FACULTY OF ECONOMICS AND BUSINESS

SYLLABUS
Bachelor of Science (Economics)
(Semester I–VI)

Session 2022-2023
(Under Continuous Evaluation System)

The Heritage Institution
KANYA MAHA VIDYALAYA
JALANDHAR
(Autonomous)

Program Specific Outcome – Bachelor of Science (Economics)

B.Sc. (Economics) is a three year graduation degree program. The program aims at creation and dissemination of knowledge regarding core economic principles and issues; focusing on the link between theory and real world.

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

PSO1: understand the basic concepts and principles of economics.

PSO2: have in depth knowledge of concepts and basic theories of consumer behaviour, cost and market structure, and production behaviour.

PSO3: have in depth knowledge of concepts and basic macroeconomics theories such as employment, consumption, investment and international trade, money, banking, development and public finance.

PSO4: understand basic techniques of presentation and analysis of data; and some advanced applications and theory of theoretical and sampling distribution and econometric estimation methodologies.

PSO5: understand Indian experience with planning and various problems faced by Indian economy and latest developments in Indian economy.

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME OF STUDIES AND EXAMINATION OF THREE YEAR DEGREE PROGRAM

Bachelor of Science (Economics)

Session: 2022-2023

Semester I									
Course Code		**Course Name**			**Course Type**	**Marks**			**Examination time (in Hours)**
						Total	**Ext.**	**CA**	
							L / **P**		
BECL-1421 BECL-1031 BECL-1431		Punjabi(Compulsory) [1]Basic Punjabi [2]Punjab History and Culture			C	50	40 / -	10	3
BECL-1212		English (Compulsory)			C	50	40 / -	10	3
BECM-1333		**Mathematics**	I	(Algebra)	E	100	80 (40+40) / -	20	3+3
			II	(Calculus and Trigonometry)					
BECL-1453		**Quantitative Techniques** (Quantitative Techniques-I)			E	100	80 / -	20	3
BECM-1134		**Computer Science** (Computer Fundamental and PC Software)			E	100	50 / 30	20	3+3
	(P)	**Computer Science**(Computer Fundamental and PC Software) (PRACTICAL)							
BECM-1124		**Computer Applications (Vocational)**(Computer Fundamentals and PC Software)			E	100	50 / 30	20	3+3
	(P)	**Computer Applications (**Computer Fundamentals and PC Software) (PRACTICAL)							
BECL-1175		**Economics**(Microeconomics)			C	100	80 / -	20	3
AECD-1161		*Drug Abuse: Problem Management and Prevention (Compulsory)			AC	50	40 / -	10	3
SECF-1492		*Foundation Course			AC	25	20 / -	5	1
Total						**400**			

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)

SCHEME OF STUDIES AND EXAMINATION OF THREE YEAR DEGREE PROGRAM

Bachelor of Science (Economics)

Session: 2022-2023

Semester II									
Course Code		**Course Name**			**Course Type**	**Marks**			**Examination time (in Hours)**
						Total	**Ext.**		**CA**
							L	**P**	
BECL-2421 BECL-2031 BECL-2431		Punjabi(Compulsory) [1]Basic Punjabi [2]Punjab History and Culture			C	50	40	-	10	3
BECL-2212		English (Compulsory)			C	50	40	-	10	3
BECM-2333		**Mathematics**	I	Calculus and Differential Equations	E	100	80 (40+40)	-	20	3+3
			II	Calculus						
BECL-2453		**Quantitative Techniques** (Quantitative Techniques-II)			E	100	80	-	20	3
BECM-2134		**Computer Science** (Programming in C)			E	100	50	30	20	3+3
	(P)	**Computer Science** (Programming in C) (PRACTICAL)								
BECM-2124		**Computer Applications (Vocational)**(Programming in C)			E	100	50	30	20	3+3
	(P)	**Computer Applications (**Programming in C) (PRACTICAL)								
BECL-2175		**Economics**(Macroeconomics)			C	100	80	-	20	3
AECD-2161		*Drug Abuse: Problem Management and Prevention (Compulsory)			AC	50	40	-	10	3
SECM-2502		*Moral Education			AC	25	20	-	5	1
Total						**400**				

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AC- Audit Course
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Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME OF STUDIES AND EXAMINATION OF THREE YEAR DEGREE PROGRAM

Bachelor of Science (Economics)

Session: 2022-2023

Semester III									
Course Code		**Course Name**			**Course Type**	**Marks**			**Examination time (in Hours)**
						Total	**Ext.**	**CA**	
							L / **P**		
BECL-3421 BECL-3031 BECL-3431		Punjabi(Compulsory) [1]Basic Punjabi [2]Punjab History and Culture			C	50	40 / -	10	3
BECL-3212		English (Compulsory)			C	50	40 / -	10	3
BECM-3333		**Mathematics**	I	(Analysis)	E	100	80 (40+40) / -	20	3+3
			II	(Analytical Geometry)					
BECL-3453		**Quantitative Techniques** (Quantitative Techniques-III)			E	100	80 / -	20	3
BECM-3134		**Computer Science** (Computer Oriented Numerical and Statistical Methods)			E	100	50 / 30	20	3+3
	(P)	**Computer Science** (Computer Oriented Numerical and Statistical Methods) (PRACTICAL)							
BECM-3124		**Computer Applications (Vocational)**(Operating System)			E	100	50 / 30	20	3+3
	(P)	**Computer Applications (**Operating System (PRACTICAL)							
BECL-3175		**Economics** (Indian Economy)			C	100	80 / -	20	3
AECE-3221		*Environmental Studies (compulsory)			AC	100	60 / 20	20	3
SECP-3512		* Gender Sensitization			AC	25	20 / 10	5	1
Total						**400**			

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

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME OF STUDIES AND EXAMINATION OF THREE YEAR DEGREE PROGRAM

Bachelor of Science (Economics)

Session: 2022-2023

Semester IV									
Course Code		**Course Name**			**Course Type**	**Marks**			**Examination time (in Hours)**
						Total	**Ext.**		**CA**
							L	**P**	
BECL-4421 BECL-4031 BECL-4431		Punjabi(Compulsory) [1]Basic Punjabi [2]Punjab History and Culture			C	50	40	-	10	3
BECL-4212		English (Compulsory)			C	50	40	-	10	3
BECM-4333		**Mathematics**	I	Statics and Vector Calculus	E	100	80 (40+40)	-	20	3+3
			II	Solid Geometry						
BECL-4453		**Quantitative Techniques** (Quantitative Techniques-IV)			E	100	80	-	20	3
BECM-4134		**Computer Science** (Data Structures)			E	100	50	30	20	3+3
	(P)	**Computer Science** (Data Structures) (PRACTICAL)								
BECM-4124		**Computer Applications (Vocational)** (Relational Database Management Systems)			E	100	50	30	20	3+3
	(P)	**Computer Applications (**Relational Database Management Systems) (PRACTICAL)								
BECL-4175		**Economics (**International Economics and Public Finance)			C	100	80	-	20	3
SECS-4522		*Social Outreach			AC	25		20	5	
Total						**400**				

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E-Elective
AC- Audit Course
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[2] Special papers in lieu of Punjabi (Compulsory) for those students who are not domicile of Punjab.
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Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME OF STUDIES AND EXAMINATIONOF THREE YEAR DEGREE PROGRAM

Bachelor of Science (Economics)

Session: 2022-2023

Semester V									
Course Code		**Course Name**			**Course Type**	**Marks**			**Examination time (in Hours)**
						Total	**Ext.**	**CA**	
							L / **P**		
BECL-5421 BECL-5031 BECL-5431		Punjabi(Compulsory) [1]Basic Punjabi [2]Punjab History and Culture			C	50	40 / -	10	3
BECL-5212		English (Compulsory)			C	50	40 / -	10	3
BECM-5333		**Mathematics**	I	Dynamics	E	100	80 (40+40) / -	20	3+3
			II	Number Theory					
BECL-5453		**Quantitative Techniques** (Quantitative Techniques-V)			E	100	80 / -	20	3
BECM-5134		**Computer Science** (Database Management Systems)			E	100	50 / 30	20	3+3
	(P)	**Computer Science** (Database Management Systems) (PRACTICAL)							
BECM-5124		**Computer Applications (Vocational)** (Internet and Web Designing)			E	100	50 / 30	20	3+3
	(P)	**Computer Applications (**Internet and Web Designing) (PRACTICAL)							
BECL-5175		**Economics (** Economics of Development)			C	100	80 / -	20	3
Total						**400**			

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

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME OF STUDIES AND EXAMINATION OF THREE YEAR DEGREE PROGRAM

Bachelor of Science (Economics)

Session: 2022-2023

Semester VI									
Course Code		**Course Name**			**Course Type**	**Marks**			**Examination time (in Hours)**
						Total	**Ext.**	**CA**	
							L / **P**		
BECL-6421 BECL-6031 BECL-6431		Punjabi(Compulsory) [1]Basic Punjabi [2]Punjab History and Culture			C	50	40 / -	10	3
BECL-6212		English (Compulsory)			C	50	40 / -	10	3
BECM-6333		**Mathematics**	I	Linear Algebra	E	100	80 (40+40) / -	20	3+3
			II	Numerical Analysis					
BECL-6453		**Quantitative Techniques** (Quantitative Techniques-VI)			E	100	80 / -	20	3
BECM-6134		**Computer Science** (Information Technology)			E	100	50 / 30	20	3+3
	(P)	**Computer Science** (Information Technology) (PRACTICAL)							
BECM-6124		**Computer Applications (Vocational)** (Business Data Processing)			E	100	50 / 30	20	3+3
	(P)	**Computer Applications (** Business Data Processing) (PRACTICAL)							
BECL-6175		**Economics** (Quantitative Methods for Economists)			C	100	80 / -	20	3
Total						**400**			

C-Compulsory

E-Elective

[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 (Economics) (Semester–I)
Session 2022-2023
Course Code: BECL-1421
PUNJABI (COMPULSORY)

COURSE OUTCOMES

CO1 d' or(eftsk Gkr) Bz{ gVkT|D dk wBoE ftfdnkoEhnK n;do eftsk g;sh fdbuAgh, AM Bz{ g'dk eoBk j' sK fe T|j nkXfBe d'o ftu uZb ojhnK ekft XkoktK ns/ ethnK pko/ frnkB jkfAb eo AeDI

CO2:fJA dk j'o wBoE eftsk dh ftnkfynk, ftPbPD s/ w|bzeD dh g;fefonk s'A ikD{ eokT|Dk th j' sK fe T|j Awekbh Awki dhnK AwZfAnktK Bz{ AwM AeD ns/ nkb'uBkswe fd;PNh pDk AeDI

CO3:A;Ako dhnK g;fAX jAshnK ihtBh dh ftXk Bz{ fAb|pA ftu Pkfwb eo e/ ftfdnkoEhnK n;do ihtBh Bz{ gV|D dh ou'h Bz{ gdk eoBk j' ns/ ihtBh irs Bkb iVDk jI

CO4:g'ok ouBk ns/ g'o\k gV\ e/ g;PBK d/ T|so d|D dk wBoE ftfdnkoEhnK dh p|ZXh B{z shyD eofdnK T|BK dh fbyD g;fsGk Bz T|ikro eoBk jI

CO5:X|Bh ftTks gVD Bkb ftfdnkoEh X|BhnK dh T;koB g;Dkbh s'A tke| jDrI

Bachelor of Science (Economics) (Semester–I)
Session 2022-2023
Course Code: BECL-1421
PUNJABI (COMPULSORY)

AY? : S x'N' **Maximum Marks: 50**
Theory 40
CA 10

gTOeY N7' gTO gA7e?

:fwN-I

Y` or (eft7T GTr) (AgT.UofKYo fAx fYW'A N7' g\h7Y fA'x AorOhNT), r|o| wTwe Yt :|whtofANh, NfY7Aol

(ਕਿਵਤਾ ਦਾ ਿਵਸ਼ਾ-ਵਸਤੂ/ATo) 8 N'e

:fwN-II

A'ATo YhN? gfAO UA7hN? (Khtwh w': 1 7'A 9 7e)

(A'gT.fg'. 7'KT fAx, UowTY fAx PTY),gKTph ATfU7 geTPw, NfY7Aol

(ਿਵਸ਼ਾ-ਵਸਤੂ/ਸਾਰ) 8 N'e

:fwN-III

(A) g'o|T ouwT (f7w ftu'A fTe)

(N) g'o|T gV' e' gPw? Y' A7ol 8 Ne

:fwN-IV

(A) gKTph O[wh ftA'7 :gfoGTPT 7 'A|uTow Nr

(N) Ato, ftN'Kw 8 N'e

N'e tv N7' gohfyNe WTh UYTfT7?

1. gPw gZ7o Y' uTo AePw U7rlAePw A-D 7Ze Y' gPw :fwN I-IV ftu'A g|ZS' KT7rl Uo A'ePw ftu Y' gPw g|ZS' KT7rl
2. ftfYNToEh w` e|W g'K gPw eow' Uwl Uo AePw ftu'A fTe gPw WT!Yh Ul gKt? gPw feA' th A'ePw ftu'A eh7T KT AeYT Ul
3. Uoe gPw Y' 08 Ne Uwl
4. ggo A'ZN eow tTWT Keo uTU' 7? gPw? Yh tv NZr'A tZO 7'A tZO uTo Ag gPw? ftu eo AeYT Ul

Bachelor of Science (Economics) (Semester–I)
Session 2022-2023
Course Code: BECL-1031
PUNJABI (Basic)

Course outcomes

CO1: YZYWh gKTph gVTA7 YT YwoE ftfYNToEhN? w{* gKTph GTPT w{* fAyTA7 Yh gfefoNT ftu gT e fTe U o GTPT fAZy7 YT YeT gYTw eowT U▌

CO2: fTA ftu ftfYNToEh w{* pTohephwh wTW GTPT YT NfONw eotTfTNT KtrT▌

CO3: ftfYNToEhN? w{* gKTph PpY ouwT 7A KT7 eotTfTNT KtrT▌

CO4: YZYWh gKTph gVTA7 YT YwoE ftfYNToEhN? w{* fwZ7 to7A Yh gKTph PpYTtWh pTo YZA7T U▌

CO5: YZYWh gKTph gVTA7 YT YwoE ftfYNToEhN? YT PpY xoT ftPTW eowT U▌

CO6: ftfYNToEhN? w{* gKTph ftu U | 7 Y AZ7 fYw? Y w?, pTo? YUhfwN? Y w?, oZ7? Y w?, fTe 7A A 7Ze fr77h PpY? ftu fAyTA7T U▌

Bachelor of Science (Economics) (Semester–I)
Session 2022-2023
Course Code: BECL-1031
PUNJABI (Basic)

AY? : S x'N' Maximum Marks: 50
Theory : 40
CA 10

gTOeY

:fwN-I

g'A7h NZyoh, NZyo eY, go fp'Yh tTW' to7 N7' go ftu g7 tTW' to7 N7' YT7t?
(YZ[YWh KT7 gST7) WrTyo (fp'Yh, fNZgh, NZOe) : gST7 N7' to7A I
08N'e

:fwN-II

g'KTph PpY p77o : YZ[YWh KT7 gST7 (ATOTow PpY, A':e7 PpY, fYPo7 PpY, Y{W PpY, Nr7o N7' fgS7o) 08Ne

:fwN-III

fwZ7 to7A Yh g'KTph PpYTtWh : pT!To, tgTo, fop7 wT7', y'7h N7 U'o OfYN? NTfY wTW Ap07I 08 N'e

:fwN-IV

U|7 Y' AZ7 fYw? Y' w?, pTo(? YUhfwN? Y' w?, oZ[7? Y' w?, fTe 7'A A' 7e fr77h PpY?ftu I

N'e tv N7' gohfyNe WTh UYTfT7?

1. gPw gZ7o Y' uTo AePw U7rIAePw A-D 7Ze Y' gPw :fwN I-IV ftu'A g[ZS' KT7rI Uo A'ePw ftu Y' gPw g[ZS' KT7rI
2. ftfYNToEh w` eZ[W g'K gPw eow' Uwl Uo AePw ftu'A fTe gPw WT!Yh UI g'Kt? gPw feA' th A'ePw ftu'A eh7TKT AeYT UI
S. Uoe gPw Y' 08 Ne Uwl
4. ggo A'ZN eow tTWT Keo uTU' 7? gPw? Yh tv NZr'A tZO 7'A tZO uTo Ag gPw? ftu eo AeYT UI

Bachelor of Science (Economics) (Semester–I)
Session 2022-2023
Course Code: BECL-1431
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 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

Bachelor of Science (Economics) (Semester–I)
Session 2022-2023
Course Code: BECL-1431
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)

Examination Time: 3 Hours **Max. Marks: 50**
Theory: 40
C A: 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 5 th question may be attempted from any of the four Units.
4. Each question will carry 8 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 (3 rd edition)
- L.M. Joshi and Fauja Singh (ed.), History of Punjab, Vol.I, Patiala 1977.

Bachelor of Science (Economics) (Semester–I)
Session 2022-2023
Course Code: BECL-1212
ENGLISH (COMPULSORY)

COURSE OUTCOMES

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

CO1: understand fundamental grammatical rules governing tenses, the use of modal verbs and make correct usage in their language through the study of "English Grammar in Use" by Raymond Murphy

CO2: write paragraphs on any given topic and translate any passage from Hindi/Punjabi to English

CO3: comprehend the meaning of texts and answer questions related to situations, episodes, themes and characters depicted in them through the study of the stories in text "Tales of Life".

CO4: appreciate the writings of various Indian and foreign story and prose writers and relate them to their socio-cultural milieu through the study of the essays in text "Prose for Young Learners"

Bachelor of Science (Economics) (Semester–I)
Session 2022-2023
Course Code: BECL-1212
ENGLISH (COMPULSORY)

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

The question paper will consist of 4 sections & distribution of marks will be as under:
Section A: The question 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. **(1x10=10)**

Section B: Two questions will be set from Unit II of the syllabus. The students would be required to attempt one paragraph out of the given two topics (word limit 150 words). It will carry five marks. The second question will be based on translation. The students would be required to translate a paragraph from Hindi/Punjabi to English. **(2x5=10)**

Section C: This section will be divided into two parts. Two questions will be set from Unit III of the syllabus. Part one will have one essay type question with internal choice carrying six marks (word limit 300 words). The students would be required to attempt any one. The second part will have three questions. The students would be required to attempt any two. Each question will carry two marks (50 words each). **(6+2+2=10)**

Section D: This section will be divided into two parts. Two questions will be set from Unit IV of the syllabus. Part one will have one essay type question with internal choice carrying six marks (word limit 300 words). The students would be required to attempt any one. The second part will have three questions. The students would be required to attempt any two. Each question will carry two marks (50 words each). **(6+2+2=10)**

Unit I
English Grammar in Use, 4th Edition by Raymond Murphy, CUP (Units: 1-37)
Unit II
Paragraph Writing and Translation of paragraph (from Hindi/Punjabi to English)
Unit III
Tales of Life (Guru Nanak Dev University, Amritsar): Stories at Sr. No. 1, 2, 3, 5, 6
Unit IV
Prose for Young Learners: Essays at Sr. No. 1, 2, 3, 5, 6

Texts Prescribed:
1. English Grammar in Use (Fourth Edition) by Raymond Murphy, CUP
2. Tales of Life (Guru Nanak Dev University, Amritsar)
3. Prose for Young Learners (Guru Nanak Dev University, Amritsar) (1/1)

Bachelor of Science (Economics) (Semester–I)
Session 2022-2023
Course Code: BECL-1333(I)
Course Title: Mathematics (Algebra)

Course Outcomes

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

CO 1: Understand the concept of matrix congruence of skew symmetric matrices and its reduction in real field. Solve system of linear equations.

CO 2: Obtain Eigen values, Eigen vectors, minimal and characteristic equation of a matrix and to apply it in advanced dynamics and electric current.

CO 3: Classify real quadratic form in variables, definite, semi- definite and indefinite real quadratic form.

CO 4: To find the relations between the roots and coefficients of general polynomial equation in one variable, distinguish between solution of cubic equations and Bi-quadratic equations.

Bachelor of Science (Economics) (Semester–I)
Session 2022-2023
Course Code: BECL-1333(I)
Course Title: Mathematics (Algebra)

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

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.

