-24)
FOOD SCIENCE AND QUALITY CONTROL (VOCATIONAL)
Course Title: Food Science and Quality Control (Vocational) (FOOD ANALYSIS)
Course Code: BSMM-5255

(THEORY)

Examination Time: 3 Hours

Max. Marks: 100
Theory Marks: 60
Practical Marks: 20
CA: 20

Instructions for the Paper Setter: Eight questions of equal marks (12 marks each) are to be set,two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

UNIT-I

1. Food composition and factors effecting food composition.
2. Proximate composition analysis of food.

UNIT-II

3. Analysis of Micronutrients and minerals.

UNIT-III

4. General physical methods of analysis of foods: Refractometry & Polarimetry.
5. Introduction and principles of Food rheology, types of viscosity, equipments used to check the viscosity.

UNIT-IV

6. Basic principles and working of Column chromatography, Gas chromatography and High Pressure Liquid Chromatography.

Reference Books:

1. Manuals of Food Quality Control additions contaminants techniques, 1980.
2. The Chemical Analysis of Food and Food Products by Morries B Jacob, 3rd Edition., Roberte, Krieger.
3. Food Analysis, 2019, 4th Edition, S. Suzanne Nielsen. (Online available) http://154.68.126.6/library/Food%20Science%20books/batch1/Food%20Analysis%20Fourth%20Edition.pdf
4. Analysis and Quality Control for Fruit and Vegetable Products, S Ranganna, McGraw Hill Education (India) Private Limited, Chennai, India.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–V (SESSION 2023-24)
FOOD SCIENCE AND QUALITY CONTROL (VOCATIONAL)
Course Title: Food Science and Quality Control (Vocational) (FOOD ANALYSIS)
Course Code: BSMM-5255
(PRACTICAL)

Course Outcomes:

After passing the course student will be able to:

CO1: Understanding of compositional analysis of food.

CO2: Familiarity with various instruments crucial for evaluating food product quality.

CO3: Ability to perform specific chemical tests to estimate the concentration of vitamins and minerals in food samples.

CO4: Analysis and assessment of various parameters critical for ensuring food product quality, safety and shelf life.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–V (SESSION 2023-24)
FOOD SCIENCE AND QUALITY CONTROL (VOCATIONAL)
Course Title: Food Science and Quality Control (Vocational) (FOOD ANALYSIS)
Course Code: BSMM-5255
(PRACTICAL)

Time: 3 Hrs **Max. Marks: 20**

Instructions for the practical examiner: Question paper is to be set on the spot jointly by the Internal and External Examiners. Two copies of the same may be submitted for the record to COE Office, Kanya Maha Vidyalaya, Jalandhar.

List of Practicals:

1. Determination of milk quality by lactometer.
2. To find out the TSS of food sample by refractometer.
3. Determination of surface tension of food sample by using drop number method.
4. Determination of viscosity index of food sample.
5. Proximate composition of different types of food.
6. Estimation of different minerals in food.
7. Estimation of vitamins in food.
8. Determination of dry and wet gluten content in wheat flour.
9. Determination of Chlorophyll content in food sample.
10. Estimation of percent loss in weight after drying and dehydration.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–VI (SESSION 2023-24)
PUNJABI
Course Title: Punjabi (Compulsory)
Course Code- BSML -6421

Course Outcomes

CO1: 'ਕਾਵਿ ਗੌਰਵ' ਨੂੰ ਪੜ੍ਹਾਉਣ ਦਾ ਮਨੋਰਥ ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਕਵਿਤਾਵਾਂ ਪ੍ਰਤੀ ਦਿਲਚਸਪੀ, ਸੂਝ ਨੂੰ ਪੈਦਾ ਕਰਨਾ ਹੈ।

CO2: 'ਧਰਤੀਆਂ ਦੇ ਗੀਤ' (ਸਫ਼ਰਨਾਮਾ) ਨੂੰ ਸਿਲੇਬਸ ਵਿਚ ਸ਼ਾਮਿਲ ਕਰ ਕੇ ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਸਫ਼ਰਨਾਮਾ ਪੜ੍ਹਣ ਦੀ ਰੁਚੀ ਨੂੰ ਪੈਦਾ ਕਰਨਾ ਹੈ ਅਤੇ ਇਸ ਸਾਹਿਤ ਰੂਪ ਨਾਲ ਨਾਲ ਜੋੜਣਾ ਹੈ।

CO3: ਲੇਖ ਰਚਨਾ ਕਰਨ ਨਾਲ ਵਿਦਿਆਰਥੀ ਆਪਣੀ ਗੱਲ ਨੂੰ ਕਹਿਣ ਦੀ ਜਾਚ ਸਿੱਖਣਗੇ ਅਤੇ ਇਹ ਦਿਮਾਗੀ ਕਸਰਤ ਵਿਚ ਸਹਾਈ ਹੋਵੇਗੀ। ਸਾਹਿਤ ਰੂਪਾਂ ਕਵਿਤਾ, ਕਹਾਣੀ, ਨਾਵਲ, ਨਾਟਕ, ਇਕਾਂਗੀ ਦੀ ਪਰਿਭਾਸ਼ਾ,ਪ੍ਰਕਾਰ ਤੇ ਤੱਤ ਨਾਲ ਜਾਣੂ ਕਰਵਾਇਆ ਜਾਵੇਗਾ।ਸਾਹਿਤ ਰੂਪਾਂ ਨੂੰ ਸਿਲੇਬਸ ਵਿੱਚ ਸ਼ਾਮਲ ਕਰਨ ਦਾ ਮਕਸਦ ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਇਨ੍ਹਾਂ ਸਾਹਿਤ ਰੂਪਾਂ ਦੀ ਪਰਿਭਾਸ਼ਾ,ਪ੍ਰਕਿਰਤੀ ਅਤੇ ਤੱਤਾਂ ਤੋਂ ਬਾਰੀਕੀ ਨਾਲ ਜਾਣੂ ਕਰਵਾਉਣਾ ਹੈ।

CO4: ਵਿਆਕਰਨਕ ਸ਼੍ਰੇਣੀਆਂ : ਲਿੰਗ, ਵਚਨ,ਕਾਰਕ ਕਿਰਿਆ ਵਾਕੰਸ਼ ਦੀ ਪਰਿਭਾਸ਼ਾ, ਬਣਤਰ ਤੇ ਪ੍ਰਕਾਰ ਨੂੰ ਪੜ੍ਹਾਉਣ ਦਾ ਮਨੋਰਥ ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਭਾਸ਼ਾ ਦੀ ਅਮੀਰੀ ਅਤੇ ਬਾਰੀਕੀਆਂ ਨੂੰ ਸਮਝਣ ਲਈ ਵੱਖਰੇ -ਵੱਖਰੇ ਸਿਧਾਂਤਾਂ ਦਾ ਵਿਕਾਸ ਕਰਨਾ ਹੈ।

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–VI (SESSION 2023-24)
PUNJABI
Course Title: Punjabi (Compulsory)
Course Code- BSML -6421

ਸਮਾਂ : 3 ਘੰਟੇ **Maximum Marks: 50**
Theory: 40
CA: 10

ਪਾਠਕ੍ਰਮ ਅਤੇ ਪਾਠ ਪੁਸਤਕਾਂ

ਯੂਨਿਟ-I

ਕਾਵਿ ਗੌਰਵ(ਪਹਿਲੇ ਛੇ ਕਵੀ)(ਸੰਪਾ.ਬਿਕਰਮ ਸਿੰਘ ਘੁੰਮਣ, ਕਰਮਜੀਤ ਕੌਰ),ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ, ਅਮ੍ਰਿਤਸਰ,
(ਸ਼ੇਖ ਫ਼ਰੀਦ, ਸ਼ਾਹ ਹੁਸੈਨ, ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਜੀ, ਗੁਰੂ ਅਰਜਨ ਦੇਵ ਜੀ,ਵਾਰਿਸ ਸ਼ਾਹ, ਸ਼ਾਹ ਮੁਹੰਮਦ)
(ਪ੍ਰਸੰਗ ਸਹਿਤ ਵਿਆਖਿਆ/ਵਿਸ਼ਾ ਵਸਤੂ/ਸਾਰ) 8 ਅੰਕ

