Faculty of Sciences

Syllabus for

Master of Science (FYIP) Physics

(Semester I -II)

(Under Credit Based Continuous Evaluation Grading System)
(12+3+2 System of Education)
Session: 2024-25

Kanya Maha Vidyalaya, Jalandhar
(Autonomous)
The Heritage Institution

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATIONS OF FIVE YEAR INTEGRATED PROGRAMME

Master of Science (FYIP) Physics

Session-2024-25

Semester-I

Sr. No.	Course Code	Course Type	Course Title	Credits	Max Marks				Exam time in Hours)
					Total	Ext		CA	
				L-T-P		L	P		
1.	FPHL-1421 FPHL-1031 FPHL-1431	C	Punjabi(Compulsory) [1]Basic Punjabi [2]Punjab History and Culture	2-0-0	50	35		15	3
2.	FPHL-1102	AEC	Communicative English	2-0-0	50	35		15	3
3.	FPHL-1393	DSC	Mechanics	4-0-0	100	70	-	30	3
4.	FPHL-1394	DSC	Thermal Physics	4-0-0	100	70	-	30	3
5.	FPHL-1335	C	Mathematics-I	4-0-0	100	70	-	30	3
6.	FPHL-1086	C	Organic Chemistry	3-0-0	100	70	-	30	3
7.	FPHP-1397	DSC	Physics Lab-I	0-0-3	100	-	70	30	3
8.	FPHP-1088	C	Qualitative Organic Analysis	0-0-1	50	-	35	15	3
9.	VACF-1491	VAC	*Foundation Course	2-0-0	50	35		15	1

[1] Special paper in lieu of Punjabi (Compulsory) for those who have not studied Punjabi upto 8th/ 10th Class. .

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

***credits/ grade points of these courses will not be added in SGPA/ CGPAof the semester/ Programme and only grades will be provided.**

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATIONS OF FIVE YEAR INTEGRATED PROGRAMME

Master of Science (FYIP) Physics

Session-2024-25

Semester II

Sr. No.	Course Code	Course Type	Course Title	Credits	Max Marks				Examination time in Hours)
					Total	Ext		CA	
				L-T-P		L	P		
1	FPHL-2421 FPHL-2031 FPHL-2431	C	Punjabi(Compulsory)-II [1]Basic Punjabi [2]Punjab History and Culture	2-0-0	50	35	-	15	3
2	FPHM-2102	AEC	Communicative English	2-0-0	50	35	-	15	3
3	FPHL-2393	DSC	Electricity and Magnetism	4-0-0	100	70	-	30	3
4	FPHL-2394	DSC	Waves and Oscillations	4-0-0	100	70	-	30	3
5	FPHL- 2335	C	Mathematics-II	4-0-0	100	70	-	30	3
6	FPHL-2086	C	Inorganic Chemistry	3-0-0	100	70	-	30	3
7	FPHP-2397	DSC	Physics Lab-II	0-0-3	100	-	70	30	3
8	FPHP-2088	C	Inorganic Chemistry Lab	0-0-1	50	-	35	15	3
9.	VACD-2161	VAC	*Drug Abuse: Problem Management & Prevention (Compulsory)	2-0-0	50	35	-	15	3

[1] Special paper in lieu of Punjabi (Compulsory) for those who have not studied Punjabi upto 8th/ 10th Class. .

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

***credits/ grade points of these courses will not be added in SGPA/ CGPA of the semester/ Programme and only grades will be provided.**

PROGRAM SPECIFIC OUTCOMES (PSOs)

Programme Specific Outcomes of Master of Science (Five Year Integrated Programme) Physics (M.Sc. (FYIP) Physics)

Upon completion of M.Sc. (FYIP) Physics, the students will be able to:

PSO 1. Develop proficient analytic and critical thinking abilities by integrating knowledge across diverse branches of physics.

PSO 2. Cultivate and sustain intellectual curiosity, fostering a lifelong commitment to learning, encompassing both traditional and contemporary issues relevant to physics and broader societal concerns.

PSO 3. Acquire skills and knowledge necessary to pursue diverse and fulfilling careers within the field of physics.

PSO 4. Demonstrate competency in conducting fundamental, applied, and collaborative research endeavors.

PSO 5. Enhance scientific writing skills utilizing modern methodologies to effectively communicate complex ideas and findings in regional and international language.

PSO 6. Attain a competitive edge at national and international levels, demonstrating proficiency and adaptability in a globalized scientific community using regional and international language.

PSO 7. Foster entrepreneurial insight and a commitment to frequent expression of their thoughts in regional and international language, to navigate evolving professional landscapes.

PSO 8. Embrace social and promote ethical and responsible conduct in scientific practice and contributing positively to society.

PSO 9. Demonstrate proficiency in mathematics and the mathematical concepts needed for a proper understanding of physics using regional and international Language.

Master of Science (Semester System) (12+3+2 System of Education with multiple Entries and Exits)

(Session-2024-25)

Master of Science (FYIP) PHYSICS (SEMESTER–I)

COURSE TITLE: Punjabi (Compulsory)

COURSE CODE- FPHL-1421

COURSE OUTCOMES

CO1:';kfjs d/ ozr' g[[[;se d/ eftsk Gkr Bz{ gVQkT[D dk wB'oE ftfdnkoEhnK nzdo eftsk gqsh fdbu;gh, ;{M Bz{ g?dk eoBk j? sK fe T[j nkX[fBe d"o ftu ub ojhnK ekftXkoktK ns/ ethnK pko/ frnkB jk;b eo ;eD.fJ; dk j'o wB'oE eftsk dh ftnkfynk, ftPb/PD s/ w[bzeD dh gqfefonk s'A ikD{ eokT[Dk th j? sK fe T[j ;wekbh ;wki dhnK ;wZf;nktK Bz{ ;wM ;eD ns/ nkb'uBkswe fdqPNh pDk ;eD.

CO2:';kfjs d/ ozr' g[[[;se d/ ejkDh Gkr B{z f;b/p; ftu Pkfwb eo e/ ftfdnkoEhnK nzdo ejkDh gVQD dh o[uh Bz{ g?dk eoBk j? ns/ ejkDh irs Bkb i'VDk j?.

CO3:g?oQk ouBk ns/ g?oQk gVQ e/ gqPBK d/ T[so d/D dk wBo'E ftfdnkoEhnK dh p[ZXh B{z shyD eofdnK T[BK dh fbyD gqfsGk B{z T[ikro eoBk j?.

CO4:X[Bh ftT[As gVQD Bkb ftfdnkoEh X[BhnK dh T[ukoB gqDkbh s'A tke| j'Dr/.

Master of Science (Semester System) (12+3+2 System of Education with multiple Entries and Exits)

(Session-2024-25)

Master of Science (FYIP) PHYSICS (SEMESTER–I)

COURSE TITLE: Punjabi (Compulsory)

COURSE CODE- FPHL-1421

Credits: 2-0-0 **Max Marks: 50 (ESE Marks:35, CA: 15)**

Examination Time: 3 Hours **Pass Mark: 13**

nze tzv ns/ gohfyne bJh jdkfJsK

1H gqPB gZso d/ uko ;?ePB j'Dr/.;?ePB A-D sZe d/ gqPB :{fBN I-IV ftu'A g[ZS/ ikDr/. jo ;?ePB ftu d' gqPB g[ZS/ ikDr/.

2H ftfdnkoEh B/ eZ[b gzi gqPB eoB/ jB. jo ;?ePB ftu'A fJe gqPB eoBk bkIwh j?. gzitK gqPB fe;/ th ;?ePB ftu'A ehsk ik ;edk j?.

3H jo/e gqPB d/ 7 nze jB.

4H g/go ;?ZN eoB tkbk i/eo ukj/ sK gqPBK dh tzv nZr'A tZX s'A tZX uko T[g gqPBK ftu eo ;edk j?.

gkmeqw ns/ gkm g[;seK

:{fBN-I

;kfjs d/ ozr (;zgkHvk wfjb f;zx),Gkr gfjbk (eftsk),
oth ;kfjs gqekPB,nzfwqs;o.
(ਪ੍ਰਸੰਗ ਸਹਿਤ ਵਿਆਖਿਆ, ;ko)
(vkH jfoGiB f;zx, gkP, ;[oihs gkso eth gkm eqw dk fjZ;k BjhA jB) **7 nze**

:{fBN-II

;kfjs d/ ozr (;zgkHvk wfjb f;zx),Gkr gfjbk (ejkDh),
oth ;kfjs gqekPB,nzfwqs;o.
(;ko,ftPk t;s{)
(e'Jh fJe ;tko,x'NDk, nkgDk nkgDk fjZ;k ejkDhnK gkm eqw dk fjZ;k BjhA jB) **7 nze**

:{fBN-III

g?oQk ouBk
g?oQk gVQ e/ gPqFBK d/ T[so. **7 nze**

:{fBN-IV

(T) gzikph X[Bh ftT[As LgfoGkPk s/ T[ukoB nzr
(n) ;to, ftnziB **7 nze**

Master of Science (Semester System) (12+3+2 System of Education with multiple Entries and Exits)

(Session-2024-25)

Master of Science (FYIP) PHYSICS (SEMESTER–I)

COURSE TITLE: BASIC PUNJABI (In lieu of Punjabi(Compulsory))

COURSE CODE - FPHL-1031

Course outcomes

CO1: w[ZYbh gzikph gVQkT[D dk wB'oE ftfdnkoEhnK B{z gzikph GkPk B{z f;ykT[D dh gqfefonk ftu gk e/ fJe j'o GkPk f;ZyD dk w"ek gqdkB eoBk j?. ftfdnkoEhnK B{z g?Ash nZyoh, nZyo eqw, g?o fpzdh tkb/ toD ns/ g?o ftu g?D tkb/ toD ns/ wksoktK (wZ[Ybh ikD gSkD) brk\o (fpzdh, fNZgh, nZXe) dh gSkD ns/ tos'A s'A ikD{ eotkfJnk ikt/rk.

