

FACULTY OF LIFE SCIENCES

Syllabus

For

**M.Sc. HUMAN GENETICS
(FIVE YEARS INTEGRATED COURSE)
(UNDER THE SCHEME OF HONOURS SCHOOL)
(Credit Based Evaluation & Grading System)**

(SEMESTER: I & II)

Examinations: 2019-20



Guru Nanak Dev University Amritsar

- Note:**
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M.Sc. HUMAN GENETICS (FYIC) (CBEGS) (SEMESTER SYSTEM)
(UNDER THE SCHEME OF HONOURS SCHOOL)

SCHEME

Semester-I

Course Category	Course No.	Course Title	L	T	P	Total Credits
CC	HGL-101	Fundamentals of Genetics	3	1	0	4
GEC	CYL-191	Organic Chemistry	3	1	0	4
GEC	PHL-191	Optics	3	1	0	4
AECC	ENL-101	Communicative English-I	2	0	0	2
AECC	PBL-121/ PBL-122/ HSL-101	Punjabi Compulsory OR *ਮੁੱਢਲੀ ਪੰਜਾਬੀ OR **Punjab History & Culture	2	0	0	2
AECC	SOA-101	***Drug Abuse: Problem, Management and Prevention (Compulsory ID Course)	3	0	0	3
GEC	CYP-195	Organic Chemistry Lab — Classical Qualitative Organic Analysis	0	0	2	2
CC	HGP-101	Lab Exercises in Genetics	0	0	2	2
GEC	PHP-192	Optics Lab	0	0	2	2
	Total Credits		13	3	6	22

Note:

1. *Special Paper in lieu of Punjabi Compulsory.
2. **For those students who are not domicile of Punjab.
3. ***Student can opt this Paper whether in 1st or 2nd Semester.

CC- Core course; GEC – Generic Elective Course; AECC – Ability Enhancement Compulsory Course; SEC- Skill Enhancement Course; DSE- Discipline Specific Elective Course

M.Sc. HUMAN GENETICS (FYIC) (CBEGS) (SEMESTER SYSTEM)
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Semester-II

Course Category	Course No.	Course Title	L	T	P	Total Credits
CC	HGL-155	Introductory Cell Biology and Biochemistry	5	1	0	6
GEC	CYL-192	Inorganic Chemistry	3	1	0	4
GEC	PHL-196	Modern Physics	3	1	0	4
GEC	MTL-163	Differential and Integral Calculus	5	1	0	6
AECC	ENL-151	Communicative English-II	2	0	0	2
AECC	PBL-131 / PBL-132 HSL-102	Punjabi (Compulsory) OR * ਮੁੱਢਲੀ ਪੰਜਾਬੀ OR **Punjab History & Culture	2	0	0	2
AECC	SOA-101	***Drug Abuse: Problem, Management and Prevention (Compulsory ID Course)	3	0	0	3
GEC	CYP-196	Inorganic Chemistry Lab — Qualitative Analysis	0	0	2	2
GEC	PHP-197	Electricity and Magnetism Lab	0	0	2	2
	Total Credits		23	4	4	31

Note:-

1. *Special Paper in lieu of Punjabi Compulsory.
2. **For those students who are not domicile of Punjab.
3. ***Student can opt this Paper whether in 1st or 2nd Semester.
4. Course contents of the papers “PHP-192 Optics Lab” and “PHP-197 Electricity and Magnetism Lab” are in continuation of theory papers “PHL-191 Optics” and “PHL-196 Modern Physics”, respectively, and will be provided by the Department of Physics.

Note : PSL-053 ID Course Human Rights & Constitutional Duties (Compulsory ID Paper). Students can opt. this paper in any semester except the 1st Semester. This ID Paper is one of the total ID Papers of this course.

CC- Core course; GEC – Generic Elective Course; AECC – Ability Enhancement Compulsory Course; SEC- Skill Enhancement Course; DSE- Discipline Specific Elective Course

HGL-101 FUNDAMENTALS OF GENETICS

Time: 3 Hours

Credits: 3-1-0

Max. Marks: 100

Mid Semester Marks : 20

End Semester Marks : 80

Mid Semester Examination: 20% weightage

End Semester Examination: 80% weightage

Instructions for the Paper Setters:

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

Section-A

Brief history of genetics, Molecular organization of Human genome, DNA and RNA as genetic material, Chromosome structure: nucleosome, solenoid, chromatin loops, chromosomal territories, Types of chromosomes .Cell cycle, cell division: mitosis, meiosis, Crossing-over, non-disjunction, recombination, linkage.

Section-B

Variation in chromosome structure and number: duplication, translocation, inversions, monosomy, nullisomy, trisomy, tetrasomy, haploidy, polyploidy. Uniparental Disomy, Genomic imprinting. Genetics basis of Sex determination, Dosage compensation with reference to X-inactivation in man, sex-linked, sex limited, sex influenced traits. Manifesting heterozygotes, mosaics, chimeras, hermaphrodites, sex ratio.

Section-C

Modes of inheritance: Mendelian principles, Non Mendelian inheritance, Gene interactions: Epistasis, additive, modifiers, lethal, penetrance, expressivity, pleiotropic genes, Extranuclear inheritance. Multifactorial inheritance and quantitative traits, multiple alleles, blood group system- ABO, Rh, MN .

Section-D

Use of sexual process in bacteria and bacteriophages in genetic mapping, genetic mapping in haploid and diploid eukaryotes. Hardy-Weinberg principle and effect of selection, mutation, migration and genetic drift on Hardy-Weinberg equilibrium.

Books Recommended :

1. Gardner, E.J. (2011). Human Genetics. Viva Books Pvt. Ltd., India.
2. Klug, W.S., Cummings, M.R., Spencer, C.A. and Palladino, M.A. (2016). Concepts of Genetics. Pearson Education, Inc., New Delhi.
3. Snustad, D.P. and Simmons, M.J. (2016). Principles of Genetics. John Wiley and Sons, Inc., New York.
4. Strickberger, M.W. (2008). Genetics. Prentice-Hall India Pvt. Ltd., New Delhi.
5. Tamarin R.H. (2012). Principles of Genetics. Tata McGrawHill, New York

CYL-191 ORGANIC CHEMISTRY**Credits: 3-1-0****Time: 3 Hours****Max. Marks: 100****Mid Semester Marks : 20****End Semester Marks : 80****Mid Semester Examination: 20% weightage****End Semester Examination: 80% weightage****Instructions for the Paper Setters:**

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

Section-A

Chemistry Alkanes ,Alkenes and Alkynes: 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. 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. 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.