ਯੂਨਿਟ-II

ਧਰਤੀਆਂ ਦੇ ਗੀਤ(ਸਫ਼ਰਨਾਮਾ), ਬਰਜਿੰਦਰ ਸਿੰਘ ਹਮਦਰਦ,ਨਾਨਕ ਸਿੰਘ ਪੁਸਤਕਮਾਲਾ, ਅੰਮ੍ਰਿਤਸਰ
(ਸਮਾਜ ਸਭਿਆਚਾਰ ਪਰਿਪੇਖ/ਸਫਰਨਾਮੇ ਦੇ ਤੌਰ ਤੇ ਪਰਖ) 8 ਅੰਕ

ਯੂਨਿਟ-III

(ੳ) ਲੇਖ ਰਚਨਾ(ਵਿਗਿਆਨ, ਤਕਨਾਲੋਜੀ ਅਤੇ ਚਲੰਤ ਮਸਲਿਆਂ ਸਬੰਧੀ)
(ਅ) ਆਧੁਨਿਕ ਸਾਹਿਤ ਰੂਪ : ਕਵਿਤਾ, ਕਹਾਣੀ, ਨਾਵਲ, ਨਾਟਕ, ਇਕਾਂਗੀ
8 ਅੰਕ

ਯੂਨਿਟ-IV

ਵਿਆਕਰਣ :
(ੳ) ਵਿਆਕਰਨਕ ਸ੍ਰੇਣੀਆਂ : ਲਿੰਗ, ਵਚਨ,ਕਾਰਕ
(ਅ) ਕਿਰਿਆ ਵਾਕੰਸ਼ : ਪਰਿਭਾਸ਼ਾ, ਬਣਤਰ ਤੇ ਪ੍ਰਕਾਰ 8 ਅੰਕ

ਅੰਕ ਵੰਡ ਅਤੇ ਪਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ

1. ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਦੇ ਚਾਰ ਸੈਕਸ਼ਨ ਹੋਣਗੇ।ਸੈਕਸ਼ਨ A-D ਤੱਕ ਦੇ ਪ੍ਰਸ਼ਨ ਯੂਨਿਟ I-IV ਵਿਚੋਂ ਪੁੱਛੇ ਜਾਣਗੇ। ਹਰ ਸੈਕਸ਼ਨ ਵਿਚ ਦੋ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ।
2. ਵਿਦਿਆਰਥੀ ਨੇ ਕੁਲ ਪੰਜ ਪ੍ਰਸ਼ਨ ਕਰਨੇ ਹਨ। ਹਰ ਸੈਕਸ਼ਨ ਵਿਚੋਂ ਇਕ ਪ੍ਰਸ਼ਨ ਕਰਨਾ ਲਾਜ਼ਮੀ ਹੈ। ਪੰਜਵਾਂ ਪ੍ਰਸ਼ਨ ਕਿਸੇ ਵੀ ਸੈਕਸ਼ਨ ਵਿਚੋਂ ਕੀਤਾ ਜਾ ਸਕਦਾ ਹੈ।
3. ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ 08 ਅੰਕ ਹਨ।
4. ਪੇਪਰ ਸੈੱਟ ਕਰਨ ਵਾਲਾ ਜੇਕਰ ਚਾਹੇ ਤਾਂ ਪ੍ਰਸ਼ਨਾਂ ਦੀ ਵੰਡ ਅੱਗੋਂ ਵੱਧ ਤੋਂ ਵੱਧ ਚਾਰ ਉਪ ਪ੍ਰਸ਼ਨਾਂ ਵਿਚ ਕਰ ਸਕਦਾ ਹੈ।

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–VI (SESSION 2023-24)

BASIC PUNJABI

Course Title: Basic Punjabi (In lieu of Punjabi Compulsory)

Course Code- BSML -6031

COURSE OUTCOMES

CO1: ਵਿਦਿਆਰਥੀ ਪੰਜਾਬੀ ਸਭਿਆਚਾਰ ਦਾ ਪਿਛੋਕੜ,ਪੰਜਾਬੀ ਸਭਿਆਚਾਰ ਦੀ ਭੂਗੋਲਿਕ ਸਥਿਤੀ,ਪੰਜਾਬੀ ਸਭਿਆਚਾਰ ਦੇ ਨਿਖੜਵੇ ਲੱਛਣ ਦਾ ਅਧਿਐਨ ਕਰਨਗੇ।

CO2: ਪੰਜਾਬ ਦੇ ਮੇਲੇ,ਪੰਜਾਬ ਦੇ ਤਿਉਹਾਰ,ਪੰਜਾਬ ਦੇ ਪ੍ਰਮੁੱਖ ਧਾਰਮਿਕ ਸਥਾਨ ਬਾਰੇ ਜਾਣ ਸਕਣਗੇ।

CO3: ਜਨਮ ਨਾਲ ਸੰਬੰਧਿਤ ਰੀਤਾਂ ਰਸਮਾਂ,ਵਿਆਹ ਨਾਲ ਸੰਬੰਧਿਤ ਰੀਤਾਂ ਰਸਮਾਂ,ਮੌਤ ਨਾਲ ਸੰਬੰਧਿਤ ਰੀਤਾਂ ਰਸਮਾਂ ਬਾਰੇ ਜਾਣ ਸਕਣਗੇ।

CO4: ਪੰਜਾਬ ਦਾ ਖਾਣ ਪੀਣ,ਪੰਜਾਬ ਦਾ ਪਹਿਰਾਵਾ,ਪੰਜਾਬ ਦੇ ਲੋਕ ਵਿਸ਼ਵਾਸ ਦਾ ਅਧਿਐਨ ਕਰਨਗੇ।

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–VI (SESSION 2023-25)

BASIC PUNJABI

Course Title: Basic Punjabi (In lieu of Punjabi Compulsory)

Course Code- BSML -6031

ਪਾਠਕ੍ਰਮ

ਯੂਨਿਟ-I

ਪੰਜਾਬੀ ਸਭਿਆਚਾਰ ਦਾ ਪਿਛੋਕੜ
ਪੰਜਾਬੀ ਸਭਿਆਚਾਰ ਦੀ ਭੂਗੋਲਿਕ ਸਥਿਤੀ
ਪੰਜਾਬੀ ਸਭਿਆਚਾਰ ਦੇ ਨਿਖੱੜਵੇ ਲੱਛਣ
08 ਅੰਕ

ਯੂਨਿਟ-II

ਪੰਜਾਬ ਦੇ ਮੇਲੇ
ਪੰਜਾਬ ਦੇ ਤਿਉਹਾਰ
ਪੰਜਾਬ ਦੇ ਪ੍ਰਮੁੱਖ ਧਾਰਮਿਕ ਸਥਾਨ
08 ਅੰਕ

ਯੂਨਿਟ-III

ਜਨਮ ਨਾਲ ਸੰਬੰਧਿਤ ਰੀਤਾਂ ਰਸਮਾਂ
ਵਿਆਹ ਨਾਲ ਸੰਬੰਧਿਤ ਰੀਤਾਂ ਰਸਮਾਂ
ਮੌਤ ਨਾਲ ਸੰਬੰਧਿਤ ਰੀਤਾਂ ਰਸਮਾਂ
08 ਅੰਕ

