

Khalsa College Amritsar

(An Autonomous College)



Faculty of Mathematical Sciences

Syllabus for

B.Sc. (Hons.) Mathematics

Semester I-II

Session 2018-19

ACADEMIC SESSION : 2018-2019

Scheme of Course B.Sc.(Hons) Mathematics

Eligibility:- The Candidate having passed 10+2 Examination (Non-Medical) from recognized board.

Scheme and Schedule of Courses

Semester-I				
Sr.No.	Course No.	Course Title	Max.Marks	Hrs.
1.	BHMH-101	Differential Calculus	50	45
2.	BHMH-102	Co-ordinate Geometry	50	45
3.	BHMH-103	Algebra-I	50	45
4.	BHMH-104	Optics	50	45
5.	BHMH-105	Organic Chemistry-I	50	45
6.	BHMH-106	Communicative English-I	50	45
7.	BHMH-107(A)	Punjabi Compulsory-I	50	45
	BHMH-107(B)	OR Basic Punjabi-I	50	45
8.	BHMH-108	Physics Lab-I	30	30
9.	BHMH-109	Organic Chemistry Practical	30	30
10.	BHMH-110	Math Lab-I	40	30
Total			450	405

ACADEMIC SESSION : 2018-2019

Scheme of Course B.Sc.(Hons) Mathematics

Eligibility:- The Candidate having passed 10+2 Examination (Non-Medical) from recognized board.

Scheme and Schedule of Courses

Semester-II				
Sr.No.	Course No.	Course Title	Max.Marks	Hrs.
1.	BHMH-201	Integral Calculus	50	45
2.	BHMH-202	Solid Geometry	50	45
3.	BHMH-203	Algebra-II	50	45
4.	BHMH-204	Modern Physics	50	45
5.	BHMH-205	Inorganic Chemistry-II	50	45
6.	BHMH-206	Communicative English-II	50	45
7.	BHMH-207(A)	Punjabi Compulsory-II	50	45
	BHMH-207(B)	OR Basic Punjabi-II	50	45
8.	BHMH-208	Physics Lab-II	30	30
9.	BHMH-209	Inorganic Chemistry Practical	30	30
10.	BHMH-210	Math Lab-II	40	30
Total			450	405

Khalsa College Amritsar

Session-2018-19

B.Sc. Hons. (Mathematics) Sem-I

BHMH-101

Differential Calculus

Time: 3 Hours

Marks: 37

Internal Assessment: 13

Instructions for the Paper Setters:

1. The question paper will consist of three sections namely Section-A which will be from entire syllabus (equally distributed from each unit), Section-B from Unit-I and Section-C from Unit-II.
2. The Section-A will consist of seven compulsory questions, each of one mark.
3. The Section-B & C will consist of five questions each. Students are to attempt any five questions in total by selecting at least two questions from section-B & C. Each question carries 6 marks.
4. Teaching time for this paper would be six periods per week for each paper.

Unit-I

Limit of a function, basic property of limits, Continuous functions and classifications of discontinuities, Differentiation (Trigonometric and Inverse Trigonometric, Hyperbolic, Logarithmic, Parametrically defined functions , Implicit functions), Successive Differentiation, Leibnitz's Theorem, Taylor's and Maclaurin's theorem, Partial differentiation.

Unit-II

Tangents and Normals, Rolle's Theorem, Langrange's Mean Value theorem, Cauchy's Mean Value Theorem, Maxima and Minima (Single Variable), Indeterminate forms, Concavity and Points of inflexion, Asymptotes, Curvature and Evolutes.

Books Recommended:

1. Shanti Narayan and P.K. Mittal: Differential Calculus, S. Chand and Co.
2. S.P. Arya : Differential Calculus, Rastogi and Co.
3. S.C. Arora and Ramesh Kumar: A text Book of Calculus ,Pitamber Publication Co.
4. A.H.Siddiqi,P.Manchanda,M.Brookate,Calculus with Applications: I.K.International Publishing House, New Delhi.

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Session-2018-19

B.Sc. Hons. (Mathematics) Sem-I

BHMH- 102

Co-ordinate Geometry

Time: 3 Hours

Marks: 37

Internal Assessment: 13

Instructions for the Paper Setters:

1. The question paper will consist of three sections namely Section-A which will be from entire syllabus (equally distributed from each unit), Section-B from Unit-I and Section-C from Unit-II.
2. The Section-A will consist of seven compulsory questions, each of one mark.
3. The Section-B & C will consist of five questions each. Students are to attempt any five questions in total by selecting at least two questions from section-B & C. Each question carries 6 marks.
4. Teaching time for this paper would be six periods per week for each paper.

Unit-I

Polar Co-ordinates of a point, Relation between rectangular Cartesian and polar co-ordinates, polar equations of straight line, circle and system of circles. Transformation of axes, shifting of origin, Rotation of axes, the invariants, joint equation of pair of straight lines, equations of bisectors.

Unit-II

Parabola , Ellipse and Hyperbola with their properties. Tangents and normals, Pole and polar, pair of tangents at a point, Chord of contact, equation of the chord in terms of midpoint and diameter of conic. Identification of curves represented by second degree equation (including pair of lines).

Books Recommended

1. Gorakh Prasad and H.C. Gupta, Text Book on Coordinate Geometry.
2. S.L. Loney, The Elements of Coordinate Geometry, Macmillan and Company, London.
3. P.K Jain and Khalil Ahmed, Analytical Geometry Part I (3rd.Edition) New Age Publication House

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Session-2018-19

B.Sc. Hons. (Mathematics) SEM-I

BHMH-103

Algebra-I

Time: 3 Hours

Marks: 37

Internal Assessment: 13

Instructions for the Paper Setters:

1. The question paper will consist of three sections namely Section-A which will be from entire syllabus (equally distributed from each unit), Section-B from Unit-I and Section-C from Unit-II.
2. The Section-A will consist of seven compulsory questions, each of one mark.
3. The Section-B & C will consist of five questions each. Students are to attempt any five questions in total by selecting at least two questions from section-B & C. Each question carries 6 marks.
4. Teaching time for this paper would be six periods per week for each paper.

Unit-I

Rank of a matrix. Concept of equivalent matrices and to compute the rank of a matrix using equivalent matrix, normal form of a matrix, elementary operations on matrices and to determine the rank of a matrix by elementary transformations, Echelon form of a matrix and to determine row and column rank of a matrix by reducing it in echelon form. Linear independence of row and column vectors. Row rank and Column rank of a matrix, Equivalence of column and row ranks. Applications of matrices to solve a system of linear (both homogeneous and non-homogeneous) equations. Null space and nullity of a matrix. Theorems on consistency of a system of linear equations. Eigen values and Eigen vectors of a matrix, minimal and characteristic equation of a matrix. Cayley-Hamilton Theorem and its use in finding inverse of a matrix.

Unit-II

Real numbers and their properties, Polar representation of complex numbers, n^{th} roots of unity, De Moivre's theorem and its applications. Equivalence relations, Functions, Composition of functions, Invertible functions, One to one correspondence and cardinality of a set, Well-ordering property of positive integers, Division algorithm, Divisibility and Euclidean algorithm, Congruence relation between integers, Principles of Mathematical Induction, statement of Fundamental Theorem of Arithmetic.