Section-B

Stereochemistry: Molecular chirality, enantiomers/symmetry in archiaral structures, chiral centres in chiral molecules, properties of chiral molecules –optical activity, absolute and relative configuration, the Cahn-IngoldPerlog 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. Stereochemistry of alkenes, naming stereo isometric alkenes by the E-Z system, mechanism of hydrogenation of alkenes. Stereochemistry of hydrogenation of cycloalkenes, stereochemistry of halogen addition to alkenes and its mechanistic explanation.

Section-C

Nucleophilic Substitution and Addition Reaction: (a) Functional group transformation by nucleophilic substitution, the bimolecular (SN₂), mechanism of nucleophilic substitution, stereochemistry of SN₂ reactions, how SN₂ reactions occur, steric effect in SN₂ reaction, nucleophilicity and nucleophilicity, the unimolecular (SN₁) mechanism of nucleophilic substitution, carbocation stability and the rate of substitution, by the SN₁ mechanism stereochemistry of SN₁ reactions, carbocation rearrangements in SN₁ reactions, solvent effect, substitution and elimination as competing reactions.

(b) Principles of nucleophilic addition to carbonyl groups: Hydration acetal formation, cyanohydrins formation; reactions with primary and secondary amines, Wittig reaction, stereoselective addition to carbonyl groups mechanism of halogenations, acid and base catalysed hydration, haloform reaction, aldol condensation, conjugate nucleophilic addition to unsaturated carbonyl compounds.

Section-D

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 and conformations carbons- ¹³C nuclear magnetic resonance, the sensitivity problem, interpretation of spectra. Infrared spectroscopy, ultraviolet visible (UV-VIS) spectroscopy and mass spectrometry.

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 Mechanism and Structure by J. March.
4. Schaum's Outlines Series Theory and Problems of Organic Chemistry.
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.

PHL-191 OPTICS

Credits: 3-1-0

Time: 3 Hours

Max. Marks: 100

Mid Semester Marks : 20

End Semester Marks : 80

Mid Semester Examination: 20% weightage

End Semester Examination: 80% weightage

Instructions for the Paper Setters:

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

Section-A

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, Newtons rings and their application, Michelson & Feby-Perot Interferometer, Anti reflection coatings, Holography.

Section-B

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, Missing orders, dispersive power, Rayleigh Criterion for resolving power, resolving power of a diffraction grating.

Section-C

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.

Section-D

Laser principle and action, Einstein theory of radiation, population inversion, Laser types, He-Ne Laser, Ruby Laser, CO₂ lasers, Semiconductor Laser. Applications of Lasers in medicine and chemistry.

Reference Books:

1. Text book of Optics: N. Subramanayam, B. Lal and M.N. Avadhamulu.
2. Fundamentals of Optics: Jenkins and White
3. Optics: A.K Ghatak

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ENL-101 : COMMUNICATIVE ENGLISH-I

Credits: 02 (L= 2, T=0, U=0)

Time: 3 Hours

Max. Marks: 100
Mid Semester Marks : 20
End Semester Marks : 80

Mid Semester Examination: 20% weightage
End Semester Examination: 80% weightage

Instructions for the Paper Setters:

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

Objective: To introduce students to the skills and strategies of reading and writing by identifying organizational patterns, spotting classification systems and understanding associations between ideas. This course will prepare students to read a variety of texts and also to communicate more effectively through writing. The course will also pay special attention to vocabulary building.

Prescribed Text books:

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

Section–A

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

Section–B

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

Section–C

Section 1 from *Making Connections: A Strategic Approach to Academic Reading* by Kenneth J. Pakenham, Second Edition.

Section–D

Section 2 from *Making Connections: A Strategic Approach to Academic Reading* by Kenneth J. Pakenham, Second Edition.

PBL 121 : ਪੰਜਾਬੀ ਲਾਜ਼ਮੀ - I (Credit Based)

Credit : 2-0-0

Time: 3 Hours

Max. Marks: 100

Mid Semester Marks : 20

End Semester Marks : 80

Mid Semester Examination: 20% weightage

End Semester Examination: 80% weightage

ਅੰਕ-ਵੰਡ ਅਤੇ ਪਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ

1. ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਦੇ ਚਾਰ ਭਾਗ ਹੋਣਗੇ। ਹਰ ਭਾਗ ਵਿੱਚੋਂ ਦੋ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ।
2. ਵਿਦਿਆਰਥੀ ਨੇ ਕੁੱਲ ਪੰਜ ਪ੍ਰਸ਼ਨ ਕਰਨੇ ਹਨ। ਹਰ ਭਾਗ ਵਿੱਚੋਂ ਇਕ ਪ੍ਰਸ਼ਨ ਲਾਜ਼ਮੀ ਹੈ। ਪੰਜਵਾਂ ਪ੍ਰਸ਼ਨ ਕਿਸੇ ਵੀ ਭਾਗ ਵਿੱਚੋਂ ਕੀਤਾ ਜਾ ਸਕਦਾ ਹੈ।
3. ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ ਬਰਾਬਰ ਅੰਕ ਹਨ।
4. ਪੇਪਰ ਸੈੱਟ ਕਰਨ ਵਾਲਾ ਜੇਕਰ ਚਾਹੇ ਤਾਂ ਪ੍ਰਸ਼ਨਾਂ ਦੀ ਵੰਡ ਅੱਗੋਂ ਵੱਧ ਤੋਂ ਵੱਧ ਚਾਰ ਉਪ-ਪ੍ਰਸ਼ਨਾਂ ਵਿੱਚ ਕਰ ਸਕਦਾ ਹੈ।