CO2: ftfdnkoEhnK B{z gzikph Ppd pDso dh wZ[Ybh ikD gSkD (;kXkoB Ppd, ;z:[es Ppd, fwPos Ppd,w{b Ppd,nr/so ns/ fgS/so) s'A ikD{ eotkfJnk ikt/rk.

CO3: ftfdnkoEhnK B{z fBZs tos'A dh gzikph Ppdktbh L pklko, tgko, foPs/Bks/, y/sh ns/ j'o XzfdnK nkfd Bkb ;zpzXs s'A ikD{ eotkfJnk ikt/rk.

CO4: ftfdnkoEhnK B{z gzikph ftu j|s/ d/ ;Zs fdBK d/ BK, pkoQK wjhfBnK d/ BK, oZ[sK d/ BK, fJe s'A ;" sZe frDsh PpdK ftu f;ykT[Dk j?.

Master of Science (Semester System) (12+3+2 System of Education with multiple Entries and Exits)

(Session-2024-25)

Master of Science (FYIP) PHYSICS (SEMESTER–I)

COURSE TITLE: BASIC PUNJABI (In lieu of Punjabi(Compulsory))

COURSE CODE - FPHL-1031

Credits: 2-0-0 **Max Marks: 50 (ESE Marks:35, CA: 15)**

Examination Time: 3 Hours **Pass Mark: 13**

nze tzv ns/ gohfyne bJh jdkfJsK

1H gqPB gZso d/ uko ;?ePB j'Dr/.;?ePB A-D sZe d/ gqPB :{fBN I-IV ftu'A g[ZS/ ikDr/. jo ;?ePB ftu d' gqPB g[ZS/ ikDr/.

2H ftfdnkoEh B/ eZ[b gzi gqPB eoB/ jB. jo ;?ePB ftu'A fJe gqPB eoBk bklwh j?. gzitK gqPB fe;/ th ;?ePB ftu'A ehsk ik ;edk j?.

3H jo/e gqPB d/ 7 nze jB.

4H g/go ;?ZN eoB tkbk i/eo ukj/ sK gqPBK dh tzv nZr'A tZX s'A tZX uko T[g gqPBK ftu eo ;edk j?.

gkmeqw

:{fBN-I

g?Ash nZyoh, nZyo eqw, g?o fpzdh tkb/ toD ns/ g?o ftu g?D tkb/ toD ns/ wksqtK (wZ[Ybh ikD gSkD) brk\o (fpzdh, fNZgh, nZXe) L gSkD ns/ tos'A . 7 nze

:{fBN-II

gzikph Ppd pDso L wZ[Ybh ikD gSkD (;kXkoB Ppd, ;z:[es Ppd, fwPos Ppd, w{b Ppd, nr/so ns/ fgS/so) 7 nze

:{fBN-III

fBZs tos'A dh gzikph Ppdktbh L pklko, tgko, foPs/ Bks/, y/sh ns/ j'o XzfdnK nkfd Bkb ;zpzXs. 7 nze

:{fBN-IV

j|s/ d/ ;Zs fdBK d/ BK, pkoQK wjhfBnK d/ BK, oZ[sK d/ BK, fJe s'A ;" se frDsh PpdK ftu .

7 nze

Master of Science (Semester System) (12+3+2 System of Education with multiple Entries and Exits)

(Session-2024-25)

Master of Science (FYIP) PHYSICS (SEMESTER–I)

COURSE TITLE: Punjab History and Culture (From Earliest Times to C 320)

(Special paper in lieu of Punjabi Compulsory)

(For those students who are not domicile of Punjab)

COURSE CODE: FPHL-1431

COURSE OUTCOMES

After completing Semester I and course on Punjab History and Culture students of History will be able to identify and have a complete grasp on the sources & writings of Ancient Indian History of Punjab.

CO1: Identify and understand the sources and physical features of Punjab

CO 2: To study the earliest civilisation (Indus Valley Civilization) and original home of Aryans

CO 3: To examine the Social, Religious and Economic life during Early and Later Vedic Age

CO 4: To comprehend the Buddhist, Jain and Hindu faith and their relevance in the modern times

Master of Science (Semester System) (12+3+2 System of Education with multiple Entries and Exits)

(Session-2024-25)

Master of Science (FYIP) PHYSICS (SEMESTER–I)

COURSE TITLE: Punjab History and Culture (From Earliest Times to C 320)

(Special paper in lieu of Punjabi Compulsory)

(For those students who are not domicile of Punjab)

COURSE CODE: FPHL-1431

Credits: 2-0-0 **Max Marks: 50 (ESE Marks:35, CA: 15)**

Examination Time: 3 Hours **Pass Mark: 13**

Instructions for the Paper Setter:

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 7 marks

Unit-I

1. Physical features of the Punjab
2. Sources of the ancient history of Punjab

Unit-II

3. Harappan Civilization: social, economic and religious life of the Indus Valley People.
4. The Indo-Aryans: Original home

Unit-III

5. Social, Religious and Economic life during Early Vedic Age.
6. Social, Religious and Economic life during Later Vedic Age.

UNIT-IV

7. Teachings of Buddhism
8. Teachings of Jainism

Suggested Readings

- B.N. Sharma, Life in Northern India, Delhi. 1966.
- Budha Parkash, Glimpses of Ancient Punjab, Patiala, 1983.
- Chopra, P.N., Puri, B.N., & Das,M.N.(1974). A Social, Cultural & Economic History of India, Vol. I, New Delhi: Macmillan India.
- L. M Joshi (ed.), History and Culture of the Punjab, Art-I, Patiala, 1989 (3rd edition)
- L.M. Joshi and Fauja Singh (ed.), History of Punjab, Vol.I, Patiala 1977.

Master of Science (Semester System) (12+3+2 System of Education with multiple Entries and Exits)

(Session-2024-25)

Master of Science (FYIP) PHYSICS (SEMESTER–I)

COURSE TITLE: COMMUNICATIVE ENGLISH

COURSE CODE: Course Code: FPHL -1102

Course Outcomes

After Completing the course the students will be:

CO 1: able to enhance their vocabulary through vocabulary-building exercises

CO2: able to improve their writing skills by writing letters and reports

CO3: able to enhance their reading and analysing power of texts through guided reading by the study of "Making Connections" by Kenneth J. Pakenham

CO4: acquainted with the techniques of effective essay writing

Master of Science (Semester System) (12+3+2 System of Education with multiple Entries and Exits)

(Session-2024-25)

Master of Science (FYIP) PHYSICS (SEMESTER–I)

COURSE TITLE: COMMUNICATIVE ENGLISH

COURSE CODE: Course Code: FPHL -1102

Credits: 2-0-0 **Max Marks: 50 (ESE Marks:35, CA: 15)**

Examination Time: 3 Hours **Pass Mark: 13**

Instructions for the Paper Setters: -

Eight questions of equal marks (Specified in the syllabus) are to be set, two from each of the four Units (I-IV). 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. Each question has a weightage of 7 marks.

UNIT-I

"Word List", "Correct Usage of Commonly used words and Phrases" from the chapter "Vocabulary" given in *The Written Word* by Vandana R. Singh

UNIT-II

Letter- writing as prescribed in *The Written Word* by Vandana R. Singh

Report writing as prescribed in *The Written Word* by Vandana R. Singh

UNIT-III

Unit-I from *Making Connections: A Strategic Approach to Academic Reading* by Kenneth J. Pakenham, Second Edition

UNIT-IV

Unit-II from *Making Connections: A Strategic Approach to Academic Reading* by Kenneth J. Pakenham, Second Edition

Prescribed Text books:

The Written Word by Vandana R. Singh, Oxford University Press, New Delhi.

Making Connections: A Strategic Approach to Academic Reading by Kenneth J.Pakenham, Second Edition

Master of Science (Semester System) (12+3+2 System of Education with multiple Entries and Exits)

(Session-2024-25)
Master of Science (FYIP) PHYSICS (SEMESTER–I)
COURSE TITLE: MECHANICS
COURSE CODE: FPHL-1393

COURSE OUTCOMES:
After passing this course, students will be able to:
CO1: Understand the concept of inertial frames and calculations of displacement, velocity and acceleration in various coordinate systems. Students will be able to know the laws of motion and relative motion by using Galilean transformations. They will learn various conservation laws and their application to variable mass systems.
CO2: They will understand elastic scattering in the lab and centre of mass systems. They will understand the physics of the rotational motion of a body by studying Euler's equations and the Moment of inertia tensor.
CO3: Learn the effects of gravitational force and other fundamental forces of nature. They will learn the concept of the centre of mass, central forces, and the motion of particles under a central force, as well as determine the turning points of orbit. They will be able to understand planetary motion by solving differential equations of orbits and studying Kepler's laws.
CO4: They will understand the origin of fictitious forces in non-inertial frames and their consequences on acceleration due to gravity, the motion of a particle on earth, and Foucault's pendulum as a real-life illustration of fictitious forces.

Master of Science (Semester System) (12+3+2 System of Education with multiple Entries and Exits)

(Session-2024-25)

Master of Science (FYIP) PHYSICS (SEMESTER–I)

COURSE TITLE: MECHANICS

COURSE CODE: FPHL-1393

Credits: 4-0-0 **Max Marks: 100 (ESE Marks:70, CA: 30)**

Examination Time: 3 Hours **Pass Mark: 25**

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. Each question carries 14 marks. **Note:** Students can use Non-Scientific calculators or logarithmic tables.

Unit- I

Co-ordinate Systems and Motion of a particle: Reference frames, Inertial frames; Displacement, velocity& acceleration in Cartesian, Plane polar, Spherical& Cylindrical coordinate systems Area and Volume in these coordinate systems. Solid angle. Review of Newton's Laws of Motion. Galilean transformations; Galilean invariance of space &time intervals, Newton's laws of motion and conservation laws.