Books Recommended

1. H.S. Hall and S.R. Knight: Higher Algebra, H.M. Publications, 1994.
2. Shanti Narayan & P.K. Mittal : A Text Book of Matrices, S.Chand & Co.
3. S.L. Loney: Trigonometry, Macmillian & Co.
4. M.K. Singal and Asha Rani Singal: Algebra, R. Chand and Co.

Khalsa College Amritsar

Session-2018-19

B.Sc. Hons. (Mathematics) SEM-I

BHMH-104

OPTICS

Time: 3 Hours
Total Lectures: 60

Total Marks: 50
Theory Marks: 37
Internal Assessment: 13

Note for paper setter and students:

1. There will be five sections.
2. Section A carries 9 marks and is compulsory consisting of eight short answer type questions of 1.5 marks each covering the whole syllabus. The candidate will have to attempt six questions in section A.
3. Sections B, C, D and E will be set from units I, II, III & IV respectively and will consist of two questions of 7 marks each from the respective unit. The candidates are required to attempt one question from each of these sections.
4. Scientific calculator is allowed.

UNIT-I

Ray Optics: Reflection of light, Refraction of light, Total internal reflection and its applications, Lenses, Lens maker's formula, Refraction and dispersion through a prism, Scattering of light, Microscope and its magnifying power.

UNIT-II

Interference: Young's experiment, Coherent Source, Phase and path differences, Theory of interference fringes, Fresnel's biprism, Thickness of thin transparent sheet, Interference in thin film due to reflected and transmitted light, Colour of thin film, Newton's rings and their applications, Michelson interferometer, Feby-Perot Interferometer, Anti reflection coatings.

UNIT-III

Diffraction: Introduction, Fraunhofer diffraction at a single slit and its discussion, Fraunhofer diffraction at double slit, Missing orders in a double slit, Diffraction of N slits and its discussion, Diffraction grating, dispersive power, Rayleigh criterion for resolving power, Resolving power of a diffraction grating.

UNIT-IV

Polarization: Transverse nature of light, Polarization by reflection and refraction, Brewster's Law, Malus Law, Double refraction, Nicol Prism, Elliptically and circularly polarized light, Quarter-wave and half-wave plates, Production and detection of polarized light, Optical activity, Specific rotation. Half shade polarimeter.

Reference Books:

1. A Text Book of Optics: N. Subramanayam, B. Lal and M. N. Avadhanulu.
2. Optics: Ajoy Ghatak. Tata Mc Graw Hill Publishing Company Limited.
3. Fundamentals of Optics: Jenkins and White.
4. A Text Book of Optics: T. S. Bhatia, V. K. Sharma, S. Vikas & Company.

Khalsa College Amritsar

Session-2018-19

B.Sc. Hons. (Mathematics) SEM-I

Organic Chemistry-I

BHMH-105

45 Hrs.

Time: 3 Hrs/week.

Max. Marks: 37+13 (Internal Assessment)

Instructions for paper setters and candidates

- I. Examiner will make five sections of paper namely Section-I, II, III, IV and V
- II. Examiner will set total of NINE questions comprising ONE compulsory question of short answer type covering whole syllabi and TWO questions from each unit.
- III. Section-I will consist of eight short answer type questions carrying 1½ mark each. Students are required to attempt any six questions.
- IV. Section-II, III, IV and V of paper will consist of EIGHT questions in total having TWO questions from each unit of the syllabus and each question carry 7 Marks.
- V. The students are required to attempt FIVE questions in all, taking ONE Compulsory question of section-I and one question from each section i.e. II, III, IV and V.

UNIT-I

10Hrs

Stereochemistry: Molecular chirality, enantiomers/symmetry in achiral structures, chiral centres in chiral molecules, properties of chiral molecules-optical activity, absolute and relative configuration, the Cahn-Ingold Perlog R-S notional system physical properties of enantiomers. Stereochemistry of chemical reactions that produce chiral centres, chemical reactions that produce stereoisomers, Resolution of enantiomers, chiral centres other than carbon.

UNIT-II

12Hrs

Chemistry alkanes and alkenes: Conformations of alkanes and cycloalkanes: conformational analysis of ethane, butane, cyclohexane, monosubstituted and disubstituted cyclohexane, conformation of small, medium and large ring cycloalkanes and of polycyclic ring systems. Stereochemistry of alkenes, naming stereo isometric alkenes by the E-Z system, mechanism of hydrogenation of alkenes, stereochemistry of hydrogenation of cycloalkenes, Dehydration of alcohols and regioselectivity of these reactions. Acid catalysed dehydration of alcohols with complete mechanistic discussion, Mechanism of dehydrohalogenation of alkylhalides (E mechanism), stereoselective and antielimination in E reactions, the E Mechanism, electrophilic addition of hydrogen halides to alkenes its regioselectivity explained on the basis of mechanism, free radical addition of hydrogen bromide to alkenes, acid catalysed hydration of alkene with mechanism stereochemistry of halogen addition to alkenes and its mechanistic explanation. Hypohalous acid addition to alkenes, epoxidation of alkenes.

Alkynes: Acidity of acetylene and terminal alkenes, metal ammonia reduction of alkyne, addition of hydrogen halides and water to alkynes, with detailed discussion of mechanism of these

reactions, the diels Alder reaction, orbital symmetry and the diels Adler reaction.

UNIT-III

12Hrs

Nucleophilic substitution and addition reaction:

(a) Functional group transformation by nucleophilic substitution, the bimolecular(SN), mechanism of nucleophilic substitution, stereochemistry of SN reactions, how SN reactions occur, steric effect in SN reactions, nucleophiles and nucleophilicity, the unimolecular (SN) mechanism of nucleophilic substitution, carbocation stability and the rate of substitution, by the SN mechanism stereochemistry of SN reactions, carbocation real arrangements in SN reactions, solvent effects, substitution and elimination as competing reactions. The SN -SN.

(b) Principles of nucleophilic addition to carbonyl groups : Hydration acetal formation, cyanohydrin formation ; reactions with primary and secondary amines, Whittig reaction, stereoselective addition to carbonyl groups mechanism of halogenation, acid and base catalysed chlorination, haloform reaction, aldol condensation, conjugate nucleophilic addition to unsaturated carbonyl compounds

UNIT-IV

11Hrs

Spectroscopy: Principles of molecular spectroscopy, electromagnetic radiation, quantized energy states, NMR(H) Spectroscopy, nuclear shielding and Chemical shift measurements chemical shift and molecular structure, interpreting proton NMR spectra, spin- spin splitting in NMR spectroscopy, patterns of spin-spin splitting, proton NMR spectra of alcohols, NMR and conformations carbons- 13 nuclear magnetic resonance, the sensitivity problem, interpretation of spectra. Infrared spectroscopy, ultraviolet-visible (UV-VIS) spectroscopy and mass spectrometry.