ਯੂਨਿਟ-IV

ਪੰਜਾਬ ਦਾ ਖਾਣ ਪੀਣ
ਪੰਜਾਬ ਦਾ ਪਹਿਰਾਵਾ
ਪੰਜਾਬ ਦੇ ਲੋਕ ਵਿਸ਼ਵਾਸ

ਅੰਕ ਵੰਡ ਅਤੇ ਪਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ

1. ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਦੇ ਚਾਰ ਸੈਕਸ਼ਨ ਹੋਣਗੇ। ਸੈਕਸ਼ਨ A-D ਤੱਕ ਦੇ ਪ੍ਰਸ਼ਨ ਯੂਨਿਟ I-IV ਵਿਚੋਂ ਪੁੱਛੇ ਜਾਣਗੇ। ਹਰ ਸੈਕਸ਼ਨ ਵਿਚ ਦੋ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ।
2. ਵਿਦਿਆਰਥੀ ਨੇ ਕੁੱਲ ਪੰਜ ਪ੍ਰਸ਼ਨ ਕਰਨੇ ਹਨ। ਹਰ ਸੈਕਸ਼ਨ ਵਿਚੋਂ ਇਕ ਪ੍ਰਸ਼ਨ ਲਾਜ਼ਮੀ ਹੈ। ਪੰਜਵਾਂ ਪ੍ਰਸ਼ਨ ਕਿਸੇ ਵੀ ਸੈਕਸ਼ਨ ਵਿਚੋਂ ਕੀਤਾ ਜਾ ਸਕਦਾ ਹੈ।
3. ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ 08 ਅੰਕ ਹਨ।
4. ਪੇਪਰ ਸੈੱਟ ਕਰਨ ਵਾਲਾ ਜੇਕਰ ਚਾਹੇ ਤਾਂ ਪ੍ਰਸ਼ਨਾਂ ਦੀ ਵੰਡ ਅੱਗੋਂ ਵੱਧ ਤੋਂ ਵੱਧ ਚਾਰ ਉਪ ਪ੍ਰਸ਼ਨਾਂ ਵਿਚ ਕਰ ਸਕਦਾ ਹੈ।

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–VI (SESSION 2023-24)
PUNJAB HISTORY AND CULTURE
Course Title: Punjab History and Culture (1947- 2000 A.D.)
(Special paper in lieu of Punjabi Compulsory)
(For those students who are not domicile of Punjab)
Course Code: BSML-6431

COURSE OUTCOMES:

After completing this paper the students will be able to

CO 1: Comprehend Punjab's contribution in the freedom struggle, the exodus and Rehabilitation and its impact on state with special reference to partition

CO 2: Comprehend the causes that led to the formation of New Punjab in 1966 and outcomes of Green Revolution in the Punjab

CO 3: Understand nature and reasons of diaspora, female foeticide and growth of education in Punjab and its impact on youth

CO 4: Comprehend the growth of Punjabi literature and Drama in the Punjab after Independence and to understand the reasons of drug abuse in Punjab, its management and prevention in the Punjab

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–VI (SESSION 2023-24)
PUNJAB HISTORY AND CULTURE
Course Title: Punjab History and Culture (1947- 2000 A.D.)
(Special paper in lieu of Punjabi Compulsory)
(For those students who are not domicile of Punjab)
Course Code: BSML-6431

Examination Time: 3 Hours **Max. Marks: 50**
Theory: 40
CA: 10

Instructions for the Paper Setters

1. **Question paper shall consist of four Units**
2. **Examiner shall set 8 questions in all by selecting Two Questions of equal marks from each Unit.**
3. **Candidates shall attempt 5 questions in 600 words, by at least selecting One Question from each Unit and the 5th question may be attempted from any of the four Units.**
4. **Each question will carry 8 marks**

UNIT I

1. Partition and its Impact on Punjab
2. Rehabilitation.

UNIT II

3. Punjabi Suba Movement and Act of 1966.
4. Green Revolution.

UNIT III

5. Punjabi Diaspora (Canada)
6. Development of education in Punjab after Independence

UNIT IV

7. Development of Punjabi Literature and Drama.(With Special Reference to Bhai Veer Singh, Shiv Kumar Batalvi)
8. Emerging Concerns: Drug Addiction and Female Foeticide (In context to the Punjab)

Suggested Readings

- Chopra, P.N. & Das, M.N. (1974), *A Social, Cultural & Economic History of India.* Vol.III, Macmillan India, New Delhi, 1974.
- Grewal, J.S., *Social and Cultural History of Punjab: Prehistoric, Ancient and Early Medieval*. Foundation Books Pvt Ltd Cambridge House, New Delhi, 2004.
- Grewal, J.S., *The Sikhs of Punjab*. New Cambridge House, New Delhi, 2005

- Rai Satya M. , *Heroic Tradition in Punjab(1900-1947)*. Publication Bureau, Punjabi University, Patiala, 1978
- Singh, Fauja*., Freedom Struggle in Punjab*. Publication Bureau, Punjabi University, Patiala, 1974
- Singh, Fauja, *History and Culture of the Punjab*. Part II, Publication Bureau, Punjabi University, Patiala, 1987.
- Singh, Kushwant, *A History of the Sikhs*. Vol. II (1839-1998), Oxford University Press, Delhi, 1991.
- Yadav, K.C., *Haryana Aitihasik Simhavalokan* (Hindi). Haryana Sahitya Akademy, Chandigarh, 1991.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–VI (SESSION 2023-24)
(ENGLISH)
Course Title: English (Compulsory)
Course Code: BSML -6212

COURSE OUTCOMES

After passing this course, the students will be able to:

CO 1: Comprehend, appreciate and critically analyse a novel through the story of the novel *Train to Pakistan* by Khushwant Singh

CO 2: Analyze and appreciate the dramatic technique, plot development and art of characterisation through the study of the prescribed plays from the book *Glimpses of Theatre*

CO 3: Enhance their writing skills by writing essay on any given topics well as to write report on any incident witnessed

CO 4: Write appropriate reports on any incident witnessed.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–VI (SESSION 2023-24)

ENGLISH

Course Title: English (Compulsory)

Course Code: BSML -6212

Max. Marks: 50

Examination Time: 3 Hrs **Theory: 40**

CA: 10

Instructions for the Examiner:

Section A: Three questions from the novel *Train to Pakistan* from Unit I and three questions from *Glimpses of Theatre* from Unit II requiring very short answers will be set. The students would be required to answer any five, each carrying 2 marks (50 words each). **(5×2=10)**

Section B: Four questions requiring brief descriptive answers based on character, plot and theme(s) in the novel *Train to Pakistan* from Unit I will be set and students would be required to attempt any two, each carrying 5 marks (250 words each). **(2×5=10)**

Section C: Four questions based on the central idea, theme, tone or style etc. of the prescribed plays from the textbook, *Glimpses of Theatre* from Unit II will be set for the students to attempt any two, each carrying 5 marks (250 words each). **(2×5=10)**

Section D: Two questions with internal choice will be set based on Unit 3 (Essay Writing) carrying six marks (word limit 300 words) and Unit 4 (Report Writing) carrying four marks word limit 200 words). **(1×6 + 1×4=10)**

Unit I

Train to Pakistan by Khushwant Singh

Unit II

Glimpses of Theatre:

i) The Will
ii) Villa for Sale
iii) Progress
iv) The Monkey's Paw

Unit III

Essay Writing

Unit IV

Report Writing

Texts Prescribed:

1. *Train to Pakistan* by Khushwant Singh
2. *Glimpses of Theatre*, Guru Nanak Dev University Amritsar

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–VI (SESSION 2023-24)
ZOOLOGY
Course Title: MEDICAL ZOOLOGY
Course Code: BSMM-6483 (I)
(THEORY)

Course Outcome

After successfully completing this course, students will be able to:

CO1: Understand about various pathogenic microbes, life history of various pathogenic protozoans and helminths as well as diseases caused by them.