Fundamentals of Dynamics: Momentum of variable-mass system: motion of the rocket. Dynamics of a system of particles: internal & external forces and momentum conservation, Centre of Mass, Impulse.

Unit- II

Collisions: Elastic and inelastic collisions between particles, Relationship of velocities, angles and energiesof the colliding particles in the Centre of Mass and Laboratory frames.

Rotational Dynamics: Angular momentum of a particle and system of particles and torques due to internal forces. Principle of conservation of angular momentum, Rotation about a fixed axis, Moment of Inertia.Kinetic energy of rotation, Motion involving both translation and rotation, Rotational motion of a rigid body in general, Rotation of angular momentum vector about a fixed axis, Angular momentum and kinetic energy of a rigid body about principal axes, Euler's equations, Precession and Elementary Gyroscope.Motion of a spinning top.

Unit- III

Gravitation Fields and Potentials: Law of gravitation. Gravitational potential energy, Inertial and gravitational mass. Potential energy and force between a point mass and spherical shell, a point mass and solid sphere. Gravitational and electrostatic self-energy, Gravitational energy of uniform sphere.

Central Force Motion: Forces in nature (Qualitative). Conservative forces. Central Forces.Motion of a particle under a central force field, Two-body problem and its reduction to one-body problem and its solution, Reduced mass, Equation of motion of a reduced mass under central force and energy. Differential equation of the orbit, Equation of orbit under inverse square force field, turning points, Kepler's Laws, Satellite in circular orbit and applications. Geosynchronous orbits. Weightlessness.

Unit- IV

Non-Inertial Systems: Non-inertial frames. Fictitious forces in non-inertial frames having translational and uniform rotational motion. Laws of Physics in rotating coordinate systems. Centrifugal force. Effect of rotation of earth on acceleration due to gravity, Effect of Coriolis force

on a particle falling freely under gravity.Effect of Coriolis force on a particle moving on the surface of earth, Foucault's pendulum and its equation of motion.

Reference Books:

1. An introduction to Mechanics, D. Kleppner, R.J. Kolenkow, 2012, McGraw-Hill.
2. Mechanics, Berkeley Physics, Vol.1, C.Kittel, W.Knight, et. al. 2007, Tata McGraw-Hill.
3. Physics, Resnick, Halliday and Walker 9/e. 2010, Wiley.
4. Analytical Mechanics, G.R.Fowles and G.L. Cassiday. 2005, Cengage Learning.
5. Feynman Lectures, Vol.1, R.P. Feynman, R.B. Leighton, M.Sands, 2008, Pearson Education.
6. University Physics, Ronald Lane Reese, 2003, Thomson Brooks/Cole

Master of Science (Semester System) (12+3+2 System of Education with multiple Entries and Exits)

(Session-2024-25)

Master of Science (FYIP) PHYSICS (SEMESTER–I)

COURSE TITLE: THERMAL PHYSICS

COURSE CODE: FPHL-1394

COURSE OUTCOMES

After passing this course the students will be able to:

CO1: Understand thermodynamic systems, properties, and equilibrium. Apply energy conservation principle through the First Law. Analyze heat and work interactions. Explore reversible and irreversible processes, Carnot cycle, and efficiency. Grasp the Second Law and its implications for temperature scales and thermodynamic processes.

CO2: Comprehend entropy, its implications on thermodynamic processes, and the Second Law. Analyze thermodynamic potentials, their properties, and applications in various systems. Apply thermodynamic concepts to phase transitions and equilibrium conditions.

CO3: Apply Maxwell's relations to derive thermodynamic properties and relationships. Analyze gas behavior using Maxwell-Boltzmann distribution, equipartition theorem, and degrees of freedom. Connect theoretical concepts to experimental observations and real-world applications.

CO4: Understand and differentiate between free expansion and throttling processes. Apply Joule-Thomson effect to real gases, including inversion temperature and cooling. Analyze adiabatic demagnetization as a cooling technique.

Master of Science (Semester System) (12+3+2 System of Education with multiple Entries and Exits)

(Session-2024-25)

Master of Science (FYIP) PHYSICS (SEMESTER–I)

COURSE TITLE: THERMAL PHYSICS

COURSE CODE: FPHL-1394

Credits: 4-0-0 **Max Marks: 100 (ESE Marks: 70, CA: 30)**

Examination Time: 3 Hours **Pass Mark: 25**

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. Each question carries 14 marks.

Note: Students can use Non-Scientific calculators or logarithmic tables.

UNIT–I

Law of Thermodynamics: Extensive and Intensive Thermodynamic Variables, Thermodynamic Equilibrium, Zeroth Law of Thermodynamic & Concept of Temperature, Concept of Work & Heat, State Functions, First Law of Thermodynamics and its differential Form, Internal Energy, First Law & Various Processes, Applications of First Law: General Relation between CpAndCv, Work Done during Isothermal and Adiabatic Processes, Carnot engine & efficiency, Refrigerator & coefficient of performance, 2nd Law of Thermodynamics: Kelvin-Planck and Clausius Statements and their Equivalence. Carnot's Theorem. Application of Second Law of Thermodynamics: Thermodynamic Scale of Temperature and its Equivalence to Perfect Gas Scale.Concept of Entropy, Clausius Theorem, Clausius Inequality, Second Law of Thernodynamics in terms of Entropy, Entropy of a perfect gas, Principle of increase of Entropy, Entropy Changes in Reversible and Irreversible processes with examples, Entropy Changes in Reversible and Irreversible Processes, Principle of Increase of Entropy, Temperature-Entropy diagrams for Carnot's Cycle, Third Law of Thermodynamics Unattainability of Absolute Zero

UNIT–II

Thermodynamic Potentials & Maxwell's Thermodynamic Relations: Thermodynamic Potentials: Internal Energy, Enthalpy, Helmholtz Free Energy, Gibb's Free Energy, Their Definitions, Properties and Applications, Derivations and applications of Maxwell's Relations, Maxwell's Relations: (1) Clausius Clapeyron equation, (2) Values of Cp-Cv, (3) TdS Equations, (4) Surface Films and Variation of Surface Tension with Temperature, (5) Energy Equations, (6) Change of Temperature during Adiabatic Process.

UNIT–III

Magnetic Work, First and second order Phase Transitions with examples, Clausius Clapeyron Equation and Ehrenfest equations. Joule's Experiment Free Adiabatic Expansion of a Perfect Gas. Joule-Thomson Porous Plug Experiment Joule Thomson Effect for Ideal and Van der Waal Gases. Temperature of Inversion. Joule Thomson Cooling.Adiabatic demagnetization.

UNIT–IV

Distribution of Velocities: Maxwell-Boltzmann Law of Distribution of Velocities in anIdeal Gas and its Experimental Verification. Doppler Broadening of Spectral Lines andStern's Experiment Mean, RMS and Most Probable Speeds.Degrees of Freedom Law of Equi-partition of Energy. Specific heats of Gases

Text and Reference Books:

1. Heat and Thermodynamics, M.W. Zemansky, Richard Dittman, 1981, McGraw-Hill.
2. A Treatise on Heat, Meghnad Saha, and B.N.Srivastava, 1958, Indian Press
3. Thermal Physics, S. Garg, R. Bansal and Ghosh, 2nd Edition, 1993, Tata McGraw-Hill
4. Thermodynamics, Kinetic Theory & Statistical Thermodynamics, Sears & Salinger. 1988, Narosa.
5. Heat Thermodynamics & Statistical Physics, Brij Lal and Subramaniam, 1st Edn., 2008, S. Chand.

Master of Science (Semester System) (12+3+2 System of Education with multiple Entries and Exits)

(Session-2024-25)

Master of Science (FYIP) PHYSICS (SEMESTER–I)

COURSE TITLE: MATHEMATICS-I

COURSE CODE: FPHL-1335

Course outcomes

After the completion of this course, students should be able to:

CO 1: Give argument related to limits, continuity and derivative of a function and to understand the concept of maxima and minima of a function of a single variable.

CO 2: Explain the significance of Roll's theorem, Mean Value theorem, and Taylor's and Maclaurin's theorem to find the expansions of functions.

CO 3: Demonstrate the geometrical meaning of integral calculus as an area and volume.

CO 4: Introduce the concept of different types of Matrices and to understand the meaning of eigen values and eigen vectors with the process of diagonalization of Matrices.

Master of Science (Semester System) (12+3+2 System of Education with multiple Entries and Exits)

(Session-2024-25)

Master of Science (FYIP) PHYSICS (SEMESTER–I)

COURSE TITLE: MATHEMATICS-I

COURSE CODE: FPHL-1335

Credits: 4-0-0 **Max Marks: 100 (ESE Marks:70, CA: 30)**

Examination Time: 3 Hours **Pass Mark: 25**

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. Each question carries 14 marks.

UNIT –I

Functions and Derivatives: Limit, continuity and derivative of a function of one variable, geometrical significance of derivative, successive differentiation, Leibnitz theorem, maxima and minima of a function of single variable, partial derivatives, total derivative, chain rule.

UNIT –II

Differential Calculus: Rolle's theorem, mean value theorem, Taylor and Maclaurin formulas, Taylor series; concavity, point of inflexion, asymptotes.

UNIT-III

AAnti derivatives: Indefinite integral as an anti derivative, method of substitution, partial fractions, integration by parts; reduction formulae; Definite integrals. Definite integral as a limit of a sum, geometrical interpretation; double and triple integrals.

UNIT-IV

Matrices: Orthogonal matrices, Hermitian matrices, Unitary matrices; Cayley Hamilton theorem and its applications; rank of a matrix, consistency of a system of linear equations, eigen values and eigenvectors, diagonalization of matrices.

Text and Reference Books:

1. Differential Calculus: Shanti Narayan, New Delhi, Shyam Lal,1983.
2. Integral Calculus: Shanti Narayan, Delhi, S. Chand,1968.
3. Higher Engineering Mathematics: B.S. Grewal, Delhi, Khanna,1995.