Text and Reference Books:

1. R.T. Morrison and R.N. Boyd, Organic Chemistry.
2. I.L. Finar, Organic Chemistry, Vol. I IV ed.
3. Advanced Organic Chemistry, Reactions Mechanisms and Structure by J. March.
4. Schaum's Outlines Series Theory and Problems of Organic Chemistry by Herbert Meislick and Jacob Sharefkin
5. Problems and their solution in Organic chemistry by I.L. Finar, Modern Organic Chemistry by J.D. Roberts and M.C. Caserio.
6. Organic Chemistry by D.J. Cram and G.S. Hammond.
7. J.E. Banks, Naming Organic Compounds – Programmed Introduction to Organic Chemistry.
8. E.L. Eliel, Stereochemistry of carbon compounds.
9. W. Camp, Organic Spectroscopy.
10. F.A. Carey, Organic Chemistry.

Khalsa College Amritsar
Session-2018-19
B.Sc. Hons. (Mathematics) SEM-I
COMMUNICATIVE ENGLISH
BHMH-106

TIME : 3 Hrs

Max. Marks: 50
Theory: 37
Internal Assessment: 13

1 Texts Prescribed:

1. *Tales of Life* (Guru Nanak Dev University, Amritsar)
2. *Comprehensive English Grammar* (Pragati Books Jalandhar)

Course Contents :

- 1) Stories at Sr.No. 1,2,3,5,6 from *Tales of Life*.
- 2) Sentences (47-60). From *Comprehensive English Grammar*

Instructions for the Paper Setter and Distribution of Marks:

The question paper will consist of three sections and distribution of marks will be as under:

Section A: 10 Marks

Section B: 19 Marks

Section C: 8 Marks

Section–A

Fifteen (15) Questions on usage of grammar related to the prescribed units of Comprehensive English Grammar will be set for the students to attempt **any Ten (10)**
(1X 10= 10 Marks)

Section–B

2) Five (5) questions on theme, characterization, tone and style etc. Will be set. The students will be required to attempt **any three (3)** questions. The answer to each question should not exceed 15-20 sentences.

(5X3 =15 Marks)

3) Comprehension of Unseen Passage. (4 marks)

Section –C

4) Report of College Activities in about 150-200 words. (4 Marks)

5) Write A notice for College Notice Board (4 Marks)

Recommended Text:-

Comprehensive English Grammar: Dr Neb (Pragati Publications)

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B.Sc. Hons. (Mathematics) SEM-I

BHMH-107(A)

ਪੰਜਾਬੀ (ਲਾਜ਼ਮੀ)

ਸਮਾਂ : 3 ਘੰਟੇ

ਥਿਊਰੀ ਅੰਕ : 37

ਇੰਟਰਨਲ ਅਸੈਸਮੈਂਟ : 13

ਕੁਲ ਅੰਕ: 50

ਪਾਠ-ਕ੍ਰਮ ਅਤੇ ਪਾਠ-ਪੁਸਤਕਾਂ

1. ਸਾਹਿਤ ਦੇ ਰੰਗ (ਸੰਪਾ. ਡਾ. ਮਹਿਲ ਸਿੰਘ), ਭਾਗ ਪਹਿਲਾ (ਕਵਿਤਾ ਅਤੇ ਕਹਾਣੀ), ਰਵੀ ਸਾਹਿਤ ਪ੍ਰਕਾਸ਼ਨ, ਅੰਮ੍ਰਿਤਸਰ।
2. ਪੈਰੂਾ ਰਚਨਾ
3. ਪੈਰੂਾ ਪੜ੍ਹ ਕੇ ਪ੍ਰਸ਼ਨਾਂ ਦੇ ਉੱਤਰ।
4. (ੳ) ਪੰਜਾਬੀ ਧੁਨੀ ਵਿਉਤ : ਉਚਾਰਨ ਅੰਗ, ਉਚਾਰਨ ਸਥਾਨ ਤੇ ਵਿਧੀਆਂ, ਸਵਰ, ਵਿਅੰਜਨ, ਸੁਰ।
(ਅ) ਭਾਸ਼ਾ ਵੰਨਗੀਆਂ : ਭਾਸ਼ਾ ਦਾ ਟਕਸਾਲੀ ਰੂਪ, ਭਾਸ਼ਾ ਅਤੇ ਉਪ-ਭਾਸ਼ਾ ਦਾ ਅੰਤਰ, ਪੰਜਾਬੀ ਉਪਭਾਸ਼ਾਵਾਂ ਦੇ ਪਛਾਣ-ਚਿੰਨ੍ਹ।
5. ਮਾਤ ਭਾਸ਼ਾ ਦਾ ਅਧਿਆਪਨ
(ੳ) ਪਹਿਲੀ ਭਾਸ਼ਾ ਦੇ ਤੌਰ ਉੱਤੇ
(ਅ) ਦੂਜੀ ਭਾਸ਼ਾ ਦੇ ਤੌਰ ਉੱਤੇ

ਅੰਕ-ਵੰਡ ਅਤੇ ਪਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ

1. ਕਿਸੇ ਕਵਿਤਾ ਦਾ ਸਾਰ ਜਾਂ ਉਸਦਾ ਵਿਸ਼ਾ ਵਸਤੂ (ਦੋ ਵਿਚੋਂ ਇੱਕ) 7 ਅੰਕ
2. ਕਿਸੇ ਕਹਾਣੀ ਦਾ ਸਾਰ, ਉਸਦਾ ਵਿਸ਼ਾ ਵਸਤੂ, ਕਹਾਣੀ ਕਲਾ ਜਾਂ ਪਾਤਰ ਉਸਾਰੀ (ਦੋ ਵਿਚੋਂ ਇੱਕ) 7 ਅੰਕ
3. ਪੈਰੂਾ ਰਚਨਾ : ਤਿੰਨ ਵਿਸ਼ਿਆਂ ਵਿਚੋਂ ਕਿਸੇ ਇੱਕ ਉੱਤੇ ਪੈਰੂਾ ਲਿਖਣ ਲਈ ਕਿਹਾ ਜਾਵੇ। 4 ਅੰਕ
4. ਪੈਰੂਾ ਦੇ ਕੇ ਉਸ ਬਾਰੇ ਚਾਰ ਪ੍ਰਸ਼ਨਾਂ ਦੇ ਉੱਤਰ 4 ਅੰਕ
5. ਨੰਬਰ 5 ਉੱਤੇ ਦਿੱਤੀ ਵਿਆਕਰਣ ਦੇ ਆਧਾਰ 'ਤੇ ਵਰਣਨਾਤਮਕ ਪ੍ਰਸ਼ਨ 7 ਅੰਕ
6. ਨੰਬਰ 6 ਵਿਚ ਮਾਤ ਭਾਸ਼ਾ ਦੇ ਪਹਿਲੀ ਭਾਸ਼ਾ ਅਤੇ ਦੂਜੀ ਭਾਸ਼ਾ ਵਜੋਂ ਅਧਿਆਪਨ, ਮਹੱਤਵ ਅਤੇ ਸਮੱਸਿਆਵਾਂ ਬਾਰੇ ਚਾਰ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ, ਜਿਨ੍ਹਾਂ ਵਿਚੋਂ ਵਿਦਿਆਰਥੀ ਨੇ ਦੋ ਦਾ ਉੱਤਰ ਦੇਣਾ ਹੋਵੇਗਾ।