CO2: Know about life history, diseases and control measures of arthropod vectors and awareness about epidemic diseases.

CO3: Provide basics knowledge about immune responses, antigens, antibody structure and immunoglobulins.

CO4: Understand antigen-antibody interactions and gain knowledge about vaccines.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–VI (SESSION 2023-24)
ZOOLOGY
Course Title: MEDICAL ZOOLOGY
Course Code: BSMM-6483 (I)
(THEORY)

Max. Time: 3 Hrs. **Max Marks: 30**

Instructions for the Paper Setter

Eight questions of equal marks (6 marks each) are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

UNIT-I

1. Introduction of Parasitology (various terminologies in use).
2. Brief introduction to pathogenic microbes, viruses, Rickettsiae, spirochaetes and bacteria.
3. Brief accounts of life history, mode of infection and pathogenicity of the following with reference to man; prophylaxis and treatment:
   a) Pathogenic protozoa: *Entamoeba, Trypanosoma, Leishmania, Giardia, Trichomonas* and *Plasmodium.*
   b) Pathogenic helminthes: *Fasciola, Schistosoma, Echinococcus, Ancylostoma, Trichinella, Wuchereria, Dracunculus* and *Oxyuris.*

UNIT-II

4. Life cycle and control measures of arthropod vectors of human disease: Malaria *(Anopheles stephens, A.culicifaces,* Yellow fever, Dengue, Dengue haemorrhagic fever and Chickengunea. *(Aedes aegypti A. Albopicuts)*; Filariasis *(Culex pipien satigeans) Mansonia* sp. Japanese Encephalitis *(C. trinanelorhynchus);* Plague *(Stenophalide cheopis)* and Epidemic Typhus *(Pediculus spp).*
5. Epidemic diseases, such as Typhoid, Cholera, Small pox; their occurrence and eradication programs.

UNIT-III

6. Brief introduction to human defence mechanisms.
7. Humoral and cell mediated immune response. Physical & chemical properties of antigens. Antibody structure and function of M, G, A, E and D immunoglobulins.

UNIT-IV

8. Antigen and antibody interactions-Serodiagnostic assays (Precipitation, agglutination immunodiffusion, ELISA, RIA)
9. Vaccines

Suggested Readings:

1. Baker, F.J. and Silverton, R.E. (1985). Introduction to Medical Laboratory Technology, (6^{th} ed), Butlerworth and Co.Ltd.
2. Chatterjee, K.D. (2019), Parasitology, Protozoology and Helminthology (13^{th}ed).
3. Cheesborough, M. (1991), Medical Laboratory Technology for Tropical countries, Butlerworth and Co.,Ltd.
4. Garcia, L.S. (2001), Diagnostic Medical Parasitology, (4^{th} ed), ASM Press Washington.
5. Kimball,J.W.(1987),Introduction of Immunology, (2^{nd} ed),MacMillian Publishing Co.,NewYork.
6. Kuby, J. (2013), Immunology, 7^{th} Edition W.H. Freeman & Co.,USA.
7. Roitt, I. (2017), Essential Immunology, 13^{th} Edition, Blackwell Scientific Publications, Oxford.
8. Talib, V.H. (2019), Essential Laboratory Manual,2^{nd} edition, Mehta Publishers, New Delhi.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–VI (SESSION 2023-24)
ZOOLOGY
Course Title: Medical Laboratory Technology
Course Code: BSMM-6483 (II)
(THEORY)

Course Outcome

After successfully completing this course, students will be able to:

CO1: Comply with safety regulations and universal precautions during lab investigations and perform basic laboratory techniques on biological specimens.

CO2: Know about routine clinical laboratory investigations including collection of different samples and perform other routine hematological procedures.

CO3: Describe basic scientific principles in learning new techniques and procedures in bacteriology and microbiology.

CO4: Apply knowledge and technical skills associated histopathology, staining techniques and biochemical estimations.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–VI (SESSION 2023-24)
ZOOLOGY
Course Title: Medical Laboratory Technology
Course Code: BSMM-6483 (II)
(THEORY)

Max. Time: 3 Hrs. **Max Marks: 30**

Instructions for the Paper Setter

Eight questions of equal marks (6 marks each) are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

UNIT-I

Laboratory safety rules, hazards and precautions during sample collection and laboratory investigations.
Laboratory Techniques: Colorimetry, Microscopy, Autoclaving, Centrifugation and Spectrophotometry

UNIT-II

Collection, transportation and preservation of different clinical samples.
Haematology: collection of blood (venous and capillary), anticoagulants (merits and demerits), Romanowsky's stains, total RBC count, erythrocyte sedimentation rate, TLC, DLC, platelet count.

UNIT-III

Bacteriology: sterilization (dry heat, moist heat, autoclave, filtration), disinfection, staining techniques, (gram stain, AFB stain, etc), culture media (defined and synthetic media & routine laboratory media), bacterial culture (aerobic and anaerobic) and antibiotic sensitivity.

UNIT-IV

Histopathology: Common fixatives and staining techniques.
Biochemistry: Principal/theory and significance of estimation of urea, sugar, cholesterol, creatinine, enzymes (transaminase, phosphatase, amylase and lipase), uric acid in blood, estimation of proteins, sugar, bile salts, ketone bodies in urine and liver function test.

Suggested Readings:

1. Baker, F.J. and Silverton, R.E. (1985) Introduction to Medical Laboratory Technology, (6^{th} ed), Butlerworth and Co.Ltd.
2. Chatterjee, K.D. (2019), Parasitology, Protozoology and Helminthology (13^{th}ed).
3. Cheesborough, M. (1991), Medical Laboratory Technology for Tropical countries, Butlerworth and Co., Ltd.

4. Garcia, L.S. (2001), Diagnostic Medical Parasitology, (4th ed), ASM Press Washington.
5. Kimball,J.W.(1987),Introduction of Immunology, (2nd ed),MacMillian Publishing Co., NewYork.
6. Kuby, J. (2013), Immunology, 7th Edition W.H. Freeman & Co.,USA.
7. Roitt, I. (2017), Essential Immunology, 13th Edition, Blackwell Scientific Publications, Oxford.
8. Talib, V.H. (2019), Essential Laboratory Manual,2nd edition, Mehta Publishers, New Delhi.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–VI (SESSION 2023-24)
ZOOLOGY
Course Title: PRACTICAL–V (Related to Medical Zoology &Medical Laboratory Technology)
Course Code: BSMM-6483 (P)
(PRACTICAL)

Course Outcomes

CO1: Apply knowledge and technical skills associated with medical laboratory technology for delivering quality clinical investigations support.

CO2: Perform basic clinical laboratory procedures using appropriate laboratory techniques and instrumentation in accordance with current laboratory safety protocol

CO3: Understanding of sterilization techniques and will also learn about various histotechniques, handling and processing of tissue specimens as well as staining procedures.

CO4: Understanding of estimation of protein & sugar

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–VI (SESSION 2023-25)
(ZOOLOGY)
Course Title: PRACTICAL–V (Related to Medical Zoology &Medical Laboratory Technology)
Course Code: BSMM-6483 (P)
(PRACTICAL)

Time: 3 hrs. **Max. Marks:20**

Instructions for the Practical Examiners: Question paper is to set on the spot jointly by the Internal and External Examiners. Two copies of the same should be submitted for the record to COE Office, Kanya Maha Vidyalaya, Jalandhar

1. Demonstration of safety rules in laboratory like proper handling of patients, specimens and disposal of syringes, needles etc.
2. Demonstration of the use of autoclave, centrifuge and spectrophotometer.
3. Cleaning and sterilization of glass ware, using hot air oven, autoclave etc.
4. Physico-chemical examination of urine.
5. Preparation of thick and thin blood smear.
6. Counting of WBC, RBC and DLC.
7. Study of permanent slides and specimens of parasitic protozoans, helminthes and arthropods mentioned in the theory syllabus.
8. ESR and haematocrit.
9. Estimation of blood sugar, protein.
10. Demonstration of fixation, embedding, cutting of tissue sections, and their staining (routine haematoxylin and eosin).
11. Visit to a pathology Lab and preparation of report.