ਸੈਕਸ਼ਨ-ਦੇ

1. **ਦੋ ਰੰਗ** (ਸੰਪਾ. ਹਰਜਿੰਦਰ ਸਿੰਘ ਢਿੱਲੋਂ, ਪ੍ਰੀਤਮ ਸਿੰਘ ਸਰਗੋਧੀਆ)
ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ, ਅੰਮ੍ਰਿਤਸਰ ਵਿੱਚੋਂ ਹੇਠ ਲਿਖੇ ਕਵੀ :
(ੳ) ਭਾਈ ਵੀਰ ਸਿੰਘ
(ਅ) ਧਨੀ ਰਾਮ ਚਾੜ੍ਹਕ
(ੲ) ਪ੍ਰੋ. ਪੂਰਨ ਸਿੰਘ
(ਕਵੀ ਦਾ ਜੀਵਨ, ਕਵਿਤਾ-ਸਾਰ, ਵਿਸ਼ਾ-ਵਸਤੂ, ਕਾਵਿ-ਕਲਾ)
- ii. ਗੁਰਮੁਖੀ ਔਰਥੋਗਰਾਫੀ ਦੀ ਜੁਗਤ (ਪੈਂਤੀ, ਮੁਹਾਰਨੀ, ਬਿੰਦੀ, ਟਿੱਪੀ ਤੇ ਅੱਧਕ); ਵਿਸ਼ਰਾਮ ਚਿੰਨ੍ਹ, ਸ਼ਬਦ ਜੋੜ (ਸੁਧ-ਅਸੁਧ)

ਸੈਕਸ਼ਨ-ਬੀ

1. **ਦੋ ਰੰਗ** (ਸੰਪਾ. ਹਰਜਿੰਦਰ ਸਿੰਘ ਢਿੱਲੋਂ, ਪ੍ਰੀਤਮ ਸਿੰਘ ਸਰਗੋਧੀਆ)
ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ, ਅੰਮ੍ਰਿਤਸਰ ਵਿੱਚੋਂ ਹੇਠ ਲਿਖੇ ਕਵੀ :
(ੳ) ਫਿਰੋਜ਼ਦੀਨ ਸ਼ਰਫ
(ਅ) ਪ੍ਰੋ. ਮੋਹਨ ਸਿੰਘ
(ਕਵੀ ਦਾ ਜੀਵਨ, ਕਵਿਤਾ-ਸਾਰ, ਵਿਸ਼ਾ-ਵਸਤੂ, ਕਾਵਿ-ਕਲਾ)
- ii. ਲੇਖ ਰਚਨਾ (ਜੀਵਨੀ-ਪਰਕ, ਸਮਾਜਕ ਅਤੇ ਚਲੰਤ ਵਿਸ਼ਿਆਂ ਉੱਤੇ) : 10 ਲੇਖ ਲਿਖਵਾਉਣੇ
(ਕਲਾਸ ਵਿੱਚ ਅਤੇ ਘਰ ਲਈ ਅਭਿਆਸ)

M.Sc. HUMAN GENETICS (FYIC) (CBEGS) (SEMESTER-I)
(UNDER THE SCHEME OF HONOURS SCHOOL)

ਸੈਕਸ਼ਨ-ਸੀ

- I. **ਦੋ ਰੰਗ** (ਸੰਘ. ਹਰਜਿੰਦਰ ਸਿੰਘ ਢਿੱਲੋਂ, ਪ੍ਰੀਤਮ ਸਿੰਘ ਸਰਗੋਧੀਆ)
ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ, ਅੰਮ੍ਰਿਤਸਰ ਵਿੱਚੋਂ ਹੇਠ ਲਿਖੇ ਕਵੀ :
(ੳ) ਨੰਦ ਲਾਲ ਠੂਰਪੁਰੀ
(ਅ) ਅਮ੍ਰਿਤਾ ਪ੍ਰੀਤਮ
(ੲ) ਡਾ. ਹਰਿਭਜਨ ਸਿੰਘ
(ਕਵੀ ਦਾ ਜੀਵਨ, ਕਵਿਤਾ-ਸਾਰ, ਵਿਸ਼ਾ-ਵਸਤੂ, ਕਾਵਿ-ਕਲਾ)
- II. ਸ਼ੁੱਧ, ਅਸ਼ੁੱਧ : ਦਿੱਤੇ ਪੈਰ੍ਹੇ ਵਿੱਚੋਂ ਅਸ਼ੁੱਧ ਸ਼ਬਦਾਂ ਨੂੰ ਸ਼ੁੱਧ ਕਰਨਾ
(15 ਪੈਰ੍ਹਿਆਂ ਦੇ ਸ਼ੁੱਧ ਅਸ਼ੁੱਧ ਅਭਿਆਸ ਕਰਵਾਉਣੇ)

ਸੈਕਸ਼ਨ-ਡੀ

- I. **ਦੋ ਰੰਗ** (ਸੰਘ. ਹਰਜਿੰਦਰ ਸਿੰਘ ਢਿੱਲੋਂ, ਪ੍ਰੀਤਮ ਸਿੰਘ ਸਰਗੋਧੀਆ)
ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ, ਅੰਮ੍ਰਿਤਸਰ ਵਿੱਚੋਂ ਹੇਠ ਲਿਖੇ ਕਵੀ :
(ੳ) ਸ਼ਿਵ ਕੁਮਾਰ ਬਟਾਲਵੀ
(ਅ) ਸੁਰਜੀਤ ਪਾਤਰ
(ਕਵੀ ਦਾ ਜੀਵਨ, ਕਵਿਤਾ-ਸਾਰ, ਵਿਸ਼ਾ-ਵਸਤੂ, ਕਾਵਿ-ਕਲਾ)
- II. ਅਖਬਾਰੀ ਇਸਤਿਹਾਰ : ਨਿੱਜੀ, ਦਫ਼ਤਰੀ ਤੇ ਸਮਾਜਕ ਗਤੀਵਿਧੀਆਂ ਨਾਲ ਸੰਬੰਧਤ

PBL-122: ਮੁੱਢਲੀ ਪੰਜਾਬੀ

(In lieu of Punjabi Compulsory)

Credits: 2-0-0

Time: 3 Hours

Max. Marks: 100
Mid Semester Marks : 20
End Semester Marks : 80

Mid Semester Examination: 20% weightage

End Semester Examination: 80% weightage

ਅੰਕ-ਵੰਡ ਅਤੇ ਪਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ

1. ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਦੇ ਚਾਰ ਭਾਗ ਹੋਣਗੇ। ਹਰ ਭਾਗ ਵਿੱਚੋਂ ਦੋ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ।
2. ਵਿਦਿਆਰਥੀ ਨੇ ਕੁੱਲ ਪੰਜ ਪ੍ਰਸ਼ਨ ਕਰਨੇ ਹਨ। ਹਰ ਭਾਗ ਵਿੱਚੋਂ ਇੱਕ ਪ੍ਰਸ਼ਨ ਲਾਜ਼ਮੀ ਹੈ। ਪੰਜਵਾਂ ਪ੍ਰਸ਼ਨ ਕਿਸੇ ਵੀ ਭਾਗ ਵਿੱਚੋਂ ਕੀਤਾ ਜਾ ਸਕਦਾ ਹੈ।
3. ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ ਬਰਾਬਰ ਅੰਕ ਹਨ।
4. ਪੇਪਰ ਸੈੱਟ ਕਰਨ ਵਾਲਾ ਜੇਕਰ ਚਾਹੇ ਤਾਂ ਪ੍ਰਸ਼ਨਾਂ ਦੀ ਵੰਡ ਅੱਗੋਂ ਵੱਧ ਤੋਂ ਵੱਧ ਚਾਰ ਉਪ-ਪ੍ਰਸ਼ਨਾਂ ਵਿੱਚ ਕਰ ਸਕਦਾ ਹੈ।