(4×2)=8 ਅੰਕ

ਨੋਟ: ਇੰਟਰਨਲ ਅਸੈਸਮੈਂਟ 13 ਅੰਕਾਂ ਦੀ ਹੈ, ਜੋ ਕਾਲਜ ਵਲੋਂ ਨਿਰਧਾਰਿਤ ਦਿਸ਼ਾ ਨਿਰਦੇਸ਼ਾਂ ਅਨੁਸਾਰ ਇਨ੍ਹਾਂ ਅੰਕਾਂ ਤੋਂ ਵੱਖਰੀ ਹੋਵੇਗੀ। ਇਸ ਪੇਪਰ ਦੇ ਕੁਲ ਅੰਕ 37+13 = 50 ਹਨ।

Khalsa College Amritsar

Session-2018-19

B.Sc. Hons. (Mathematics) SEM-I

BHMH-107(B)

ਮੁੱਢਲੀ ਪੰਜਾਬੀ

(In Lieu of Compulsory Punjabi)

ਸਮਾਂ : 3 ਘੰਟੇ

ਥਿਊਰੀ ਅੰਕ : 37

ਇੰਟਰਨਲ ਅਸੈਸਮੈਂਟ : 13

ਕੁਲ ਅੰਕ: 50

1. **ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਤੇ ਗੁਰਮੁਖੀ ਲਿਪੀ**
ੳ) ਨਾਮਕਰਣ ਤੇ ਸੰਖੇਪ ਜਾਣ ਪਛਾਣ : ਗੁਰਮੁਖੀ ਵਰਣਮਾਲਾ, ਅੱਖਰ ਕ੍ਰਮ, ਸਵਰ ਵਾਹਕ (ੳ ਅ ਈ), ਲਗਾਂ ਮਾਤਰਾਂ, ਪੈਰ ਵਿਚ ਬਿੰਦੀ ਵਾਲੇ ਵਰਣ, ਪੈਰ ਵਿਚ ਪੈਣ ਵਾਲੇ ਵਰਣ, ਬਿੰਦੀ, ਟਿੱਪੀ, ਅੱਧਕ।
ਅ) ਸਿਖਲਾਈ ਤੇ ਅਭਿਆਸ **12 ਅੰਕ**
2. **ਗੁਰਮੁਖੀ, ਆਰਥੋਗ੍ਰਾਫੀ ਅਤੇ ਉਚਾਰਨ** : ਸਵਰ, ਵਿਅੰਜਨ : ਮੁੱਢਲੀ ਜਾਣ-ਪਛਾਣ ਅਤੇ ਉਚਾਰਣ, ਮੁਹਾਰਨੀ, ਲਗਾਂ ਮਾਤਰਾਂ ਦੀ ਪਛਾਣ । **10 ਅੰਕ**
3. **ਪੰਜਾਬੀ ਸ਼ਬਦ ਜੋੜ** : ਮੁਕਤਾ (ਦੋ ਅੱਖਰਾਂ ਵਾਲੇ ਸ਼ਬਦ, ਤਿੰਨ ਅੱਖਰਾਂ ਵਾਲੇ ਸ਼ਬਦ), ਸਿਹਾਰੀ ਵਾਲੇ ਸ਼ਬਦ, ਬਿਹਾਰੀ ਵਾਲੇ ਸ਼ਬਦ, ਔਂਕੜ ਵਾਲੇ ਸ਼ਬਦ, ਦੁਲੈਂਕੜ ਵਾਲੇ ਸ਼ਬਦ, ਲਾਂ ਵਾਲੇ ਸ਼ਬਦ, ਦੁਲਾਵਾਂ ਵਾਲੇ ਸ਼ਬਦ, ਹੋੜੇ ਵਾਲੇ ਸ਼ਬਦ, ਕਨੌੜੇ ਵਾਲੇ ਸ਼ਬਦ, ਲਗਾਂਖਰ (ਟਿੱਪੀ, ਬਿੰਦੀ, ਅੱਧਕ) ਵਾਲੇ ਸ਼ਬਦ, ਸ਼ੁੱਧ-ਅਸ਼ੁੱਧ। **15 ਅੰਕ**

ਅੰਕ ਵੰਡ ਅਤੇ ਪਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ

1. ਪਹਿਲੇ ਭਾਗ ਵਿਚੋਂ ਵਰਣਨਾਤਮਕ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ। ਜਿਨ੍ਹਾਂ ਵਿਚੋਂ ਤਿੰਨ ਪ੍ਰਸ਼ਨਾਂ ਦਾ ਉੱਤਰ ਦੇਣਾ ਲਾਜ਼ਮੀ ਹੈ। ਹਰ ਪ੍ਰਸ਼ਨ ਦੇ ਚਾਰ-ਚਾਰ ਅੰਕ ਹਨ। **(4+4+4) 12 ਅੰਕ**
2. ਭਾਗ ਦੂਸਰਾ ਵਿਚੋਂ ਦੋ-ਦੋ ਨੰਬਰ ਦੇ ਪੰਜ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ। ਸਾਰੇ ਪ੍ਰਸ਼ਨ ਲਾਜ਼ਮੀ ਹਨ। **10 ਅੰਕ**
3. ਭਾਗ ਤੀਸਰਾ ਵਿਚੋਂ ਤਿੰਨ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ। ਜਿਨ੍ਹਾਂ ਦੇ ਪੰਜ-ਪੰਜ ਅੰਕ ਹਨ। **15 ਅੰਕ**

Khalsa College Amritsar

Session-2018-19

B.Sc. Hons. (Mathematics) SEM-I

BHMH-108

Physics Lab-I

General Guidelines for Practical Examination

Periods 4 Periods/week

Time: 3 Hours

Total Marks: 30

(Max. Marks: 22 + Internal Assessment: 08)

I. The distribution of marks is as follows:

i) One experiment **10 Marks**

ii) Brief Theory **4 Marks**

iii) Viva-Voce **4 Marks**

iv) Record (Practical file) **4 Marks**

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

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

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

1. To find the angle of prism by rotating telescope.
2. To find the refractive index of the glass prism using a spectrometer.
3. To find the refractive index of a transparent liquid using a hollow glass prism and spectrometer for given wavelength.
4. To study the variation of refractive index with wavelength of spectral line of mercury source and hence find the values of Cauchy's constant.
5. To measure the wavelength of sodium light by using Newton's rings apparatus.
6. To determine the wavelength of spectral line of mercury using diffraction grating.
7. To determine the wavelength of sodium light using plane diffraction grating.
8. To determine the resolving power of plane diffraction grating.
9. To measure an accessible distance between two points using a sextant.
10. To measure an inaccessible distance between two points using a sextant.
11. To find the magnification power of a telescope.
12. To find the specific rotation of sugar solution by Laurentz half shade polarimeter

Reference Books :

Practical Physics Vol.II, T.S. Bhatia, Gursharan Kaur, Iqbal Singh, Vishal Publications

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

Khalsa College Amritsar

Session-2018-19

B.Sc. Hons. (Mathematics) SEM-I

Organic Chemistry Practical

BHMH-109

Max. Marks: 22+8 (Internal Assessment)

Labs 3 Hrs/week

The preliminary examination of physical and chemical characteristics (physical state, colour, odor and ignition tests), elemental analysis (nitrogen, sulphur, chlorine, bromine, iodine), solubility tests including acid-base reactions, classification tests involving functional reactivity other than acid-base test, preparation of derivatives for given pure organic compounds.