Master of Science (Semester System) (12+3+2 System of Education with multiple Entries and Exits)

(Session-2024-25)

Master of Science (FYIP) PHYSICS (SEMESTER–I)

COURSE TITLE: ORGANIC CHEMISTRY

COURSE CODE: FPHL-1086

Course outcomes:

After Completing the Course the students will be able to

CO1: learn about the basic chemistry of organic chemistry.

CO2: interpret the reactions and properties of alcohols and Phenols and provide basic knowledge of organic reaction mechanisms.

CO3: understand preparations and reactions of ethers and epoxides, understand cleavages in ethers, the ring opening reactions of epoxides.

CO4: to resolve the different enantiomers and differentiate between dextrorotatory-leavorotatory chiral and achiral compounds, understand the concept of isomerism, conformation and configuration.

Master of Science (Semester System) (12+3+2 System of Education with multiple Entries and Exits)

(Session-2024-25)

Master of Science (FYIP) PHYSICS (SEMESTER–I)

COURSE TITLE: ORGANIC CHEMISTRY

COURSE CODE: FPHL-1086

Credits: 3-0-0 **Max Marks: 100 (ESE Marks:70 , CA: 30)**

Examination Time: 3 Hours **Pass Mark: 25**

Instructions for the Paper Setters: Eight questions of equal marks (Sixteen 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. Each question carries 14 marks.

UNIT-I

Basics concepts of Organic Chemistry: Classification and Nomenclature of organic compounds. Electronic Effects: Inductive, electromeric, resonance and mesomeric effects, hyperconjugation. Reactive intermediates: carbocations, carbanions, free radicals. Electrophiles and Nucleophiles. Nucleophilicity and basicity. Relative strengths of acids and bases, concept of p*K*a, effect of substituents and steric effects of substituents.

UNIT-II

Chemistry of functional groups–I: Selective methods of preparation: dehydration of alcohols, dehydrohalogenation of alkyl halides with complete mechanistic discussion. (E mechanism), Saytzeff's rule. Reactions: addition of hydrogen halides (Markovnikov's and anti-Markovnikov's addition), halogen addition to alkenes, epoxidation of alkenes. Acidity of acetylene, Birch reduction, addition of hydrogen halides and water to alkynes, Diels-Alder reaction.

UNIT-III

Chemistry of functional groups–II: Ethers and Epoxides: methods of their formation, Chemical reactions Cleavage and autoxidation, Zeisel's method, Acids and base catalysed ring opening of epoxide, Alkyl Halides, Types of Nucleophilic Substitution (SN1, SN2) reactions, solvent effect, substitution and elimination as competing reactions. Principles of nucleophilic addition to carbonyl groups: acetal formation, cyanohydrins formation; reactions with primary and secondary amines, Witting reaction, aldol condensation

UNIT-III

Stereochemistry: Introduction, Conformations of ethane and butane. Interconversion of Wedge Formula, Newmann, Sawhorse and Fischer representations. Configuration: Geometrical and Optical isomerism, Molecular chirality, optical activity, absolute and relative configuration, the Cahn-Ingold Perlog R-S notional system, physical properties of enantiomers, naming stereo isometric alkenes by the E/Z system.

Books suggested

1. R.T. Morison and R.N Boyd, Organic Chemistry.
2. I.L. Finar, Organic Chemistry, Vol. I- IV
3. J. March, Advanced Organic Chemistry, Reactions Mechanism and Structure.
4. F.A. Carey, Organic Chemistry.

Master of Science (Semester System) (12+3+2 System of Education with multiple Entries and Exits)

(Session-2024-25)

Master of Science (FYIP) PHYSICS (SEMESTER–I)

COURSE TITLE: PHYSICS LAB-I

COURSE CODE: FPHP-1397

COURSE OUTCOMES:

After passing this course, students will be able to:

CO1: Students will demonstrate the ability to conduct a specific experiment from a given list, applying theoretical knowledge and practical skills to accurately complete the procedure and obtain reliable results.

CO2: Students will be able to articulate the theoretical background and principles underlying the chosen experiment.

CO3: Students will demonstrate their understanding of the experiment through oral questioning and discussion.

CO4: Students will maintain a well-organized and accurate practical file documenting all experiments conducted.

Master of Science (Semester System) (12+3+2 System of Education with multiple Entries and Exits)

(Session-2024-25)

Master of Science (FYIP) PHYSICS (SEMESTER–I)

COURSE TITLE: PHYSICS LAB-I

COURSE CODE: FPHP-1397

Credits: 0-0-3 **Max Marks: 100 (ESE Marks: 70, CA: 30)**

Examination Time: 3 Hours **Pass Mark: 25**

Instructions to Practical Examiner

Question paper is to be set on the spot jointly by the external and internal examiners. Two copies of the same to be submitted for the record to COE office, Kanya Maha Vidyalaya, Jalandhar

General Guidelines for Practical Examination

I. The distribution of marks is as follows:

i) One experiment 30 Marks

ii) Brief Theory 15 Marks

iii) Viva–Voce 15 Marks

iv) Record (Practical file) 10 Marks

II. There will be one session of 3 hours duration. The paper will have one session and will consist of 8 experiments out of which an examinee will mark 6 experiments and one of these is to be allotted by the external examiner.

III. Number of candidates in a group for practical examination should not exceed 20.

IV. In a single group no experiment be allotted to more than three examinee in any group.

LIST OF EXPERIMENTS

1. Use of Vernier calliper, screw gauge and travelling microscope.
2. To determine the Moment of Inertia of a Flywheel.
3. To find Young's modulus of the material of a rectangular bar by bending.
4. To determine the Modulus of Rigidity of a Wire by Maxwell‟s needle.
5. To determine the value of g using Bar Pendulum.
6. To determine the value of g using Kater‟s Pendulum.
7. To find the efficiency of an electric kettle with varying input voltage.
8. To determine the coefficient of thermal conductivity of a bad conductor by Lee and Charlton disc method.
9. To determine Stefan's constant using Boltzmann's law.
10. To Study the variation of Thermo-Emf of a thermocouple with difference of temperature of its two Junctions using a null method and also calibrate the thermocouple in a specified temperature range.
11. To find unknown low resistance using Carey Foster's bridge without calibrating the bridge-wire.

Reference Books:

1. Practical Physics, C.L. Arora, S. Chand & Co.

Master of Science (Semester System) (12+3+2 System of Education with multiple Entries and Exits)

(Session-2024-25)

Master of Science (FYIP) PHYSICS (SEMESTER–I)

COURSE TITLE: QUALITATIVE ORGANIC ANALYSIS LAB-I

COURSE CODE: FPHP-1088

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

Master of Science (Semester System) (12+3+2 System of Education with multiple Entries and Exits)

(Session-2024-25)

Master of Science (FYIP) PHYSICS (SEMESTER–I)

COURSE TITLE: QUALITATIVE ORGANIC ANALYSIS LAB-I

COURSE CODE: FPHP-1088

Credits: 0-0-1 **Max Marks: 50 (ESE Marks:35, CA:15)**

Examination Time: 2 Hours **Pass Mark: 9**

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.

General Guidelines for Practical Examination

The preliminary examination of physical and chemical characteristics (Physical state, colour and odour), elemental analysis (nitrogen, sulphur, chlorine, bromine, iodine), solubility tests including acid-base reactions, classification tests involving functional reactivity other than acid-base test. The following categories of compounds should be analysed: phenols, carboxylic acids, carbonyl compounds- ketones and aldehydes, aromatic amines, amides.

Suggested Book:

1. Mann, F.G. & Saunders, B.C. Practical Organic Chemistry, Pearson Education (2009)
2. Furniss, B.S., Hannaford, A.J., Smith, P.W.G. & Tatchell, A.R. Practical Organic Chemistry, 5 th Ed. Pearson (2012)
3. Ahluwalia, V.K. & Aggarwal, R. Comprehensive Practical Organic Chemistry: Preparation and Quantitative Analysis, University Press (2000).
4. Ahluwalia, V.K. & Dhingra, S. Comprehensive Practical Organic Chemistry: Qualitative Analysis, University Press (2000).

Master of Science (Semester System) (12+3+2 System of Education with multiple Entries and Exits)

(Session-2024-25)

Master of Science (FYIP) PHYSICS (SEMESTER–I)

COURSE TITLE: FOUNDATION COURSE

COURSE CODE: VACF-1491

Course Outcomes

After the completion of this Audit course, students will be able to

- learn how past societies, systems, ideologies, governments, cultures and technologies were built, how they operated, and how they have changed
- understand how the rich history of the world helps us to paint a detailed picture of where we stand today.
- understand the Vedic theism, Upanishads Philosophy and doctrines of Jainism, Buddhism and Sikhism
- acquire knowledge of women rights and courage to face day to day challenges
- acknowledge the changes in society, religion and literature in the renaissance period and the importance of empathy and compassion for humanity
- learn about the prominent Indians (Men and Women) who contributed significantly in freedom struggle, education, economic development and in the formation and evolution of our nation
- understand meaning of race and how that concept has been used to justify exclusion, inequality, and violence throughout history and the origin of civil right movements to fight for equality, liberty and fraternity
- critically evaluate the socio-political and economic issues at global level and its implications in the present
- upgrade and enhance learning technological skills and striking a balance between technology and their well being
- take pride in learning the saga of Indian Past Culture and Heritage
- understand the rich legacy of KMV and its progressive endeavours.