ਪਾਠ-ਕ੍ਰਮ

ਸੈਕਸ਼ਨ-ਏ

ਪੌੜੀ ਅੱਖਰੀ, ਅੱਖਰ ਕ੍ਰਮ,
ਮਾਤ੍ਰਾਵਾਂ (ਮੁੱਢਲੀ ਜਾਣ-ਪਛਾਣ)
ਲਗਾਖਰ (ਬਿੰਦੀ, ਟਿੱਪੀ, ਅੱਧਕ) : ਪਛਾਣ ਤੇ ਵਰਤੋਂ

ਸੈਕਸ਼ਨ-ਬੀ

ਪੰਜਾਬੀ ਸ਼ਬਦ ਬਣਤਰ : ਮੁੱਢਲੀ ਜਾਣ-ਪਛਾਣ
ਸਾਧਾਰਨ ਸ਼ਬਦ, ਸੰਯੁਕਤ ਸ਼ਬਦ, ਮਿਸ਼ਰਤ ਸ਼ਬਦ
ਮੂਲ ਸ਼ਬਦ, ਅਗੇਤਰ ਅਤੇ ਪਿਛੇਤਰ

ਸੈਕਸ਼ਨ-ਸੀ

ਸ਼ੁੱਧ ਅਸ਼ੁੱਧ : ਦਿੱਤੇ ਪੈਰ੍ਹੇ ਵਿੱਚੋਂ ਅਸ਼ੁੱਧ ਸ਼ਬਦ ਨੂੰ ਸ਼ੁੱਧ ਕਰਨਾ।
ਸਮਾਨਾਰਥਕ ਤੇ ਵਿਰੋਧਾਰਥਕ ਸ਼ਬਦ

ਸੈਕਸ਼ਨ-ਡੀ

ਹਫਤੇ ਦੇ ਸੱਤ ਦਿਨਾਂ ਦੇ ਨਾਂ, ਬਾਰਾਂ ਮਹੀਨਿਆਂ ਦੇ ਨਾਂ, ਰੁੱਤਾਂ ਦੇ ਨਾਮ, ਇਕ ਤੋਂ ਸੌ ਤੱਕ ਗਿਣਤੀ ਸ਼ਬਦਾਂ ਵਿੱਚ।

M.Sc. HUMAN GENETICS (FYIC) (CBEGS) (SEMESTER-I)
(UNDER THE SCHEME OF HONOURS SCHOOL)

HSL-101 : Punjab History & Culture (1450-1716)
(Special paper in lieu of Punjabi Compulsory)
(For those students who are not domicile of Punjab)

Credits: 2-0-0

Time: 3 Hours

Max. Marks: 100
Mid Semester Marks : 20
End Semester Marks : 80

Mid Semester Examination: 20% weightage
End Semester Examination: 80% weightage

Instructions for the Paper Setters:

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

Section-A

1. Land and the People.
2. Bhakti Movement

Section-B

3. Life and Teaching of Guru Nanak Dev.
4. Contribution of Guru Angad Dev, Guru Arjun Dev, Guru Amar Das and Guru Ram Das.

Section-C

5. Guru Hargobind.
6. Martyrdom of Guru Teg Bahadur

Section-D

7. Guru Gobind Singh and the Khalsa.
8. Banda Singh Bahadur: Conquests and Execution.

Suggested Reading

1. Kirpal Singh(ed.), *History and Culture of the Punjab, Part-ii, Punjabi University, Patiala, 1990.*
2. Fauja Singh (ed.), *History of Punjab, Vol, III Punjabi University, Patiala, 1987.*
3. J.S. Grewal, *The Sikhs of the Punjab, Cup, Cambridge, 1991.*
4. Khushwant Singh, *A History of the Sikhs, Vol. I, OUP, New Delhi, 1990*

**SOA-101 : DRUG ABUSE: PROBLEM, MANAGEMENT AND PREVENTION
(COMPULSORY ID PAPER)**

(Student can opt. this paper whether in 1st or 2nd semester)

PROBLEM OF DRUG ABUSE

Credit 3-0-0

Time: 3 Hours

**Max. Marks: 100
Mid Semester Marks : 20
End Semester Marks : 80**

Mid Semester Examination: 20% weightage

End Semester Examination: 80% weightage

Instructions for the Paper Setters:

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

Section – A

Meaning of Drug Abuse:

- 1) Meaning, Nature and Extent of Drug Abuse in India and Punjab.
- 2) Consequences of Drug Abuse for:

Individual	:	Education, Employment, Income.
Family	:	Violence.
Society	:	Crime.
Nation	:	Law and Order problem.

Section – B

Management of Drug Abuse:

- (i) Medical Management: Medication for treatment and to reduce withdrawal effects.
- (ii) Psychiatric Management: Counselling, Behavioural and Cognitive therapy.
- (iii) Social Management: Family, Group therapy and Environmental Intervention.

Section – C

Prevention of Drug abuse:

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

Section – D

Controlling Drug Abuse:

- (i) Media: Restraint on advertisements of drugs, advertisements on bad effects of drugs, Publicity and media, Campaigns against drug abuse, Educational and awareness program
- (ii) Legislation: NDPs act, Statutory warnings, Policing of Borders, Checking Supply/Smuggling of Drugs, Strict enforcement of laws, Time bound trials.