The following categories of compounds should be analyzed.

-phenols, carboxylic acids

-carbonyl compounds - ketones, aldehydes

-carbohydrates

-aromatic amines

-aromatic hydrocarbons

Suggested Book:

Practical Organic Chemistry by F.G. Mann and B.C. Saunders

Khalsa College Amritsar
Session-2018-19
B.Sc. Hons. (Mathematics) SEM-I
BMH-110
Math Lab-I

Max. Marks: 30+10 (Internal Assessment)

Labs Hrs. 30

List of Practical's (using any software):-

(a) Operations on matrices using Matlab:

1. Addition of matrices
2. Subtraction of matrices
3. Multiplication of matrices
4. Inverse of matrices
5. Determinants of matrices
6. Eigen values and Eigen vectors of matrices
7. Rank of matrices

(b) Plotting of graphs of function e^{ax+b} , $\log(ax+b)$, $1/(ax+b)$, $\sin(ax+b)$, $\cos(ax+b)$, $|ax+b|$ and to illustrate the effect of a and b on the graph.

(c) Plotting the graphs of polynomial of degree 4 and 5, the derivative graph, the second derivative graph and comparing them.

(d) Sketching parametric curves (e.g. Parabola, ellipse, hyperbola).

(e) Tracing of conics in Cartesian coordinates/ polar coordinates.

Books Recommended:

1. Thomas, George B., and Finney Ross L. Calculus. Pearson Education, 9th Ed, 2010.
2. Strauss, M.J., and G.L. Bradley and K. J. Smith. Calculus. Delhi: Dorling Kindersley (India) P. Ltd. (Pearson Education), 3rd Ed, 2007.
3. Anton, H., and I. Bivens, and S. Davis. Calculus. Singapore: John Wiley and Sons (Asia) P. Ltd., 7th Ed. 2002.
4. Courant, R., and F. John. Introduction to Calculus and Analysis. New York: Springer-Verlag (Volumes I & II), 1989.

Khalsa College Amritsar

Session-2018-19

B.Sc. Hons(Mathematics) Sem-II

BMMH-201

Integral Calculus

Time: 3 Hours

Marks: 37

Internal Assessment: 13

Instructions for the Paper Setters:

1. The question paper will consist of three sections namely Section-A which will be from entire syllabus (equally distributed from each unit), Section-B from Unit-I and Section-C from Unit-II.
2. The Section-A will consist of seven compulsory questions, each of one mark.
3. The Section-B & C will consist of five questions each. Students are to attempt any five questions in total by selecting at least two questions from section-B & C. Each question carries 6 marks.
4. Teaching time for this paper would be six periods per week for each paper.

Unit-I

Integral of a function, definite integrals and their properties, geometrical interpretation of a definite integral, integration by substitution, integration of a rational function, Integration of Trigonometric functions, , Integration of hyperbolic functions. Trapezoidal, Simpson's and Prismoidal rules. Reduction Formulae

Unit-II

Area enclosed by two curves, Quadrature, Rectification, volume and surface of revolution, C.G. and M.I., Fundamental Theorem of integral calculus and applications, Beta and Gamma Functions.

Books Recommended:

1. G.B. Thomas and R.L. Finney, Calculus, 9th Ed, Pearson Education, Delhi, 2005.
2. Erwin Kreyszig: Advanced Engineering Mathematics, John Wiley and Sons, 1999.
3. Shanti Narayan and P.K. Mittal: Integral Calculus, S. Chand and Co.
4. M.J. Strauss, G.L. Bradley and K.J. Smith, Calculus, 3rd Ed, Dorling Kindersley(India) P. Ltd. (Pearson Education), Delhi, 2007.
5. A text Book of Calculus: S.C.Arora and Ramesh Kumar, Pitamber Publishing Co.

Khalsa College Amritsar

Session-2018-19

B.Sc. Hons. (Mathematics) SEM-II

BHMH- 202

Solid Geometry

Time: 3 Hours

Marks: 37

Internal Assessment: 13

Instructions for the Paper Setters:

1. The question paper will consist of three sections namely Section-A which will be from entire syllabus (equally distributed from each unit), Section-B from Unit-I and Section-C from Unit-II.
2. The Section-A will consist of seven compulsory questions, each of one mark.
3. The Section-B & C will consist of five questions each. Students are to attempt any five questions in total by selecting at least two questions from section-B & C. Each question carries 6 marks.
4. Teaching time for this paper would be six periods per week for each paper.

Unit-I

The plane, The line, angle between line and a plane, shortest distance between two lines. Intersection of three planes, condition for three planes to intersect in a point or along a line or to form a prism. Change of axes, Shift of origin, rotation of axes, 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 w.r.t. a sphere, radical planes.

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

Books Recommended:

1. Narayan.S. & Mittal P.K. : Analytical Solid Geometry, S. Chand & Co.
2. Krysizig, E. : Advanced Engineering Mathematics, John Wiley & Sons.
3. P.K Jain and Khalil Ahmed, Analytical Geometry Part II (3rd.Edition) New Age Publication House

Khalsa College Amritsar

Session-2018-19

B.Sc. Hons. (Mathematics) SEM-II

BHMH- 203

Algebra-II

Time: 3 Hours

Marks: 37

Internal Assessment: 13

Instructions for the Paper Setters:

1. The question paper will consist of three sections namely Section-A which will be from entire syllabus (equally distributed from each unit), Section-B from Unit-I and Section-C from Unit-II.
2. The Section-A will consist of seven compulsory questions, each of one mark.
3. The Section-B & C will consist of five questions each. Students are to attempt any five questions in total by selecting at least two questions from section-B & C. Each question carries 6 marks.
4. Teaching time for this paper would be six periods per week for each paper.

Unit-I

Introduction to linear transformations, matrix of a linear transformation, inverse of a matrix, characterizations of invertible matrices. Subspaces of \mathbb{R}^n , dimension of subspaces of \mathbb{R}^n . Quadratic forms, 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 n - variables. Definite, semi definite and indefinite real quadratic forms. Characteristic properties of definite, semi definite and indefinite forms.

Unit-II

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

Books Recommended

1. K.B. Dutta: Matrix and Linear Algebra, Prentice Hall of India Pvt. Ltd., New Delhi (2002).
2. H.S. Hall and S.R. Knight: Higher Algebra, H.M. Publications, 1994.
3. Shanti Narayan and P.K. Mittal: A Text Book of Matrices, S.Chand and Co.

Khalsa College Amritsar

Session-2018-19

B.Sc. Hons. (Mathematics) SEM-I

BHMH- 204

Modern Physics

Time: 3 Hour

Total Marks: 50

Max. Marks: 37

Internal Assessment: 13

Note for paper setter and students:

1. There will be five sections.
2. Section A carries 9 marks and is compulsory consisting of eight short answer type questions of 1.5 marks each covering the whole syllabus. The candidate will have to attempt six questions in section A.
3. Sections B, C, D and E will be set from units I, II, III & IV respectively and will consist of two questions of 7 marks each from the respective unit. The candidates are required to attempt one question from each of these sections.
4. Scientific calculator is allowed.