Master of Science (Semester System) (12+3+2 System of Education with multiple Entries and Exits)

(Session-2024-25)

Master of Science (FYIP) PHYSICS (SEMESTER–I)

COURSE TITLE: FOUNDATION COURSE

COURSE CODE: VACF-1491

Credits: 2-0-0 **Max Marks: 50 (ESE Marks:35, CA: 15)**

Examination Time: 1 Hour **Pass Mark: 13**

SYLLABUS

Module I Being a Human: Introduction & Initial Assessment

- Introduction to the programme
- Initial Assessment of the students through written answers to a couple of questions

Module 2 The Human Story

- Comprehensive overview of human intellectual growth right from the birth of human history
- The wisdom of the Ancients
- Dark Middle Ages
- Revolutionary Renaissance
- Progressive modern times
- Most momentous turning points, inventions and discoveries

Module 3 The Vedas and the Indian Philosophy

- Origin, teachings and significance of *The Vedas*
- Upnishads and Puranas
- Karma Theory of *The Bhagwad Gita*
- Main tenets of Buddhism & Jainism
- Teachings of Guru Granth Sahib

Module 4 Changing Paradigms in Society, Religion & Literature

- Renaissance: The Age of Rebirth
- Transformation in human thought
- Importance of humanism
- Geocentricism to heliocentricism
- Copernicus, Galileo, Columbus, Darwin and Saint Joan
- Empathy and Compassion

o Module 5 Woman: A Journey through the Ages

- Status of women in pre-vedic times
- Women in ancient Greek and Roman civilizations
- Women in vedic and ancient India
- Status of women in the Muslim world
- Women in the modern world
- Crimes against women
- Women labour workforce participation
- Women in politics
- Status of women- our dream

o Module 6 Makers of Modern India

- Early engagement of foreigners with India
- Education: The first step to modernization
- Railways: The lifeline of India
- Raja Ram Mohan Roy, Gandhi, Nehru, Vivekanand, Sardar Patel etc.
- Indira Gandhi, Mother Teresa, Homai Vyarawala etc.

- The Way Ahead
    - ***Module 7 Racism: Story of the West***
- European beginnings of racism
- Racism in the USA - Jim Crow Laws
- Martin Luther King Jr. and the battle against racism
- Apartheid and Nelson Mandela
- Changing face of racism in the modern world
    - ***Module 8 Modern World at a Glance: Political & Economic Perspective***
- Changing world order
- World War I & II
- UNO and The Commonwealth
- Nuclear Powers; Terrorism
- Economic Scenario: IMF, World Bank
- International Regional Economic Integration
    - ***Module 9 Technology Vis a Vis Human Life***
- Impact of technology on modern life
- Technological gadgets and their role in our lives
- Technology and environment
- Consumerism and materialism
- Psychological and emotional consequences of technology
- Harmonizing technology with ethics and humaneness
    - ***Module 10 My Nation My Pride***
- Indian Past Culture and Heritage
- Major Discoveries (Medicinal and Scientific)
- Vedic Age
- Prominent Achievements
- Art, Architecture and Literature
    - ***Module 11 The KMV Experience***
- Rich Legacy of KMV
- Pioneering role in women emancipation and empowerment
- KMV Contribution in the Indian Freedom Struggle
- Moral, cultural and intellectual heritage of KMV
- Landmark achievements
- Innovative initiatives; international endeavours
- Vision, mission and focus
- Conduct guidelines for students
    - ***Module 12 Final Assessment, Feedback & Closure***
- Final multiple-choice quiz
- Assessment through the same questions asked in the beginning
- Feedback about the programme from the students
- Closure of the programme
    - ***PRESCRIBED READING***
- ***The Human Story*** published by Dawn Publication

SEMESTER-II

Master of Science (Semester System) (12+3+2 System of Education with multiple Entries and Exits)

(Session-2024-25)

Master of Science (FYIP) PHYSICS (SEMESTER–II)

COURSE TITLE: PUNJABI (COMPULSORY)

COURSE CODE: FPHL-2421

Course Outcomes

CO1: nkX[fBe fJeKrh g[[[;se Bz{ gVQkT[D dk wB'oE ftfdnkoEhnK nzdo fJeKrh gqsh fdbu;gh, ;{M Bz{ g?dk eoBk j?.

CO2 nkX[fBe fJeKrh g[[[;se Bz{ gVQkT[D dk wB'oE ftfdnkoEhnK nzdo fJeKrh gqsh fdbu;gh, ;{M Bz{ g?dk eoBk j?.

CO3: w[jkto// / nykD dh tos'A Bkb rZbpks ftu gogZesk nkT[Adh j?.fJj ftfdnkoEhnK dh rZbpks ftu fByko fbnkT[D dk ezw eoBr/.

CO4: Ppd Pq/DhnK Bz{ gVQkT[D dk wB'oE ftfdnkoEhnK nzdo gzikph GkPk dh nwhoh dk ns/ pkohehnK Bz{ ;wMD bJh tZyo/ -tZyo/ f;XKsK dk ftek; eoBk j?.

Master of Science (Semester System) (12+3+2 System of Education with multiple Entries and Exits)

(Session-2024-25)

Master of Science (FYIP) PHYSICS (SEMESTER–II)

COURSE TITLE: PUNJABI (COMPULSORY)

COURSE CODE: FPHL-2421

Credits: 2-0-0 **Max Marks: 50 (ESE Marks:35, CA: 15)**

Examination Time: 3 Hours **Pass Mark: 13**

nze tzv ns/ gohfyne bJh jdkfJsK

1H gqPB gZso d/ uko ;?ePB j'Dr/.;?ePB A-D sZe d/ gqPB :{fBN I-IV ftu'A g[ZS/ ikDr/. jo ;?ePB ftu d' gqPB g[ZS/ ikDr/.

2H ftfdnkoEh B/ eZ[b gzi gqPB eoB/ jB. jo ;?ePB ftu'A fJe gqPB eoBk bklwh j?. gzitK gqPB fe;/ th ;?ePB ftu'A ehsk ik ;edk j?.

3H jo/e gqPB d/ 7 nze jB.

4H g/go ;?ZN eoB tkbk i/eo ukj/ sK gqPBK dh tzv nr'A tZX s'A tZX uko T[g gqPBK ftu eo ;edk j?.

gkmeqw ns/ gkm g[;seK

:{fBN-I

nkX[fBe fJeKrh, ;zgkde o"PB bkb nj{ik, r[o{ BkBe d/t :{Bhtof;Nh, nzfwqs;o ;[jkr, l|oBkwk, fJZe n?stko fJeKrhnK gVQkJhnK ikDrhnK.

(;ko,ftPk t;s{) 7 nze

:{fBN-II

nkX[fBe fJeKrh, ;zgkde o"PB bkb nj{ik, r[o{ BkBe d/t :{Bhtof;Nh, nzfwqs;o pzp e/;, i[ZshnK dk l'Vk, eZu dk riok fJeKrhnK gVQkJhnK ikDrhnK.

(;ko,ftPk t;s{) 7 nze

:{fBN-III

(T) w[jkto// / nykD

(n) xo/b{ fuZmh gZso 7 nze

:{fBN-IV

(T) Ppd Pq/DhnK L BKt,gVBKt,fefonk,ftP/PD

(n) Ppd Pq/DhnKL fefonk ftP/PD,;zpzXe,:'ie,ft;fwe 7 nze

Master of Science (Semester System) (12+3+2 System of Education with multiple Entries and Exits)

(Session-2024-25)

Master of Science (FYIP) PHYSICS (SEMESTER–II)

COURSE TITLE: BASIC PUNJABI (IN LIEU OF PUNJABI(COMPULSORY))

COURSE CODE: FPHL-2031

Course outcomes

CO1: Ppd P/qDhnK L gSkD ns/ tos'A (BKt, gVBKt, fefonk, ftP/PD, fefonk ftP/PD, ;pzXe, :'ie ns/ ft;fwe) Bz{ gVQkT[D dk wB'oE ftfdnkoEhnK nzdo gzikph GkPk dh nwhoh dk ns/ pkohehnK Bz{ ;wMD bJh tZyo/ -tZyo/ f;XKsK dk ftek; eoBk j?/.

CO2: ftfdnkoEh gzikph tke pDso (;kXkoB tke, ;z:[es tke, fwPos tke, fpnkBhnk tke, gqPB tkue tke ns/ j[ewh tke) dh gfoGkPk ns/ fJ; dh pDso s'A ikD{ j'Dr/ ns/ T[BQK dh GkPk s/ geV wip{s j't/rh.

CO3: g?oQk ouBk ns/ ;zy/g ouBk dk wB'oE ftfdnkoEhnK dh p[ZXh B{z shyD eofdnK T[BK dh fbyD gqfsGk B{z T[ikro eoBk j?.

CO4: xo/b{ ns/ d|soh fuZmh gZso fbyD dk wB'oE ftfdnkoEhnK B{z fJ; ebk ftu fBg[zB eoBk j? ı nykD ns/ w[jkto/ dh tos'A Bkb rZbpks ftu gogZesk nkT[Adh j?.fJj ftfdnkoEhnK dh rZbpks ftu fByko fbnkT[D dk ezw eoBr/.

Master of Science (Semester System) (12+3+2 System of Education with multiple Entries and Exits)

(Session-2024-25)

Master of Science (FYIP) PHYSICS (SEMESTER–II)

COURSE TITLE: BASIC PUNJABI (IN LIEU OF PUNJABI(COMPULSORY))

COURSE CODE: FPHL-2031

Credits: 2-0-0 **Max Marks: 50 (ESE Marks:35, CA: 15)**
Examination Time: 3 Hours **Pass Mark: 13**

nze tzv ns/ gohfyne bJh jdkfJsK

1H gqPB gZso d/ uko ;?ePB j'Dr/.;?ePB A-D sZe d/ gqPB :{fBN I-IV ftu'A g[ZS/ ikDr/. jo ;?ePB ftu d' gqPB g[ZS/ ikDr/.

2H ftfdnkoEh B/ eZ[b gzi gqPB eoB/ jB. jo ;?ePB ftu'A fJe gqPB eoBk bklwh j?. gzitK gqPB fe;/ th ;?ePB ftu'A ehsk ik ;edk j?.

3H jo/e gqPB d/ 7 nze jB.