References:

1. Ahuja, Ram (2003), *Social Problems in India*, Rawat Publication, Jaipur.
2. Extent, Pattern and Trend of Drug Use in India, Ministry of Social Justice and Empowerment, Government of India, 2004.
3. Inciardi, J.A. 1981. *The Drug Crime Connection*. Beverly Hills: Sage Publications.
4. Kapoor. T. (1985) *Drug epidemic among Indian Youth*, New Delhi: Mittal Pub.
5. Kessel, Neil and Henry Walton. 1982, *Alcoholism. Harmond Worth*: Penguin Books.
6. Modi, Ishwar and Modi, Shalini (1997) *Drugs: Addiction and Prevention*, Jaipur: Rawat Publication.
7. National Household Survey of Alcohol and Drug abuse. (2003) New Delhi, Clinical Epidemiological Unit, All India Institute of Medical Sciences, 2004.
8. Ross Coomber and Others. 2013, *Key Concept in Drugs and Society*. New Delhi: Sage Publications.
9. Sain, Bhim 1991, *Drug Addiction Alcoholism*, Smoking obscenity New Delhi: Mittal Publications.
10. Sandhu, Ranvinder Singh, 2009, *Drug Addiction in Punjab: A Sociological Study*. Amritsar: Guru Nanak Dev University.
11. Singh, Chandra Paul 2000. *Alcohol and Dependence among Industrial Workers*: Delhi: Shipra.
12. Sussman, S and Ames, S.L. (2008). *Drug Abuse: Concepts, Prevention and Cessation*, Cambridge University Press.
13. Verma, P.S. 2017, “*Punjab’s Drug Problem: Contours and Characteristics*”, Economic and Political Weekly, Vol. LII, No. 3, P.P. 40-43.
14. World Drug Report 2016, United Nations office of Drug and Crime.
15. World Drug Report 2017, United Nations office of Drug and Crime.

**CYP-195 ORGANIC CHEMISTRY LAB — CLASSICAL QUALITATIVE
ORGANIC ANALYSIS (Practical)**

Credits: 0-0-2

Total Marks-100

The preliminary examination of physical and chemical characteristics (Physical state, color, 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

-aromatic amines

-amides

Suggested Book

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

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**M.Sc. HUMAN GENETICS (FYIC) (CBEGS) (SEMESTER-I)
(UNDER THE SCHEME OF HONOURS SCHOOL)**

HGP-101 LAB EXERCISES IN GENETICS

**Credits: 0-0-2
Total Marks-100**

Numericals based on Mendelian principles, Hardy-Weinberg principles, Human morphogenetic traits, Pedigree analysis, Barr body analysis in buccal smear, Color blindness from Isihara charts, fingerball and palmer dermatoglyphics, Blood grouping for ABO and Rh, Preparation of karyogram from solid-stained and G-banded metaphase chromosomes.

PHP-192 Optics Lab

Credits: 0-0-2

Course contents of the papers “PHP-192 Optics Lab” and are in continuation of theory papers PHL-191 Optics and will be provided by the Department of Physics.

HGL-155 INTRODUCTORY CELL BIOLOGY AND BIOCHEMISTRY

Time: 3 Hours

Credits: 5-1-0

Max. Marks: 100

Mid Semester Marks : 20

End Semester Marks : 80

Mid Semester Examination: 20% weightage

End Semester Examination: 80% weightage

Instructions for the Paper Setters:

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

Section-A

Structure and dynamics of cells (prokaryotes and eukaryotes), Structure and function of cell wall, nucleus, DNA and RNA organization in prokaryotes and eukaryotes, Overview of genetic code and central dogma. Definition and functions of nucleic acids, Structure of purines and pyrimidine bases, nucleosides and nucleotides.

Structural organization and function of intracellular organelles — mitochondria, golgi bodies, lysosomes, endoplasmic reticulum, peroxisomes, plasmids, vacuoles, chloroplasts and cytoskeletons.

Section-B

Carbohydrates: Definition, importance and functions, Families of monosaccharides, Structure of carbohydrates, stereoisomerism and mutarotation, Derivatives of monosaccharides, disaccharides, and polysaccharides (starch, glycogen, cellulose, dextrans, agarose), proteoglycans and glycoproteins, sugars of bacterial cell wall.

Proteins: Definition, importance, classification and functions. Amino acids as building blocks of proteins, Structure and properties of amino acids, essential and non-essential amino acids, non-protein amino acids, Structure of peptide bond, Levels of protein structure, secondary (- helix, sheets), Tertiary and Quaternary structures of proteins.

Section-C

Definition, functions and classification and structure of fatty acids, omega fatty acids, Essential fatty acids, General structure and functions of major lipid subclasses, fats, phospholipids, sphingolipids, cerebrosides, gangliosides, terpenes, steroids, eicosanoids, prostaglandins and their synthesis in brief.

Molecular constituents and supramolecular architecture of biological membranes, Model membranes and liposomes, Solute transport across membranes, Ion transduction (Na⁺ and K⁺-ATPase), Electrical properties of membrane, Mechanism of sorting and regulation of intracellular transport.

Section-D

Definition, nomenclature and IUB classification of enzymes, Chemical basis of enzyme action, Kinetics of enzyme-catalyzed reactions, Derivation of Michaelis-Menten equation, L-B plot, Enzyme inhibition (reversible and irreversible), Regulation of enzyme activity, Allosteric enzymes, Co-factors, co-enzymes and prosthetic groups, Water soluble vitamins, Biosynthesis of nucleotide coenzymes.

Cell surface receptors, Signalling through G-protein-coupled receptors, Signal transduction pathways, Second-messenger systems, Regulation of signalling pathways, Principles of cell communication, Cell adhesion and role of adhesion molecules, Gap junction, Extracellular matrix.

Books Recommended:

1. Alberts, B., Bray, D., Hopkins, K., Johnson, A., Lewis, J., Raff, M., Roberts, K. and Walter, P. (2010). *Essential Cell Biology*. Garland Publishing Co. Inc, New York, 3rd ed.
2. Alberts, B., Bray, D., Lewis, J., Raff, M., Roberts, K. and Watson, I.D. (2010). *Molecular Biology of Cell*. Garland Publishing Co., Inc., New York.
3. Berg, J.M., Tymoczko, J.L. and Stryer, L. (2010). *Biochemistry*. W.H. Freeman and Co., New York, 7th ed.
4. Gupta, P.K. (1999). *A Textbook of Cell and Molecular Biology*. Rastogi Publications, Meerut.
5. Karp, G. (1999). *Cell and Molecular Biology, Concepts and Experiments*. John Wiley and Sons, New York.
6. Karp, G. (2014). *Cell Biology*. John Wiley and Sons, Singapore, 7thed.
7. Lehninger, A.L., Nelson, D.L. and Cox, M. (1993). *Principles of Biochemistry*. CBS Publishers and Distributors, New Delhi, 3rd ed.
8. Lodish, H., Berk, A., Zipursky, S.L., Malsudaira, P., Baltimore, D. and Darnell, J. (2000). *Molecular Cell Biology*. W.H. Freeman and Co., New York.
9. Voet, D. and Voet, J.G. (2004). *Biochemistry*. John Wiley and Sons, Inc., New York, 3rded.
10. Zubey, G.L., Parson, W.W. and Vance, D.E. (1998). *Principles of Biochemistry*. W.M.C. Brown Publishers, USA.
11. Garrett, R.H., Grisham, C.M. (2013) *Biochemistry*. Brook/Cole Cengage Learning, Belmont, CA, USA, 6th Ed.
12. Murray, R.K., Bender, D.A., Botham, K.M., Kenelly, P.J., Rodwell, V.W. and Mayes, P.A. (2012). *Harper's Illustrated Biochemistry*. McGraw-Hill, California, 29th ed.

CYL-192 INORGANIC CHEMISTRY

Credits: 3-1-0

Time: 3 Hours

Max. Marks: 100

Mid Semester Marks : 20

End Semester Marks : 80

Mid Semester Examination: 20% weightage

End Semester Examination: 80% weightage

Instructions for the Paper Setters:

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

Section- A

Co-ordinations 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. VSEPR 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.

Section- B

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.

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). Thermodynamic 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 antiferromagnetism.

Section- C

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

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

Section- D

II Acid Ligands Definition Carbon monoxide complexes, bonding in linear MCO groups, polynuclear metal carbonyls, vibrational spectra, Reactons, 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.

Alkali Metal and Alkaline Earth Metal Chelators Macrocylic ligands, Macrocylic 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, Topic in Current chemistry Vol-II.

PHL-196 MODERN PHYSICS**Credits: 3-1-0****Time: 3 Hours****Max. Marks: 100****Mid Semester Marks : 20****End Semester Marks : 80****Mid Semester Examination: 20% weightage****End Semester Examination: 80% weightage****Instructions for the Paper Setters:**

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

Section A

Dual Nature of Matter and Radiation: De Broglie's hypothesis, electron diffraction experiments of Davission and Germer, Wave group and particle velocities, Heisenberg's uncertainty principle, principle of the electron microscope, Diffraction of X-rays from crystals, Planck's quantum hypothesis, Bragg's law of determination of structure of simple crystals.

Section B

Radioisotopes and their Application: Radioactive decay laws, Uranium and Carbon dating, introduction to α , β and γ decays, Radioisotopes, their production and separation, mass spectrograph, uses of radioisotopes in medicine, agriculture and geology Radiation doses and their units, Biological effects of radiation.

Section C

Nuclear detection, Ionization detector, proportional counter, Geiger Muller detector, Cloud chamber, Scintillation counter and photographic emulsions as detectors.

Section D

Elementary particles and cosmic rays, Classification of elementary particles and their properties, conservation laws. Antiparticles, 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. Acota and C.L Grown.
3. Fundamentals of Modern Physics: B.D. Duggal and C.L. Chhabra.

M.Sc. HUMAN GENETICS (FYIC) (CBEGS) (SEMESTER-II)
(UNDER THE SCHEME OF HONOURS SCHOOL)

MTL-163 DIFFERENTIAL AND INTEGRAL CALCULUS

Credits: 5-1-0

Syllabus will be provided by the concerned department

ENL-151 :COMMUNICATIVE ENGLISH-II

Credits: 02 (L= 2, T=0, U=0)

Time: 3 Hours

Max. Marks: 100
Mid Semester Marks : 20
End Semester Marks : 80

Mid Semester Examination: 20% weightage

End Semester Examination: 80% weightage

Instructions for the Paper Setters:

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

Objective: To introduce students to the skills and strategies of reading and writing by identifying organizational patterns, spotting classification systems and understanding associations between ideas. This course will prepare students to read a variety of texts and also to communicate more effectively through writing. The course will also pay special attention to vocabulary building.

Prescribed Text books:

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

SECTION-A

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

SECTION-B

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

SECTION-C

Theoretical questions based on ABC of Good Notes as prescribed in *The Written Word* by Vandana R. Singh.

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

SECTION-D

Practical question on Essay writing from *The Written Word* by Vandana R. Singh
Section 4 from *Making Connections: A Strategic Approach to Academic Reading* by Kenneth J. Pakenham, Second Edition.

PBL 131 : ਪੰਜਾਬੀ ਲਾਜ਼ਮੀ - II (Credit Based)

Credit : 2-0-0

Time: 3 Hours

Max. Marks: 100
Mid Semester Marks : 20
End Semester Marks : 80

Mid Semester Examination: 20% weightage
End Semester Examination: 80% weightage

ਅੰਕ-ਵੰਡ ਅਤੇ ਪਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ

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

ਸੈਕਸ਼ਨ-ਏ

- I. **ਦੋ ਰੰਗ** (ਸੰਪਾ. ਹਰਜਿੰਦਰ ਸਿੰਘ ਢਿੱਲੋਂ, ਪ੍ਰੀਤਮ ਸਿੰਘ ਸਰਗੋਧੀਆ)
ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ, ਅੰਮ੍ਰਿਤਸਰ ਵਿਚੋਂ ਹੇਠ ਲਿਖੇ ਕਹਾਣੀਕਾਰ :
(ੳ) ਨਾਨਕ ਸਿੰਘ : **ਭੂਆ**
(ਅ) ਗੁਰਮੁਖ ਸਿੰਘ ਮੁਸਾਫਿਰ : **ਬਾਰੀ ਦੀ ਧੀ**
(ੲ) ਸੰਤ ਸਿੰਘ ਸੇਖੋਂ : **ਪੇਮੀ ਦੇ ਨਿਆਣੇ**
(ਕਹਾਣੀਕਾਰ ਦਾ ਜੀਵਨ, ਕਹਾਣੀ ਸਾਰ, ਵਿਸ਼ਾ-ਵਸਤੂ, ਕਹਾਣੀ ਕਲਾ)
- II. ਪੰਜਾਬੀ ਸ਼ਬਦ ਬਣਤਰ : ਧਾਤੂ/ਮੂਲ, ਵਧੇਤਰ (ਅਗੇਤਰ, ਪਿਛੇਤਰ, ਵਿਉਂਤਪਤ ਅਤੇ ਰੁਪਾਂਤਰੀ), ਸਮਾਸ।