Guidelines for conduct of Practical Examination:

1.	Write down the principle and working of the given equipment.	4
2.	Write down the procedure, precautions and perform the experiment for physico-chemical examination of urine/ haematology.	4
3.	Identification, pathogenicity and host of parasitic organism.	4
4.	Estimation of blood sugar / protein in the given sample.	4
5.	Viva-voce and practical file	4

(Note:- Some changes can be made in the practicals depending on the availability of material.)

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–VI (SESSION 2023-24)
MICROBIOLOGY
Course Title: Applied Microbiology-II
Course Code: BSMM-6343
(THEORY)

Course Outcomes:

After passing this course the student will be able to:

CO1: Understand the processing of fermented foods.

CO2: Understand the Microbial Cell as Fermentation Products and production of different industrial chemicals.

CO3: Understand the role of microorganisms in preparation of alcoholic beverages andindustrial enzymes.

CO4: Understand the role of microorganisms in the production of vitamins, amino acids and antibiotics.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–VI (SESSION 2023-24)
MICROBIOLOGY
Course Title: Applied Microbiology-II
Course Code: BSMM-6343
(THEORY)

Time: 3 Hrs. **Max Marks:100**

Theory Marks: 60

Practical Marks: 20

CA: 20

Instructions for the Paper Setters: Eight questions of equal marks are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

UNIT-I

Fermentation Process of Fermented Foods: Fermented cereal, legume and milk products. Microbiology of natural fermentation. Sauerkraut, Yoghurt, Soya sauce, Cheese.

UNIT-II

Microbial Cell as Fermentation Products: Baker's and brewer's yeast, single cell protein, mushroom farming. Production of industrial chemicals: Acetic acid, Citric acid, Acetone and Butanol.

UNIT-III

Production of alcoholic Beverages: Beer, wine and distilled beverages – Whisky, Brandy, Vodka, Gin production and applications of industrial enzymes: Amylases, Proteases, immobilization of enzymes.

UNIT-IV

Vitamins and Amino acids production by Microorganisms: Riboflavin (B2) and Cyanocobalamin (B12), Glutamic acid. Production of antibiotics: Penicillin and Streptomycin.

Books Recommended:

1. Read, G. 1982. Prescott and Dunn, *Industrial Microbiology.*CBS Publishers &Distributers, New Delhi.
2. Casida, L.E. 1991. *Industrial Microbiology*. Wiley Eastern Ltd., New Delhi.

3. Patel, A.H. 1984. *Industrial Microbiology*. Macmillan India Ltd., Delhi.
4. Trevan, M.D. Saffey, S., Goulding, K.H. and Stanberry, P. 1988. *Biotechnology: The Biological Principles*, Tata McGraw Hill Publishing Co. Ltd., New Delhi
5. Wiseman, A. 1995. *Handbook of Enzyme Biotechnology*. Ellis Harwood Ltd., London.
6. Wood, J.B.B., 1998. *Microbiology of Fermented Foods*, Volumes 1 and 2, Blackie Academic and Professional, London.
7. Power C.B. and Dagniwala, H.F.1992. *General Microbiology*. Volume-2. Himalaya Publishing House, New Delhi.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–VI (SESSION 2023-24)

MICROBIOLOGY

Course Title: Applied Microbiology-II

Course Code: BSMM-6343

(PRACTICAL)

COURSE OUTCOMES

After passing the course student will be able to:

CO1: Demonstrate the crude production of amylase and protease enzymes

CO2: Preparation of wine and vinegar

CO3: Understand the submerged and solid-state fermentation techniques for enzyme production

CO4: Knowledge about the kinetics of growth of yeast

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–VI (SESSION 2023-24)
MICROBIOLOGY
Course Title: Applied Microbiology-II
Course Code: BSMM-6343
(PRACTICAL)

Time: 3 hrs **Marks: 20**

Instructions for the practical examiner: Question paper is to be set on the spot jointly by the Internal and External Examiners. Two copies of the same may be submitted for the recordto COE Office, Kanya Maha Vidyalaya, Jalandhar.

LIST OF PRACTICALS

1. Production of amylases and proteases in liquid medium using the selected organisms.
2. Assay of crude enzyme preparation for Amylase.
3. Assay of crude enzyme preparation for Protease.
4. Production of alcohol from molasses and cereal grains.
5. Immobilization of microbial cells and enzyme preparations by calcium alginateentrapment method.
6. Comparison of submerged and solid state fermentation techniques for amylaseproduction.
7. To study the production of wine and vinegar.
8. To study the kinetics of growth of yeast in batch/continuous culture.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–VI (SESSION 2023-24)

CHEMISTRY

Course Title: Chemistry (Molecular Spectroscopy)

Course Code: BSMM -6084 (I)

(THEORY)

Course outcomes:

Students will be able to

CO1: understand the principle and applications of ultraviolet and apply Woodward Fisher Rule to calculate λ_{max}

CO2: understand the concepts of Vibrational spectroscopy, Vibrational coupling overtones and Fermi resonance and its application in Organic Chemistry

CO3: know about the Nuclear magnetic resonance spectroscopy. Proton chemical shift, spin-spin coupling, coupling constants and its applications to determine organic structures

CO4: to understand different cleavage patterns of organic compounds in Mass spectrometry and apply the knowledge for interpretation of the spectrum of an unknown compound.

Bachelor of Science (Medical) Semester–VI (Session 2023-24)
CHEMISTRY
Course Title: Chemistry (Molecular Spectroscopy)
Course code: BSMM -6084 (I)
(THEORY)

Examination Time: 3 Hrs. **Max. Marks: 30**

Instructions for the Paper Setters:

Eight questions of equal marks (six marks each) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

UNIT –I

1. Energy and Electromagnetic Spectrum (10 Hrs)

Introduction, electromagnetic spectrum and Units, Regions of the spectrum, Statement of Born-Oppenheimer approximation, Degree of freedom, Frank Condon Principle, Fluorescence and Phosphorescence.

II. Ultraviolet and Visible Spectroscopy

The energy of electronic excitation, Measurement techniques, Beer-Lambert Law, Molar extinction coefficient. Different types of transition noticed in UV spectrum of organic functional groups and their relative energies. Chromophore, Auxochromes, Absorption and intensity shifts, Factors affecting λ_{max}, Effect of steric hindrance to coplanarity, Solvent effects.

UNIT – II

III. Infrared Spectroscopy (10 Hrs)

Vibrational energy levels, Selection rules, Force constant, Fundamental vibration frequencies, Factors influencing Vibrational Frequencies (Vibrational Coupling, Hydrogen Bonding, Electronic effect, Bond Angles, Field Effect) of different functional groups, Sampling techniques.

IV. Applications of UV and IR Spectroscopy

Applications of UV spectroscopy, Woodward Fieser rules for calculating λ_{max} of conjugated polyenes and α,ß -unsaturated carbonyl compounds. Applications of IR spectroscopy,

Absorption of Common functional Groups, Interpretation of simple IR spectra, Finger print regions. Simple numerical problems based on UV and IR spectroscopy.