UNIT-I

Atomic Structure: Structure of Atom, Rutherford Scattering, Impact parameter, Distance of closest approach, Nucleus and its properties, The Bohr model of atom, Electron orbits, Energy levels and Hydrogen spectra, Bohr's correspondence principle, Atomic excitation, Franck Hertz experiment, Introduction to Lasers, Einsteins coefficients, He-Ne Laser.

UNIT-II

Radioisotopes and their Application: Radioactivity, Radioactive decay laws, Uranium and Carbon dating, α , β and γ decays and their properties, Radioisotopes, their production and separation, Uses of radioisotopes in medicine, agriculture and geology, Radiation doses and their units, Biological effects of radiation.

UNIT-III

Dual Nature of Matter and Radiation: Planck's quantum hypothesis, de Broglie's hypothesis, Electron diffraction experiments of Davisson and Gemen, Wave group and particle velocities, Heisenberg's uncertainty principle, Principle of the electron microscope, Diffraction of X-rays from crystals, , Bragg's law of diffraction.

UNIT-IV

Elementary Particles: Classification of elementary particles and their properties, Antiparticles, Conservation laws (qualitative only), Uses of ionization chamber, G.M. Counter, Scintillation counter and Photographic emulsions as detectors, Origin and general characterization of cosmic rays (Primary and Secondary).

Reference Books:

1. Concepts of Modern Physics: A. Beiser.
2. Essentials of Modern Physics: V. Acosta and C. L. Grown
3. Fundamentals of Modern Physics: B. D. Duggal and C. L. Chhabra.

Khalsa College Amritsar

Session-2018-19

B.Sc. Hons. (Mathematics) SEM-I

BHMH-205

Inorganic Chemistry-II

45 Hrs.

Time: 3 Hrs/week.

Max. Marks: 37+13 (Internal Assessment)

Instructions for paper setters and candidates

- I. Examiner will make five sections of paper namely Section-I, II, III, IV and V
- II. Examiner will set total of NINE questions comprising ONE compulsory question of short answer type covering whole syllabi and TWO questions from each unit.
- III. Section-I will consist of eight short answer type questions carrying 1½ mark each. Students are required to attempt any six questions.
- IV. Section-II, III, IV and V of paper will consist of EIGHT questions in total having TWO questions from each unit of the syllabus and each question carry 7 Marks.
- V. The students are required to attempt FIVE questions in all, taking ONE Compulsory question of section-I and one question from each section i.e. II, III, IV and V.

UNIT-I

12Hrs

Co-ordination Chemistry: Introduction, Werner's coordination theory, naming of co-ordinate complexes. Co-ordination numbers 1-12 and their stereo-chemistries. Factors affecting co-ordination numbers and stereo-chemistry

(a) Configurational Isomers

(b) Conformational isomerism, VSPER theory, molecular orbital theory applied to homonuclear diatomic molecules and heteronuclear Diatomic molecules.

Bonding in metal complexes: Valence bond theory for co-ordinate complexes, inner and outer orbital complexes, Electro-neutrality and back bonding, limitations of V.B. theory.

Stability of coordination compounds: Introduction, Stability constant, stepwise stability constant, overall stability constant. Factors affecting the stability of metal ion complexes with general ligands, HSAB principle.

UNIT-II

12Hrs

Crystal field theory: Splitting of d-orbitals in octahedral, tetrahedral, cubic and square planer fields of ligands. Calculation of C.F.S.E. in high spin and low spin octahedral and High spin tetrahedral complexes, factors affecting the $10 Dq$ Value. Structural effects of crystal field splitting (Jahn-Teller distortion, variation of Ionic radii with increase in atomic number). Thermodynamics effects of C.F. splitting, variation in lattice energies, Hydration energies, Dissociation energies, Formation constants of hexammines. Site selection in spinels, Paramagnetism, diamagnetism, ferro and anti ferromagnetism. Microstates and spectroscopic terms, a calculation of spectroscopic terms for d^1 electronic configurations, L S coupling,

Hund's rule for finding the ground state terms, Electronic spectral properties of 1st transition series, Orgel Diagrams for $d^1 - d^{10}$ systems, for weak field octahedral and tetrahedral complexes, limitations of C.F.T

UNIT-III

11Hrs

Molecular Orbital Theory: Evidence for covalent character in Bonding, MOEL diagram for octahedral and tetrahedral complexes involving bonding, charge transfer transitions.

π Acid Ligands: Definition Carbon monoxide complexes, bonding in linear MCO groups, polynuclear metal carbonyls, vibrational spectra, Reactions, carbonyl hydrides and halides. Metal-metal bonding metal-metal multiple bonding, isolable analogies, Structure of high nuclearity carbonyl clusters, counting of electrons in carbonyl clusters.

UNIT-IV

10Hrs

Alkali metal and alkaline earth metal chelators: Macrocyclic ligands, macrocyclic effect, crown ethers and podands, coronands, cryptands, structure of 18 crown-6 complex with KNCS, ion cavity complex, effect of anion and cation type on complex structure, simultaneous complexation of metal ion and water or of two metal ions, sandwich formation, cryptands and their cation complexes, podands with aromatic donors and groups.

Text and Reference Books:

1. J.E. Huheey, Inorganic Chemistry, 3rd Ed.
2. F.A. Cotton and G. Wilkinson, Advanced Inorganic Chemistry.
3. B.E. Douglas and D.H. McDaniel, Concepts and Models of Inorganic Chemistry.
4. R. Hilgenfeld and W. Saengar, Topics in current chemistry Vol-II.

Khalsa College Amritsar

Session-2018-19

B.Sc. Hons. (Mathematics) SEM-II
COMMUNICATIVE ENGLISH
BMMH-206

TIME : 3 Hrs

Max. Marks: 50

Theory: 37

Internal Assessment: 13

1 Texts Prescribed:

1. *Tales of Life* (Guru Nanak Dev University, Amritsar)
2. *Comprehensive English Grammar* (Pragati Books Jalandhar)

Course Contents :

- 1) Stories at Sr.No.7,9,10,11,12 from *Tales of Life*..
- 2) English tenses (147-210) from *Comprehensive English Grammar*

Instructions for the Paper Setter and Distribution of Marks:

The question paper will consist of three sections and distribution of marks will be as under:

Section A: 10 Marks

Section B: 19 Marks

Section C: 8 Marks

Section A

1. **Fifteen (15)** Questions on usage of grammar related to the prescribed units of Comprehensive English Grammar will be set for the students to attempt **any Ten (10)**

(1X 10= 10 Marks)

Section-B

2) **Five (5)** questions on theme, characterization, tone and style etc. Will be set. The students will be required to attempt **any three (3)** questions. The answer to each question should not exceed 15-20 sentences. (5X3 =15 Marks)

3) Transcoding from given dialogues to a prose (4 marks)