Unit–I

Linear independence of row and column vectors. Row rank, Column rank of a matrix, Equivalence of column and row ranks, Nullity of matrix, Applications of matrices to a system of linear (both homogeneous and non–homogeneous) equations. Theorems on consistency of a system of linear equations.

Unit-II

Eigen values, Eigen vectors, minimal and the characteristic equation of a matrix. Cayley Hamilton theorem and its use in finding inverse of a matrix. Quadratic Forms, quadratic form as a product of matrices. The set of quadratic forms over a field.

Unit–III

Congruence of quadratic forms and matrices. Congruent transformations of matrices. Elementary congruent transformations. Congruent reduction of a symmetric matrix. Matrix Congruence of skew–symmetric matrices. Reduction in the real field. Classification of real quadratic forms in variables. Definite, semi–definite and indefinite real quadratic forms. Characteristic properties of definite, semi–definite and indefinite forms.

Unit-IV

Relations between the roots and coefficients of general polynomial equation in one variable. Transformation of equations and symmetric function of roots, Descarte's rule of signs, Newton's Method of divisors, Solution of cubic equations by Cardon method, Solution of biquadratic equations by Descarte's and Ferrari's Methods.

Reference Books:

1. K.B. Datta: Matrix and Linear Algebra, Prentice Hall of India Pvt. Ltd., New Delhi (2003).
2. S. Narayan and P.K. Mittal : Text Book of Matrices, Sultan Chand & Co. Ltd., New Delhi, 11th edition, 2005.
3. S. Hall and S.R. Knight: Higher Algebra, Arihant Prakashan, Merrut.
4. C.Prasad, Text Book on Algebra and Theory of Equations, Pothishala Pvt. Ltd.

Bachelor of Science (Economics) (Semester–I)
Session 2022-2023
Course Code: BECL-1333(II)
Course Title: Mathematics (Calculus and Trigonometry)

Course Outcomes

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

CO 1: Understand real number system, lub & glb of set of real numbers, limit of a function, basic properties of limit & to apply it in real world problem. Analyse continuous and discontinuous function, Apply concept of continuity in uniform continuity.

CO 2: Manage to solve problems related to successive differentiation, Leibnitz theorem, Taylor's & Maclaurin's theorem with various forms of remainders and to use these expansion to compute values of Sine, Cosine, tangent or log function.

CO 3: Understand the concept of De Moivre's theorem & its applications. Identify circular, hyperbolic function and their inverses.

CO 4: Demonstrate exponential and logarithmic function of complex numbers, and to solve Gregory's series and summation of series.

Bachelor of Science (Economics) (Semester–I)
Session 2022-2023
Course Code: BECL-1333(II)
Course Title: Mathematics (Calculus and Trigonometry)

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

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.

Unit–I

Real number system and its properties, lub, glb of sets of real numbers, limit of a function, Basic properties of limits, Continuous functions and classification of discontinuities, Uniform continuities.

Unit-II

Differentiation of hyperbolic functions, Successive differentiation, Leibnitz theorem, Taylor's and Maclaurin's theorem with various forms of remainders, Indeterminate forms.

Unit-III

De–Moivre's Theorem and its applications, circular and hyperbolic functions and their inverses.

Unit-IV

Exponential and Logarithmic function of a complex numbers, Expansion of trigonometric functions, Gregory's series, Summation of series.

Text Book:

1. G. B. Thomas and R .L. Finney, Calculus and Analytic Geometry, Pearson, Ninth edition, 2016.

Reference Books:

1. E. Kreyszig, Advanced Engineering Mathematics, John Wiley and Sons, New Delhi, Eighth edition,2010.

2. N. Piskunov, Differential and Integral Calculus, Peace Publishers, Moscow, 1969.

3. G. Prasad, Differential Calculus, Pothishala Pvt. Ltd., Allahabad, 1950.

4. S. L. Loney, Plane trigonometry part –II, Cambridge university press, 1948.

Bachelor of Science (Economics) (Semester–I)
Session 2022-2023
Course Code: BECL-1453
Course title: Quantitative Techniques–I

Course Outcomes

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

CO 1: Solve linear equations of two variables and its applications in economics under the quadratic equations, arithmetic progression, geometric progression and their applications in economics.

CO 2: Develop understanding of elements of analytical geometry, straight lines, basic concepts of trigonometry and permutations and combinations.

CO 3: Differentiate between a constant and a variable, graph of linear and quadratic functions and its applications in economics.

CO 4: Recognize derivative of implicit functions, parametric functions, exponential functions, logarithmic functions and how to apply these derivatives in economics theory.

Bachelor of Science (Economics) (Semester–I)
Session 2022-2023
Course Code: BECL-1453
Course title: Quantitative Techniques–I

ExaminationTime:3 Hours **Max. Marks: 100**
Theory: 80
CA:20

Note: Instructions for the Paper–Setters/Examiners:
Eight questions of equal marks (16 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

Solution of Linear Equations: Solution of Simultaneous Linear Equations (upto two variable case), Application of Linear Equation in Economics; Solution of Quadratic Equations Series: Arithmetic Progression Series, Geometric Progression Series and their applications in economics.

UNIT–II

Elements of Analytical Geometry: Straight line; Basic concepts of trigonometry(with formulae); Concepts of combination and permutation, Elements of set theory, union, intersection, difference, symmetric difference, complementation, Venn diagrams.

UNIT–III

Difference between a constant and a variable, concept of functions, classifications of functions, graph of linear and quadratic functions (Economic applications).Limits and continuity of a function. Concept of differentiation.

UNIT–IV

Derivatives of elementary functions excluding inverse trigonometric functions, Rules of derivatives; functions of functions rule; derivatives of implicit functions, parametric functions, logarithmic differentiation (Application in Economics).

Text Book:
C.S. Aggarwal, R.C. Joshi, Mathematics for students of Economics, New Academic Publishing Co., Jalandhar, Thirty first edition, 2016.

Reference Books:
1. G.S. Monga, Mathematics and Statistics for Economics, Sangam Books Ltd, New edition, 1998.
2. T. Yamane, Mathematics for Economists (An Elementary Survey), Literary Licensing, LLC, 2012.
3. R.G.D. Allen, Mathematical Analysis for Economists, Trinity Press, 2014.
4. E.T. Dowling, Introduction to Mathematical Economics, McGraw Hill Publisher, Third edition, 2011.
5. A.C. Chiang, K. Wainwright, Fundamental Methods of Mathematical Economics, McGraw Hill, New York, Fourth edition, 2017.

Bachelor of Science (Economics) (Semester–I)
Session 2022-2023
Course Code: BECL-1134
COMPUTER SCIENCE
(COMPUTER FUNDAMENTALS AND PC SOFTWARE)

Course Outcomes:

After passing this course the student will be able to:
CO1: comprehend about computer hardware, operating system concepts and various system software.
CO2: Identify various input, output and memory devices.
CO3: Apply office automation software to create professional and academic documents.
CO4: Apply skills to make effective presentations using associated application software.

Bachelor of Science (Economics) (Semester–I)
Session 2022-2023
Course Code: BECL-1134
COMPUTER SCIENCE
(COMPUTER FUNDAMENTALS AND PC SOFTWARE)

Examination Time: (3+3) Hrs.

Max. Marks: 100
Theory: 50
Practical: 30
CA: 20

Instructions for Paper Setter -
Eight questions of equal marks (10 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 divided 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

Fundamentals of Computer: Introduction to computer, Applications of computer, Components of computers (Input unit, Output Unit, Memory Unit & CPU), type of Software, Translators (compiler, interpreter, assembler), Booting a System.

UNIT II

Input and Output Devices: Keyboards, Mouse, Joystick, Track Ball, Light Pen and Data Scanning devices (scanner, OCR, OMR, MICR, Bar Code Reader, Card Reader), Monitor, Printers (laser printer, dot matrix printer, ink jet printer).
Memories: Primary Memory-RAM and ROM. Secondary Memory- Hard Disk, CD, DVD.
Introduction to Windows based operating system and Desktop icons.

UNIT III

Word Processing: Introduction to word, Parts of window of word (Title bar, menu bar, status bar, and ruler), understanding the Ribbon, Use of Office Button and Quick Access Toolbar, Creation of new documents, opening document, insert a document into another document. Page setup, margins, gutters, font properties, Alignment, page breaks, header &footer, deleting, moving, replace, editing text in document, saving a document, spell checker, printing a document. Creating a table, entering and editing, Text in tables. Changing format of table, height, width of row/column. Editing, deleting Rows, columns in table. Adding picture, page colors and Watermarks, Borders and shading, Templates, wizards, Mail Merge.

UNIT IV

PowerPoint Presentation: Introduction to PowerPoint, exploring menus, starting a new slide, saving presentation, moving/rearranging slides, printing slides. Applying theme to presentation, Views (slide View, slide sorter, notes view, outline view), Formatting & enhancing text formatting. Creating a graph, displaying slide show, adding multimedia. Slide transitions, applying Animation, Timing slide display, adding movies & sounds. Using a pick look Wizards to change format.

References/Textbooks:

1. Anshuman Sharma, A book of Fundamentals of Information Technology, Lakhanpal Publishers, 5th Edition.
2. Prof. Satish Jain, M. Geetha, Kratika, BPB's Office 2010 Course Complete Book, BPB Publications, 2017.
3. Joyce Cox, Joan Lambert and Curtis Frye, Microsoft office Professional 2010 Step by Step, Microsoft Press, 2010.
4. V. Rajaraman, Neeharika Adabala, Fundamentals of Computers, PHI Learning, 2015.
5. P.K. Sinha, Computer Fundamentals, BPB Publications, 2004.

Note: The latest editions of the books should be followed.

Bachelor of Science (Economics) (Semester–I)
Session 2022-2023
Course Code: BECL-1134
COMPUTER SCIENCE
(COMPUTER FUNDAMENTALS AND PC SOFTWARE)
(PRACTICAL)

Examination Time: (3+3) Hrs.

Max. Marks: 100
Theory: 50
Practical: 30
CA: 20

Practical on PC Software - Office.

Bachelor of Science (Economics) (Semester–I)
Session 2022-2023
Course Code: BECL-1124
COMPUTER APPLICATIONS (VOCATIONAL)
(COMPUTER FUNDAMENTALS ANDPC SOFTWARE)
(THEORY)

Course Outcomes:

After passing this course the student will be able to:

CO1: comprehend about computer hardware, operating system concepts and various system software.

CO2: Identify various input, output and memory devices.

CO3: Apply office automation software to create professional and academic documents.

CO4: Apply skills to make effective presentations using associated application software.

Bachelor of Science (Economics) (Semester–I)
Session 2022-2023
Course Code: BECL-1124
COMPUTER APPLICATIONS (VOCATIONAL)
(COMPUTER FUNDAMENTALS ANDPC SOFTWARE)
(THEORY)

Examination Time: (3+3) Hrs.

Max. Marks: 100
Theory: 50
Practical: 30
CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (10 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 divided 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

Fundamentals of Computer: Introduction to computer, Applications of computer, Components of computers (Input unit, Output Unit, Memory Unit & CPU), type of Software, Translators (compiler, interpreter, assembler), Booting a System.

UNIT II

Input and Output Devices: Keyboards, Mouse, Joystick, Track Ball, Light Pen and Data Scanning devices (scanner, OCR, OMR, MICR, Bar Code Reader, Card Reader), Monitor, Printers (laser printer, dotmatrix printer, ink jet printer).
Memories: Primary Memory-RAM and ROM. Secondary Memory - Hard Disk, CD, DVD.
Introduction to Windows based operating system and Desktop icons.

UNIT III

Word Processing: Introduction to word, Parts of window of word (Title bar, menu bar, status bar, and ruler), Understanding the Ribbon, Use of Office Button and Quick Access Toolbar, Creation of new documents, opening document, insert a document into another document. Page setup, margins, gutters, font properties, Alignment, page breaks, header & footer, deleting, moving, replace, editing text in document, saving a document, spell checker, printing a document. Creating a table, entering and editing, Text in tables. Changing format of table, height, width of row/column. Editing, deleting Rows, columns in table. Adding picture, page colors and Watermarks, Borders and shading, Templates, wizards, Mail Merge.

UNIT IV

PowerPoint: Introduction to PowerPoint, Exploring menus, starting a new slide, saving presentation, moving/rearranging slides, printing slides. Applying theme to presentation, Views (slide View, slide sorter, notes view, outline view), Formatting & enhancing text formatting. Creating a graph, displaying slide show, adding multimedia. Slide transitions, applying Animation, Timing slide display, adding movies & sounds. Using a pick look Wizards to change format.

References:

1. Anshuman Sharma, A book of Fundamentals of Information Technology, Lakhanpal Publishers, 5th Edition.
2. Prof. Satish Jain, M. Geetha, Kratika, BPB's Office 2010 Course Complete Book, BPB Publications, 2017.
3. Joyce Cox, Joan Lambert and Curtis Frye, Microsoft office Professional 2010 Step by Step, Microsoft Press, 2010.
4. V. Rajaraman, NeeharikaAdabala, Fundamentals of Computers, PHI Learning, 2015.
5. P.K. Sinha, Computer Fundamentals, BPB Publications, 2004.

Note: The latest editions of the books should be followed.

Bachelor of Science (Economics) (Semester–I)
Session 2022-2023
Course Code: BECL-1124
COMPUTER APPLICATIONS (VOCATIONAL)
(COMPUTER FUNDAMENTALS ANDPC SOFTWARE)
(PRACTICAL)

Examination Time: (3+3) Hrs.

Practical based on PC Software - Office.

Bachelor of Science (Economics) (Semester–I)
Session 2022-2023
Course Code: BECL-1175
Economics (Microeconomics)

Course outcomes:

After passing this course, students will be able to

CO1: describe and apply the methods of analyzing consumer behavior through demand and supply ,elasticity and utility.

CO2: learn about the various cost and revenue curves and the production function.

CO3: learn about various market structures.

CO4: have an in-depth understanding of various theories of rent, interest, profit and distribution.

Bachelor of Science (Economics) (Semester–I)
Session 2022-2023
Course Code: BECL-1175
Economics (Microeconomics)

Time: 3 Hours **Max. Marks: 100**
Theory: 80
CA: 20

Note: Instructions for the Paper–Setter:

Two questions, each carrying 16 marks, from each of the Units I-IV (i.e. a total of eight questions) are to be set. Candidates are required to attempt five questions, selecting at least one from each unit. The fifth question may be attempted from any unit.

UNIT–I

Introductory: Definition of Economics, Nature, Scope and Assumptions of Microeconomics. Demand Function, Supply Function, Price Determination, Elasticity of Demand – Price, Income and Cross elasticities and their Measurement.

Utility Analysis: law of diminishing marginal utility and law of equi-marginal utility, Indifference Curve Analysis and Revealed Preference Analysis (Meaning and Equilibrium).

UNIT–II

Theory of Production and Costs: Concept of Production Function. Laws of Returns to Scale and Returns to Factor

Cost: Concepts and Cost curves in the short and in the long run; Traditional and modern cost Theory, Revenue Curves and their relationship with elasticity of demand.

UNIT–III

Market forms: Perfect Competition- Assumptions, Price and output determination of firm and Industry in Short run and Long run; Monopoly-Assumptions and Equilibrium.

Monopolistic Competition- Assumptions and Equilibrium (except Group Equilibrium).

UNIT–IV

Marginal Productivity Theory; Factor pricing (with reference to labour) under Perfect Competition and Imperfect Competition, Modern Theory of Distribution.

Rent: Concept, Ricardian Theory and Modern Theory of Rent.

Interest: Concept of interest; classical theory, loanable funds theory.

Profit: Concept of profit; Risk and uncertainty theories.

Suggested Readings:

1. Ahuja, H. L.(2018),'*Advanced Economics Theory: Micro Economics analysis'*, S. Chand Publishing.
2. Dwivedi, D.N. (2018), '*Microeconomics: Theory and Applications'*, Pearson Education, New Delhi.
3. Koutsoyiannis,A.(2015),'*ModernMicroeconomics',*MacmillanPress,London.
4. Sen,A.(2007),'*Microeconomics:TheoryandApplications',*OxfordUniversityPress,NewDelhi.

Note: The latest edition of the books is recommended..

Bachelor of Science (Economics) (Semester–II)
Session 2022-2023
Course Code: BECL-2421
PUNJABI (COMPULSORY)

COURSE OUTCOMES

CO1:Y' or (eUT7h GTr) w*{ gV|TA|7 YT Yw'oE ftfYNToEhN? NYo eft7T g¡7h fYWuAgh, A|M w¸ gYT eowT U' 7? fe A|U NTO|fwe Y'o ftu uZW oUhN? eTft OToTt? N7' ethN? pTo' frNTw UTfAW eo Ae7I

CO2:fTA YT U'o YwoE eft7T Yh ftNTfyNT, ftPWP7 7 Y|W'e7 Yh gfefoNT 7A KT7{ eoTA|7T th U' 7? fe A|U AYeTWh AYTK YhN? AYZfANTt? w*{ AYM Ae7 N7' NTWuwT7Ye fY¡PNh p7T Ae7I

CO3:A'ATo YhN? g¡fAO UA7hN? Khtwh Yh ftOT w*{ fAW'pA ftu PTfYW eo e' ftfYNToEhN? NYo Khtwh w*{ gV7 Yh o|uh w*{ gYT eowT U` N7 Khtwh Kr7 wTW KV7T UI

CO4:PpY p77o N7' PpY ouwT gV|7 wTW ftfYNToEh fTAY' Y|ZYW' A'eWg? w{' NTOTo p7T e' fTUw? A'eWg? 7'A KT7| U7r I

CO5:PpY P¡'7hN? w*{ gV|TA|7 YT Yw'oE ftfYNToEhN? NYo g'KTph GTPT Yh NYhoh YT N7' pTohehN? w*{ AYM7 WTh tZyo' -tZyo' fAO?7? YT fteTA eowT UI

CO6:Y|UTtfoN? Yh to7A wTW rZWpT7 ftu gogZe7T NTA|AYh UIfTU ftfYNToEhN? Yh rZWpT7 ftu fwyTo fWNTA|7 YT e'Y eowrI

Bachelor of Science (Economics) (Semester–II)
Session 2022-2023
Course Code: BECL-2421
PUNJABI (COMPULSORY)

AY? : S x'N' **Maximum Marks: 50**
Theory 40
CA 10

gTOeY N7 gTO gA7e?

:fwN-I

Y' or (eUT7h GTr) (AgT.UofKYo fAx fYW'A N7 gh7Y fAx AorOhNT),ro wTwe Yt :whtofANh, NfY7Aol

(ਿਵਸ਼ਾ-ਵਸਤੂ/ਸਾਰ) 8 N'e

:fwN-II

AAAo YhN? gfAZO UA7hN? (Khtwh w': 10 7'A18 7e)(AgT.fg. 7KT fAx, UowTY fAx PTY), g'KTph ATfU7 geTPw, NfY7Aol

(ਿਵਸ਼ਾ/ਸਾਰ) 8 N'e

:fwN-III

(A) PpY p77o N7' PpY ouwT : gfoGTPT, Y'|ZYW' AeWgl

(N) PpY P'7hN? 8 N'e

:fwN-IV

(A) Y|7oh fuZOh gZ7o

(N) Y'|UTto' 8 N'e

N'e tv N7' gohfyNe WTh UYTfT7?