UNIT-III

V. Proton Magnetic Resonance spectroscopy (^{1}HNMR) (13 Hrs)

The Nuclear spin, Larmor frequency, the NMR isotopes, Population of nuclear spin level, Spin and Spin lattice relaxation, Measurement techniques (CW and FT method), Solvent used, Reference compounds, Chemical shift, nuclear shielding and deshielding, chemical shift, spin-spin splitting and coupling constants, Anisotropic effect, Application of structure elucidation of simple organic molecules.

UNIT- IV

VI. Mass Spectrometery (12 Hrs)

Basic Principles, Elementary theory, Molecular ions, isotope ions, Fragment ions of odd and even electron types, Nitrogen rule, Factors affecting cleavage patterns, Simple cleavage, Cleavages at a hetero atom, Multicentre fragmentations, Rearrangements, Diels – Alder fragmentation, Mc Lafferty rearrangement, Interpretation of the spectrum of unknown simple molecules.

Books Recommended:

1. Organic Spectroscopy By W. Kemp; Publisher- Palgrave, NewYork
2. D.H. Williams and I. Fleming. Spectroscopic Methods in Organic Chemistry.
3. Spectrometric Identification of Organic Compounds - R.M. Silverstein and F. X. Webster; Publisher: John Willey and Sons,Inc.
4. Introductory Problems in Spectroscopy- By R.C. Banks, E.R. Matjeha and G. Mercer; Publisher : The Benzamine / Cummings Publishing CompanyInc.
5. Introduction to Spectroscopy – D. L. Pavia, G. M .Lampman, and G. S. Kriz Publisher: Brooks / Cole, a part of cengage learning.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–VI (SESSION 2023-24)

CHEMISTRY

Course Title: Chemistry (Physical Chemistry)

Course Code: BSMM -6084 (II)

(THEORY)

Course outcomes:

Students will be able to

CO1: Understand schrodinger wave equation (S.W.E) and its applications to partical in one-, two- and three-dimensional boxes.

CO2: Understand the applications of S.W.E to rigid rotator, harmonic oscillators, hydrogen and hydrogen like atoms, quantum numbers

CO3: Acquire knowledge about unit cell,space lattice, miller indices, symmetry operations, Bragg equation, powder method

CO4: Understand photophysical, photo chemical, radioative and non-radiative processes, quantum yield, energy transfer processes

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–VI (SESSION 2023-24)
CHEMISTRY
Course Title: Chemistry (Physical Chemistry)
Course Code: BSMM -6084 (II)
(THEORY)

Time: 3 Hrs. **Max. Marks: 30**

Note: Instructions for the Paper Setter

Eight questions of equal marks (6 each) are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

UNIT–I

1. Quantum Mechanics-I **(12 Hrs)**

Black-body radiation, Planck's radiation law, Photoelectric effect, heat capacity of solids, Bohr's model of hydrogen atom (no derivation) and its defects, Compton effect. de Broglie hypothesis, Heisenberg's uncertainty principle, Sinusoidal wave equation, Hamiltonian operator, Schrodinger wave equation and its importance, physical interpretation of the wave function, postulates of quantum mechanics, particle in a one dimensional box, quantization of energy levels, extension to two and three dimensional boxes, degeneracy.

UNIT–II

2. Quantum Mechanics-II **(12 Hrs)**

Simple harmonic oscillator model of vibrational motion, setting up Schrodinger equation and discussion of solution and wave functions. Rigid rotator model of rotation of diatomic molecules transformation to spherical polar coordinates spherical harmonics and their discussion. Qualitative investigation H-atom, setting up Schrodinger equation, radial and angular part, radial distribution functions of 1s, 2s, 2p, 3s, 3p and 3d.

UNIT–III

3. Solid State **(10 Hrs)**

Definition of space lattice and unit cell, Law of crystallography- (i) Law of constancy of interfacial angles, (ii) Law of rationality of indices, (iii) Symmetry elements in crystals. X-ray diffraction by crystals. Derivation of Bragg’s Law in Reciprocal space. Determination of crystal structure of NaCl, KCl by use of Powder method; Laue’s method.

UNIT-IV

4. Photochemistry **(11 Hrs)**

Interaction of radiation with matter, difference between thermal and photochemical processes. Laws of photochemistry: Grothus–Drapper law, Stark–Einstein law, Jablonski diagram

depicting various processes occurring in the excited state, qualitative description of flourescence, phosphorescence, non–radiative processes (internal conversion, intersystem crossing), quantum yield, photosensitized reactions–energy transfer processes (simple examples).

Books Suggested :

1. Atkins, P., Paula, J.de, Atkins, Physical Chemistry; 8th edition, Pubs: Oxford University Press, 2008.
2. Puri, B.R., Sharma, L.R., Pathania, M.S., Principles of Physical Chemistry; 43rd edition, Pubs: Vishal Publishing Co., 2008.
3. Barrow, G.M., Physical Chemistry; 6th edition, Pubs: McGraw Hill Company Inc., 1996.
4. Rao, C.N.R., University General Chemistry; Pubs: Macmillan of India, 1985.
5. Berry, R.S., Rice, S.A., Ross, J., Physical Chemistry; 2nd edition, Pubs: Oxford University Press, 2000.
6. Albert, R.A., Silbey, R.J., Physical Chemistry; I edition, Pubs: John Wiley and Sons Inc., 1992.
7. Dogra, S.K., Dogra, S., Physical Chemistry Through Problems, Pubs: Wiley Eastern Ltd., 1991.
8. Levine, I.N., Physical Chemistry; 5th edition, Pubs : Tata McGraw Hill Publishing Co. Ltd., 2002.
9. Moore, W.J., Basic Physical Chemistry; Pubs : Prentice Hall of India Pvt. Ltd., 1983.
10. Metz, C.R., Theory and Problems of Physical Chemistry; Schaum's outline series, 2nd edition, Pubs: McGraw-Hall Book Company, 1989.
11. Banwell, C.N., McCash, E.M., Fundamentals of Molecular Spectroscopy; 4th edition, Pubs: Tata McGraw Hill Publishing Co. Ltd., 1999.
12. Atkins, P. Friedman, R., Molecular Quantum Mechanics; 4th edition Pubs: Oxford University Press, 2007.
13. Levine, I.N., Quantum Chemistry; 5th edition, Pubs: Prentice Hall International Inc., 2000.
14. Inorganic Chemistry, W.W. Porterfield Addison-Wesley.
15. Inorganic Chemistry, A.G. Sharpe, ELBS.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–VI (SESSION 2023-24)

CHEMISTRY

Course Title: Chemistry Practical

Course Code: BSMM -6084 (P)

(PRACTICAL)

Course outcomes:

Students will be able to

CO1: Separate the various mixtures by Column Chromatography technique

CO2: Synthesize different Organic Compounds

CO3: Synthesise the different compounds by Green Approach

CO4: Prepare the different dyes

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–VI (SESSION 2023-24)

CHEMISTRY

Course Title: Chemistry Practical

Course Code: BSMM -6084 (P)

(PRACTICAL)

Duration: 3½ hrs. **Max. Marks: 20**

Instruction for practical examiner: Question paper is to be set on the spot jointly by the Internal and External Examiners. Two copies of the same should be submitted for the record to COE office, Kanya MahaVidyalaya, Jalandhar.

(I) Organic Chemistry Laboratory Techniques

(a) Column Chromatography

Separation of o and p nitrophenol

Separation of Leaf pigments from Spinnach leaves

Separation of o and p nitro aniline

Separation of dyes.

(b) Synthesis of Organic Compounds

Preparation of p-nitroacetanilide

Preparation of p-bromoacetanilide

Preparation of benzilic acid from Benzyl-using green approach (Green Chemistry Experiment)

Preparation of Methyl Orange, Methyl Red

Practical Examination

1) Column Chromatography= 07

2) Organic Synthesis =16

3) Viva-Voce =04

4) Note Book= 03

Books suggested:

1. Experimental Organic Chemistry, Vol. I and II, P.R. Singh, D.S. Gupta and K.S. Bajpai,

Tata McGraw Hill.