4H g/go ;?ZN eoB tkbk i/eo ukj/ sK gqPBK dh tzv nZr'A tZX s'A tZX uko T[g gqPBK ftu eo ;edk j?.

gkmeqw

:{fBN-I

Ppd P/qDhnK L gSkD ns/ tos'A (BKt, gVBKt, fefonk, ftP/PD, fefonk ftP/PD, ;pzXe, :'ie ns/ ft;fwe) 7 nze

:{fBN-II

gzikph tke pDso L w[ZYbh ikD gSkD

(T) ;kXkoB tke, ;z:[es tke ns/ fwPos tke (gSkD ns/ tos'A)

(n) fpnkBhnk tke, gqPB tkue tke ns/ j[ewh tke (gSkD ns/ tos'A) 7 nze

:{[fBN-III

g?oQk ouBk

;zy/g ouBk 7 nze

:{fBN-IV

fuZmh gZso (xo/b{ ns/ d|soh)

nykD ns/ w[jkto/ (fb;N Bkb BZEh j?) 7 nze

Master of Science (Semester System) (12+3+2 System of Education with multiple Entries and Exits)

(**Session-2024-25)**
Master of Science (FYIP) PHYSICS (SEMESTER–II)
COURSE TITLE: PUNJAB HISTORY AND CULTURE (C. 320 TO 1000 A.D.)
(SPECIAL PAPER IN LIEU OF PUNJABI COMPULSORY)
(FOR THOSE STUDENTS WHO ARE NOT DOMICILE OF PUNJAB)
COURSE CODE: FPHL-2431

COURSE OUTCOMES

After completing Semester II and course on Ancient History of Punjab students will be able to understand:

CO 1: The reasons and impact of Alexander's invasions and to comprehend various factors leading to rise and fall of empires and emergence of new dynasties and their administration specifically of Maurya rule in general and Ashok in particular

CO 2: art and architecture of Gupta period and the Indo-Greek style of architecture under Gandhara School

CO 3: To have an insight into the socio-cultural history under Harshvardhan and punjab under the stated period

CO 4: To enable students to have thorough insight into the various forms/styles of Architecture and synthesis of Indo - Greek Art and Architecture in Punjab

Master of Science (Semester System) (12+3+2 System of Education with multiple Entries and Exits)
(**Session-2024-25)**
Master of Science (FYIP) PHYSICS (SEMESTER–II)
COURSE TITLE: PUNJAB HISTORY AND CULTURE (C. 320 TO 1000 A.D.)
(SPECIAL PAPER IN LIEU OF PUNJABI COMPULSORY)
(FOR THOSE STUDENTS WHO ARE NOT DOMICILE OF PUNJAB)
COURSE CODE: FPHL-2431

Credits: 2-0-0 **Max Marks: 50 (ESE Marks:35, CA: 15)**
Examination Time: 3 Hours **Pass Mark: 13**

Instructions for the Paper Setter:

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 7 marks

Unit-I

1. Alexander's Invasion's and Impact
2. Administration of Chandragupta Maurya with special reference to reforms introduced by Ashok

Unit-II

3. The Kushans: Gandhar School of Art
4. Gupta Empire: Golden Period-Social and cultural life, Art and Architecture)

Unit-III

5. The Punjab under Harshvardhana-Society and Religion During the time of Harshvardhana
6. Socio-cultural History of Punjab from 7th to 1000 A.D.

UNIT IV

7. Development of Languages and Education with Special reference to Taxila
8. Development to Art and Architecture

Suggested Readings

- B.N. Sharma: *Life in Northern India*, Delhi. 1966
- Budha Parkash, *Glimpses of Ancient Punjab*, Patiala, 1983.
- L. M Joshi (ed), *History and Culture of the Punjab*, Art-I, Punjabi University, Patiala, 1989 (3rd edition)
- L.M. Joshi and Fauja Singh (ed.), *History of Punjab*, Vol.I, Punjabi University, Patiala, 1977.

Master of Science (Semester System) (12+3+2 System of Education with multiple Entries and Exits)
(Session-2024-25)
Master of Science (FYIP) PHYSICS (SEMESTER–II)
COURSE TITLE: COMMUNICATIVE ENGLISH

COURSE CODE: FPHL-2102

Course Outcomes

At the end of this course, students will be able to:

CO1: distinguish the main points from the supporting details and the irrelevant information from the relevant one through Note-Taking

CO2: learn the skills and strategies of effective writing by paragraph writing

CO3: enhance their reading and analyzing power of texts through guided reading through the study of "Making Connections" by Kenneth J. Pakenham

CO4: be acquainted to the techniques of effective essay writing

Master of Science (Semester System) (12+3+2 System of Education with multiple Entries and Exits)

(Session-2024-25)

Master of Science (FYIP) PHYSICS (SEMESTER–II)

COURSE TITLE: COMMUNICATIVE ENGLISH

COURSE CODE: FPHL-2102

Credits: 2-0-0 **Max Marks: 50 (ESE Marks:35, CA: 15)**

Examination Time: 3 Hours **Pass Mark: 13**

Instructions for the Paper Setters: -

Eight questions of equal marks (Specified in the syllabus (Units: I-IV)) are to be set, two in each of the four Sections. 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. Each question has a weightage of 7 marks.

UNIT-I

Practical question on Note Making, Summarizing and Abstracting as given in The Written Word by Vandana R. Singh

UNIT-II

Practical question on Paragraph writing as prescribed in The Written Word by Vandana R. Singh

UNIT-III

Theoretical questions based on ABC of Good Notes as prescribed in The Written Word by Vandana R. Singh, Unit-III from Making Connections: A Strategic Approach to Academic Reading by Kenneth J. Pakenham, Second Edition

UNIT-IV

Practical question on Essay writing from The Written Word by Vandana R. Singh,
Unit - IV from Making Connections: A Strategic Approach to Academic Reading by Kenneth J. Pakenham, Second Edition.

Prescribed Text books:

- The Written Word by Vandana R. Singh, Oxford University Press, New Delhi
- Making Connections: A Strategic Approach to Academic Reading by Kenneth J. Pakenham, second edition.

Master of Science (Semester System) (12+3+2 System of Education with multiple Entries and Exits)

(Session-2024-25)

Master of Science (FYIP) PHYSICS (SEMESTER–II)

COURSE TITLE: ELECTRICITY AND MAGNETISM

COURSE CODE: FPHL-2393

COURSE OUTCOMES

Course Outcomes: Electricity and Magnetism-

After passing this course the students will be able to:

CO1: understand vector calculus and vector algebra and its applications in electricity and magnetism. The students will be able to solve the electrostatic problems with the help of Gauss law and Coulomb's law.

CO2: understand the applications of scalar potential for the calculation of electric field and electric potential due to an arbitrary charge distribution.

CO3: solve the problems with the help of method of images and understand the conduction of electric current and fundamental laws of electricity and relate the electric and magnetic fields in two inertial frames of reference.

CO4: able to understand electric field, potential and polarization of different media and related quantities.

Master of Science (Semester System) (12+3+2 System of Education with multiple Entries and Exits)

(Session-2024-25)

Master of Science (FYIP) PHYSICS (SEMESTER–II)

COURSE TITLE: ELECTRICITY AND MAGNETISM

COURSE CODE: FPHL-2393

Credits: 4-0-0 **Max Marks: 100 (ESE Marks: 70, CA: 30)**

Examination Time: 3 Hours **Pass Mark: 25**

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. Each question carries 14 marks.

Note: Students can use Non-Scientific calculators or logarithmic tables.

UNIT-I

Calculus of vectors: Introduction to gradient, divergence and curl; their physical significance. Rules for vector derivatives, useful relations involving gradient, divergence and curl. Fundamental theorem for gradients, Gauss's and Stoke's theorems (statements only). Electric Field and Electric Potential: Conservation and quantization of charge. Coulomb's law.

Electric field: Electric field lines, Electric flux. Gauss's law with applications to charge distributions with spherical, cylindrical and planar symmetry. Conservative nature of Electrostatic field. Electrostatic potential. Potential as line integral of field, potential difference.Derivation of the field from the potential. Potential of a point and line charge distribution, uniformly charged disc, spherical shell and solid sphere. Energy associated with an electric field. Electrostatic energy of a system of charges and of a charged sphere. The Uniqueness Theorem.Differential form of Gauss's law. Laplace's and Poisson's equations.Potential and electric field of a dipole. Force and torque on a dipole.

UNIT-II

Electric Fields Around Conductors: Conductors in an electrostatic field. Equipotential Surfaces.Method of Electrical Images for finding the potential and its application to Plane Infinite Sheet.

Dielectric Properties of Matter: Dielectrics.Effect of electric field on dielectrics. Electric field due to polarisation of dielectric, Polarisationvector. Dielectricconstant, Relation between electrical Susceptibility and Dielectric constant.Capacitor (parallel-plate, spherical and cylindrical) filled with dielectric. Dipole moment of an atom. Atomic polarizability, polarizing field in Dielectric.Clausius-Mosotti formula, Gauss's law for dielectrics.Permittivity of dielectric.Energy stored in a capacitor. Electric energy density. Displacement vector D. Relation between E, P and D.

UNIT-III

Magnetic Field: Definition of Magnetic Field B.Force on a (1) point charge (2) current carrying wire in a magnetic field. Torque on a current loop in a uniform magnetic field.Biot-Savart's Law and its simple applications: straight wire and circular loop. Current loop as a Magnetic Dipole and its Dipole Moment (Analogy with Electric Dipole). Magnetic force between current elements.Ampere's Circuital law and its application to (i) Solenoid and (ii) Toroid. Properties of B: curl and divergence. Vector Potential.

Magnetic Properties of Matter: Response of various substances to magnetic fields. Magnetic dipole moment of current loop, Energy of magnetic dipole in external magnetic field.Magnetic dipole moment of atom.Orbital magnetic moment of an electron.Bohr Magneton. Types of magnetic materials.Properties of diamagnetic, paramagnetic and ferromagnetic substances. Magnetisation vector (M), Magnetic Intensity(H), Magnetic Susceptibility and Permeability.Relation between B, H, M. B-H curve and hysteresis.