ਸੈਕਸ਼ਨ-ਬੀ

- I. **ਦੋ ਰੰਗ** (ਸੰਪਾ. ਹਰਜਿੰਦਰ ਸਿੰਘ ਢਿੱਲੋਂ, ਪ੍ਰੀਤਮ ਸਿੰਘ ਸਰਗੋਧੀਆ)
ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ, ਅੰਮ੍ਰਿਤਸਰ ਵਿਚੋਂ ਹੇਠ ਲਿਖੇ ਕਹਾਣੀਕਾਰ :
(ੳ) ਸੁਜਾਨ ਸਿੰਘ : **ਬਾਗਾਂ ਦਾ ਰਾਖਾ**
(ਅ) ਕਰਤਾਰ ਸਿੰਘ ਦੁੱਗਲ : **ਤੈਂ ਕੀ ਦਰਦ ਨਾ ਆਇਆ**
(ਕਹਾਣੀਕਾਰ ਦਾ ਜੀਵਨ, ਕਹਾਣੀ ਸਾਰ, ਵਿਸ਼ਾ-ਵਸਤੂ, ਕਹਾਣੀ ਕਲਾ)
- II. ਪੈਰੂਾ ਰਚਨਾ : ਕਲਾਸ ਵਿਚ 10 ਵਿਸ਼ਿਆਂ (ਸਭਿਆਚਾਰ, ਧਾਰਮਕ ਅਤੇ ਰਾਜਨੀਤਕ) 'ਤੇ ਪੈਰੂਾ ਰਚਨਾ ਦੇ ਅਭਿਆਸ ਕਰਵਾਉਣੇ।

M.Sc. HUMAN GENETICS (FYIC) (CBEGS) (SEMESTER-II)
(UNDER THE SCHEME OF HONOURS SCHOOL)

ਸੈਕਸ਼ਨ-ਸੀ

- I. **ਦੋ ਰੰਗ** (ਸੰਪਾ. ਹਰਜਿੰਦਰ ਸਿੰਘ ਢਿੱਲੋਂ, ਪ੍ਰੀਤਮ ਸਿੰਘ ਸਰਗੋਧੀਆ)
ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ, ਅੰਮ੍ਰਿਤਸਰ ਵਿੱਚੋਂ ਹੇਠ ਲਿਖੇ ਕਹਾਣੀਕਾਰ :
(ੳ) ਕੁਲਵੰਤ ਸਿੰਘ ਵਿਰਕ : **ਧਰਤੀ ਹੇਠਲਾ ਬੋਲਦ**
(ਅ) ਨਵਤੇਜ ਸਿੰਘ : **ਦੂਜੀ ਵਾਰ ਜੇਬ ਕੱਟੀ ਗਈ**
(ੲ) ਪ੍ਰੇਮ ਪ੍ਰਕਾਸ਼ : **ਲੰਛਮੀ**
(ਕਹਾਣੀਕਾਰ ਦਾ ਜੀਵਨ, ਕਹਾਣੀ ਸਾਰ, ਵਿਸ਼ਾ-ਵਸਤੂ, ਕਹਾਣੀ ਕਲਾ)
- II. ਮੁਹਾਵਰੇ ਤੇ ਅਖਾਣ (ਅਖਾਣ ਤੇ ਮੁਹਾਵਰਾ ਕੋਸ਼ ਵਿਚ) 200 ਮੁਹਾਵਰਿਆਂ ਅਤੇ 100 ਅਖਾਣਾਂ ਨੂੰ ਵਾਕਾਂ ਵਿਚ ਵਰਤਣ ਦੇ ਅਭਿਆਸ ਕਰਵਾਉਣੇ (ਕਲਾਸ ਵਿਚ ਤੇ ਘਰ ਲਈ)।

ਸੈਕਸ਼ਨ-ਡੀ

- I. **ਦੋ ਰੰਗ** (ਸੰਪਾ. ਹਰਜਿੰਦਰ ਸਿੰਘ ਢਿੱਲੋਂ, ਪ੍ਰੀਤਮ ਸਿੰਘ ਸਰਗੋਧੀਆ)
ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ, ਅੰਮ੍ਰਿਤਸਰ ਵਿੱਚੋਂ ਹੇਠ ਲਿਖੇ ਕਹਾਣੀਕਾਰ :
(ੳ) ਅਜੀਤ ਕੌਰ : **ਬੁੱਤ ਸ਼ਿਕਨ**
(ਅ) ਦਲੀਪ ਕੌਰ ਟਿਵਾਣਾ : **ਬੱਸ ਕੰਡਕਟਰ**
(ਕਹਾਣੀਕਾਰ ਦਾ ਜੀਵਨ, ਕਹਾਣੀ ਸਾਰ, ਵਿਸ਼ਾ-ਵਸਤੂ, ਕਹਾਣੀ ਕਲਾ)
- II. ਸ਼ਬਦ ਸ਼੍ਰੇਣੀਆਂ : ਨਾਂਵ, ਪੜਨਾਂਵ, ਵਿਸ਼ੇਸ਼ਣ, ਕਿਰਿਆ, ਕਿਰਿਆ ਵਿਸ਼ੇਸ਼ਣ, ਸੰਬੰਧਕ

PBL-132: ਮੁੱਢਲੀ ਪੰਜਾਬੀ
(In lieu of Punjabi Compulsory)

Credits: 2-0-0

Time: 3 Hours

Max. Marks: 100
Mid Semester Marks : 20
End Semester Marks : 80

Mid Semester Examination: 20% weightage
End Semester Examination: 80% weightage

ਅੰਕ-ਵੰਡ ਅਤੇ ਪਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ

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

ਪਾਠ-ਕ੍ਰਮ

ਸੈਕਸ਼ਨ-ਏ

ਸਬਦ ਸੁਣਾਓ : ਪਛਾਣ ਅਤੇ ਵਰਤ

(ਨਾਂਵ, ਪੜਨਾਂਵ, ਵਿਸ਼ੇਸ਼ਣ, ਕਿਰਿਆ, ਕਿਰਿਆ ਵਸ਼ਸ਼ਣ)