1. gPw gZ7o Y' uTo AePw U7rlAePw A-D 7Ze Y' gPw :fwN I-IV ftu'A g|ZS' KT7rl Uo AePw ftu Y' gPw g|ZS' KT7rl
2. ftfYNToEh w` e|W g'K gPw eow Uwl Uo AePw ftu'A fTe gPw WT!Yh Ul gKt? gPw feA' th AePw ftu'A eh7T KT AeYT Ul
S. Uoe gPw Y' 08 Ne Uwl
4. ggo A'ZN eow tTWT Keo uTU' 7? gPw? Yh tv NZr'A tZO 7'A tZO uTo Ag gPw? ftu eo AeYT Ul

Session 2022-2023
Course Code: BECL-2031
PUNJABI (Basic)

AY? : S x'N'

Maximum Marks: 50
Theory : 40
CA 10

Course outcomes

CO1:YZYWh g'KTph gV[TA[7 YT YwoE ftfYNToEhN? w{* g'KTph GTPT w{* fAyTA7 Yh gfefoN'T ftu gT e' fTe U'o GTPT fAZy7 Y' Y'e' g,YTw eowT U▌

CO2:fTA ftu ftfYNToEh w{* pTohephwh wTW GTPT YT NfONw eotTfTNT K'tr'T▌

CO3:ftfYNToEhN? w{* g'KTph PpY ouwT 7'A KT7{ eotTfTNT K'tr'T▌

CO4: PpY P'7hN? w*{ gV[TA[7 YT YwoE ftfYNToEhN? NYo g'KTph GTPT Yh NYhoh YT N7 pTohehN? w*{ AYM7 WTh tZyo' -tZyo' fAO?7? YT fteTA eowT U▌

CO5:YZYWh g'KTph gV[TA[7 YT YwoE ftfYNToEhN? YT PpY xoT ftPTW eowT U▌

CO6:ftfYNToEh tTe Yh gfoGTPT N7' fTAYh p77o 7`A KT7{ U'7r' N7' GTPT 7' geV YKp[7 Utrh▌

CO7:g'o[T ouwT YT YwoE ftfYNToEhN? Yh p[Oh w{* 7hy7 eofYN? Aw? Yh fWy7 g,f7GT w{* A[KTro eowT U▌

CO8: xo'W{ N7' Y|7oh fuZOh gZ7o fWy7 YT YwoE ftfYNToEhN? w{* fTA eWT ftu fwg['w eowT U▌

CO9:YUTtfoN? Yh to7'A wTW rZWpT7 ftu gogZe7T NTA[AYh U▌fTU ftfYNToEhN? Yh rZWpT7 ftu fwyTo fWNTA[7 YT e'Y eowr▌

Bachelor of Science (Economics) (Semester–II)
Session 2022-2023
Course Code: BECL-2031
PUNJABI (Basic)

AY? : S x'N' Maximum Marks: 50
Theory : 40
CA 10

gTOeY

:fwN-I

PpY P'7hN? : gST7 N7' to7A (w?t, gVw?t, fefoNT, ftPP7, fefoNT ftPP7, ApOe,
:Ke N7' ftAfYe)

08 N'e

:fwN-II

gKTphtTep77o : YZYWhKT7gST7
(A) ATOTowtTe, A':e7 tTe N7' fYPo7 tTe (gST7 N7' to7A)
(N) fpNTwhNT tTe, gPw tTue tTe N7' U|eYh tTe (gST7 N7' to7A)

08 N'e

:fwN-III

goT ouwT
NyT7 (NyT7? Yh fWAN wTW wZEh U')

08 N'e

:fwN-IV

fuZOh gZ7o (xoW| N7 Y|7oh)
Y|UTto' (YUTtfoN? Yh fWAN wTW wZEh U)

08 N'e

N'e tv N7' gohfyNe WTh UYTfT7?

1. gPw gZ7o Y' uTo AePw U7rIAePw A-D 7Ze Y' gPw :fwN I-IV ftu'A g|ZS' KT7rI Uo A'ePw ftu Y' gPw g|ZS' KT7rI
2. ftfYNToEh w` eZ|W g'K gPw eow' Uwl Uo AePw ftu'A fTe gPw WT!Yh UI gKt? gPw feA' th A'ePw ftu'A eh7T KT AeYT UI
S. Uoe gPw Y' 08 Ne Uwl
4. ggo A'ZN eow tTWT Keo uTU' 7? gPw? Yh tv NZr'A tZO 7'A tZO uTo Ag gPw? ftu eo AeYT UI

NyT7

ਉਹ

ਆਪ ਅਕਲ ਇਕ ਇਕ

ਇਕ ਮਰ

ਗਈ ਕਰ

ਘਰ ਘਰ

ਉਹ

ਚਤਰ

ਗਲ ਸਰਾਫ਼

YUTto

ਉਸਤਾਦੀ ਕਰਨੀ, ਜਾਲ ਕਰਨੀ, ਉਲੂ ਬਣਾਉਣਾ ,ਉਚਾ ਸਾਹ ਨਾ ਕੱਢਣਾ, ਉਡਦੇ ਿਫਰਨਾ ,ਉਘ ਸੁੱਘ ਿਮਲਣੀ,ਅੱਖਾਂ ਿਵਚ ਰੜਕਣਾ ,ਅੱਗ ਲਾਉਣਾ ,ਆਵਾ ਊਤ ਜਾਣਾ ,ਅਸਮਾਨ ਨੂੰ ਟਾਕੀਆਂ ਲਾਉਣਾ, ਅੱਖਾਂ ਿਵੱਚ ਲਾਲੀ ਉਤਰਨੀ ,ਅਕਲ ਤੇ ਪਰਦਾ ਪੈਣਾ, ਈਨ ਮੰਨ ਣੀ, ਈਦ ਦਾ ਚੰਨ ਹੋਣਾ, ਇੱਟ ਨਾਲ ਇੱਟ ਖੜਕਾਉਣ,ਿਸਰ ਿਫਰਨਾ, ਿਸਰ ਤੇ ਚੜ੍ਹਨਾ ,ਸਬਰ ਦਾ ਘੁੱਟ ਭਰਨਾ, ਿਸਰ ਪੈਰ ਨਾ ਹੋਣਾ, ਹੱਥ ਧੋ ਕੇ ਿਪੱਛੇ ਪੈਣਾ, ਹੱਥ? ਛਾਂਵਾਂ ਕਰਨੀਆਂ, ਹੱਡ ਣੇ, ਹੱਥ ਤੰਗ ਹੋਣਾ ,ਹੱਥ ਮਲਣਾ,ਹੱਥ ਪੈਰ ਮਾਰਨਾ,ਕੰਨ? ਕਤਰਾਉਣਾ, ਕੰਨ ਤੇ ਜੂੰ ਨਾ ਸਰਕਣਾ, ਕੰਨ ਘੇਸਲ ਮਾਰਨੀ, ਖ਼ਾਨਾ ਖ਼ਰਾਬ ਹੋਣਾ, ਖਾਿਨਓ ਜਾਣਾ, ਗੁੱਡੀ ਚੜ੍ਹਨੀ, ਗਲ ਪੈਣਾ ,ਗਗੰ ਾ ਨਹਾਉਣਾ ,ਚੜ੍ਹ ਮੱਚਣੀ, ਚੰਦ ਚਾੜ੍ਹਨਾ, ਚਾਦਰ ਵੇਖ ਕੇ ਪੈਰ ਪਸਾਰਨਾ ,ਚਕਮਾ ਦੇਣਾ ,ਛੱਕੇ ਛੜਾਉਣਾ ,ਛਾਪਾ ਮਾਰਨਾ, ਿਛੱਲ ਲਾਉਣੀ ,ਿਛੱਕੇ ਰੰਗ ਣਾ, ਜਾਨ ਤੇ ਖੇਡਣਾ, ਜ਼ੁਬਾਨ ਕਰਨੀ, ਜਾਨ ਮਾਰਨਾ, ਜੰਗ ਲ ਿਵੱਚ ਲ ਹੋਣਾ, ਝੋਲੀ ਚੱੁਕਣਾ, ਝੱਟ ਟਪਾਉਣਾ, ਟੱਸ ਮੱਸ ਨਾ ਹੋਣਾ, ਠੰਗ ਅੜਾਉਣੀ, ਟਰ ਟਰ ਮੰਗ ਕਰਨਾ, ਟੇਢੀ ਖੀਰ, ਟਕੇ ਵਰਗਾ ਜਵਾਬ ਦੇਣਾ, ਠੰਡ ਸਾਹ ਭਰਨਾ,ਡੰਗ ਾ ਮਾਰਨਾ, ਠੂਠਾ ਫੜਨਾ, ਠਣ ਠਣ ਗੋਪਾਲ, ਡਕਾਰ ਜਾਣਾ, ਡੁੱਬ ਮਰਨਾ, ਡੰਡੇ ਵਜਾਉਣਾ, ਿਢੱਡ ਿਵੱਚ ਰੱਖਣਾ, ਿਢੱਡ ਿਵੱਚ ਚੂਹੇ ਨੱਚਣਾ, ਿਢੱਡ? ਪੀੜਾਂ ਪੈਣੀਆਂ, ਢੇਰੀ ਢਾਹੁਣਾ, ਤੱਤੀ ਵਾ ਨਾ ਲੱਗਣੀ, ਤਰਲੇ ਲੈ ਣਾ, ਤੀਲੀ ਲਾਉਣੀ, ਤਾਰੇ ਤੋੜਨਾ, ਤਾੜੀ ਲਾਉਣੀ,ਥੱੁਕ? ਵੜੇ ਪਕਾਉਣਾ, ਥਰ ਥਰ ਕੰਬ ਣਾ, ਦਮ ਲੈ ਣਾ, ਿਦਲ ਖੱਟਾ ਹੋਣਾ, ਦੰਦ ਖੱਟੇ ਕਰਨੇ, ਦੀਵਾ ਗੁੱਲ ਕਰਨਾ, ਧੱੁਪ ਿਵੱਚ ਵਾਲ ਿਚੱਟੇ ਹੋਣਾ, ਧਰਮ ਿਨਭਾਉਣਾ, ਧੱਕਾ ਲੱਗਣਾ, ਧਰਨਾ ਮਾਰਨਾ, ਧੁੰਮ ਾਂ ਪੈ ਜਾਣੀਆਂ, ਧੱਜੀਆਂ ਉਡਾਉਣੀਆਂ, ਨਹੰੁ ਮਾਸ ਦਾ ਿਰਸ਼ਤਾ, ਨੱਕ ਚਾੜ੍ਹਨਾ, ਨੱਕ ਰੱਖਣਾ, ਨੱਕ ਉਤੇ ਮੱਖੀ ਨਾ ਬਿਹਣ ਦੇਣਾ, ਨਜ਼ਰ ਸਵੱਲੀ ਹੋਣੀ, ਪੱਟੀ ਪੜ੍ਹਾਉਣੀ, ਪਾਰਾ ਚੜ੍ ਜਾਣਾ, ਪੈਰ ਜ਼ਮੀਨ ਤੇ ਨਾ ਲੱਗਣਾ, ਪੈਰਾਂ ਹੇਠ ਜ਼ਮੀਨ ਿਨਕਲਣਾ, ਪਾਣੀ ਿਸਰ ਲੰਘਣਾ, ਪੁੱਠੀਆਂ ਛਾਲਾਂ ਮਾਰਨੀਆਂ, ਪੈਰਾਂ ਤੇ ਪਾਣੀ ਨਾ ਪੈਣ ਦੇਣਾ, ਫੁੱਲਾਂ ਵਾਂਗ ਰੱਖਣਾ, ਫੁੱਲੇ ਨਾ ਸਮਾਉਣਾ, ਫਸਲੀ ਬਟੇਰਾਂ ਹੋਣਾ, ਫੂਕਾਂ ਨਾਲ ਉਡਾ ਦੇਣਾ, ਬਾਜ਼ੀ ਲੈ ਜਾਣਾ, ਬੇੜਾ ਗਰਕ ਹੋਣਾ, ਬੇੜਾ ਪਾਰ ਕਰਨਾ, ਬੀੜਾ ਚੱੁਕਣਾ, ਬੇੜੀਆਂ ਿਵੱਚ ਵੱਟੇ ਪਾਉਣਾ, ਬੀਜ ਨਾਸ਼ ਕਰਨਾ, ਭਾਰ ਿਸਰ ਲਾਹੁਣਾ, ਭੁੱਖ ਲਿਹ ਜਾਣੀ, ਭੁੱਖੇ ਸ਼ੇਰ ਵਾਂਗ ਪੈਣਾ, ਭੂਤ ਸਵਾਰ ਹੋਣਾ, ਭੰਗ ਭੁੱਜਣੀ, ਮੱਖੀਆਂ ਮਾਰਨੀਆਂ, ਮਰ੍ਹੂ ਮਰੰ੍ਹ ਕਰਦੇ ਰਿਹਣਾ, ਮਾਤ ਪਾ ਦੇਣਾ, ਮਾਰੋਮਾਰ ਕਰਨੀ, ਿਮਰਚ ਮਸਾਲਾ ਲਾਉਣਾ, ਿਮਰਚਾਂ ਲੱਗਣੀਆਂ, ਮੂੰਹ ਦੀ ਖਾਣਾ, ਮੋਰਚਾ ਮਾਰਨਾ, ਿਮੱਟੀ ਖਰਾਬ ਕਰਨੀ, ਯੱਬਲੀਆਂ ਮਾਰਨੀਆਂ, ਰਚ ਿਮਚ ਜਾਣਾ, ਰਾਈ ਦਾ ਪਹਾੜ ਬਣਾਉਣਾ, ਰਾਤ ਿਦਨ ਇੱਕ ਕਰਨਾ, ਰਾਹ ਦਾ ਰੋੜਾ ਬਣਨਾ, ਰੰਗ ਬਦਲਣਾ, ਰੰਗ ਿਵੱਚ ਭੰਗ ਪਾਉਣਾ, ਲਹੂ ਨਾਲ ਹੱਥ ਰੰਗ ਣਾ, ਲਹੂ ਦੇ ਘੱੁਟ ਭਰਨਾ, ਲੱਕ ਟੱੁਟ ਜਾਣਾ, ਲਾਹ ਪਾਹ ਕਰਨੀ, ਲਾਲ ਪੀਲਾ ਹੋਣਾ, ਲੂਣ ਹਰਾਮ ਕਰਨਾ, ਵੱਡ ਵੱਡ ਖਾਣਾ।

Bachelor of Science (Economics) (Semester–II)
Session 2022-2023
Course Code: BECL-2431
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 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

CO 1 (a): To understand the 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

Bachelor of Science (Economics) (Semester–II)
Session 2022-2023
Course Code: BECL-2431
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)

Examination Time: 3 Hours **Max. Marks: 50**
Theory: 40
C A: 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. 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
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.

Bachelor of Science (Economics) (Semester–II)
Session 2022-2023
Course Code: BECL-2212
ENGLISH (COMPULSORY)

COURSE OUTCOMES

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

CO1: change the narration and voice of sentences after understanding fundamental grammatical rules governing them through the study of "English Grammar in Use" by Raymond Murphy

CO2: Write personal letters and increase their knowledge of vocabulary by studying the synonyms and antonyms in the prescribed text *The Students' Companion* by Wilfred D. Best

CO3: comprehend the meaning of texts and answer questions related to situations, episodes, themes and characters depicted in them through the study of the stories in text "Tales of Life".

CO4: appreciate the writings of various Indian and foreign story and prose writers and relate them to their socio-cultural milieu through the study of the essays in text "Prose for Young Learners"

Bachelor of Science (Economics) (Semester–II)
Session 2022-2023
Course Code: BECL-2212
ENGLISH (COMPULSORY)

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

Instructions for the Examiner:
The question paper will consist of 4 sections & distribution of marks will be as under:
Section A: The question 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. **(10x1=10)**

Section B: Two questions will be set from Unit II of the syllabus. The students would be required to attempt one personal letter out of the given two. It will carry five marks (word limit 150 words). The second question will be based on vocabulary. The students would be required to write Antonyms or Synonyms for given words choosing any 5 out of 8 and each carrying one mark. **(2x5=10)**

Section C: This section will be divided into two parts. Two questions will be set from Unit III of the syllabus. Part one will have one essay type question with internal choice carrying six marks (word limit 300 words). The students would be required to attempt any one. The second part will have three questions. The students would be required to attempt any two. Each question will carry two marks (50 words each). **(6+2+2=10)**

Section D: This section will be divided into two parts. Two questions will be set from Unit IV of the syllabus. Part one will have one essay type question with internal choice carrying six marks (word limit 300 words). The students would be required to attempt any one. The second part will have three questions. The students would be required to attempt any two. Each question will carry two marks (50 words each). **(6+2+2=10)**

Unit I

English Grammar in Use, 4th Edition by Raymond Murphy, CUP (Units: 42-52, 69-81)

Unit II

Personal letter Writing and *The Students' Companion* (Section 9: Antonyms and Synonyms)

Unit III

Tales of Life (Guru Nanak Dev University, Amritsar): Stories at Sr.No. 7, 9, 10, 11, 12

Unit IV

Prose for Young Learners: Essays at Sr.No. 7, 8, 9, 10, 11

Texts Prescribed:

1. *English Grammar in Use* (Fourth Edition) by Raymond Murphy, CUP
2. *The Students' Companion* by Wilfred D. Best
3. *Tales of Life* (Guru Nanak Dev University, Amritsar)
4. *Prose for Young Learners* (Guru Nanak Dev University, Amritsar)

Bachelor of Science (Economics) (Semester–II)
Session 2022-2023
Course Title: Mathematics (Calculus and Differential Equations)
Course Code: BECM -2333(I)

Course Outcomes

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

CO 1: Demonstrate Asymptotes, points of inflexion, multiple points, concavity and convexity of a curve and apply these concepts in curve tracing.

CO 2: Find arc length of a curve and able to establish reduction formulae for various functions.

CO 3: Understand concept of Exact Differential Equations and demonstrate the geometrical meaning of a differential equation & orthogonal trajectories

CO 4: Understand the concept of linear differential equation with constant and variable coefficients and to apply in a wide variety of disciplines like Bio, Eco, Physics and Engineering. Manage to solve the problem related to series solution of differential equations like Bessel and Legendre equation by Power series method.

Bachelor of Science (Economics) (Semester–II)
Session 2022-2023
Course Title: Mathematics (Calculus and Differential Equations)
Course Code: BECM -2333(I)

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

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.

Unit–I

Asymptotes, Tests for concavity and convexity, Points of inflexion, Multiple Points, Curvature, Tracing of Curves (Cartesian and Parametric coordinates only).

Unit-II

Integration of hyperbolic functions. Reduction formulae. Definite integrals. Fundamental theorem of integral calculus. Quadrature, rectification.

Unit– III

Exact differential equations. First order and higher degree equations solvable for x,y,p. Clairaut's form and singular solutions. Geometrical meaning of a differential equation. Orthogonal trajectories.

Unit-IV

Linear differential equations with constant and variable coefficients. Variation of Parameters method, reduction method, series solutions of differential equations. Power series method, Bessel and Legendre equations (only series solution).

Text Book:

O.P.Chug, P. Gupta and R.S.Dahiya, Topics in Mathematics: Calculus and Differential Equations, Laxmi Publications Private Ltd.

Reference Books:

1. D.A.Murray, Introductory Course in Differential Equations, Orient Longman Private Limited, Hyderabad, 11th edition,2003.
2. G.F.Simmons, Differential Equations, McGraw Hill Education, 2nd edition, 2017.
3. G. Prasad: Integral Calculus, Pothishala Pvt. Ltd., Allahabad, 2015.
4. E. Kreyszig: Advanced Engineering Mathematics, John Wiley and Sons, 8th edition, 2010.

Bachelor of Science (Economics) (Semester–II)
Session 2022-2023
Course Title: Mathematics (Calculus)
Course Code: BECM -2333(II)

Course Outcomes

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

CO 1: Differentiate between limit and continuity of function of two variables and apply this concept in partial derivatives & differentiability of real valued function of two variables. Application of inverse & implicit function theorems.

CO 2: Manage to solve problems related to Maxima, Minima & Saddle points of functions of two variables. Classify Envelopes & Evolutes.

CO 3: Understand the concept of Double and Triple integrals.

CO 4: Apply double and triple integral to evaluation of areas, volumes, surfaces of solid of revolution and to find out area and volume of plane and solid figure.

Bachelor of Science (Economics) (Semester–II)
Session 2022-2023
Course Title: Mathematics (Calculus)
Course Code: BECM -2333(II)

Examination Time: 3 Hours
Max.Marks:50

Theory :40
CA:10

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.

Unit–I

Limit and Continuity of functions of two variables, Partial differentiation, Change of variables, Partial derivatives and differentiability of real–valued functions of two variables, Schwartz's and Young's Theorem, Statements of Inverse and implicit function theorems and applications.

Unit-II

Euler's theorem on homogeneous functions, Taylor's theorem for functions of two variables, Jacobians, Envelopes. Evolutes, Maxima, Minima and saddle points of functions of two variables.

Unit-III

Lagrange's undetermined multiplier method, Double and Triple Integrals, Change of variables, Change of order of integration in double integrals.

Unit-IV

Application to evaluation of area, volume, surface of solids of revolutions.