SECTION C

4) Translation from English to Hindi/ Punjabi (4Marks)

5) Write a paragraph in about 150 to 200 words on a given topic (4 Marks)

Recommended Text:-

Comprehensive English Grammar: Dr Neb (Pragati Publications)

Khalsa College Amritsar

Session-2018-19

B.Sc. Hons. (Mathematics) SEM-II

BHMH-207(A)

ਪੰਜਾਬੀ (ਲਾਜ਼ਮੀ)

ਸਮਾਂ : 3 ਘੰਟੇ

ਥਿਊਰੀ ਅੰਕ : 37

ਇੰਟਰਨਲ ਅਸੈਸਮੈਂਟ : 13

ਕੁਲ ਅੰਕ : 50

ਪਾਠ-ਕ੍ਰਮ ਅਤੇ ਪਾਠ-ਪੁਸਤਕਾਂ

1. ਸਾਹਿਤ ਦੇ ਰੰਗ (ਸੰਪਾ. ਡਾ. ਮਹਿਲ ਸਿੰਘ), ਭਾਗ ਦੂਜਾ (ਵਾਰਤਕ ਅਤੇ ਰੇਖਾ-ਚਿੱਤਰ), ਰਵੀ ਸਾਹਿਤ ਪ੍ਰਕਾਸ਼ਨ, ਅੰਮ੍ਰਿਤਸਰ।
2. ਸ਼ਬਦ-ਬਣਤਰ ਅਤੇ ਸ਼ਬਦ ਰਚਨਾ : ਪਰਿਭਾਸ਼ਾ, ਮੁਢਲੇ ਸੰਕਲਪ।
3. ਸ਼ਬਦ ਸ਼੍ਰੇਣੀਆਂ
4. ਪੈਰ੍ਹਾ ਰਚਨਾ
5. ਪੈਰ੍ਹਾ ਪੜ੍ਹ ਕੇ ਪ੍ਰਸ਼ਨਾਂ ਦੇ ਉੱਤਰ
6. ਮੁਹਾਵਰੇ ਅਤੇ ਅਖਾਣ

ਅੰਕ-ਵੰਡ ਅਤੇ ਪਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ

1. ਕਿਸੇ ਲੇਖ/ਨਿਬੰਧ ਦਾ ਸਾਰ ਜਾਂ ਉਸਦਾ ਵਿਸ਼ਾ ਵਸਤੂ (ਦੋ ਵਿਚੋਂ ਇੱਕ) (7 ਅੰਕ)
 2. ਰੇਖਾ ਚਿੱਤਰ : ਸਾਰ, ਵਿਸ਼ਾ-ਵਸਤੂ, ਸ਼ਖਸੀਅਤ ਦੇ ਗੁਣ (7 ਅੰਕ)
 3. ਯੂਨਿਟ 3-4 ਨੰਬਰ ਉੱਤੇ ਦਿੱਤੀ ਵਿਆਕਰਣ ਦੇ ਆਧਾਰ ਤੇ ਵਰਣਨਾਤਮਕ ਪ੍ਰਸ਼ਨ (7 ਅੰਕ)
 5. ਪੈਰ੍ਹਾ ਰਚਨਾ : ਤਿੰਨ ਵਿਸ਼ਿਆਂ ਵਿਚੋਂ ਕਿਸੇ ਇੱਕ ਉੱਤੇ ਪੈਰ੍ਹਾ ਲਿਖਣ ਲਈ ਕਿਹਾ ਜਾਵੇ। (4 ਅੰਕ)
 6. ਪੈਰ੍ਹਾ ਦੇ ਕੇ ਉਸ ਬਾਰੇ ਚਾਰ ਪ੍ਰਸ਼ਨਾਂ ਦੇ ਉੱਤਰ (4 ਅੰਕ)
 7. ਨੰਬਰ 7 ਵਿਚ ਅੱਠ ਅਖਾਣ ਅਤੇ ਅੱਠ ਮੁਹਾਵਰੇ ਪੁੱਛੇ ਜਾਣਗੇ, ਜਿਨ੍ਹਾਂ ਵਿਚੋਂ ਵਿਦਿਆਰਥੀ ਨੇ ਚਾਰ-ਚਾਰ ਨੂੰ ਵਾਕਾਂ ਵਿਚ ਵਰਤ ਕੇ ਅਰਥ ਸਪੱਸ਼ਟ ਕਰਨੇ ਹੋਣਗੇ। (4+4 = 8 ਅੰਕ)
- ਨੋਟ: ਇੰਟਰਨਲ ਅਸੈਸਮੈਂਟ 13 ਅੰਕਾਂ ਦੀ ਹੈ, ਜੋ ਕਾਲਜ ਵਲੋਂ ਨਿਰਧਾਰਿਤ ਦਿਸ਼ਾ ਨਿਰਦੇਸ਼ਾਂ ਅਨੁਸਾਰ ਇਨ੍ਹਾਂ ਅੰਕਾਂ ਤੋਂ ਵੱਖਰੀ ਹੋਵੇਗੀ। ਇਸ ਪੇਪਰ ਦੇ ਕੁਲ ਅੰਕ $37+13 = 50$ ਹਨ।

Khalsa College Amritsar

Session-2018-19

B.Sc. Hons. (Mathematics) SEM-II

BHMH-207(B)

ਮੁੱਢਲੀ ਪੰਜਾਬੀ

(In Lieu of Compulsory Punjab)

ਸਮਾਂ : 3 ਘੰਟੇ

ਥਿਊਰੀ ਅੰਕ : 37

ਇੰਟਰਨਲ ਅਸੈਸਮੈਂਟ : 13

ਕੁਲ ਅੰਕ : 50

ਪਾਠ-ਕ੍ਰਮ ਅਤੇ ਪਾਠ-ਪੁਸਤਕਾਂ

1. ਪੰਜਾਬੀ ਸ਼ਬਦ ਬਣਤਰ : ਧਾਤੂ, ਵਧੇਤਰ (ਅਗੇਤਰ, ਮਧੇਤਰ, ਪਿਛੇਤਰ), ਪੰਜਾਬੀ ਕੋਸ਼ਗਤ ਸ਼ਬਦ ਅਤੇ ਵਿਆਕਰਣਿਕ ਸ਼ਬਦ 12 ਅੰਕ
2. ਪੰਜਾਬੀ ਸ਼ਬਦ ਪ੍ਰਕਾਰ :
ੳ) ਸੰਯੁਕਤ ਸ਼ਬਦ, ਸਮਾਸੀ ਸ਼ਬਦ, ਦੋਜਾਤੀ ਸ਼ਬਦ, ਦੋਹਰੇ/ਦੁਹਰੁਕਤੀ ਸ਼ਬਦ ਅਤੇ ਮਿਸ਼ਰਤ ਸ਼ਬਦ
ਅ) ਸਿਖਲਾਈ ਤੇ ਅਭਿਆਸ 10 ਅੰਕ
3. ਪੰਜਾਬੀ ਸ਼ਬਦ ਰਚਨਾ :
ੳ) ਇੱਕ-ਵਚਨ ਬਹੁ-ਵਚਨ, ਲਿੰਗ-ਪੁਲਿੰਗ, ਬਹੁ-ਅਰਥਕ ਸ਼ਬਦ, ਸਮਾਨ-ਅਰਥਕ ਸ਼ਬਦ, ਬਹੁਤੇ ਸ਼ਬਦਾਂ ਲਈ ਇੱਕ ਸ਼ਬਦ, ਸ਼ਬਦ ਜੋੜ, ਵਿਰੋਧਆਰਥਕ ਸ਼ਬਦ
ਅ) ਨਿੱਤ ਵਰਤੋਂ ਦੀ ਪੰਜਾਬੀ ਸ਼ਬਦਾਵਲੀ : ਖਾਣ-ਪੀਣ, ਸਾਕਾਦਾਰੀ, ਰੁੱਤਾਂ, ਮਹੀਨਿਆਂ, ਗਿਣਤੀ, ਮੌਸਮ, ਮਾਰਕੀਟ/ਬਾਜ਼ਾਰ, ਵਪਾਰ, ਧੰਦਿਆਂ ਨਾਲ ਸੰਬੰਧਿਤ। 10+5=15 ਅੰਕ