UNIT-IV

Electrical Circuits: AC circuits: Kirchhoff's laws for AC circuits. Complex Reactance and Impedance. Series LCR Circuit: (1) Resonance (2) Power Dissipation and (3) Quality Factor, and (4) Band Width. Parallel LCR circuit.

Fields of Moving Charges: Measurement of charge in motion, Electric field in different frames of references. Electric field due to moving charge. Relation between electric fields in two inertial frames, Interaction between moving charges.

Reference Books:

1. Electricity, Magnetism & Electromagnetic Theory, S. Mahajan and Choudhary, 2012, Tata McGraw
2. Electricity and Magnetism, Edward M. Purcell, 1986 McGraw-Hill Education
3. Introduction to Electrodynamics, D.J. Griffiths, 3rdEdn., 1998, Benjamin Cummings.
4. Feynman Lectures Vol.2, R.P. Feynman, R.B Leighton, M. Sands,2008, Pearson Education
5. Elements of Electromagnetics, M.N.O. Sadiku, 2010, Oxford University Press
6. Electricity and Magnetism, J.H.Fewkes&J.Yarwood, Vol.I, 1991, Oxford Univ. Press
7. Electricity and Magnetism: A.K. Sikri. Pradeep Publications. 8. Electricity and Magnetism: A.S Mahajan and A.A Rangwala. Tata McGraw Hill

Master of Science (Semester System) (12+3+2 System of Education with multiple Entries and Exits)

(Session-2024-25)

Master of Science (FYIP) PHYSICS (SEMESTER–II)

COURSE TITLE: WAVES AND OSCILLATIONS

COURSE CODE: FPHL-2394

COURSE OUTCOMES

After passing this course the student will be able to:

CO1: demonstrate Lissajous figures by mechanical and analytical method with different cases.

CO2: understand fundamental description of harmonic oscillator, damped, forced and N- coupled oscillators with real examples from everyday life i.e. vibration isolation, shocker etc.

CO3: solve differential equations of forced oscillations & to obtain related quantities.

CO4: understand the concept of coupled oscillators and wave motion. Students will also be able to apply the concept of waves and oscillations to any type of waves like e. m. waves, mechanical waves.

Master of Science (Semester System) (12+3+2 System of Education with multiple Entries and Exits)

(Session-2024-25)

Master of Science (FYIP) PHYSICS (SEMESTER–II)

COURSE TITLE: WAVES AND OSCILLATIONS

COURSE CODE: FPHL-2394

Credits: 4-0-0 **Max Marks: 100 (ESE Marks: 70, CA: 30)**

Examination Time: 3 Hours **Pass Mark: 25**

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) 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. Each question carries 14 marks.

UNIT-I

Damped Oscillations: Superposition of two SHM by vector addition, superposition of two perpendicular SHM, Polarization, Lissajous figures–superposition of many SHMs, complex number notation and use of exponential series. Damped motion of mechanical and electrical oscillator, heavy damping, critical damping. Damped single harmonic oscillator, amplitude decay, logarithmic decrement, relaxation time, energy decay, Q value, rate of energy decay equal to work rate of damping force, problems. **15 Lectures**

UNIT-II

Forced Oscillations: Transient and steady state behaviour of a forced oscillator, Variation of displacement and velocity with frequency of driving force, frequency dependence of phase angle between force and (a) displacement, (b) velocity, Vibration Insulation – Power supplied to oscillator, Q-value as a measure of power absorption bandwidth, Q-value as amplification factor of low frequency response. **15 Lectures**

UNIT-III

Coupled Oscillations: Stiffness (or Capacitance) coupled oscillators, normal coordinates, degrees of freedom, normal modes of vibration, general method of finding normal modes, forced vibrations of two coupled oscillators, linear oscillations (two masses coupled by three springs) and their normal modes, transverse oscillations (one mass coupled with two springs, two masses coupled with three springs) and respective normal modes, N-coupled oscillators (longitudinal and vertical oscillations) and their normal modes and properties, inductance coupling of electrical oscillators, wave motion as the limit of coupled oscillations. **15 Lectures**

UNIT-IV

Wave Motion: The wave equation, transverse waves on a string, the string as a forced oscillator, characteristic impedance of a string, reflection and transmission of transverse waves at a boundary , impedance matching, insertion of quarter wave element, standing waves on a string of fixed length, normal modes and eigen frequencies. Energy in a normal mode of oscillation, wave groups, group velocity, dispersion, wave group of many components, bandwidth theorem, Doppler effect, sound waves in gases. **15 Lectures**

Reference Books:

1. The Physics of Vibrations and Waves- H.J. Pain, John Wiley, Chichester, 1999
2. Vibrations and Waves in Physics- I.G. Main-Cambridge University, Cambridge, 1993.
3. Berkeley Physics Course Vol. III (Waves)-Frank S Crawford Jr-Frank S. Crawfold Jr, 1970.
4. Vibrations and Waves, George C King, Wiley Publication 2009.

Master of Science (Semester System) (12+3+2 System of Education with multiple Entries and Exits)

(Session-2024-25)

Master of Science (FYIP) PHYSICS (SEMESTER–II)

COURSE TITLE: MATHEMATICS-II

COURSE CODE: FPHL-2335

Course outcomes

CO 1: Understand the concept of transformation and rotation of axes with the brief introduction of Conic section.

CO 2: Enhance their knowledge in the field of Solid Geometry.

CO 3: Explain the significance and Relation between the roots and co-efficients of polynomial equations and to identify the Solutions of biquadratic polynomial equations by Descartes and Ferrari's methods.

CO 4: Demonstrate the concept of Binary operations, Groups, Subgroups, Group table, Circle Group, Dihedral groups, Cyclic groups, Conjugate elements and Conjugacy classes,

Master of Science (Semester System) (12+3+2 System of Education with multiple Entries and Exits)

(Session-2024-25)

Master of Science (FYIP) PHYSICS (SEMESTER–II)

COURSE TITLE: MATHEMATICS-II

COURSE CODE: FPHL-2335

Credits: 4-0-0 **Max Marks: 100 (ESE Marks: 70, CA: 30)**

Examination Time: 3 Hours **Pass Mark: 25**

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. Each question carries **14 marks.**

Note: Students can use Non-Scientific calculators or logarithmic tables**.**

UNIT –I

Coordinates Geometry(2D): Transformation of axes, shifting of origin, Rotation of axes, Parabola, Ellipse, Hyperbola and their properties; Tangent and normal, pair of tangents, Chord of contact for alltheconics; Identifications of curves represented by second degree equation (without derivation).

15 Hours

UNIT –II

Solid Geometry: Straight line and planes in Intersection of two and three planes, Intersection of a line and plane; Sphere, Section of a sphere by a plane, Intersection of a line and asphere, Intersection of two spheres; Right circular Cone, Right circular Cylinder, Tangent lines, Tangent planes, and normal lines to these surfaces. 15 Hours

UNIT –III

Polynomial equations: Relation between the roots and co-efficients of polynomial equations (in one variable), Horner's method, Transformation of equations and symmetric functions of roots, Descartes rule of signs, Newton's method of divisors, Cardano's method, Solutions of biquadratic polynomial equations by Descartes and Ferrari's methods. 15 Hours

UNIT –IV

Introduction to Groups: Binary operations, Groups, Subgroups, Group table, SU(2), SU(3), Heisenberg's Group, Circle Group, The Torus Group, Dihedral groups, Cyclic groups, Order of an element of a group, Conjugate elements and Conjugacy classes, Group Homomorphism and Isomorphism, Algebraic property, some standard algebraic properties (without proofs). 15 Hours

Text and Reference Books:

1. S. Narayan, Coordinate Geometry, Sultan Chand &Sons (2005).
2. S. Narayan, Analytical Solid Geometry, Sultan Chand &Sons (2005).
3. B.S. Grewal, Higher Engineering Mathematics: Khanna Publishers, Delhi (1995).
4. Mohan Singh, Topics in Maths, Lakshmi Publication, New Delhi, (1997)
5. N. S. Gopalakrishnan.: University Algebra, New Age International Publishers. (2007)

Master of Science (Semester System) (12+3+2 System of Education with multiple Entries and Exits)

(Session-2024-25)

Master of Science (FYIP) PHYSICS (SEMESTER–II)

COURSE TITLE: INORGANIC CHEMISTRY

COURSE CODE: FPHL-2086

COURSE OUTCOMES:

After completing this course the studens will be able to

CO1: Describe VBT, VSEPR theory and predicts the geometry of simple molecules & molecular orbital theory of homonuclear diatomic molecules, explain, predict & draw structures of simple ionic compounds.

CO2: To enrich the factual knowledge of chemistry related to theories of coordination complexes and calculation of C.F.S.E.

CO3: To develop an understanding of the concepts of structure and bonding of inorganic complexes and calculate microstates and spectroscopic terms.

CO4: To familiarize with p-acid ligands.

Master of Science (Semester System) (12+3+2 System of Education with multiple Entries and Exits)

(Session-2024-25)

Master of Science (FYIP) PHYSICS (SEMESTER–II)

COURSE TITLE: INORGANIC CHEMISTRY

COURSE CODE: FPHL-2086

Credits: 3-0-0 **Max Marks: 100 (ESE Marks: 70, CA: 30)**
Examination Time: 3 Hours **Pass Mark: 25**

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. **Each question carries 14 marks.**

Note: Students can use Non-Scientific calculators or logarithmic tables.

UNIT- I

Introduction, Werner's coordination theory, naming of co-ordinate complexes. Co-ordination numbers 1-12 and their stereo-chemistries. Factors affecting co-ordination number and stereochemistry. Configurational Isomers, Conformational isomerism, VSPER theory, molecular orbital theory applied to homo-nuclear diatomic molecules. Bonding in metal complexes, Valence bond theory for co-ordinate complexes, inner and outer orbital complexes, Electro-neutrality and back bonding, limitations of V.B. theory.