Text Book:

G.B. Thomas and R.L. Finney, Calculus and Analytic Geometry, 9th Edition, Addison Wesley, 1998

Reference Books:

1. S. Narayan and P.K. Mittal, Integral Calculus, Sultan Chand & Sons, New Delhi, 1983.
2. E. Kreyszig, Advanced Engineering Mathematics, John Wiley and Sons, New Delhi, eighth edition, 2010
3. S. Narayan and P.K. Mittal, Differential Calculus, Sultan Chand & Sons, Jalandhar, 1956.

Bachelor of Science (Economics) (Semester –II)

Session: 2022-2023

Course Code: BECL-2453

Quantitative Techniques–II

Course outcomes:

After passing this course, students will be able to:

CO1: organize, manage and present data.

CO2: analyze the data by using central tendency , dispersion and understand the slope of the curve .

CO3: learn the relationship between variables and prediction using correlation and regression.

CO4: compare magnitudes of related variables to each other and over a period of time.

CO5: understand the concept of time series in analyzing economics problems.

Bachelor of Science (Economics) (Semester –II)
Session 2022-2023
Course Code: BECL-2453
Quantitative Techniques–II

Time: 3 Hours **Max. Marks: 100**
Theory: 80
CA: 20

Note: Instructions for the Paper–Setters:
Two questions, each carrying 16 marks, from each of Units I-IV (i.e. a total of eight questions) are to be set. Candidates are required to attempt five questions, selecting at least one from each unit. The fifth question may be attempted from any unit.

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UNIT–I

Statistics: Definition, Scope in Economics, Significance, Limitations. Classification, Tabulation, Diagrammatic and Graphical Representation of Data.

UNIT–II

Concepts and Measures of Central Tendency: Mean, Median, Mode, GM, and HM. Concepts and Measures of Relative Dispersion, Concepts and Measures of Skewness (Stress on Numerical Examples).

UNIT–III

Correlation Analysis: Introduction, Importance, Karl-Pearson's Coefficient of Correlation, Spearman's Rank Correlation Coefficient, Simple Regression Analysis; Difference Between Correlation and Regression, Lines of Regression, Properties of Correlation and Regression Coefficients (Stress on Numerical Examples).

UNIT–IV

Index Numbers: Concept of Index Number, Purpose Construction & Problems, Laspeyre's, Paasche's and Fisher's Formulae, Tests of Consistency.
Analysis of Time Series: Definition, Components of Time Series, Measurement of Trend by Different Methods, Measurement of Seasonal Variations (Stress on Examples).

Suggested Readings:

1. Gupta, S.P. (2014), *Statistical Methods*, Sultan Chand & Sons, New Delhi.
2. Croxton, F.E., Cowden D.J. and Klein, S. (1973), *Applied General Statistics*, 3rd. Ed., Prentice Hall of India, New Delhi.
3. Nagar, A.L. and Das, R.K. (1976), *Basic Statistics*, Oxford University Press, Bombay.

Note: The latest edition of the books is recommended.

Bachelor of Science (Economics) (Semester–II)
Session 2022-2023
Course Code: BECM-2134
COMPUTER SCIENCE
(PROGRAMMING IN C)

Course Outcomes:

After passing this course the student will be able to:

CO1: Design symbolic representation of a problem and its solution through tools like algorithms, flowcharts, etc.
CO2: Comprehend different programming constructs involved in C programming.
CO3: Apply programming concepts such as arrays, control structure and strings to provide solution in different problem domains.
CO4: Work with functions, storage classes, structures and union.

Bachelor of Science (Economics) (Semester–II)
Session 2022-2023
Course Code: BECM-2134
COMPUTER SCIENCE
(PROGRAMMING IN C)
(THEORY)

Examination Time: (3+3) Hrs. **Max. Marks: 100**
Theory: 50
Practical: 30
CA: 20

Instructions for Paper Setter –
Eight questions of equal marks (10 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 divided 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

Data Representation, Introduction to Number Systems and Character Set, ASCII Codes, Flow Charts, pseudo codes and, algorithms.

UNIT–II

Programming Using C:
Basics of C: Introduction to C, Applications and Advantages of C, Tokens, Types of Errors
Data Types: Basic & Derived Data Types, User Defined Data Types, Declaring and initializing variables.
Operators and Expressions: Types of operators (Unary, Binary, Ternary), Precedence and Associativity
Data I/O Functions: Types of I/O function, Formatted & Unformatted console I/O Functions

UNIT–III

Control Statements: Jumping, Branching and Looping–Entry controlled and exit controlled, Advantages/Disadvantages of loops, difference between for, while and do–while.
Arrays: Types of Arrays, One Dimensional and Two-Dimensional Arrays.
Strings: Introduction to Strings and String functions, array of strings.

UNIT-IV

Functions: User Defined & Library Function, Function (Prototype, Declaration, Definition), Methods of passing arguments, local and global functions, Recursion.
Storage Classes: Introduction to various storage classes, scope and lifetime of a variable,Storage class specifiers (auto, register, static, extern), advantages and disadvantages.
Structure and Union: Introduction to structure and union, pointers with structure.

References/Textbooks:

1. E. Balagurusamy, Programming in ANSI C, Tata McGraw-Hill (2002), 5th edition.
2. Stephen G. Kochan, Programming in C, Pearson Education (2015), 4th edition.
3. Rachhpal Singh K.S. Kahlon, Gurvinder Singh, Programming in C, Kalyani Publishers (2011).
4. Yashwant Kanetkar, Let us C, BPB Publications (2020), 17th edition.
5. R.S. Salari, Application Programming in C, Khanna Book Publishing (2012), 4th edition.
6. Anshuman Sharma, Learn programming in C, Lakhanpal Publishers (2016), 7th edition.

Bachelor of Science (Economics) (Semester–II)
Session 2022-2023
Course Code: BECM-2134
COMPUTER SCIENCE
(PROGRAMMING IN C)
(PRACTICAL)

Examination Time: (3+3) Hrs.

Max. Marks: 100
Theory: 50
Practical: 30
CA: 20

Practical on Programming in C.

Bachelor of Science (Economics) (Semester–II)
Session 2022-2023
Course Code: BECM-2124
COMPUTER APPLICATIONS (VOCATIONAL)
(PROGRAMMING IN C)

Course Outcomes:

After passing this course the student will be able to:

CO1: Comprehend the working of various programming constructs involved in C Programming.
CO2: Apply various operators and control sequence of program using various control statements.
CO3: Apply programming concepts such as arrays, functions and strings to provide solution in different problem domains.
CO4: Work with pointers, structures and union.

Bachelor of Science (Economics) (Semester–II)
Session 2022-2023
Course Code: BECM-2124
COMPUTER APPLICATIONS (VOCATIONAL)
(PROGRAMMING IN C)
(THEORY)

Examination Time: (3+3) Hrs. **Max. Marks: 100**
Theory: 50
Practical: 30
CA: 20

Instructions for Paper Setter -
Eight questions of equal marks (10 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 divided 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

Data Representation, Flow Charts, Problem Analysis, Decision tables, Pseudo codes and Algorithms.

Programming Using C:
Basics of C: Introduction to C, Applications and Advantages of C, Tokens, Types of Errors
Data Types: Basic and Derived Data Types, User Defined Data Types, Declaring and initializing variables.

UNIT-II

Operators and expressions: Types of operators **(**Unary, Binary, Ternary), Precedence and Associativity

Data I/O Functions: Types of I/O function, Formatted & Unformatted console I/O Functions

Control Statements: Jumping, Branching and Looping–Entry controlled and exit controlled, Advantages/Disadvantages of loops, difference between for, while and do–while.

UNIT-III

Arrays: Types of Arrays, Advantages/Disadvantages of arrays. Insertion, Deletion, Searching and sorting operations on array

Strings: Introduction to Strings and String functions, array of strings.

Functions: User Defined and Library Function, Function (Prototype, Declaration, Definition), Methods of passing arguments, local and global functions, Recursion.

UNIT-IV

Storage classes: Introduction to various storage classes, scope and lifetime of a variable, Storage class specifiers (auto, register, static, extern), advantages and disadvantages.

Pointers: Introduction, Advantages/Uses of pointers, Limitations of pointers, Difference between void pointer and Null pointer, Pointer arithmetic, operators not allowed on pointers, Types of Pointer**,** Passing Pointers to function, concept of pointer to pointer.

Structure and Union: Introduction to structure and union, pointers with structure**.**

References:

1. E. Balagurusamy, Programming in ANSI C, Tata McGraw-Hill (2002), 5th edition.
2. Stephen G. Kochan, Programming in C, Pearson Education (2015), 4th edition.
3. Rachhpal Singh K.S. Kahlon, Gurvinder Singh, Programming in C, Kalyani Publishers (2011).
4. YashwantKanetkar, Let us C, BPB Publications (2020), 17th edition.
5. R.S. Salari, Application Programming in C, Khanna Book Publishing (2012), 4th edition.
6. Anshuman Sharma, Learn programming in C, Lakhanpal Publishers (2016), 7th edition.

Bachelor of Science (Economics) (Semester–II)
Session 2022-2023
Course Code: BECM-2124
COMPUTER APPLICATIONS (VOCATIONAL)
(PROGRAMMING IN C)
(PRACTICAL)

Examination Time: (3+3) Hrs.

Lab based on Programming in C.

Bachelor of Science (Economics) (Semester –II)

Session 2022-2023

Course Code: BECL-2175

Economics (Macroeconomics)

Course outcomes:

After passing this course students will be able to:

After passing this course students will be able to:

CO1: learn the determination of equilibrium in the economy using classical and Keynesian models.

CO2: understand the Consumption behaviour of an economy and factor affecting consumption decisions.

CO3: understand the investment behaviour of an economy and different theories of trade cycle.

.**CO4**: understand the nature and functions of money and the role of financial markets and institutions in the economy.

CO5: understand the basic causes and solution to problem of inflation.

Bachelor of Science (Economics) (Semester –II)

Session 2022-2023

Course Code: BECL-2175

Economics (Macroeconomics)

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

Theory: 80

CA: 20

Note: Instructions for the Paper–Setter:

Two questions, each carrying 16 marks, from each of the Units I-IV (i.e. a total of eight questions) are to be set. Candidates are required to attempt five questions, selecting at least one from each unit. The fifth question may be attempted from any unit.

UNIT–I

Distinction between Micro and Macro Economics; Determination of Income and Employment: Classical and Keynesian models; Say's Law of Market and aggregate demand and aggregate supply. Consumption functions; average (short-run and long run) and marginal propensity to consume; Keynes' Psychological Law of Consumption, Multiplier: Meaning and its working.

UNIT–II

Investment: Meaning, Investment Demand schedules and factors affecting investment decision. Marginal Efficiency of Capital, Accelerator, multiplier-accelerator interaction.

Trade cycles-meaning, characteristics and phases, Samuelson and Hicks Models of trade cycles.

UNIT–III

Money: Its functions and role. Money and Capital Markets (Introductory); Quantity Theory of Money: Fisher's and Cambridge's equations, Liquidity preference theory.

Banking: Meaning and Functions of commercial and central banks, Credit creation and credit control.

UNIT–IV

Inflation: Concept, Causes and cures. Inflation-unemployment Trade-off (only Phillips' contribution).**Macroeconomic Policies:** Fiscal policy – meaning, objectives and instruments. Monetary policy: meaning, objectives and instruments.

Suggested Readings:

1. Shapiro E.,(2001),*Macroeconomic Analysis, Harcourt, Brach and World*, New York.

2. Dwivedi D.N., (2018),*Macroeconomics: Theory and Policy*, Tata McGraw-Hill.

Note: The latest edition of the books is recommended.

Bachelor of Science (Economics) (Semester–III)
Session 2022-2023
Course Code: BECL-3421
PUNJABI (COMPULSORY)

COURSE OUTCOMES

CO1:u7t gKTph fwpO w*{ gV|TA|7 YT YwoE ftfYNToEhN? NYo □□□□□ g7h fYWuAgh, AM w*{ gYT eowT UI

CO2: 'AY? Yr eoYT U' fTe?rh ArfU w*{ fAWpA ftu PTfYW eo e ftfYNToEhN? NYo fTe?rh gV7 Yh o|uh w*{ gYT eowT U` N7 fTA ATfU7 og wTW KV7T UI

CO3:Aygouw T eow wTW ftfYNToEh NTg7h rZW w{ Aygftu efU7 Yh KTu fAZy7r N7 fTU fYYTrh eAo7 ftu AUTTh Utrh I

CO4: Wy ouwT YT YwoE ftfYNToEhN? Yh pZOh w{ 7hy7 eofYN? Aw? Yh fWy7 gf7GT w{ AKTro eowT UI

CO5:Y|W ftNTeo7e fTeTThN? : gfoGTPT N7 twrhN? (GTtP, PpY, tTeP, AgtTe N7 tTe)w| gV|TA|7 YT YwoE ftfYNToEhN? NYo GTPT Yh NYhoh N7 pTohehN? w*{ AYM7 WTh tZyo -tZyo fAO?7? YT fteTA eowT UI

Bachelor of Science (Economics) (Semester–III)
Session 2022-2023
Course Code: BECL-3421
PUNJABI (COMPULSORY)

AY? : S xN | **Maximum Marks: 50**
Theory 40
CA 10

gTOeY N7 gTO gA7e?
: fwN-I
u7t gKTph fwpO (KfrYo fAx gNTo,goYKh7 fAx fAZO), gKTph : wtofANh,gfNNTWT
xo YT fgNTo, AYo W Yh U` AeYh U,NZEo, goT7T gKTp, fTrWAvYT Arh AYtTo,fyvTohN? Y tfUYI
(gTO eY YT fUZAT Uw)
(ftPT tA7/ATo) 8 Ne
: fwN-II
AY? Yr eoYT U` (fTe?rh Arf U) (-) u 7wT geTPw,WfONT7T
(ftPT tA7 /ATo) 8 Ne
: fwN-III
(A) Ayg ouwT (g Ah)
(N) Wy ouwT 8 Ne
: fwN-IV
Y{W ftNTeo7e fTeTThN? : gfoGTPT N7 twrhN? (GTtP, PpY, tTeP, AgtTe N7 tTe) 8 Ne

Ne tv N7 gohfyNe WTh UYTfT7?

1. gPw gZ7o Y uTo AePw U7r AePwA-D7Ze Y gPw : fwNI-IV ftuA gZS K7r Uo AePw ftu Y gPw gZS K7r
2. ftfYNToEh w` eW gK gPw eow Uwl Uo AePw ftuA fTe gPw WT!Yh U gKt? gPw feA th AePw ftuA eh7T KT AeYT U
S. Uoe gPw Y` 08 NeUw
4. ggo AZN eow tTWT Keo uTU 7? gPw? Yh tv NZr AtZO 7A tZO uTo Ag gPw? ftu eo AeYT U

Bachelor of Science (Economics) (Semester–III)
Session 2022-2023
Course Code: BECL-3031
PUNJABI (Basic)

Course outcomes

CO1:A'y'g ouwT eow wTW ftfYNToEh NTg7h rZW w{' A'y'g ftu efU7 Yh KTu fAZy7r' N7' fTU fYYTrh eAo7 ftu AUTTh Utrh▌

CO2:g'o'T gV' e'g'Pw? Y A'7o Y'7 YT YwoE ftfYNToEhN? Yh p'Oh w{' 7hy7 eofYN? A'w? Yh fWy7 g'f7GT w{* A'KTro eowT U▌

CO3:eft7T GTr w*{ gV'TA'7 YT YwoE ftfYNToEhN? N'Yo eft7T g'7h fYWuAgh, A'M w{ g'YT eowT U' 7? fe A'U NTO'fwe Y'o ftu uZW oUhN? eTft OToTt? N7' ethN? pTo'frNTw UTfAW eo Ae7I

CO4:eUT7h GTr w*{ gV'TA'7 YT YwoE ftfYNToEhN? N'Yo eft7T g'7h fYWuAgh, A'M w{ g'YT eowT U' 7? fe A'U NTO'fwe Y'o ftu uZW oUhN? eTftOToTt? N7' ethN? pTo' frNTw UTfAW eo Ae7I

CO5:fwpO w*{ gV'TA'7 YT YwoE ftfYNToEhN? NYo gV7 Yh o'uh w*{ g'YT eowT U' N7 Y'ZWtTw fTf7UTA 7'KT7' eotTA7T U▌

Bachelor of Science (Economics) (Semester–III)
Session 2022-2023
Course Code: BECL-3031
PUNJABI (Basic)

AY? : S x'N' **Maximum Marks: 50**
Theory : 40
CA 10

gTOeY
: fwN-I

goT gV e gPw? Y' A7o
Ayg ouwT **08 Ne**

: fwN-II

eft7Tt?
(A) AY? (GTTh tho fAx)
(N) yo g'KTph Yh (|ho!Yhw Po|)
(T) !wrTUh YhtT pTWYhT' (g'.YUw fAx)
(A) o|Zy (fPt e|YTo)
(gA'r AfU7 ftNTfyNT,ATo) **08 Ne**

: fwN-III

eUT7hN?
(A) G|NT (wTwe fAx)
(N) gYh Y' fwNT7 (fg'. A'7 fAx A'y'A)

(T) e|W |h (A|KTw fAx)
(A) Oo7h UOWT pWY(eWt7 fAx ftoe)
(ftPT tA7,ATo) **08 Ne**

: fwN-IV

fwp'O
(A) xo YT fgNTo (7'KT fA'x)
(N) Y? (rop!P fA'x)
(T) GTTh YoYTwT Kh (UogTW fA'x g'w|)
(A) Yw|Zy eYo7 Yh w'e NWTY wUhA (AfoYo Yv)
(ft¯PT tA7,ATo) **08 Ne**

Ne tv N7' gohfyNe WTh UYTfT7?

1. gPw gZ7o Y' uTo AePw U7rIAePw A-D 7Ze Y' gPw : fwN I-IV ftu'A g|ZS' KT7rI Uo A'ePw ftu Y' gPw g|ZS' KT7rI
2. ftfYNToEh w` eZ|W g'K gPw eow' Uwl Uo A'ePw ftu'A fTe gPw WT!Yh UI gKt? gPw feA' th A'ePw ftu'A eh7TKT AeYT UI
3. Uoe gPw Y' 08 Ne Uwl
4. ggo A'ZN eow tTWT Keo uTU' 7? gPw? Yh tv NZr'A tZO 7'A tZO uTo Ag gPw? ftu eo AeYT UI

Bachelor of Science (Economics) (Semester–III)

Session 2022-2023

Course Code: BECL -3431

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)

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.

CO4 (a): Understand and analyze the institutions started by Sikh Gurus and their implications till date

Bachelor of Science (Economics) (Semester–III)
Session 2022-2023
Course Code: BECL -3431
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)

Examination Time: 3 Hours **Max. Marks: 50**
Theory: 40
C A: 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 5 th question may be attempted from any of the four Units.
4. Each question will carry 8 marks

Unit -1.
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 Sikhsof the Punjab, Cambridge University Press, New Delhi.
Singh, Fauja (1972), A History of the Sikhs, Vol. II,I. Patiala: Punjabi University.
Singh, Khuswant (2011). A History of Sikhs- Vol. I (1469-1839), New Delhi, Oxford University Press.

Bachelor of Science (Economics) (Semester–III)
Session 2022-2023
Course Code: BECL-3212
ENGLISH (COMPULSORY)

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 (Economics) (Semester–III)
Session 2022-2023
Course Code: BECL-3212
ENGLISH (COMPULSORY)

Max. Marks: 50
Examination Time: 3 Hrs **Theories: 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. **(10x1=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. **(1x6+4x1=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 (1/2)

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 (Economics) (Semester–III)
Session 2022-2023
Course Code: BECL-3333(I)
Course Title: Mathematics (Analysis)

Course Outcomes
After passing this course, the students will be able to:
CO 1: Demonstrate an understanding of limits and how they are used in sequences.
CO 2: Understanding how limits are used in series and apply various test on series.
CO 3: To understand the concepts of Riemann sum, partitions, upper and lower sums, Riemann Integrability of continuous functions and of monotone functions. Distinguish between the absolute convergence and conditional convergence.
CO 4: To know and describe the converging behaviour of improper integrals and Beta , Gamma functions. To find the relation between Beta and Gamma functions.

Bachelor of Science (Economics) (Semester–III)
Session 2022-2023
Course Code: BECL-3333(I)
Course Title: Mathematics (Analysis)

Examination Time: 3 Hours

Max.Marks:50
Theory: 40
CA: 10

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.