2. Laboratory Manual in Organic Chemistry, R.K. Bansal, Wiley Eastern.

3. Vogel's Textbook of Practical Organic Chemistry, B.S. Furniss, A.J. Hannaford, V.

Rogers, P.W.G. Smith and A.R. Tatchell, ELBS.

4. Experiments in General Chemistry, C.N.R. Rao and U.C. Aggarwal, East-West Press.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER-VI (SESSION 2023-24)

BOTANY
Course Title: Ecology
Course Code: BSMM-6075 (I)
(THEORY)

Course outcome: -

After passing this course the student will develop:

CO1.Understand the abiotic components and relationship with living organism.

CO2. Demonstrate an understanding keys of community ecology and biodiversity

CO3.Understand the structure and function of ecosystem and growth curve

CO4. Study the biogeographical region and vegetation of India

BACHELOR OF SCIENCE (MEDICAL) SEMESTER-VI (SESSION 2023-24)
BOTANY
Course Title: Ecology
Course Code: BSMM-6075 (I)
(THEORY)

Examination Time: 3Hrs **Max. Marks: 30**

Instructions for the Paper Setters:
Eight questions of equal marks (6 marks each) are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.
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UNIT-I

Plants and Environment: Atmosphere (gaseous compositions), water (properties of water cycle),light (global radiation, photosynthetically active radiation), temperature, soil (development, soil profiles, physico-chemical properties), and biota.
Morphological, anatomical and physiological responses of plants to water (hydrophytes and xerophytes), temperature (thermoperiodicity and vernalization), light (photoperiodism, heliophytes and sciophytes) and salinity.

UNIT-II

Community Ecology: Community characteristics, absolute and relative frequency, density and dominance, basal area and importance value index (IVI), Whittaker's classification of biodiversity, indices of alpha, beta and gamma diversity, life forms, biological spectrum, ecological succession.

UNIT-III

Population Ecology: Growth curves, ecotypes, ecads.
Ecosystem: Structure, abiotic and biotic components, food chain, food web, ecological pyramids, energy flow, biogeochemical cycles of carbon, nitrogen and phosphorus.

UNIT-IV

Biogeographical Regions of India
Vegetation types of India: Forests and grasslands
Landscape Ecology: Definition & concept, effect of patch size and shape on biodiversity, dynamics of land use.

Suggested Readings:

1. De, Debapriya and De, Debasish (2014). Fundamentals of Environment and Ecology. S. Chand Publishing, New Delhi
2. Kumar, H.D. (2018). Modern Concepts of Ecology 8thedition.Vikas Publishing House, New Delhi.

3. Mackenzie, A., Ball, A. and Virdee, S. (2001). Instant Notes in Ecology. Taylor & Francis, London, United Kingdom
4. Odum, E.P. and Barrett, G.W. (2012). Fundamentals of Ecology. Cengage Learning India Pvt.Ltd., New Delhi.
5. Saini, A. (2019). Plant Ecology. Trueman Book Company. New Delhi.
6. Sharma, P.D. (2017). Environmental Biology and Toxicology. 3rd edition. Rastogi Publications, Meerut.
7. Srivastava, H. N. (2020). Botany Vol VI, Ecology and Utilization of Plants. Pradeep publications, Jalandhar.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER-VI (SESSION 2023-24)

BOTANY
Course Title: Economic Botany
Course Code: BSMM-6075 (II)
(THEORY)

Course outcome: -

After passing this course the students will be able to:

CO1: Understand the cultivation and economic importance of various food plant crops, fibre and oil yielding plants.

CO2: Understand the economic importance of spices and condiments.

CO3: Understand economic importance of medicinal plants.

CO4: Understand the processing and economic value of beverages, rubber plant, firewood, timber and bamboos.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER-VI (SESSION 2022-23)
BOTANY
Course Code: BSMM-6075 (II)
Economic Botany
(THEORY)

Examination Time: 3Hrs **Max. Marks: 30**

Instructions for the Paper Setters:
Eight questions of equal marks (6 marks each) are to be set, two in each of the four Sections (I-IV). Questions of Sections I-IV should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

Unit-I

Food Plants: *Oryza sativa* (Rice), *Triticum aestivum* (Wheat), *Zea mays* (Maize), *Solanum tuberosum* (Potato), *Saccharum officinarum* (Sugarcane).

Fibres: *Gossypium hirsutum* (Cotton) and *Chorchorus capsularis* (Jute).

Vegetable Oils: *Arachis hypogea* (Groundnut), *Brassica campestris* (Mustard) and *Cocos nucifera* (Coconut).

Unit-II

Spices: General account of *Piper nigrum* (Black pepper), *Eugenia caryophyllum* (Cloves), *Cinnamomum verum* (Cinnamomum), *Elettaria cardamomum* (cardamom), *Zingiber officinalis* (Ginger), *Curcuma longa* (Turmeric), *Coriandrum sativum* (Coriander), *Foeniculum vulgaris*(Fennel) and *Mentha arvensis* (Mint).

Unit-III

Medicinal Plants: General account of *Terminalia chebula* (Harar), *Terminalia belerica* (Bahera), *Azadirachta indica* (Neem), *Phyllanthus emblica* (Amla), *Aconitum napellus* (Aconite), *Rauwolfia serpentina* (Sarpagandha), *Atropa belladonna* (Belladonna), *Datura stramonium* (Datura), *Withania somnifera* (Ashwagandha) *and Papaver somniferum* (Poppy).

Unit-IV

Beverages: *Camellia sinensis* (Tea) and *Coffea arabica* (Coffee).

Rubber: Morphology of *Hevea brasiliensis* (Rubber), Processing and Uses. General account of sources of firewood, timber and bamboos.

Suggested Readings:

1. Verma, V. (2016). Textbook of Economic Botany, ANE Books, New Delhi.
2. Das, K. (2014). Medicinal plants- Their importance in Pharmaceutical Sciences, Kalyani Publishers, New Delhi.
3. Kocchar, S.L. (2016). Economic Botany of the Tropics, Macmillan India Pvt. Ltd., New Delhi.
4. Prinentel, D. and Hall, C.W. (Eds.) (2001). Food and Natural Resources. Academic

Press,London, New York.

5. Reddy, K. et al. (2015). Advances in Medicinal plants, Universities Press, Hyderabad.
6. Sharma, O.P. (1996). Hill's Economic Botany. Tata McGraw Hill Co. Ltd., New Delhi.
7. Swaminathan, M.S. and Kocchar, S.L. (Eds) (2009). Plants and Society. Macmillan Publications Ltd., London.
8. Council of Scientific & Industrial Research (1986). The Useful Plants of India. Publications and Information Directorate. CSIR, New Delhi.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER-VI (SESSION 2023-24)
BOTANY
Practical: - Ecology and Economic Botany (I &II)
Course Code: BSMM-6075 (P)
(PRACTICAL)

Course Outcomes:

On completion of this course, the students will be able to:

CO1. Determination of abundance and frequency of species by quadrate method.

CO2. To measure the dissolved oxygen content in polluted and unpolluted water samples.

CO3. To understand the economic importance of plants.

CO4. To acquire knowledge in the preparation of herbarium techniques. Submission of field report and practical records.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER-VI (SESSION 2023-24)
BOTANY
Practical: - Ecology and Economic Botany (I &II)
Course Code: BSMM-6075 (P)
(PRACTICAL)

TIME: 3Hrs **Practical: 20**

Instructions for the paper setter: question paper is to be set on the spot jointly by the Internal and External Examiners. Two copies of the same may be submitted for the record to COE Office, Kanya Maha Vidyalaya, Jalandhar.