ਸੈਕਸ਼ਨ-ਬੀ

ਨਤ ਵਰਤ ਦਾ ਪੰਜਾਬੀ ਸ਼ਬਦਾਵਲੀ : ਬਾਜ਼ਾਰ, ਵਪਾਰ, ਰਸਤ-ਨਾਤੇ, ਖੇਤੀ ਅਤੇ ਹੋਰ ਧੰਦਿਆਂ ਨਾਲ ਸਬੰਧਤ ।

ਸੈਕਸ਼ਨ-ਸੀ

ਪੰਜਾਬੀ ਵਾਕ-ਬਣਤਰ

ਸਾਧਾਰਨ-ਵਾਕ (ਪਛਾਣ ਅਤੇ ਵਰਤ)

ਸੰਯੁਕਤ-ਵਾਕ (ਪਛਾਣ ਅਤੇ ਵਰਤ)

ਮਿਸ਼ਰਤ-ਵਾਕ (ਪਛਾਣ ਅਤੇ ਵਰਤ)

ਸੈਕਸ਼ਨ-ਡੀ

ਪੜ੍ਹਾ ਰਚਨਾ

ਸੰਖੇਪ ਰਚਨਾ

M.Sc. HUMAN GENETICS (FYIC) (CBEGS) (SEMESTER-II)
(UNDER THE SCHEME OF HONOURS SCHOOL)

HSL-102 : Punjab History & Culture (1717-1947)
(Special paper in lieu of Punjabi Compulsory)
(For those students who are not domicile of Punjab)

Credits: 2-0-0

Time: 3 Hours

Max. Marks: 100
Mid Semester Marks : 20
End Semester Marks : 80

Mid Semester Examination: 20% weightage
End Semester Examination: 80% weightage

Instructions for the Paper Setters:

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

Section-A

1. Sikh Struggle for Sovereignty.
2. Ranjit Singh : Conquests, Administration and the Anglo-Sikh Relations.

Section-B

3. Anglo-Sikh Wars and the Annexation.
4. The Punjab under the British: New Administration, Education and social Change.

Section-C

5. Economic Changes: Agricultural
6. Socio-Religious Reform Movements.

Section-D

7. Role of Punjab in the Freedom Struggle.
8. Fairs and Festivals.

Suggested Reading

1. Kirpal Singh (ed.), *History and Culture of the Punjab*, Part-II, Punjabi University, Patiala, 1990.
2. Fauja Singh (ed.), *History of Punjab*, Vol, III, Punjabi University, Patiala, 1987.
3. J.S. Grewal, *The Sikhs of the Punjab*, *Cup, Cambridge, 1991.*
4. Khushwant Singh, *A History of the Sikhs*, Vol. I, OUP, New Delhi, 1990

**SOA-101 : DRUG ABUSE: PROBLEM, MANAGEMENT AND PREVENTION
(COMPULSORY ID PAPER)**

(Student can opt. this paper whether in 1st or 2nd semester)

PROBLEM OF DRUG ABUSE

Time: 3 Hours

Credit 3-0-0

**Max. Marks: 100
Mid Semester Marks : 20
End Semester Marks : 80**

Mid Semester Examination: 20% weightage

End Semester Examination: 80% weightage

Instructions for the Paper Setters:

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

Section – A

Meaning of Drug Abuse:

1. Meaning, Nature and Extent of Drug Abuse in India and Punjab.
2. Consequences of Drug Abuse for:

Individual	:	Education, Employment, Income.
Family	:	Violence.
Society	:	Crime.
Nation	:	Law and Order problem.

Section – B

Management of Drug Abuse:

- (iv) Medical Management: Medication for treatment and to reduce withdrawal effects.
- (v) Psychiatric Management: Counselling, Behavioural and Cognitive therapy.
- (vi) Social Management: Family, Group therapy and Environmental Intervention.

Section – C

Prevention of Drug abuse:

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

Section – D

Controlling Drug Abuse:

- (iii) Media: Restraint on advertisements of drugs, advertisements on bad effects of drugs, Publicity and media, Campaigns against drug abuse, Educational and awareness program
- (iv) Legislation: NDPs act, Statutory warnings, Policing of Borders, Checking Supply/Smuggling of Drugs, Strict enforcement of laws, Time bound trials.

References:

1. Ahuja, Ram (2003), *Social Problems in India*, Rawat Publication, Jaipur.
2. Extent, Pattern and Trend of Drug Use in India, Ministry of Social Justice and Empowerment, Government of India, 2004.
3. Inciardi, J.A. 1981. *The Drug Crime Connection*. Beverly Hills: Sage Publications.
4. Kapoor. T. (1985) *Drug epidemic among Indian Youth*, New Delhi: Mittal Pub.
5. Kessel, Neil and Henry Walton. 1982, *Alcoholism. Harmond Worth*: Penguin Books.
6. Modi, Ishwar and Modi, Shalini (1997) *Drugs: Addiction and Prevention*, Jaipur: Rawat Publication.
7. National Household Survey of Alcohol and Drug abuse. (2003) New Delhi, Clinical Epidemiological Unit, All India Institute of Medical Sciences, 2004.
8. Ross Coomber and Others. 2013, *Key Concept in Drugs and Society*. New Delhi: Sage Publications.
9. Sain, Bhim 1991, *Drug Addiction Alcoholism, Smoking obscenity* New Delhi: Mittal Publications.
10. Sandhu, Ranvinder Singh, 2009, *Drug Addiction in Punjab: A Sociological Study*. Amritsar: Guru Nanak Dev University.
11. Singh, Chandra Paul 2000. *Alcohol and Dependence among Industrial Workers*: Delhi: Shipra.
12. Sussman, S and Ames, S.L. (2008). *Drug Abuse: Concepts, Prevention and Cessation*, Cambridge University Press.
13. Verma, P.S. 2017, “*Punjab’s Drug Problem: Contours and Characteristics*”, Economic and Political Weekly, Vol. LII, No. 3, P.P. 40-43.
14. World Drug Report 2016, United Nations office of Drug and Crime.
15. World Drug Report 2017, United Nations office of Drug and Crime.

CYP-196: INORGANIC CHEMISTRY LAB — QUALITATIVE ANALYSIS
(Practical)

Credits: 0-0-2

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

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

Book Recommended:

Vogel's book on Inorganic Qualitative Analysis.

PHP-197 Electricity and Magnetism Lab

Credits: 0-0-2

Course contents of the papers PHP-197 Electricity and Magnetism Lab are in continuation of theory paper PHL-196 Modern Physics and will be provided by the Department of Physics.