Unit-I

Definition of a sequence. Theorems on limits of sequences. Bounded and monotonic sequences. Cauchy's convergence criterion.

Unit-II

Series of non-negative terms. Comparison tests. Cauchy's integral tests. Ratio tests. Cauchy's root test. Raabe's test, logarithmic test. Demorgan's and Bertrand's tests. Kummer's test, Cauchy Condensation test, Gauss test, Alternating series. Leibnitz's test, absolute and conditional convergence

Unit-III

Partitions, Upper and lower sums. Upper and lower integrals, Riemann integrability. Conditions of existence of Riemann integrability of continuous functions and of monotone functions. Algebra of integrable functions.

Unit-IV

Improper integrals and statements of their conditions of existence. Test of the convergence of improper integral, beta and gamma functions.

Text Book:

A. Kumar and S. Kumaresan , A Basic Course in Real Analysis, CRC Press, New York, 2014.

Reference Books:

1.S.C Malik and S. Arora, Mathematical Analysis, New Age international Publishers, New Delhi, second edition, 2005.

2.T. M. Apostal, Mathematical Analysis, Pearson education, second edition, 2004.

Bachelor of Science (Economics) (Semester–III)
Session 2022-2023
Course Code: BECL-3333(II)
Course Title: Mathematics (Analytical Geometry)

Course Outcomes
After passing this course, the students will be able to:
CO 1: Understand the concept of the geometry of lines, shifting of origin and rotation of axis in the Euclidian plane.
CO 2: Develop geometry with a degree of confidence and will gain fluency in the basics of parabola in Euclidian geometry.
CO 3: Demonstrate the concept of ellipse and hyperbola in general quadratic equation.
CO 4: Understand the concept of geometry and real time characteristics of plain and spheres.

Bachelor of Science (Economics) (Semester–III)
Session 2022-2023
Course Code: BECL-3333(II)
Course Title: Mathematics (Analytical Geometry)

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

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.

Unit-I

Transformation of axes, shifting of origin, Rotation of axes in two dimension and three dimension, the invariants, Joint equation of pair of straight lines, equations of bisectors

Unit-II

Parabola and its properties. Tangents and normal, Pole and polar, pair of tangents at a point, Chord of contact, equation of the chord in terms of mid point and diameter of conic.

Unit-III

Ellipse and hyperbola with their properties. Tangents and normal, Pole and polar. pair of tangents at a point, Chord of contact, Identifications of curves represented by second degree equation (including pair of lines).

Unit-IV

Intersection of three planes, condition for three planes to intersect in a point or along a line or to form a prism. Sphere: Section of a sphere by a plane, spheres of a given circle. Intersection of a line and a sphere. Tangent line, tangent plane, power of a point with respect to a sphere, radical planes.

Text Book:

S.L. Loney, The Elements of Coordinate Geometry, Arihant Publications, Sixth edition, 2016.

Reference Books:

1. G. Prasad and H.C. Gupta, Text Book on Coordinate Geometry, Pothishala Private Limited, Allahabad, 2000.
2. S. Narayan and P.K. Mittal, Analytical Solid Geometry, S. Chand & company, Seventeenth edition, 2007.
3. E. Kreyszig, Advanced Engineering Mathematics, Wiley Publisher, Tenth edition, 2010.
4. G.B. Thomos, and R.L. Finney, Calculus and Analytic Geometry, Addison Wesley, Ninth edition, 1995.

Bachelor of Science (Economics) (Semester –III)
Session 2022-2023
Course Code: BECL-3453
Quantitative Techniques–III

Course outcomes:

After passing this course students will be able to:

CO1: understand and apply the concept of differentiation in economic applications such as profit maximization, cost minimization or utility optimization.

CO2: understand and apply the concept of indefinite and definite integrals to the economics concepts like consumer and producer surplus.

CO3: explain and use matrix operations to solve system of equations.

CO4: understand the basics of linear programming for the efficient computation of optimal solutions of a problem in decision making.

Bachelor of Science (Economics) (Semester –III)
Session 2022-2023
Course Code: BECL-3453
Quantitative Techniques–III

Time: 3 Hours **Max. Marks: 100**
Theory: 80
CA: 20

Note: Instructions for the Paper–Setter:
Two questions, each carrying 16 marks, from each of the Units I-IV (i.e. a total of eight questions) are to be set. Candidates are required to attempt five questions, selecting at least one from each unit. The fifth question may be attempted from any unit.

UNIT–I

Differentiation: Maxima and Minima of Functions, Partial derivatives, higher order partial derivatives.

UNIT–II

Integration (Excluding Trigonometric and Inverse Functions): Indefinite Integrals; Integration by Partial Fractions; Integration by substitution; Integration by parts; Definite Integrals; Application of Integration in Consumer Surplus and Producer Surplus.

UNIT–III

Matrices: Definition, Types, Addition, Subtraction and Multiplication of Matrices, Scaler Multiplication, Transposition, Determinants and their Properties, Minors and Co-factors, Rank of a Matrix, Inverse of a Matrix, Crammer's Rule for Solution of Simultaneous system of equations; Applications of matrices in economics.

UNIT–IV

Linear Programming: Formulation of problem, Assumptions, Graphical solution, Simplex method, Use of Artificial Variables, Dual Simplex method. Input-Output Analysis: Basic concepts, Input-Output tables for closed and open economies, Leontief Basic Input-Output Model, Simple Applications of Input-Output Analysis.

Suggested Readings:

1. Rangi, S.S. and Chowdhary, V. (2013), "*Mathematical Techniques*", S. Vikas& Co. Publishing House, India.
2. Allen, R.G.D.(1938), Mathematical Analysis for Economists, ELBS and Macmillan Press, New York.
3. Chiang, A.(1967), Fundamental Methods of Mathematical Economics, McGraw Hill.

Note: The latest edition of the books is recommended.

Bachelor of Science (Economics) (Semester–III)
Session 2022-2023
Course Code: BECL-3134
COMPUTER SCIENCE
(COMPUTER ORIENTED NUMERICAL AND STATISTICAL METHODS)

Course Outcomes:
After passing this course the student will be able to:
CO1: Solve non-linear and linear equations using different methods.
CO2: comprehend interpolation and numerical integration.
CO3: Calculate different means and deviations using statistical techniques.
CO4: Comprehend correlation, curve fitting and regression for finding solutions to various statistical problems.

Bachelor of Science (Economics) (Semester–III)
Session 2022-2023
Course Code: BECL-3134
COMPUTER SCIENCE
(COMPUTER ORIENTED NUMERICAL AND STATISTICAL METHODS)
(THEORY)

Examination Time: (3+3) Hrs.

Max. Marks: 100
Theory: 50
Practical: 30
CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (10 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 divided 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: Numerical methods, Numerical methods versus numerical analysis, Errors and Measures of Errors. Bisection method, false position method and Newton Raphson method.
Simultaneous Solution of Equations: Gauss Elimination Method, Gauss Jordan method, Gauss Siedel Method.

Unit -II

Interpolation: Interpolation and Curve Fitting, Lagrangian Polynomials, Newtons Methods: Forward Difference Method, Backward Difference Method and Divided Difference Method.
Numerical Integration: Trapezoidal Rule, Simpson's 1/3 Rule Simpson's 3/8 Rule.

Unit -III

Measure of Central Tendency: Preparing frequency distribution table, Mean Arithmetic, Mean Geometric, Mean Harmonic, Mean, Median and Mode.
Measure of dispersion: Range, Mean deviation, Standard deviation, co-efficient of variation, Moments, Skewness, Kurtosis.

Unit –IV

Correlation: Meaning, Bivariate Distribution, Multivariate distribution, Karl Pearson method, Rank correlation.
Regression: Meaning, Linear Regression.

References/ Textbooks:

1. B.S. Grewal, Numerical Methods in Engineering & Science: With Programs in C, C++ & MATLAB, Khanna Publisher, 2014.
2. V. Rajaraman, Computer Oriented Numerical Methods, Prentice Hall of India Private Ltd., 2009.

Note: The latest editions of the books should be followed.

Bachelor of Science (Economics) (Semester–III)
Session 2022-2023
Course Code: BECL-3134
COMPUTER SCIENCE
(COMPUTER ORIENTED NUMERICAL AND STATISTICAL METHODS)
PRACTICAL

Examination Time: (3+3) Hrs.

Max. Marks: 100
Theory: 50
Practical: 30
CA: 20

PRACTICAL based on
Computer Oriented Numerical and Statistical Methods

Bachelor of Science (Economics) (Semester–III)
Session 2022-2023
Course Code: BECL-3124
COMPUTER APPLICATIONS (VOCATIONAL)
(OPERATING SYSTEM)

Course Outcomes:

After passing this course the student will be able to:

CO1: Describe, contrast and compare different types of Operating System.
CO2: Analyze CPU scheduling and memory management policies.
CO3: Comprehend about deadlock along with its prevention and detection.
CO4: Apply commands to perform various tasks in Linux operating system.

Bachelor of Science (Economics) (Semester–III)
Session 2022-2023
Course Code: BECL-3124
COMPUTER APPLICATIONS (VOCATIONAL)
(OPERATING SYSTEM)
(THEORY)

Examination Time: (3+3) Hrs.

Max. Marks: 100
Theory: 50
Practical: 30
CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (10 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 divided 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 Operating System, Types of Operating systems: Multiuser, Multitasking and Multiprogramming, Functions of Operating System, Booting a System, Language Processors: Compiler, Assembler, Interpreter, Linker and Loader.

UNIT-II

CPU Scheduling: Basic concepts, Scheduling Algorithms, Algorithm, Evaluation: Turnaround Time, Waiting Time.

Memory Management::Logical address space and physical address space, schemes.
Introduction to File Management, I/O Device Management, Data Management.

UNIT-III

Deadlocks: System Model, Deadlock characterization, Methods for handing deadlocks, Deadlocks Prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock, Approach to Deadlock handling.

UNIT–IV

Linux: Introduction, Features, Architecture of linux (Kernel, Shell)

Linux Commands: cat, cd, chmod, chown,cp, ls, mkdir, mv, rmdir, rm,mv, sort, ln,df, echo, exit, find, free, whoami, grep ,cal, who, pwd.

Introduction to Vi Editor, commands : opening, inserting, modifying, deleting and saving files.

References:

1. AviSilberschatz, Peter Baer Galvin, Greg Gagne, Operating System Concepts, Wiley, 2013.
2. Charles Crowley, Operating Systems: A Design-Oriented Approach, Tata McGraw Hill, 2001.
3. Deitel, An Introduction to Operating Systems, Second Edition, Addison Wesley, 1990.
4. William Stallings, Operating Systems: Internals and Design Principles, Pearson Education Limited, 2014.
5. Anshuman Sharma, Fundamentals of Operating System, Lakhanpal Publishers, 2nd Edition.

Note: The latest editions of the books should be followed.

Bachelor of Science (Economics) (Semester–III)
Session 2022-2023
Course Code: BECL-3124
COMPUTER APPLICATIONS (VOCATIONAL)
(OPERATING SYSTEM)
(PRACTICAL)

Examination Time: (3+3) Hrs.

Practical based on Operating System.

Bachelor of Science (Economics) (Semester –III)
Session 2022-2023
Course Code: BECL-3175
Economics (Indian Economy)

Course outcomes:

After passing this course students will be able to:

CO1: understand the nature, importance and problems of Indian agriculture and new agriculture strategy.
CO2: understand the role and problems of industrial development in India and role of public and private sector, latest industrial policy.
CO3: understand composition, direction and volume of international trade along with balance of payment problems and role of foreign capital and MNC's.
CO4: understand major economic problems of Indian economy, Indian economic planning – its objectives, strategy and evaluation.

Bachelor of Science (Economics) (Semester –III)
Session 2022-2023
Course Code: BECL-3175
Economics (Indian Economy)

Time: 3 Hours **Max. Marks: 100**
Theory: 80
CA: 20

Note: Instructions for the Paper–Setter:
Two questions, each carrying 16 marks, from each of the Units I-IV (i.e. a total of eight questions) are to be set. Candidates are required to attempt five questions, selecting at least one from each unit. The fifth question may be attempted from any unit.

UNIT- I

Nature of Indian Economy; Agriculture in India: Nature and Importance of Agriculture, Causes of Decline in Productivity, Sustainable Agricultural Growth, Green Revolution and New Agricultural Strategy; WTO and Indian Agriculture (Introductory).

UNIT- II

Industry: Performance and Problems of Industrial Development; Public Sector versus Private Sector, Role of Privatization, Role of Small and Cottage Industries, Latest Industrial Policy.

UNIT- III

Foreign Trade: Direction and Composition of Exports and Imports since 1991; Recent Foreign Trade Policy, Balance of Payment Problem, Foreign Capital and Multinational Corporations in India.

UNIT- IV

Features of Population Growth in India. Major Problems of the Economy – Inflation, Unemployment, Poverty and Inequality. Current Indian Tax Structure. Planning- Objectives, Strategy, Evaluation of Planning in India; A Brief Idea of Objectives, Targets, Resources of the Latest Five Year Plan (Twelfth Five Year Plan).

Suggested Readings:

1. Mishra, S.K. and Puri, V.K. (2019), "*Indian Economy",* Himalaya Publication House, Mumbai.
2. Dutt, R. and Sundharam, *K.P.M.* (2018), "*Indian Economy",* S. Chand & Co. Ltd., New Delhi.
3. Aggarwal, A. N. (1975), "*Indian Economy",* Vikas Publishing House, Delhi.
4. Wadhwa, C. D. (1980), "*Indian Economic Policy",* Tata McGraw Hill, Bombay.

Note: The latest edition of the books is recommended.

Bachelor of Science (Economics) (Semester–IV)
Session 2022-2023
Course Code: BECL-4421
PUNJABI (COMPULSORY)

COURSE OUTCOMES

CO1: ‘grvvhN?’ ( ) w*{ gV|TA|7 YT YwoE ftfYNToEhN? NYo fTA ATfU7 o[g g,7h fYWuAgh, AM w*{ gYT eowT U▌

CO2: ‘ ’ ( ) w*{ fAWpA ftu PTfYW eo e ftfYNToEhN? NYo w*{ gV|7 Yh o[uh w*{ gYT eowT U` N7 Kr7 wTW KV7T U▌

CO3: Y|7oh fuZOh gZ7o fWy7 YT YwoE ftfYNToEhN?w| fTA eWT ftu fwg|w eowT U` ı

CO4: PpY KV? Y` fw:Y w{* fAWpA ftu PTfYW eow YT YeAY ftfYNToEhN? Y|NToT fW!7 ftu eh7hN? KT7 tTWhN? rW7hN? w{* A|OTowT U▌

CO5: r|oY|yh fWgh YhN? ftPP7Tt? w*{ gV|TA|7 YT YwoE ftfYNToEhN? NYo gKTph GTPT Yh NYhoh YT N7 pTohehN? w*{ AYM7 WTh tZyo -tZyo fAO?7? YT fteTA eowT U▌

Bachelor of Science (Economics) (Semester–IV)
Session 2022-2023
Course Code: BECL-4421
PUNJABI (COMPULSORY)

AY? : S x'N' **Maximum Marks: 50**
Theory 40
CA 10

gTOeY N7 gTO gA7e?
: fwN-I
grvvhN? ( ) : .pfu7 e'o
(ATo /ftPT tA7) 8 N'e

: fwN-II
( ) :Kf7'Yo poTV,
(ftPT tA7/ATo) 8 N'e

: fwN-III
Y|7oh fuZOh gZ7o 8 N'e

: fwN-IV
ftNTeo7
(A) PpY KV? Y' fw:Y
(N) r|oY|yh fWgh YhN? ftPP7Tt? 8 N'e

N'e tv N7' gohfyNe WTh UYTfT7?

1. gPw gZ7o Y' uTo AePw U7rIAePwA-D7Ze Y' gPw : fwNI-IV ftu'A g|ZS' K|7rI Uo AePw ftu Y' gPw g|ZS' K|7rI
2. ftfYNToEh w` e|W g'K gPweow' Uwl Uo AePw ftu'A fTe gPw WT!Yh UI gKt? gPw feA' th AePw ftu'A eh7TKT AeYT UI
S. Uoe gPw Y` 08 NeUwI
4. ggo A'ZN eow tTWT Keo uTU' 7? gPw? Yh tv NZr'A tZO 7'A tZO uTo Ag gPw? ftu eo AeYT UI

Bachelor of Science (Economics) (Semester–IV)
Session 2022-2023
Course Code: BECL-4031
PUNJABI (Basic)

Course outcomes

CO1:ਮੁੱਢਲੀ ਯੰਜ ਾਬੀ ਦੇ ਿਵਿਦਆਰਥੀਆਂ ਨੂੰ ਭਾਸ਼ਾ ਦੀ ਮੱੁਢਲੀ ਜਾਣਕਾਰੀ ਦੇਣ ਝ ਾਬੀ ਬਾਅਦ ਯੰਜ ਸਾਿਹਤ ਦੇ ਰੂ ਬ ਰੂ ਕਰਵਾਏ ਜਾਣ ਦਾ ਮਨੋਰਥ ਿਵਿਦਆਰਥੀਆਂ ਨੂੰ ਸਾਿਹਤ ਪੜ੍ਹਨ ਲਈ ਉਤਸ਼ਾਹਤ ਕਰਨਾ ਹੈ। ਯੰਜ ਾਬੀ ਸਾਿਹਤ ਜਗਤ ਦੇ ਨਾਮਵਰ ਕਵੀਆਂ ਦੀਆਂ ਰਚਨਾਵਾਂ ਪੜ੍ ਕੇ ਿਵਿਦਆਰਥੀ ਇਨ੍ਾਂ ਦੇ ਜੀਵਨ ਤੇ ਸਾਿਹਤ ਝਜਾਣੂ ਹੋਣਗੇ।

CO2:ਵੱਖੋ ਵੱਖਰੀਆਂ ਧਾਰਾਵਾਂ ਨਾਲ ਸਝਯੰ ਤ ਇਨ੍ਾਂ ਕਵੀਆਂ ਦੀਆਂ ਰਚਨਾਵਾਂ ਪੜ੍ ਕੇ ਿਵਿਦਆਰਥੀਆਂ ਨੂੰ ਨਵੀਨ ਿਵਚਾਰਧਾਰਾ ਬਾਰੇ ਜਾਣਕਾਰੀ ਿਮਲੇ ਗੀ।

CO3: Wy ouwT YT YwoE ftfYNToEhN? Yh pZOh w{* 7hy7 eofYN? Aw? Yh fWy7 gf7GT w{* AKTro eowT U▌

CO4: PpY KV? Y fw:Y w{* fAWpA ftu PTfYW eow YT YeAY ftfYNToEhN? YNToT fW!7 ftu eh7hN? KT7 tTWhN? rW7hN? w{* AOTowT U▌

Bachelor of Science (Economics) (Semester–IV)
Session 2022-2023
Course Code: BECL-4031
PUNJABI (Basic)

AY? : S x'N' **Maximum Marks: 50**

Theory : 40

CA 10

gTOeY

: fwN-I

NT7Y NwT7Y (eft7T GTr)(AgTYe vT. A[fU'Yo pho N7' vT.tfoNTY fA'x A'O){
r[o{ wTwe Yt :whtofANh, NfY7Aol
Y'Uw fAx,Kr7To,AoKh7 gT7o,gTP fAWpA YT fUZAT Uwl
gA'r AfU7 ftNTfyNT

08 N'e

: fwN-II

NT7Y NwT7Y (eft7T GTr)(AgTYe vT. A[fU'Yo pho N7' vT.tfoNTY fA'x A'O){
r[o{ wTwe Yt :whtofANh, NfY7Aol
Y'Uw fAx,Kr7To,AoKh7 gT7o,gTP fAWpA YT fUZAT Uwl
(ATo)

08 N'e

: fwN-III

NT7Y NwT7Y (eft7T GTr)(AgTYe vT. A[fU'Yo pho N7' vT.tfoNTY fA'x A'O){
r[o{ wTwe Yt :whtofANh, NfY7Aol
Y'Uw fAx,Kr7To,AoKh7 gT7o,gTP fAWpA YT fUZAT Uwl
(ethN? Y' Khtw N7 ouwT pTo' YZ[YWh KT7eToh)

08 N'e

: fwN-IV

Wy ouwT
NP[ZO PpY K'V? w{* P[O eoe fWy7T 08
N'e

N'e tv N7' gohfyNe WTh UYTfT7?