Suggested Laboratory Exercises

1. To determine minimum number of quadrats required for reliable estimate of biomass ingrasslands through species area curves.
2. To study the frequency of herbaceous species in grassland and to compare the frequency distribution with Raunkiaer's Standard Frequency Diagram.
3. To estimate Importance Value Index for grassland species on the basis of relative frequency, relative density and relative dominance in protected and grazed grassland.
4. To measure the vegetation cover of grassland through point frame method.
5. To measure the above ground plant biomass in a grassland.
6. To study the morphological anatomical features of hydrophytes (*Hydrilla, Eichhornia*) Xerophytes (*Nerium, Calotropis*).
7. To determine diversity indices (richness, Simpson, Shannon-Weaver) in grazed and protectedgrassland.
8. To estimate bulk density and porosity of grassland and woodland soils.
9. To determine moisture content and water holding capacity of grassland and woodland soil.
10. To study the vegetation structure through profile diagram.
11. To estimate transparency, pH and temperature of different water bodies.
12. To measure dissolved oxygen content in polluted and unpolluted water samples.
13. To estimate salinity of different water samples.
14. To determine the percent leaf area injury of different leaf samples collected around polluted sites.
15. To estimate dust-holding capacity of the leaves of different plant species.
16. **Food Plants:** Study of the morphology, structure and simple microchemical tests of thefoodsstoring tissues rice, wheat, maize, potato and sugarcane. Microscopic examination of starch in these plants (excepting sugarcane).
17. **Fibres:** Study of cotton flowers, sectioning of the cotton ovules/developing seeds to trace

theorigin and development of cotton fibers. Microscopic study of cotton and test for cellulose.

18. Sectioning and staining of jute stem to show the location and development of fibers.
19. Microscopic structure.Tests for lignocelluloses.
20. **Vegetable Oils:** Study of hand sections of groundnut, mustard and coconut and staining ofoildroplets by Sudan III and Sudan Black.
21. **Field Visits:** To study sources of firewood (10 plants)/timberyielding trees (10trees)/bamboos,list to be prepared mentioning special features, collection of plant based articlesofcommonuse.
22. **Spices:** Examine black pepper, cloves, cinnamon (hand sections) and opened of cardamomanddescribe them briefly.
23. Preparations of an illustrated inventory of 10 medicinal plants used in indigenous systems of medicine or allopathy: Write their botanical and common names parts used anddiseases/disorders for which they are prescribed.
24. **Beverages:** Section boiled coffee beans and tea leaves to study the characteristic structuralfeatures.
25. Visit to *in situ* conservation site/Botanical Garden.

Suggested Readings (for laboratory exercises)

1. Council of Scientific & Industrial Research. (1986). The Useful Plants of India. PublicationsandInformation Directorate. CSIR, New Delhi.
2. Kocchar, S.L. (2016). Economic Botany of the Tropics, Macmillan India Pvt. Ltd., New Delhi.
3. De, Debapriya and De, Debasish (2014). Fundamentals of Environment and Ecology. S. Chand Publishing, New Delhi
4. Kumar, H.D. (2018). Modern Concepts of Ecology 8thedition. Vikas Publishing House, New Delhi.
5. Mackenzie, A., Ball,A. and Virdee, S. (2001). Instant Notes in Ecology. Taylor & Francis, London, United Kingdom
6. Prinentel, D. and Hall, C.W. (Eds.) (2001). Food and Natural Resources. Academic Press,London, New York.
7. Sharma, O.P. (1996). Hill's Economic Botany. Tata McGraw Hill Co. Ltd., New Delhi.
8. Swaminathan, M.S. and Kocchar, S.L. (Eds.) **(2009).** Plants and Society. Macmillan Publications Ltd., London.

Bachelor of Science (Medical) Semester–VI (Session 2023-24)
FOOD SCIENCE AND QUALITY CONTROL (VOCATIONAL)
Course Title: Food Plant layout and management
Course Code: BSMM- 6255
(THEORY)

Course Outcomes: After passing this course the student will be able to:

CO1: Understand the importance of plant layout and learn how to set up the proper plant layoutto reduce the production cost and increase the productivity.

CO2: Learn how market research helps to understand the consumers, their needs and their satisfaction level.

CO3: Understand the societal changes and their impact on food consumption trends.

CO4: Learn about product development and different types of food products.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–VI (SESSION 2023-24)
FOOD SCIENCE AND QUALITY CONTROL (VOCATIONAL)
Course Title: Food Plant Layout & Management
Course Code: BSMM-6255
(THEORY)

Examination Time: 3 Hrs.

Max. Marks: 100
Theory Marks: 60
Practical Marks: 20
CA: 20

Instructions for the Paper Setter: Eight questions of equal marks (12 marks each) are to be set,two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

UNIT-I

1. Importance of a plant layout, selection of site and layouts of different food industries.
2. Selection of equipments, machinery and building material, selection and planning ofmanufacturing process and service facilities
3. Maintenance and replacement, Depreciation of machinery, Management set up in a plant.

UNIT-II

4. Market and Consumer Research
5. Economic, Psychological, Anthropological and Sociological dimensions of food consumptionpattern. Food situation in India and outside.

UNIT-III

6. Needs and types of Food consumption trends. Trends in social change and its role in dietpattern using social trends as a framework in new product innovation.
7. Trapping the unconventional post-harvest losses and prospects of food processing for export.

UNIT –IV

8. Traditional foods-Status and need for revival in the context of westernized non-traditionalfoods, urbanization and such factors.
9. Product development: Primary Processing, Secondary Processing, Types of products e.g.Quick cooking, fast foods, fabricated food, convenience foods.

Recommended Books:

1. Principle of Food Sanitation by Marriott, 5th ed., 2006, CBS Publishers, New Delhi.

2. Food Processing Waste Management by Green JH and Kramer A, 1979, AVI Publishers, USA.

3. Food Science by Potter NN, 5th ed., 2006, CBS Publishers, New Delhi.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–VI (SESSION 2023-24)
FOOD SCIENCE AND QUALITY CONTROL (VOCATIONAL)
Course Title: Food Plant Layout and Management
Course Code: BSMM-6255
(PRACTICAL)

Course Outcomes:

After passing the course student will be able to:

CO1: Familiarity with effective facility layout and process design critical for efficient and safe food production.

CO2: Proficiency in designing efficient facility layouts taking into account factors such as workflow, safety and hygiene and regularity compliance.

CO3: Understanding of financial concepts including depreciation and cost analysis.

CO4: Gaining practical exposure to real-world food processing facilities to observe and analyze different layout designs.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–VI (SESSION 2023-24)
FOOD SCIENCE AND QUALITY CONTROL (VOCATIONAL)
Course Title: Food Plant Layout and Management
Course Code: BSMM-6255
(PRACTICAL)

Time: 3 hrs **Max. Marks: 20**

Instructions for the practical examiner: Question paper is to be set on the spot jointly by the Internal and External Examiners. Two copies of the same may be submitted for the record to COE office, Kanya Maha Vidyalaya, Jalandhar.

List of Practicals:

1. Calculation of depreciation and processing costs.
2. Preparation of layout and Process diagram of potato chips manufacturing plant.
3. Preparation of layout and Process diagram of jam/marmalade manufacturing plant.
4. Preparation of layout and Process diagram of bread making plant.
5. Preparation of layout and Process diagram of dairy industry.
6. Preparation of layout and Process diagram of wine making unit.
7. Preparation of layout and Process diagram of modern slaughter plant.
8. Preparation of layout and Process diagram of confectionary unit.
9. Determination of sanitary status of plant equipment.
10. Visit to various food industries.