UNIT- II

Stability of coordination compoundsIntroduction, Stability constant, stepwise stability constant, overall stability constant. Factors affecting the stability of metal ion complexes with general ligands, HSAB principle.Crystal field theory- Splitting of d-orbitals in octahedral, tetrahedral, cubic and square planar fields of ligands. Calculation of C.F.S.E. in high spin and low spin octahedral and High spin tetrahedral complexes, factors affecting the 10 Dq Value. Structural effects of crystal field splitting- Jahn-Teller distortion, variation of Ionic radii with increase in atomic number. Paramagnetism, diamagnetism, ferro and anti-ferromagnetism.

UNIT- III

Microstates and spectroscopic terms, a calculation of spectroscopic terms for d1 - d10 electronic configurations, L S coupling, Hund's rule for finding the ground state terms, Electronic spectral properties of Ist transition series, Orgel Diagrams for d1 - d10 systems, for weak field octahedral and tetrahedral complexes, limitations of C.F.T.

UNIT- IV

p -Acid Ligands definition Carbon monoxide complexes, bonding in linear MCO groups, polynuclear metal carbonyls, vibrational spectra, carbonyl hydrides and halides. Metal-metal bonding, metal metal multiple bonding, Structure of high nuclearity carbonyl clusters, counting of electrons in carbonyl clusters.

Text and Reference Books:

1. J.E. Huheey, Inorganic Chemistry, 3rd Ed.
2. F.A. Cotton and G. Wilkinson, Advanced Inorganic Chemistry.
3. B.E. Douglas and D.H. McDaniel, Concepts and Models of Inorganic Chemistry

Master of Science (Semester System) (12+3+2 System of Education with multiple Entries and Exits)

(Session-2024-25)

Master of Science (FYIP) PHYSICS (SEMESTER–II)

COURSE TITLE: PHYSICS LAB-II

COURSE CODE: FPHP-2397

Course Outcomes:

After passing this course, students will be able to:

CO1: Students will demonstrate the ability to conduct a specific experiment from a given list, applying theoretical knowledge and practical skills to accurately complete the procedure and obtain reliable results.

CO2: Students will be able to articulate the theoretical background and principles underlying the chosen experiment.

CO3: Students will demonstrate their understanding of the experiment through oral questioning and discussion.

CO4: Students will maintain a well-organized and accurate practical file documenting all experiments conducted.

Master of Science (Semester System) (12+3+2 System of Education with multiple Entries and Exits)

(Session-2024-25)

Master of Science (FYIP) PHYSICS (SEMESTER–II)

COURSE TITLE: PHYSICS LAB-II

COURSE CODE: FPHP-2397

Credits: 0-0-3 **Max Marks: 100 (ESE Marks: 70, CA: 30)**

Examination Time: 3 Hours **Pass Mark: 25**

General Guidelines for Practical Examination

I. The distribution of marks is as follows:

i) One experiment 30 Marks

ii) Brief Theory 15 Marks

iii) Viva–Voce 15 Marks

iv) Record (Practical file) 10 Marks

II. There will be one session of 3 hours duration. The paper will have one session and will consist of 8 experiments out of which an examinee will mark 6 experiments and one of these is to be allotted by the external examiner.

III. Number of candidates in a group for practical examination should not exceed 12.

IV. In a single group no experiment be allotted to more than three examinee in any group.

LIST OF EXPERIMENTS

1. Use a Multimeter for measuring (a) Resistance, (b) AC and DC Voltages, (c) DC Current, (d) Capacitances, and (e) Checking electrical fuses.
2. To study the characteristics of a RC Circuit.
3. To compare capacitances using De Sauty's bridge.
4. Measurement of field strength and its variation in a solenoid.
5. To verify the Thevenin and Norton theorems.
6. To verify the Superposition, and Maximum power transfer theorems.
7. To determine self-inductance of a coil by Anderson's bridge.
8. To study response curve of a Series LCR circuit and determine its (a) Resonant frequency, (b) Impedance at resonance, (c) Quality factor Q And (d) Band width
9. To study the response curve of a parallel LCR circuit and determine its a Anti resonant frequency and (b) Quality factor Q
10. To study C.R.O as a display and measuring device by reading sine and square waves.
11. To determine the capacity of a capacitor by discharging through voltmeter.
12. To find the capacity of a capacitor using flashing and quenching of a neon lamp.
13. To determine the frequency of an electric tuning fork by Melde‟s experiment and verifyλz–T law.
14. To investigate the motion of coupled oscillators.
15. To study Lissajous Figures.

Reference Books:

1. Advanced Practical Physics for students, B.L. Flint and H.T. Worsnop, 1971, Asia Publishing House
2. A Text Book of Practical Physics, I. Prakash& Ramakrishna, 11th Ed., 2011, KitabMahal
3. Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinmann Educational Publishers
4. Engineering Practical Physics, S. Panigrahi and B. Mallick, 2015, Cengage Learning
5. A Laboratory Manual of Physics for undergraduate classes, D.P. Khandelwal, 1985, Vani Pub.
6. Practical Physics, C.L. Arora, S. Chand & Company.

Master of Science (Semester System) (12+3+2 System of Education with multiple Entries and Exits)

(Session-2024-25)

Master of Science (FYIP) PHYSICS (SEMESTER–II)

COURSE TITLE: INORGANIC CHEMISTRY LAB

COURSE CODE: FPHP-2088

Course outcomes:

Students will be able

CO1: To develop technical skills relevant to quantitative analysis.

CO2: Will have knowledge of cations and anions.

CO3: To separate and identify the various ions present in the mixture.

CO4: To perform confirmatory tests of various ions present in the mixture.

Master of Science (Semester System) (12+3+2 System of Education with multiple Entries and Exits)

(Session-2024-25)

Master of Science (FYIP) PHYSICS (SEMESTER–II)

COURSE TITLE: INORGANIC CHEMISTRY LAB

COURSE CODE: FPHP-2088

Credits: 0-0-1 **Max Marks: 50 (ESE Marks: 35, CA: 15)**

Examination Time: 3 Hours **Pass Mark: 13**

1. Identification of cations and anions in a mixture which may contain four ions (cations and anions).

2. Perform systematic group analyses to identify the cations in the mixture. Any cation from Group I, Group II (Group IIA and IIB) Group IV, Group V and Group VI may be present.

Reference Books:

Vogel's book on Inorganic Qualitative Analysis

Master of Science (Semester System) (12+3+2 System of Education with multiple Entries and Exits)

(Session-2024-25)

Master of Science (FYIP) PHYSICS (SEMESTER–II)

COURSE TITLE: DRUG ABUSE: PROBLEM, MANAGEMENT AND PREVENTION

COURSE CODE: AECD-2161

Course Outcomes

After completing the course the students will be able to:

CO1. Learn how to include factual data about what substance abuse is; warning signs of addiction; information about how alcohol and specific drugs affect the mind and body;

CO 2. Focus on substance abuse education- is teaching individuals about drug and alcohol abuse and how to avoid, stop, or get help for substance use disorders.

CO3. Learn how to be supportive during the detoxification and rehabilitation process

CO 4. Understand that substance abuse education is important for students alike; there are many misconceptions about commonly used legal and illegal substances, such as alcohol and marijuana

Master of Science (Semester System) (12+3+2 System of Education with multiple Entries and Exits)

(Session-2024-25)

Master of Science (FYIP) PHYSICS (SEMESTER–II)

COURSE TITLE: DRUG ABUSE: PROBLEM, MANAGEMENT AND PREVENTION

COURSE CODE: VACD -2161

Credits: 2-0-0 **Max Marks: 50 (ESE Marks: 35, CA: 15)**

Examination Time: 3 Hours **Pass Mark: 13**

Instructions for the Paper Setter:

Eight questions of equal marks (8 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. Each question carries 7 marks.

UNIT-I

Meaning of Drug Abuse:

(i)Meaning, Nature, Types and Extent of Drug Abuse in India and Punjab.

(ii)Consequences of Drug Abuse for:

Individual: Education, Employment, Income.

Family: Violence.

Society: Crime, Social Disorganization

UNIT-II

MANAGEMENT OF DRUG ABUSE:

(i) Medical management: medication for treatment and to withdrawal effects.

(ii) Psychiatric Management: Counseling, Behavioral and Cognitive therapy.

UNIT-III

Prevention of Drug abuse: (i) Role of family: Parent child relationship, Family support, Supervision, Shaping values, Active Scrutiny. (ii) School: Counselling, Teacher as role-model. Parent-teacher-Health Professional Coordination, Random testing on students.

UNIT-IV

Controlling Drug Abuse: (i) Legislation: NDPs act, Statutory warnings, Policing of Borders, Checking Supply/Smuggling of Drugs, Strict enforcement of laws, Time bound trials

Suggested Readings:

1.Ahuja, Ram (2003), *Social Problems in India*, Rawat Publication, Jaipur.

2 Extent, Pattern and Trend of Drug Use in India, Ministry of Social Justice and Empowerment, Government of India,2004.

3.Inciardi, J.A. 1981. *The Drug Crime Connection.*Beverly Hills: SagePublications.

4. Kapoor. T. (1985) *Drug epidemic among Indian Youth*, New Delhi: MittalPub.

5.Modi, Ishwar and Modi, Shalini (1997) *Drugs: Addiction and Prevention*, Jaipur: Rawat Publication.

6.National Household Survey of Alcohol and Drug abuse. (2003) New Delhi, Clinical Epidemiological Unit, All India Institute of Medical Sciences,2004.

7.Sain, Bhim 1991, *Drug Addiction Alcoholism,* Smoking obscenity New Delhi: Mittal Publications.

8.Sandhu, Ranvinder Singh, 2009, *Drug Addiction in Punjab*: A Sociological Study. Amritsar: Guru Nanak Dev University.

9.Singh, Chandra Paul 2000. *Alcohol and Dependence among Industrial Workers*: Delhi: Shipra.

10.Sussman, S and Ames, S.L. (2008). *Drug Abuse: Concepts, Prevention and Cessation,*Cambridge University Press.