1. gPw gZ7o Y' uTo AePw U7rlAePw A-D 7Ze Y' gPw :fwN I-IV ftu'A g[ZS' K[7rl Uo A'ePw ftu Y' gPw g[ZS' K[7rl
2. ftfYNToEh w` e[W g'K gPw eow' Uwl Uo AePw ftu'A fTe gPw WT!Yh Ul gKt? gPw feA' th AePw ftu'A eh7TKT AeYT Ul
S. Uoe gPw Y' 08 Ne Uwl
4. ggo A'ZN eow tTWT Keo uTU' 7? gPw? Yh tv N[r'A tZO 7'A tZO uTo Ag gPw? ftu eo AeYT Ul

Bachelor of Science (Economics) (Semester–IV)
Session 2022-2023
Course Code: BECL-4431
PUNJAB HISTORY AND CULTURE (From 1605 to 1849 A.D.)
(Special paper in lieu of Punjabi Compulsory)
(For those students who are not domicile of Punjab)

CourseOutcomes

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 (Economics) (Semester–IV)
Session 2022-2023
Course Code: BECL-4431
PUNJAB HISTORY AND CULTURE (From 1605 to 1849 A.D.)
(Special paper in lieu of Punjabi Compulsory)
(For those students who are not domicile of Punjab)

Examination Time: 3 Hours **Max. Marks: 50**
Theory: 40
C A: 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 5 th 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.
Oxford University Press.
Patiala: Publication Bureau, Punjabi University.
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 (Economics) (Semester–IV)
Session 2022-2023
Course Code: BECL-4212
ENGLISH (COMPULSORY)

Max. Marks: 50
Examination Time: 3 Hrs **Theories: 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. **(10x1=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. **(1x6+4x1=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 (Economics) (Semester–IV)
Session 2022-2023
Course Code: BECL-4333(I)
Course Title: Mathematics (Statics and Vector Calculus)

Course Outcomes

After passing this course, the students will be able:
CO 1: To apply parallelogram law of forces, triangle law of forces, Lami's theorem to real life problems and also understand that how one can resolve number of coplanar forces, parallel forces and concurrent forces acting at a body.
CO 2: To find the applications of CG of a rod, triangular lamina, solid hemisphere, hollow hemisphere, solid cone and hollow cone.
CO 3: To find the values of gradient, divergence and curl operator of given vectors
CO 4: To find the application of Gauss theorem, Green's theorem and Stokes's theorem in real life problems.

Bachelor of Science (Economics) (Semester–IV)
Session 2022-2023
Course Code: BECL-4333(I)
Course Title: Mathematics (Statics and Vector Calculus)

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

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.

Unit-I

Composition and resolution of forces (parallelogram law, triangle law, polygon law, Lami's Theorem(ञ-μ) theorem). Resultant of a number of coplanar forces, parallel forces. Moments ,Varignon's Theorem of moments, Couples , Resultant of two Coplanar Couples, Equilibrium of two coplanar couples, Resultant of a force and a couple, Equilibrium of coplanar forces.

Unit-II

Friction, Laws of friction, Equilibrium of a particle on a rough plane. Centre of Gravity: Centre of gravity of a rod, triangular lamina, solid hemisphere, hollow hemisphere, solid cone and hollow cone.

Unit-III

Vector differentiation, Gradient, divergence and curl operators, line integrals, Vector identity, and Vector integration.

Unit-IV

Theorems of Gauss, Green, Stokes and problems based on these.

Reference Books:

1. N.P. Bali, Statics, Laxmi Publications, Sixth edition, 2007.
2. M.R. Spiegal, Vector Analysis, Schaum's outline Series, McGraw Hill, Second edition, 2017.
3. S.L. Loney, The Elements of Statics and Dynamics, Arihant Publications, Sixth edition, 2016.
4. R.S. Verma, A Text Book on Statics, Pothishala Private Limited, Allahabad, 1962.

Bachelor of Science (Economics) (Semester–IV)
Session 2022-2023
Course Code: BECL-4333(II)
Course Title: Mathematics (Solid Geometry)

Course Outcomes

After passing this course, the students will be able to:
CO 1: Understand the concept of cylinder, enveloping cylinder and its limiting form.
CO 2: Demonstrate the concept of cone, classification of cone, intersection of line and cone, reciprocal cone.
CO 3: Describe the concept of conicoids or quadratic surface, its classification, trace different types of conicoids and hence find surface of revolution.
CO 4: Describe the concept of tangent and normal plane to the conicoid and identify the conicoids, representing it in the form of hyperboloid, ellipsoid, paraboloid.

Bachelor of Science (Economics) (Semester–IV)
Session 2022-2023
Course Code: BECL-4333(II)
Course Title: Mathematics (Solid Geometry)

Examination Time: 3 Hours **Max.Marks:50**

Theory :40

CA:10

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.

Unit-I

Cylinder as surface generated by a line moving parallel to a fixed line and through fixed curve. Different kinds of cylinders such as right circular, elliptic, hyperbolic and parabolic in standard forms

Unit-II

Cone with a vertex at the origin as the graph of homogeneous equation of second degree in x, y, z . Cone as a surface generated by a line passing through a fixed curve and fixed point outside the plane of the curve. Right circular and elliptic cones.

Unit-III

Equation of surface of revolution obtained by rotating the curve $f(x,y)=0$ about the z-axis in the form of $f(x^2+y^2, z) =0$.Equation of ellipsoid, hyperboloid and Paraboloid in standard forms.

Unit-IV

Surfaces represented by general equation of 2nd degree $S = 0$. Tangent lines, tangent planes and Normal Plane.

Text Book:

P. K. Jain & Khalil Ahmed, A text book of Analytical Geometry of three dimensions, New age international limited, Second edition, 2003.

Reference Books:

1. S. Narayan, & P.K.Mittal , Analytical Solid Geometry, Sultan Chand & Sons, New Delhi, Sixteenth edition, 2002 (Scope in Chapters-7,8,11).
2. E. Kreyszig, Advance Engineering Mathematics, John Willey & Sons, tenth edition, 2011.

Bachelor of Science (Economics) (Semester –IV)
Session: 2022-2023
Course Code: BECL-4453
Quantitative Techniques–IV

Course outcomes:

After passing this course students will be able to**:**

CO1: understand the concept of correlation and regression, and learn how to apply these statistical techniques in practice

CO2: understand the axiomatic formulation of modern probability theory and think of random variables as intrinsic need for analysis of random phenomena.

CO3: recognize the connection between theory and applications by appropriately fitting, assessing and interpreting the results/ outcomes

CO4: understand the basic principles underlying survey design and estimation.

Bachelor of Science (Economics) (Semester –IV)
Session 2022-2023
Course Code: BECL-4453
Quantitative Techniques–IV

Time: 3 Hours **Max. Marks: 100**
Theory: 80
CA: 20

Note: Instructions for the Paper–Setter:
Two questions, each carrying 16 marks, from each of the Units I-IV (i.e. a total of eight questions) are to be set. Candidates are required to attempt five questions, selecting at least one from each unit. The fifth question may be attempted from any unit.

UNIT–I

Multiple Linear Regression: Concepts, Estimation and Applications (without derivations). Partial and Multiple Correlation. Non-Linear Regression: Quadratic and Exponential; Estimation of Fitting of Various Growth Curves (Modified Exponential, Gompertz).

UNIT–II

Probability: Definition, Additive & Multiplicative Laws and their Applications, Bayes Theorem, Concept of Random Variable, Probability Mass Function & Density Function, Mathematical Expectation (meaning and properties), Moments, Moment Generating Function and Characteristic Function.

UNIT–III

Theoretical Probability Distributions: Derivations of the properties of Binomial (with numerical), Poisson (with numerical), Normal (with numerical), Beta and Gamma Distributions.

UNIT–IV

Sampling: Various concepts – Population, Sampling Units, Complete Enumeration sample Surveys, Concept of an Estimator and The Standard Error, Standard Error of Estimates. Features of a Good Sample, Random and Subjective Sampling, Simple Random Sampling (with and without replacement), Stratified Random sampling (applications only).

Suggested Readings:

1. Gupta, S.C. (2018), "Fundamentals of Statistics", Himalaya Publishing House, 7th Edition,Delhi
2. Gupta, S.P. (2014), "Statistical Methods", Sultan Chand & Sons, 43rd Edition, Delhi
3. Rangi, S. S. and Nayyar, R.K. (2014), "Statistical Techniques (Vol. II)", S. Vikas and Company, India.
3. Siegel, Andrew F. (2002), Practical Business Statistics, International Edition, 5th Edition, McGraw Hill Irwin.

Note: The latest edition of the books is recommended.

Bachelor of Science (Economics) (Semester–IV)
Session 2022-2023
Course Code: BECL-4134
COMPUTER SCIENCE

(DATA STRUCTURES)

Course Outcomes:

After passing course the student will be able to:

CO1: Analyze complexity of algorithms to determine their efficiency.
CO2: Comprehend various hashing method, sorting and searching algorithms.
CO3: Comprehend various operations of stack and queue along with different scenarios.
CO4: Comprehend advanced data structures such as tree and graph.

Bachelor of Science (Economics) (Semester–IV)
Session 2022-2023
Course Code: BECL-4134
COMPUTER SCIENCE
(DATA STRUCTURES)

Examination Time: (3+3) Hrs. **Max. Marks: 100**
Theory: 50
Practical: 30
CA: 20

Instructions for Paper Setter -
Eight questions of equal marks (10 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 divided 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. The students can use Non–programmable/ scientific & Non–storage type calculator.

UNIT–I

Data Structures: Introduction to elementary data organization, Common Operation on Data Structures, Algorithm Complexity, Big O Notation, Time-Space Tradeoff between Algorithms.

Arrays: Array defining, representing arrays in memory, various operations on linear arrays, Multi-Dimensional arrays.

UNIT–II

Linked Lists: Types of Linked Lists, representing linked list in memory, advantages of using linked lists over arrays, various operations of linked lists.

Stacks: Description of stack structure, Implementation of stack, using arrays and linked lists, application of stack-converting, arithmetic expression from infix notation to polish notation and their subsequent evaluation, quicksort technique.

UNIT–III

Queues: Description of queue structure, Implementation of queue using arrays and linked lists, description or priorities of queues, deques.

Sorting and Searching: Sorting Algorithms, bubble sort, selection sort, insertion sort, quick sort, merge sort, heap sort, searching Algorithms, linear search and binary search.

UNIT-IV

Trees: Description of Tree Structure and its Terminology, Binary Trees and Binary Search Trees and their representation in Memory, Heapsort.

Graphs: Description of Graph Structure, Implement Graphs in Memory using Adjacency Matrix, Path Matrix, graph traversal techniques - DFS, BFS.

References / Textbooks:

1. Seymour Lipschutz, Data Structures with C (Schaum's Outline Series), McGraw Hill Education (2017), 1st Edition
2. Reema Thareja, Data Structures Using C, Oxford Publication (2014), 2nd Edition
3. Sahni Horowitz, Fundamentals of Data Strucetures in C (2008), 2nd Edition
4. Narasimha Karumanchi, Data Structures and Algorithms made easy, Careermonk Publications (2016), 5th Edition
5. S.K. Srivastava and Deepali Srivastava, Data Structures through C, BPB Publications (2004)
6. Yedidyah Langsam, Augestein and Tanenbaum, Data Structures using C and C++, Pearson Education India (2015), 2nd Edition

Bachelor of Science (Economics) (Semester–IV)
Session 2022-2023
Course Code: BECL-4134
COMPUTER SCIENCE
(DATA STRUCTURES)
(PRACTICAL)

Examination Time: (3+3) Hrs.

Max. Marks: 100
Theory: 50
Practical: 30
CA: 20

Practical on Data Structures .

Bachelor of Science (Economics) (Semester–IV)
Session 2022-2023
Course Code: BECL-4124
COMPUTER APPLICATIONS (VOCATIONAL)
(RELATIONAL DATA BASE MANAGEMENT SYSTEMS)

Course Outcomes:

After passing this course the student will be able to:

CO1: Illustrate the concept of data models, database normalization along with its various forms.
CO2: Apply SQL to design basic to intermediate level of databases.
CO3: Apply various built-in functions for formatting of data.
CO4: Comprehend the concept of PL/SQL and its relationship with SQL.

Bachelor of Science (Economics) (Semester–IV)
Session 2022-2023
Course Code: BECL-4124
COMPUTER APPLICATIONS (VOCATIONAL)
(RELATIONAL DATA BASE MANAGEMENT SYSTEMS)
(THEORY)

Examination Time: (3+3) Hrs.

Max. Marks: 100
Theory: 50
Practical: 30
CA: 20

Instructions for Paper Setter -
Eight questions of equal marks (10 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 divided 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

Basic Concepts: An overview of Database Management, (database, database system, why database). An architecture for a database system (levels of the architecture, mapping, data independence), DBA, Definition of CODD's Rules.
Normalization of Data: First, Second and Third Normal form, **Database Models:** Hierarchical, Network, Relational, Introduction to Relational database systems .

UNIT II

ORACLE: Introduction to Oracle ,**Data Types:** Char, numbers, date long, raw, long raw.
DDL Commands of SQL: Create Tables, Constraints, Alter Table, Drop Table, Rename.
Data Manipulation Language: Insert Into, Update Statement, Delete Statement, Select statement (Select distinct, Select from where, Select from where order by, Select group by clause, Select Group by having clause).
Transaction Control Language: Roll back, Savepoint, Commit.

UNIT III

Built in Functions- Aggregate Functions (Sum, Avg, max, min, count), Character Functions (Lower, Upper, Length, Substr, RPAD, LPAD), Arithmetic Functions (Round, Trunc, Sqrt, Mod, Abs, Sine) Date and Time Functions and Other Miscellaneous Functions (Add-months, Month-between, NVL, NVL2, decode) & Conversion Functions (to-char,to-number, to-date). Join methods and Sub query, Union, Intersection, Minus, Views, Security amongst users.

UNIT IV

PL/SQL: Introduction to PL/SQL, Relationship between SQL & PL/SQL, Advantages, block structure, Valuable and Constant declaration, Declaration using attributes %type attribute, control statements.

References:

1. Silberschatz, Korth&Sudarshan, Database Systems Concepts, McGraw-Hill Inc.(2020), 7th edition.
2. C.J. Date, An Introduction of Database System, Addison-Wesley Publishing co. (2003), 8th edition.
3. Anshuman Sharma, Fundamentals of DBMS, Lakhanpal Publishers (2016), 4th edition.
4. Ivan Bayross, SQL/PL/SQL. The Programming Language of Oracle, BPB Publications(2010), 4th edition.
5. RamezElmasri and ShamkantNavathe, Fundamentals of Database Systems, Pearson Education (2015), 7th edition.
6. P.S. Gill, Database Management Systems, Dreamtech Press (2019), 2th edition.

Bachelor of Science (Economics) (Semester–IV)
Session 2022-2023
Course Code: BECL-4124
COMPUTER APPLICATIONS (VOCATIONAL)
(RELATIONAL DATA BASE MANAGEMENT SYSTEMS)
(PRACTICAL)

Examination Time: (3+3)
Hrs.

Practical on Relational Data Base Management System .

Bachelor of Science (Economics) (Semester –IV)
Session 2022-2023
Course Code: BECL-4175
Economics (International Economics and Public Finance)

Course outcomes:

After studying this course, students will be able to:

CO1: understand the basis of and gains from international trade and basic understanding of terms of trade and commercial policy.
CO2: To understand basic concept of BOP and methods to correct disequilibrium and determination of exchange rate.
CO3: To understand the basics of public finance and public expenditure.
CO4: To understand taxes and burden of public debt.

Bachelor of Science (Economics) (Semester –IV)
Session 2022-2023
Course Code: BECL-4175
Economics (International Economics and Public Finance)

Time: 3 Hours **Max. Marks: 100**
Theory: 80
CA: 20

Note: Instructions for the Paper–Setter:

Two questions, each carrying 16 marks, from each of the Units I-IV (i.e. a total of eight questions) are to be set. Candidates are required to attempt five questions, selecting at least one from each unit. The fifth question may be attempted from any unit.

UNIT–I

International Trade: Internal and External Trade; Classical and Heckscher-Ohlin Theories, Gains from Trade, Terms of Trade, (gross, net and income terms of trade).Trade and economic development.
Commercial Policy: Free trade vs. protection, rationale of a protectionist policy in less developed area. GATT & WTO (Introductory).

UNIT–II

Balance of Payments: Meaning and components of balance of payments, Methods for Correcting adverse balance of payments, devaluation and direct control.
Rate of Exchange: Meaning and determination (PPP and BOP Theory), Fixed and flexible exchange rates.

UNIT–III

Public Finance: Nature, scope importance. Public Expenditure: Meaning, principles, importance, effect of public expenditure on production and distribution.

UNIT–IV

Taxes: Meaning, classification, features of a good taxation system, canons of taxation, incidence and impact of taxation. Public Debt: Meaning, objectives, importance, its burden.

Suggested Readings:

1. Sodersten, B.O. (1970), "*International Economics",* Macmillan, London.
2. Salvatore, D. and Reed, G. (1983), "*International Economics",* Macmillan Publishing Company, New York.
3. Tyagi, B.P. (2004), "Public Finance", Jai Prakash Nath & Company, Meerut.

Note: The latest edition of the books is recommended.

Bachelor of Science (Economics) (Semester–V)
Session 2022-2023
Course Code: BECL-5421
PUNJABI (COMPULSORY)

COURSE OUTCOMES

CO1:u7thN? gKTph eUT7hN? w*{ gV|TA|7 YT YwoE ftfYNToEhN? NYo eUT7hN? g|7h fYWuAgh, AM w*{ gYT eowT U▌

CO2:wTtW TU| UYToT Kht7T (YWhg eo fNtT7T) w*{ fAWpA ftu PTfYW eo e ftfYNToEhN? NYo wTtW gV|7 Yh o|uh w*{ gYT eowT U N7 fTA ATfU7 o|g wTW wTW KV7T U▌

CO3:go|T ouwT eow wTW ftfYNToEh NTg7h rZW w{* efU7 Yh KTu fAZy7r N7 fTU fYYTrh eAo7 ftu AUTTh Utrh▌

CO4: AoW Nro!h go|' YT gKTph ftu Nw|tTY YT YwoE ftfYNToEhN? Yh p|ZOh w{* 7hy7 eofYN? A|w? Yh fWy7 g|f7GT w{* A|KTro eowT U▌

CO5:tTeT7Ye Kr7? : YW 7 NfOeTo w*{ gV|TA|7 YT YwoE ftfYNToEhN? NYo GTPT Yh NYhoh N7 pTohehN? w*{ AYM7 WTh tZyo -tZyo fAO?7? YT fteTA eowT U▌

Bachelor of Science (Economics) (Semester–V)
Session 2022-2023
Course Code: BECL-5421
PUNJABI (COMPULSORY)

AY? : S x'N' **Maximum Marks: 50**
Theory 40
CA 10

GTO eY N7 gTO gA7e?
:fwN-I

u7thN? g'KTph eUT7hN?
(AgT.vT.ofYYo eo, gpWhePw fpAo, r|o| wTwe Yt :whtofANh, NfY7Ao, 2018)

Wye A'rfU	eUT7h	eUT7h
NKh7 e'o Yh	fwA| :hNo	Y7 NWh pTp'
fK'Yo AyKh7 U?	A'oh U!To eUT7hN? YT pTg	K!Y Y` fTK|NTT eoYh
!f7Yo U?A gY geTP uYw w'rh KAftYo fAx roYt fAx o|gT7T	oTU| e'7| NoKw SV rvhowT Uoy Ar PhPT	ThPto YT KwY eM N7feUTth Uoy Ar yU yT7 PhPT N7 Uo

eUT7hN?
(ਿਵਸ਼ਾ-ਵਸਤੂ/ਸਾਰ) 8 N'e
:fwN-II
wTtW : T`U[UYToT Kht7T(YWhg eo fNtT7T)
(ਿਵਸ਼ਾ-ਵਸਤੂ/ਸਾਰ) 8 N'e
:fwN-III
Wrgr 200 PpY? ftu g'o(T ouwT
AoW Nro!h g'o(' YT g'KTph ftu NwtTY 8 N'e
:fwN-IV
ftNTeo7 :
(A) w?t tTe'P
(N) YW 7` NfOeTo 8 N'e

N'e tv N7' gohfyNe WTh UYTfT7?