ਅੰਕ ਵੰਡ ਅਤੇ ਪਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ

1. ਭਾਗ ਪਹਿਲਾਂ ਵਿਚੋਂ ਚਾਰ ਪ੍ਰਸ਼ਨ ਪੁਛੇ ਜਾਣਗੇ ਜਿਨ੍ਹਾਂ ਵਿਚੋਂ ਤਿੰਨ ਪ੍ਰਸ਼ਨਾਂ ਦਾ ਉੱਤਰ ਦੇਣਾ ਲਾਜ਼ਮੀ ਹਨ। ਹਰ ਪ੍ਰਸ਼ਨ ਦੇ ਚਾਰ-ਚਾਰ ਨੰਬਰ ਹਨ। (4+4+4) 12 ਅੰਕ
2. ਭਾਗ ਦੂਸਰਾ ਵਿਚੋਂ ਦੋ-ਦੋ ਨੰਬਰ ਦੇ ਪੰਜ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ। ਸਾਰੇ ਪ੍ਰਸ਼ਨ ਲਾਜ਼ਮੀ ਹਨ। 10 ਅੰਕ
3. ਭਾਗ ਤੀਸਰਾ ਦੇ (ੳ) ਭਾਗ ਵਿਚੋਂ ਦੋ ਸਵਾਲ ਅਤੇ (ਅ) ਭਾਗ ਵਿਚੋਂ ਇੱਕ ਸਵਾਲ ਪੁਛਿਆ ਜਾਵੇਗਾ। ਹਰ ਪ੍ਰਸ਼ਨ ਦੇ ਪੰਜ-ਪੰਜ ਅੰਕ ਹਨ। 10+5=15 ਅੰਕ

ਨੋਟ: ਇੰਟਰਨਲ ਅਸੈਸਮੈਂਟ 13 ਅੰਕਾਂ ਦੀ ਹੈ, ਜੋ ਕਾਲਜ ਵਲੋਂ ਨਿਰਧਾਰਿਤ ਦਿਸ਼ਾ ਨਿਰਦੇਸ਼ਾਂ ਅਨੁਸਾਰ ਇਨ੍ਹਾਂ ਅੰਕਾਂ ਤੋਂ ਵੱਖਰੀ ਹੋਵੇਗੀ। ਇਸ ਪੇਪਰ ਦੇ ਕੁਲ ਅੰਕ $37+13 = 50$ ਹਨ।

Khalsa College Amritsar

Session-2018-19

B.Sc. Hons. (Mathematics) SEM-II

BHMH-208

Physics Lab-II

Time: 3 Hours

Total Marks: 30

Max. Marks: 22

Internal Assessments: 08

I. The distribution of marks is as follows:

i) One experiment **10 Marks**

ii) Brief Theory **4 Marks**

iii) Viva-Voce **4 Marks**

iv) Record (Practical file) **4 Marks**

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

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

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

1. To study the gas discharge spectrum of hydrogen.
2. To study the absorption spectra of iodine vapours.
3. To determine the ionization potential of mercury.
4. To study the photoelectric effect and determine the value of Planck's constant.
5. Study of variation of light intensity with distance using photovoltaic cell (Inverse Square Law).
6. To draw the plateau of a GM counter and find the operating voltage of GM tube.
7. To find the dead time of GM counter.
8. To study the absorption coefficient beta particles in aluminium using GM counter and find the absorption coefficients.
9. To study the statistical fluctuations and end point energy of beta particles using GM counter.
10. Measurement of reverse saturation current in pn junction diode at various temperatures and find the approximate value of the band gap.
11. To determine the wavelength of He-Ne laser using plane diffraction grating.

Reference Books :

Practical Physics Vol.II, T.S. Bhatia, Gursharan Kaur, Iqbal Singh, Vishal Publications

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

Khalsa College Amritsar

Session-2018-19

B.Sc. Hons. (Mathematics) SEM-II

Inorganic Chemistry Practical

BHMH-209

Max. Marks: 22+8 (Internal Assessment)

Labs 3 Hrs/week

Identification of cations and anions in a mixture which may contain combinations of acid ions. These must contain interfering acid anions and one, the insoluble.

a) Special Tests for Mixture of Anions

- (i) Carbonate in the presence of sulphate.
- (ii) Nitrate in the presence of nitrite
- (iii) Nitrate in the presence of bromide and iodide.
- (iv) Nitrate in the presence of chlorate.
- (v) Chloride in the presence of bromide and iodide.
- (vi) Chloride in the presence of iodide.
- (vii) Bromide and iodide in the presence of each other and of chloride.
- (viii) Phosphate, arsenate and arsenite in the presence of each other.
- (ix) Sulphide, sulphite, thiosulphate and sulphate in the presence of each other.
- (x) Borate in the presence of copper and barium salts.
- (xi) Oxalate in the presence of fluoride.

b) Separation and Identification of Cations in Mixtures

- (i) Separation of cations in groups.
- (ii) Separation and identification of Group I, Group II (Group IIA and IIB), Group III, Group IV, Group V and Group VI cations.

Book: Vogel's book on Inorganic Qualitative Analysis

Khalsa College Amritsar
B.Sc. Hons. (Mathematics) SEM-II
BHMH-210
Math Lab-II

Max. Marks: 30+10 (Internal Assessment)

Labs Hrs. 30

List of Practical's (using any software):-

- (a) Trapezoidal rule.
- (b) Simpson's $1/3$ rd and $3/8$ th rule.
- (c) Prismoidal rule.
- (d) Sketching ellipsoid, hyperboloid of one and two sheets, elliptic cone, elliptic, parabolic, hyperbolic paraboloid using Cartesian coordinates.
- (e) Area enclosed by curves.
- (f) Obtaining surface of revolution of curves.

Books Recommended:

1. Shastry, S.S. Introductory Methods of Numerical Analysis. New Delhi: PHI Learning Private Limited, 2005. Print.
2. Mathews, John H., and D. Fink Kurtis. Numerical Methods using Matlab, 4th Ed. New Delhi: PHI Learning Private Limited, 2012. Print.