1. gPw gZ7o Y' uTo AePw U7rIAePw A-D 7Ze Y' gPw :fwN I-IV ftu'A g|ZS' K|T7rI Uo AePw ftu Y' gPw g|ZS' K|T7rI
2. ftfYNToEh w` e|W g'K gPw eow Uwl Uo AePw ftu'A fTe gPw WT!Yh UI gKt? g|Pw feA' th AePw ftu'A eh7T KT AeYT UI
3. Uoe gPw Y' 08 Ne Uwl
4. ggo A'ZN eow tTWT Keo uTU' 7? gPw? Yh tv NZr'A tZO 7'A tZO uTo Ag gPw? ftu eo AeYT UI

Bachelor of Science (Economics) (Semester–V)
Session 2022-2023
Course Code: BECL-4031
PUNJABI (Basic)

COURSE OUTCOMES

CO1:fTU gouT th fAO?7e 7' ftUToe frNTw YT A[Y'W U▌

CO2:fTA oTUhA ftfYNToEhN? w*{ g[oT7w g'KTp'h We wTu,We eWTt?, We rh7? w*{ AYl7 Y' eTpW p7TA[7 YT :7w U` ▌

CO3:fTw[? Y' NfONw Y' YTfONY oTUhA ftfYNToEh g[oT7w We? Y' Khtw w*{ AYl Ae7r feA[Afe NTg7hN? KV[? Yh gST7 eo Ae7 Y' pro eT'h th e'Y K? We NTg7T to7YTw Khtw u'r'h 7o\? fp7T Ae7 Y' AYoZE wUhA U` AeY▌

CO4:fAO?7 gZOo Y' frNTw 7'A pTY fTA frNTw Y' NTOTo 7' g[oT7w We rh7? K? We eUT7hN? YT ftUToe NfONw eo Ae7 Y' AYoZE p7T Ae7T U▌

CO5:fTA gou' YT :7w fwAu' Uh ftfYNToEhN? w*{ NTg7hN? KV[? g[7h A[u'7 eow 7' :7w wTW A'p'fO7 U▌

Bachelor of Science (Economics) (Semester–V)
Session 2022-2023
Course Code: BECL-4031
PUNJABI (Basic)

AY? : S x'N' **Maximum Marks: 50**

Theory : 40
CA 10

gTOeY

:fwN-I

ATfU7 N7 W'e ATfU7 (Y|ZYWh KT7 gST7)
W'e eTft (Y|ZYWh KT7 gST7)
W'e tTo7e fpo7?7 (Y|ZYWh KT7 gST7) 08 N'e

:fwN-II

A|UTr (Y|ZYWh KT7 gST7)
xVhN? (Y|ZYWh KT7 gST7)
fAZO7hN? (Y|ZYWh KT7 gST7) 08 N'e

:fwN-III

frZOT (Y|ZYWh KT7 gST7)
GrVT (Y|ZYWh KT7 gST7)
lYo (Y|ZYWh KT7 gST7) 08 N'e

:fwN-IV

W'e yv? (Y|ZYWh KT7 gST7)
W'e 7YTP' (Y|ZYWh KT7 gST7)
W'e eWTt? (Y|ZYWh KT7 gST7) 08 N'e

Netv N7 gohfyNeWThUYTfT7?

1. gPw gZ7o Y' uTo AePw U7rlAePw A-D 7Ze Y' gPw :fwN I-IV ftu'A g|ZS' KT7rl Uo A'ePw ftu Y' g|Pw g|ZS' KT7rl
2. ftfYNToEh w` e|W g'K g|Pw eow' Uwl Uo AePw ftu'A fTe g|Pw WT!Yh Ul gKt? g|Pw feA' th AePw ftu'A eh7T KT AeYT Ul
3. Uoe gPw Y' 08 Ne Uwl
4. ggo A'ZN eow tTWT Keo uTU' 7? gPw? Yh tv NZr'A tZO 7'A tZO uTo Ag gPw? ftu eo AeYT Ul

Bachelor of Science (Economics) (Semester–V)
Session 2022-2023
Course Code: BECL-5431
Punjab History and Culture (From 1849-1947A.D.)
(Special paper in lieu of Punjabi Compulsory)
(For those students who are not domicile of Punjab)

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 (Economics) (Semester–V)
Session 2022-2023
Course Code: BECL-5431
Punjab History and Culture (From 1849-1947A.D.)
(Special paper in lieu of Punjabi Compulsory)
(For those students who are not domicile of Punjab)

Examination Time: 3 Hours **Max. Marks: 50**
Theory: 40
C A: 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 5
th
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 (Economics) (Semester–V)
Session 2022-2023
Course Code: BECL-5212
ENGLISH (COMPULSORY)

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

Bachelor of Science (Economics) (Semester–V)
Session 2022-2023
Course Code: BECL-5212
ENGLISH (COMPULSORY)

Max. Marks: 50
Examination Time: 3 Hrs **Theories: 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). **(5x2=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). **(2x5= 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. **(2x5= 10)**

Section D: Two questions with internal choice will be set based on (a) formal letter (b) Job application and Resume Writing, each carrying five marks. **(2x5=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, 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 (Economics) (Semester–V)
Session 2022-2023
Course Code: BECL-5333(I)
Course Title: Mathematics (Dynamics)

Course Outcomes

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

CO 1: Demonstrate the basic relations between distance, time, velocity and acceleration, manage to solve the problems of Newton's Laws of Motion and the motion of particles connected by a string.

CO 2: Illustrate motion along a smooth inclined plane. Solve different types of problems with Variable Acceleration. Discuss Simple Harmonic Motion .

CO 3: Understand the concept of projectile, oscillating system.

CO 4: Define Work, Power and Energy and explain their relationship. Use measurement tools to apply the concepts of Work and power to solve real life problems. Identify the different types of energy.

Bachelor of Science (Economics) (Semester–V)
Session 2022-2023
Course Code: BECL-5333(I)
Course Title: Mathematics (Dynamics)

Examination Time:3 Hours **Max.Marks: 50**

Theory:40
CA:10

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. The question paper must contain 30% of the article/theory from the syllabus.

Unit-I

Rectilinear motion in a straight line with uniform acceleration, Newton's laws of motion. Motion of two particles connected by a string.

Unit-II

Motion along a smooth inclined plane. Variable acceleration. Simple Harmonic Motion.

Unit-III

Curvilinear motion of particle in a plane, Definition of velocity and acceleration, projectiles, velocity and direction of motion of a projectile after a given time, projectiles on an inclined plane. Oscillations: Free Vibrations, Simple Pendulum, Conical Pendulum.

Unit-IV

Work, Power and Energy: Kinetic and Potential energy, Conservative forces. Theorem of conservation of energy. Work done against gravity.

Text Book:

R. Kumar, Fundamentals of Dynamics, Pardeep Publications, Jalandhar city, second edition, 2004

Reference Books:

1. F. Chorlton, Text Book of Dynamics, CBS Publishers, New Delhi, second edition, 2004 (Scope in chapters 3,8).
2. S.R. Gupta, Elementary Analytical Dynamics, S. Chand and Company, New Delhi, Fourteenth Edition, 1983(Scope in chapters 1,2,3)

Bachelor of Science (Economics) (Semester–V)
Session 2022-2023
Course Code: BECL-5333(II)
Course Title: Mathematics (Number Theory)

Course Outcomes

Successful completion of this course will enable the students to:

CO 1: Prove results involving divisibility and greatest common divisors.

CO 2: Find solutions of specified linear Diophantine equation, basic properties of Congruences.

CO 3: Solve system of linear congruences. Apply Fermat's and Wilson's theorem to solve numerical problems.

CO 4: Apply Euler's theorem and apply properties of phi functions in real world problems. Understand application of important arithmetic functions.

Bachelor of Science (Economics) (Semester–V)
Session 2022-2023
Course Code: BECL-5333(II)
Course Title: Mathematics (Number Theory)

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

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. The question paper must contain 30% of the article/theory from the syllabus.

Unit-I

The division algorithm, The greatest common divisor, least common multiple, The Euclidean algorithm.

Unit-II

The Diophantine equation ax + by = c, Prime numbers and their distribution, the fundamental theorem of arithmetic, Basic properties of congruences.

Unit-III

Linear congruences, Special divisibility tests, Chinese remainder theorem, The Fermat's theorem, Wilson's theorem

Unit-IV

Euler's Phi function, Euler's theorem, some properties of the Phi Function, σ and τ functions, Mobius Inversion formula, Greatest integer function

Text Book:
D. M. Burton, Elementary Number Theory, Mc Graw-Hill, seventh edition, 2010.

Reference Books,
1. Niven and Zuckerman, An Introduction to the theory of Numbers, John Willey & Sons, 1991.

Bachelor of Science (Economics) (Semester–V)
Session 2022-2023
Course Code: BECL-5453
Quantitative Techniques-V

Course outcomes:

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

CO1: understand the basics of methods of estimation and the process of formulation and of testing the hypothesis.

CO2: understand the theoretical details of sampling distributions

CO3: understand the basic applications of sampling distributions.

CO4: understand ANOVA to split and analyze the variations in economic phenomenon.

Bachelor of Science (Economics) (Semester–V)

Session 2022-2023

Course Code: BECL-5453

Quantitative Techniques-V

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

Theory: 80

CA: 20

Note: Instructions for the Paper–Setter:
Two questions, each carrying 16 marks, from each of the Units I-IV (i.e. a total of eight questions) are to be set. Candidates are required to attempt five questions, selecting at least one from each unit. The fifth question may be attempted from any unit.

UNIT–I

Statistical Inference: Point & Interval Estimation, Properties of a Good Estimator, Maximum Likelihood Method of Estimation and derivation of mean and variance of Binomial, Poisson and Normal distributions using MLE. Basic Concepts of Null and Alternative Hypotheses, Types of Errors, One Tailed and Two Tailed Tests, Power of Test, Critical Region.

UNIT–II

Sampling Distributions: Derivation of properties of Z, T, Chi Square and F distributions.

UNIT–III

Tests of significance based upon distribution of Z, t, F and Chi-square.

UNIT–IV

Analysis of Variance: Introduction, Assumptions, Techniques of Analyzing Variance-Analysis of Variance of one-way and two-way classification.

Suggested Readings:

1. Gupta and Kapoor(2014) , *Fundamentals of Mathematical Statistics* , Sultan Chand & Sons , New Delhi
2. Rangi S.S.(2016), Statistical Techniques, S. Vikas &Co. (Publishing House) India.

Note: The latest edition of the books is recommended.

Bachelor of Science (Economics) (Semester–V)
Session 2022-2023
Course Code: BECL--5134
COMPUTER SCIENCE
(DATA BASE MANAGEMENT SYSTEM)

Course Outcomes:

After passing course the student will be able to:

CO1: Understand data, database and database models.
CO2: Gain knowledge of normalization, security and recovery of database.
CO3: Create, manage and access database using SQL.
CO4: Comprehend the application of programming language constructs in database access.

Bachelor of Science (Economics) (Semester–V)
Session 2022-2023
Course Code: BECL--5134
COMPUTER SCIENCE
(DATA BASE MANAGEMENT SYSTEM)
(THEORY)

Examination Time: (3+3) Hrs. **Max. Marks: 100**
Theory: 50
Practical: 30
CA: 20

Instructions for Paper Setter -
Eight questions of equal marks (10 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 divided 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

DBMS: Introduction to database management system, Components of DBMS, Three Level Database System Architecture, ER. Diagrams. Data Models, Hierarchical Model, Network Model and Relational Model, Relational Databases, Relational Algebra and Calculus.

UNIT–II

Normalisation: Introduction, Normal Forms: 1NF, 2NF, 3NF, BCNF, 4NF, 5NF.
Database Security: Protection, Integrity.
Recovery: Introduction, Recovery Techniques: Log Based Recovery and Shadow Paging.
Concurrency Control: Introduction, Concurrency control with locking methods, Two Phase locking, Precedence graph, Concurrency control based on timestamp ordering, Concurrency control based on optimistic scheduling.

UNIT–III

SQL * PLUS: Introduction to Oracle , Features of Oracle .
SQL Statements: DDL, DML, DCL, TCL, constraints, Join methods & Sub query, Union, Intersection, Built in Functions, View, and Security amongst users, Sequences, indexing object

UNIT–IV

PL/SQL: Introduction to PL/SQL. Cursors – Implicit & Explicit. Procedures, Functions & Packages, Database Triggers.

References/Textbooks:

1. C. J. Date, An Introduction to Database Systems, Pearson Education 2000.
2. F. Korth & Silverschatz, A., Database System Concepts, Tata McGraw Hill, 2010.
3. Elmasri & Navathe, Fundamentals of Database Systems, Addison-Wesley, 2011.
4. B.C.Desai, An Introduction to Database Management System, Galgotia Publication, 1991.
5. Ivan Bayross, SQL, PL/SQL - The Programming Language of Oracle, BPB Publications, 2010.
6. Gurvinder Singh, Parteek Bhatia, Simplified Approach to DBMS, Kalyani Publishers, 2016.
7. Anshuman Sharma, Fundamentals of DBMS, Lakhanpal Publications, 4th Edition.

Note: The latest editions of the books should be followed.

Bachelor of Science (Economics) (Semester–V)
Session 2022-2023
Course Code: BECL-5134
COMPUTER SCIENCE
\(DATA BASE MANAGEMENT SYSTEM)
(PRACTICAL)

Examination Time: (3+3) Hrs.

Max. Marks: 100
Theory: 50
Practical: 30
CA: 20

Lab on database management system.

Bachelor of Science (Economics) (Semester–V)
Session 2022-2023
Course Code: BECL-5124
COMPUTER APPLICATIONS (VOCATIONAL)
(INTERNET AND WEB DESIGNING)

Course Outcomes:

After passing course the student will be able to:

CO1: Understand Internet and search engine basics and their working.

CO2: Gain knowledge of email service on different mail servers.

CO3: Understand different Internet protocols at application layer.

CO4: Have knowledge of basic web designing using HTML.

Bachelor of Science (Economics) (Semester–V)
Session 2022-2023
Course Code: BECL-5124
COMPUTER APPLICATIONS (VOCATIONAL)
(INTERNET AND WEB DESIGNING)
(THEORY)

Examination Time: (3+3) Hrs. **Max. Marks: 100**
Theory: 50
Practical: 30
CA: 20

Instructions for the Paper Setters:–
Eight questions of equal marks (10 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 divided 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

Internet: Introduction, its evolution, working, IP Address, DNS and its classification, working of DNS, Internet Services, ISP, Types of internet connection, Internet Security, Advantages, Disadvantages and Uses of Internet.

Search Engines: Introduction, its working, searching using google, web directory, Meta search engines.

UNIT – II

E–Mail: Introduction, its working, E-mail protocols: SMTP, POP, IMAP, Structure of E-mail, Operations on E-mail, Address Book, Signature, File attachment, MIME, Web based E-mail, Spams, Advantages and limitations of E-mail

Browsers: Introduction, Features of Internet Explorer and Google Chrome.

UNIT – III

HTTP: HTTP Protocol and its structure. **WWW:** Introduction and its working

TCP/IP Protocols: PPP, SLIP.

FTP: Introduction, its working, FTP Commands, FTP Session, Advantages and Disadvantages of FTP.

UNIT – IV

HTML and Web Designing: Introduction, Structure and creation of HTML document, Formatting Text, Lists, Font element, Advantages and Disadvantages of HTML, Hyperlinks, Images, Tables, Frames, Forms.

References:

1. Keith Sutherland, Understanding the Internet: A Clear Guide to Internet Technologies, Butterworth-Heinemann, 2000.
2. S. K. Bansal, Internet Technologies, APH Publishing Corporation, 2002.
3. Forouzan B., Data Communications and networking, McGraw Hill, 2007.

Note: The latest editions of the books should be followed.

Bachelor of Science (Economics) (Semester–V)
Session 2022-2023
Course Code: BECL-5124
COMPUTER APPLICATIONS (VOCATIONAL)
(INTERNET AND WEB DESIGNING)
(PRACTICAL)

Examination Time: (3+3) Hrs.

Practical on Internet and Web Designing.

Bachelor of Science (Economics) (Semester–V)
Session 2022-2023
Course Code: BECL-5175
Economics (Economics of Development)-V

Course outcomes

CO1: evaluate economic problems of developing and least developed countries and participate in the contemporary policy debate on development priorities

CO2: examine the models of growth critically and recognize the importance of their underlying assumptions

CO3: analyze the different strategies of economic development and their policy implications.

CO4: understand the role of planning and contribution of capital formation and choice of techniques in the development of UDCs and their changing landscape after globalization and liberalization

Bachelor of Science (Economics) (Semester–V)
Session 2022-2023
Course Code: BECL-5175
Economics (Economics of Development)

Time: 3 Hours **Max. Marks: 100**
Theory: 80
CA: 20

Note: Instructions for the Paper–Setter:
Two questions, each carrying 16 marks, from each of the Units I-IV (i.e. a total of eight questions) are to be set. Candidates are required to attempt five questions, selecting at least one from each unit. The fifth question may be attempted from any unit.

UNIT–I

Economic Development: Meaning and Measurement, Economic and Non-Economic Factor, Characteristics of Developing and Least Developed Countries. Human Development Index, Concept of Sustainable Development.

Dualism: Social and Technological Dualism

Lewis Model of Unlimited Supply of Labour, Problems of Unemployment and Disguised Unemployment.

UNIT–II

Models of Growth: Classical, Marxian, Schumpeter's, Harrod-Domar and Solow's Growth Models.

UNIT–III

Rostow's Stages of Growth

Strategies of Economic Development-Balanced vs. Unbalanced Growth; Theory of Big Push; Leibenstein's Critical Minimum Efforts Thesis

Export Promotion and Import Substitution.

UNIT–IV

Capital Formation – Meaning and Sources; **Choice of Technique**

Role of Planning in Under Developed Countries, Need, Objective, Strategy, Types and Problems of Planning.

Suggested Readings:

1. Meier, G.M.(1995),*Leading Issues in Economic Development*, Oxford University Press, New Delhi.
2. Thirlwall, A.P.(2011), *Economics of Development*, Palgrave Macmillan.
3. Todaro, M.P. and Smith, S.C. (2018), *Economic Development*, Pearson India
4. Misra and Puri (2017), *Economics of Development and Planning*, Himalaya Publishing House, New Delhi.
5. Jhingan,M.L.(2011), *The Economics of Development and Planning*, Vrinda Publications Pvt. Ltd., Delhi

Note: The latest edition of the books is recommended.

Bachelor of Science (Economics) (Semester–VI)
Session 2022-2023
Course Code: BECL-6421
PUNJABI (COMPULSORY)

COURSE OUTCOMES

CO1:eTft rot w*{ gV¶TA|7 YT YwoE ftfYNToEhN? NYo eft7Tt? g|7h fYWuAgh, A‖ w*{ g|YT eowT U‖

CO2: Oo7hN? Y rh7(A|owTYT)w fAWpA ftu PTfYW eo e ftfYNToEhN? NYo A|owTYT gV7 Yh o|uh w*{ g|YT eowT U N7 fTA ATfU7 o|g wTW wTW KV7T U‖

CO3: Wy ouwT N7 A'y'g ouwT eow wTW ftfYNToEh NTg7h rZW w{* efU7 Yh KTu fAZy7r N7 fTU fYYTrh eAo7 ftu AUTTh Utrh‖

CO5:ftNTeowe A|7hN? : fW'r, tuw,eToe fefoNT t¶e'P : gfoGTPT, p77o 7 g|eTo w*{ gV¶TA|7 YT YwoE ftfYNToEhN? NYo GTPT Yh NYhoh N7 pTohehN? w*{ AYl7 WTh tZyo -tZyo fAO?7? YT fteTA eowT U‖

Bachelor of Science (Economics) (Semester–VI)
Session 2022-2023
Course Code: BECL-6421
PUNJABI (COMPULSORY)

AY? : S x'N' **Maximum Marks: 50**
Theory 40
CA 10

gTOeY N7 gTO gA7e?

:fwN-I
eTft rot(gfUW S' eth)(AgT.fpeoY fA'x x|Y7, eoYKh7 e'o),r|o| wTwe Yt :whtofANh, NfY7Ao,
(Py |ohY, PTU U|A'w, r|o| wTwe Yt Kh, r|o| NoKw Yt Kh,tTfoA PTU, PTU Y|U'YY)
(g|A'r AfU7 ftNTfyNT/ftAT tA7/ATo) 8 N'e

:fwN-II
Oo7hN? Y` rh7(A|owTYT), pofKYo fA'x UYYoY,wTwe fA'x g|A7eYTWT, NfY|7Ao
(AYTK AfGNTuTo gfogy/AcowTY Y' 7'o 7' goy) 8 N'e

:fwN-III
(A) W'y ouwT(ftfrNTw, 7ewTW'Kh N7 uW'7 YAfWN? Ap'Oh)
(N) NTO|fwe ATfU7 o|g : eft7T, eUT7h, wTtW, wTNe, fTe?rh
8 N'e

:fwN-IV
ftNTeo7 :
(A) ftNTeowe A|'7hN? : fWr, tuw,eToe
(N) fefoNT tTe'P : gfoGTPT, p77o 7' g|eTo 8 N'e

N'e tv N7 gohfyNe WTh UYTfT7?
1. gPw gZ7o Y' uTo A'ePw U7r'AePw A-D 7Ze Y' gPw :fwN I-IV ftu'A g|ZS' KT7r' Uo A'ePw ftu Y' gPw g|ZS' KT7r'
2. ftfYNToEh w` e|W g'K gPw eow Uwl Uo AePw ftu'A fTe gPw WT!Yh U' gKt? g|Pw feA' th AePw ftu'A eh7T KT AeYT U'
S. Uoe gPw Y' 08 Ne Uwl
4. ggo A'ZN eow tTWT Keo uTU' 7? g|Pw? Yh tv NZr'A tZO 7'A tZO uTo A|g g|Pw? ftu eo AeYT U'

Bachelor of Science (Economics) (Semester–VI)
Session 2022-2023
Course Code: BECL-6031
PUNJABI (Basic)

COURSE OUTCOMES

CO1:fTA gou ftu ftfYNToEh AfGNTuTo Yh gfoGTPT, WZS7 AfGNTuToe gfoto7w? Y wTW fTA YT GrW, YwftfrNw 7 NToEe7T wTW A'p'O? pTo KTw7 7`A pTNY AfGNTuTo 7 AfGN7T, AfGNTuTo 7 ATfU7, AfGNTuTo 7 GTPT Y NTgAh A'p'O? YT NfONw eowrI

CO2:fTA 7'A fTWTtT g'KTph AfGNTuTo Y Y'W A'Y 7 g'KTph AfGNTuTo Y fwteW WZS7? pTo KT7 Ae7rI

CO3:ATfU7 feA AfGNTuTo Yh gPeToh Uh U'Yh U` 7 fTA gou oTUhA ftfYNToEh g'KTph AfGNTuTo YT NfONw eoe fTA Y AKht 7 r7tw WZS7? 7 gfto7hN? 7'A KT7' U7rI

Bachelor of Science (Economics) (Semester–VI)
Session 2022-2023
Course Code: BECL-6031
PUNJABI (Basic)

AY? : S x'N' Maximum Marks: 50
Theory : 40
CA 10

gTOeY
: fwN-I

g'KTph AfGNTuTo YT fgSeV
g'KTph AfGNTuTo Yh GrfWe AfE7h
g'KTph AfGNTuTo Y` fwyVt WZS7 08 Ne

: fwN-II

gKTp Y' Y'W'
gKTp Y' f7AUTo
gKTp Y' gYZy OTofYe AETw 08 Ne

: fwN-III

KwY wTW A'p'fO7 oh7? oAY?
ftNTU wTW A'p'fO7 oh7? oAY?
Y7 wTW ApfO7 oh7? oAY? 08 Ne

: fwN-IV

g'KTp YT yT7 gh7
g'KTp YT gfUoTtT
gKTp Y' We ftPtTA 08 Ne

Ne tv N7' gohfyNe WTh UYTfT7?

1. gPw gZ7o Y' uTo AePw U7rIAePw A-D 7Ze Y' gPw : fwN I-IV ftu'A gZS' KT7rI Uo AePw ftu Y' gPw gZS' KT7rI
2. ftfYNToEh w` eZW g'K gPw eow' Uwl Uo AePw ftu'A fTe gPw WT!Yh UI gKt? gPw feA' th AePw ftu'A eh7T KT AeYT UI
S. Uoe gPw Y` 08 NeUwI
4. ggo A'ZN eow tTWT Keo uTU' 7? gPw? Yh tv NZr'A tZO 7'A tZO uTo Ag gPw?

ftu eo AeYT UI

Bachelor of Science (Economics) (Semester–VI)
Session 2022-2023
Course Code: BECL-6431
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 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

CO 1 (a):- understand the history of Punjab from independence 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 of diaspora and growth of education in Punjab Punjabi literature and Drama in the Punjab after Independence

CO 4: understand the drug abuse problem, management and prevention in the Punjab

CO 4 (a) understand the problem of drug addiction and Female Foeticide in context to the Punjab

Bachelor of Science (Economics) (Semester–VI)
Session 2022-2023
Course Code: BECL-6431
Punjab History and Culture (1947- 2000 A.D.)
(Special paper in lieu of Punjabi Compulsory)
(For those students who are not domicile of Punjab)

Examination Time: 3 Hours **Max. Marks: 50**
Theory: 40
C A: 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 (Economics) (Semester–VI)
Session 2022-2023
Course Code: BECL-6212
ENGLISH (COMPULSORY)

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

CO2: 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

Bachelor of Science (Economics) (Semester–VI)
Session 2022-2023
Course Code: BECL-6212
ENGLISH (COMPULSORY)

Max. Marks: 50
Examination Time: 3 Hrs **Theories: 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). **(5x2=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). **(2x5=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). **(2x5=10)**

Section D: Two questions with internal choice will be set based on (a) Essay Writing, carrying six marks (word limit 300 words) (b) Report Writing, carrying four marks (word limit 200 words). **(1x6+1x4=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 and Report Writing

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

Bachelor of Science (Economics) (Semester–VI)

Session 2022-2023

Course Code: BECL-6333(I)

Course Title: Mathematics (Linear Algebra)

Course Outcomes

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

CO 1: Express the algebraic concepts such as binary operation, groups, rings and fields. Define a vector space and subspace of a vector space and check the linear dependence and linear independence of vectors.

CO 2: Describe the concepts of basis and dimension of vector spaces.

CO 3: Investigate properties of vector spaces and subspaces using linear transformation.

CO 4: Find the matrix representing a linear transformation.

Bachelor of Science (Economics) (Semester–VI)
Session 2022-2023
Course Code: BECL-6333(I)
Course Title: Mathematics (Linear Algebra)

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

Instructions for the paper setters/examiners:
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.

Unit-I

Definition of groups, rings and fields with examples. Definition of a vector space, subspaces with examples. Direct sum of subspaces. Linear span, Linear dependence, Linear independence of vectors. Linear combination of vectors.

Unit-II

Basis of a vector space, Finitely generated vector spaces. Existence theorem for basis. Invariance of the number of elements of the basis set. Dimension of sum of two subspaces. Quotient space and its dimension.

Unit-III

Linear transformation. Algebra of linear transformation. Rank-Nullity theorem, Isomorphism and Isomorphic spaces.

Unit-IV

Matrix of a linear transformation. Changes of basis, Linear operator.

Text Book:

C.W.Curtis, Linear Algebra, Springer, New York, 2017

Reference Books:

1.S. Singh, Linear Algebra, Vikas Publishing, sixth edition, 1983.
2. V. Krishnamurthy, V. P. Mainra and J. L. Arora, An Introduction to Linear Algebra, East West Press, 1976.
3. S. Narayan and P.K. Mittal, A Text Book of Matrices, S. Chand & Co, tenth edition, 1972.

Bachelor of Science (Economics) (Semester–VI)
Session 2022-2023
Course Code: BECL-6333(II)
Course Title: Mathematics (Numerical Analysis)

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

CO 1. Know how to find the roots of transcendental and polynomial equations.
CO 2. Perform computation for solving a system of equations.
CO 3. Learn how to interpolate the given set of values.
CO 4. Learn numerical solution of differential equations & compute numerical integration and differentiation, numerical solution of ordinary differential equations.

Bachelor of Science (Economics) (Semester–VI)
Session 2022-2023
Course Code: BECL-6333(II)
Course Title: Mathematics (Numerical Analysis)

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

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.
The students can use only Non Programmable& Non Storage Type Calculator.

Unit-I

Error generation, propagation, error estimation and error bounds, Solution of non-linear equations, Bisection method, Iteration method, Newton's Method, Generalized Newton's Method, Method of false position, Muller's method, Rate of convergence of these methods.

Unit-II

Solution of linear system of equation; Direct method, Gauss elimination variant (Gauss Jordan and Crout reduction), Triangular Method, Iterative Method, Jacobi's Method, Gauss Seidel Method. Finite Differences: Forward, Backward, Central, Divided differences, shift operator, relationship between the operators and detection of errors by use of difference operator. Interpolation with divided difference, Newton's formula, Lagrangian Method.

Unit-III

Finite difference interpolation, Gauss formula, Stirling formula, Bessel's formula, Error Estimation Extrapolation. Numerical differentiation, Method based on interpolation. Numerical Integration, Trapezoidal rule, Simpson's rule, Weddle rule, Romberg Integration, Gaussian integration method, Gaussian legendre integration. Double numerical integration.

Unit-IV

Numerical solution of ordinary differential equations, Initial value problem, Taylor's method, Euler's methods, Picard's method, Milne's Method, Runge-Kutta Method. Predictor- Corrector's Method.

Text Book:

M K Jain, S R K Iyenger, R K Jain, Numerical Methods for Scientific and Engineering Computation, New Age International Private Limited, Seventh edition, 2019.

Bachelor of Science (Economics)(Semester–VI)
Session 2022-2023
Course Code: BECL-6453
Quantitative Techniques-VI

Course outcomes:

After passing this course students will be able to:

CO1: understand the nature and methodology of econometrics.

CO2: understand the OLS procedure of estimation of model and tests of significance.

CO3: understand the nature and solutions of problems associated with estimation of regression

CO4: understand basics of dummy variables and estimation of models with lags.

Bachelor of Science (Economics)(Semester–VI)
Session 2022-2023
Course Code: BECL-6453
Quantitative Techniques-VI

Time: 3 Hours **Max. Marks: 100**
Theory: 80
CA: 20

Note: Instructions for the Paper–Setter:
Two questions, each carrying 16 marks, from each of the Units I-IV (i.e. a total of eight questions) are to be set. Candidates are required to attempt five questions, selecting at least one from each unit. The fifth question may be attempted from any unit.

Unit – I

Definition, Scope and Nature of Econometrics. Simple Linear Regression Model (OLS method) with applications

Unit – II

General Linear Regression Model: assumptions, properties (BLUE). Gauss-Markov Theorem (Two Variable and K-variable). Concepts of R^2 and Adjusted R^2, Test of Significance (Stress on Numericals);

Unit – III

Econometric Problems of Heteroscedasticity and Multicollineraity in the Regression Analysis: Sources, Consequences, Tests and Remedial Measures. Specification Bias.

Unit – IV

Problem of Auto-Correlation in the Regression Analysis: Sources, Consequences, Tests and Remedial Measures. Distributed Lag Models and Auto-Regressive Models (Introductory). Dummy Variable Technique and its uses.

Software:
SPSS - Defining Variable and Entering Data, Estimation of regression.

Suggested Readings:

1. Madnani GMK, (2015), *Introduction of Econometrics,* Oxford and IBH Publishing, N. Delhi.
2. Koutsoyiannis, A, *(2001), Theory of Econometrics,* The Macmillan Press Ltd., London.

Note: The latest edition of the books is recommended.

Bachelor of Science (Economics) (Semester–VI)
Session 2022-2023
Course Code: BECL-6134
COMPUTER SCIENCE
(INFORMATION TECHNOLOGY)

Course Outcomes:

After passing course the student will be able to:

CO1: Identify usage of various communication media and internet.

CO2: Acquaint with the usage of various information systems.

CO3: Comprehend digital marketing concepts and content.

CO4: Create and manage YouTube channel and blog.

Bachelor of Science (Economics) (Semester–VI)
Session 2022-2023
Course Code: BECL-6134
COMPUTER SCIENCE
(INFORMATION TECHNOLOGY)
(Theory)

Examination Time: (3+3) Hrs. **Max. Marks: 100**
Theory: 50
Practical: 30
CA: 20

Instructions for Paper Setter -
Eight questions of equal marks (10 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 divided 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. The students can use only Non–programmable & Non–storage type calculator

UNIT-I

Data and Network Communication: Communication media: Twisted pair, Coaxial, Fiber optics, Wireless (Line of Sight and Satellite), Network Advantages, Typesand Topologies, Communication using Network protocol/Network Interface card (NP/NIC), Transmission & Communication protocol/protocol (TCP/IP)
Internet: Internet basics**,** its uses and applications. System Development Process and System development Tools.

UNIT-II

Information Technology: Introduction to IT and its components, Information systems, Components of Computer based information systems. Types of Information systems- TPS, MIS, and DSS.

UNIT-III

Introduction to Digital Marketing: Digital Strategy and Planning, Website marketing tools, Digital content – website, blogs, email, webinars, videos, podcasts, e-zines, PPC advertising.
Social Media and Social Bookmarking: Facebook, Twitter, Pinterest, Instagram,
Search Engine Marketing: Meaning, Working and Search Engine Optimization,

UNIT-IV

YouTube Studio: Navigating studio, Uploading videos, Edit Video settings, Analytics, Copyright and Monetization.
Blog Writing: Blog Domain, choice of CMS, Register a domain or subdomain with a website host.

References/Textbooks:

1. Peter Norton, Introduction to Computers, McGraw Hill (2017), 7th edition.
2. Patrick, G.Mckeown, Living with the Computers, Harcourt College Pub (1990) 3rd edition.
3. Hussain & Hussain, Computer: Technology, Applications & Social Implications, PHI Learning (2006)
4. Behrouz A. Forouzan, Data Communications & Networking, McGraw-Hill Education (2012), 5th edition.
5. Andrew S. Tanenbaum, Computer Network, Prentice Hall (2010), 5th edition.
6. Abraham Silberschatz, Greg Gagne, Peter B. Galvin, Operating System Concepts, Wiley Publishers (2018), 10th edition.
7. Yashavant Kanetkar, Unix Shell Programming, BPB Publications (2003), 1st edition.

Bachelor of Science (Economics) (Semester–VI)
Session 2022-2023
Course Code: BECL-6134
COMPUTER SCIENCE
(INFORMATION TECHNOLOGY)
(PRACTICAL)

Examination Time: (3+3) Hrs.

Max. Marks: 100
Theory: 50
Practical: 30
CA: 20

Lab on Information Technology.

Bachelor of Science (Economics) (Semester–VI)
Session 2022-2023
Course Code: BECL-6124
COMPUTER APPLICATIONS (VOCATIONAL)
(BUSINESS DATA PROCESSING)

Course Outcomes:

After passing course the student will be able to:

CO1: Identify the impact of data and information on working of various organizations.

CO2: Comprehend different types of Data Processing Methods and File Processing techniques.

CO3: Create, edit, save, format and print spreadsheets.

CO4: Apply function and formulas in spreadsheets for data processing.

Bachelor of Science (Economics) (Semester–VI)
Session 2022-2023
Course Code: BECL-6124
COMPUTER APPLICATIONS (VOCATIONAL)
(BUSINESS DATA PROCESSING)

Examination Time: (3+3) Hrs.

Max. Marks: 100
Theory: 50
Practical: 30
CA: 20

Instructions for the Paper Setters:–
Eight questions of equal marks (10 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 divided 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 Data Processing, Need of Computers in Business.
Characteristics of Business Organization and Use of computers in various work areas of business like: Payroll System, Inventory Control, Online Reservation, Computer in Banks and Computer Application in Educational Institutions.

UNIT–II

Data Processing Methods: Batch Processing, Online Systems, Time Sharing, Real Time Systems and Distributed Processing.
File Organization: Types of Files (Master, Transaction, Work, Backup, Audit Files), File Organization (Serial, Sequential, Indexed Sequential, Direct Assess Files).

UNIT–III

Spreadsheets : Introduction, Worksheet, Data Entry, Editing, Cell Addressing Range, Copying and Moving Cell Content, Inserting and Deleting Rows and Column, Column Formats, Printing, Creating, displaying charts, Create, manage, and format pivot tables and pivot charts. Printing the Worksheet.

UNIT–IV

Working with functions - Date and time function, Statistical function, Mathematical and Trigonometric functions, Text function, Logical functions, other computations , using data analytics tools and what if analysis- data sort, fill, query, filter etc.

References:

1. Murdick& Ross, Introduction to Management Information Systems, Prentice Hall (1977).
2. Muneesh Kumar, Business Information Systems, Vikas Publishing (1998), 1st edition.
3. Silberschatz, Korth&Sudarshan, Database Systems Concepts, McGraw-Hill Inc.(2020), 7th edition.
4. Anshuman Sharma, Fundamentals of DBMS, Lakhanpal Publishers (2016), 4th edition.
5. Rachhpal Singh, Gurvinder Singh, Windows based computer courses, Kalyani Publishers (2011).
6. Peter Norton, Introduction to Computers, McGraw Hill Education (2017), 7th edition.

Bachelor of Science (Economics) (Semester–VI)
Session 2022-2023
Course Code: BECL-6124
COMPUTER APPLICATIONS (VOCATIONAL)
(BUSINESS DATA PROCESSING)
(PRACTICAL)

Examination Time: (3+3) Hrs.

Practical on business data processing.

Bachelor of Science (Economics) (Semester –VI)
Session 2022-2023
Course Code: BECL-6175
Economics (Quantitative Methods for Economists)

Course outcomes:

After passing this course students will be able to:

CO1: learn basic techniques of mathematics and its applications in economics

CO2: analyze data by using means of central tendency and dispersion.

CO3: understand the shapes of the curve and relationship between variables by using techniques of skewness, kurtosis and correlation.

CO4: learn prediction and forecasting by using regression

CO5: to find out relative changes in magnitude of related variables and also missing vales with in the data.

Bachelor of Science (Economics) (Semester –VI)
Session 2022-2023
Course Code: BECL-6175
Economics (Quantitative Methods for Economists)

Time: 3 Hours **Max. Marks: 100**
Theory: 80
CA: 20

Note: Instructions for the Paper–Setter:

Two questions, each carrying 16 marks, from each of the Units I-IV (i.e. a total of eight questions) are to be set. Candidates are required to attempt five questions, selecting at least one from each unit. The fifth question may be attempted from any unit.

UNIT–I

Sets, Relations and functions, Derivative of simple functions only (excluding log & exponential functions).Maxima/Minima for single variable functions. Introduction to Matrices - definition, properties & inverse.

UNIT–II

Measures of Central Tendency — Mean, Mode, Median and Geometric Mean; Measures of Dispersion.

UNIT–III

Concepts and Measure of Skewness and Kurtosis: Boyle's & Karl Pearson's measures. Simple Correlation & Regression (ungrouped & grouped data).

UNIT–IV

Interpolation: Concepts and Methods — Binomial expansion, Newton and Lagrange's Method (with emphasis on missing values only). Price Index Numbers–Weighted and Unweighted Index Numbers, various formulae and consistency tests.

Suggested Readings:

1. Gupta, S.P. (2014), *Statistical Methods*, Sultan Chand & Sons, New Delhi.
2. Gupta, S.C. (2018), *Fundamentals of Statistics*, Himalaya Publishing House, New Delhi
3. Elhance, D.N. and Elhance, V. (2018), *Fundamentals of Statistics* , Kitab Mahal, Allahabad
4. Croxton, F.E., Cowden D.J. and Klein. S. (1973), *Applied General Statistics*, 3rd. Ed., Prentice Hall of India, New Delhi.
5. Nagar, A.L. and Das, R.K. (1976), *Basic Statistics*, Oxford University Press, Bombay.
6. Aggarwal, C.S and Joshi, S.C.(2017) ,*Mathematics for Students of Economics*, New Academic Publishing Co., Jalandhar

Note: The latest edition of the books is recommended.