PUNJABI UNIVERSITY PATIALA

Scheme of Studies and Examinations for the PART-I

B.Sc. (Hons. in Agriculture) Ist Semester

COURSE CODE	SUBJECT	Period per week		THEORY		PRACTICAL	TOTAL
		Theory	Practical	EXTERNAL	INTERNAL		
AGRON-101	FUNDAMENTALS OF AGRONOMY	3	2	45	15	40	100
AGRON- 102	INTRODUCTORY AGROMETEROLOGY	3	2	45	15	40	100
SOIL- 101	FUNDAMENTALS OF SOIL SCIENCE	3	2	45	15	40	100
MICRO-101	AGRICULTURAL MICROBIOLOGY	3	2	45	15	40	100
ECON-101	FUNDAMENTALS OF AGRICULTURAL ECONOMICS	3	-	75	25	-	100
ENG-101	ENGLISH	3	-	75	25	-	100
QUALIFYING SUBJECT							
PUN-101/ BPB-101	PUNJABI (FOR PROFESSIONAL COURSES)/ PUNJABI MUDLA GYAN/ ELEMENTORY PUNJABI (FOR STUDENTS OF OTHER STATE)	3	-	75	25	-	100 (**Qualifying**)
OPTIONAL							
MATH-101	MATHEMATICS (FOR MEDICAL STUDENTS)	3	-	75	25	-	100
BOT-101	BASIC BOTANY (FOR NON-MEDICAL STUDENTS)	3	2	45	15	40	100
Total		**24**	**10**				**700**

B.Sc. (Hons. in Agriculture) IInd Semester

PAPER NO.	SUBJECT	Period per week		THEORY		PRACTICAL	TOTAL
		Theory	Practical	EXTERNAL	INTERNAL		
PATH-101	FUNDAMENTALS OF PLANT PATHOLOGY	3	2	45	15	40	100
HORT -101	FUNDAMENTALS OF HORTICULTURE	3	2	45	15	40	100
FOR-101	INTRODUCTORY FORESTRY	3	2	45	15	40	100
GPB-101	PRINCIPLES OF GENETICS	3	2	45	15	40	100
BIOCHEM-101	FUNDAMENTALS OF BIOCHEMISTRY	3	2	45	15	40	100
ENG-102	ENGLISH	3	-	75	25	-	100
QUALIFYING SUBJECTS							
PUN-102/ BPB-102	PUNJABI (FOR PROFESSIONAL COURSES)/ PUNJABI MUDLA GYAN/ ELEMENTORY PUNJABI (FOR STUDENTS OF OTHER STATE)	3	-	75	25	-	100 (**Qualifying**)
DA-101	DRUG ABUSE: PROBLEM, MANAGEMENT & PREVENTION	3	-	70	30	-	100 (**Qualifying**)
OPTIONAL							
MATH-102	MATHEMATICS II (FOR MEDICAL STUDENTS)	3	-	75	25	-	100
ZOO-101	BASIC ZOOLOGY (FOR NON MEDICAL STUDENTS)	3	2	45	15	40	100
Total		**27**	**12**				**700**

AGRON-101: FUNDAMENTALS OF AGRONOMY

Max Marks: 100 **Duration of the Paper: 3 Hour**
Theory: 45 **Practical: 40**
Internal Assessment: 15

INSTRUCTIONS FOR PAPER SETTER

The question paper will consist of three sections A, B and C. Section A and B will have four questions from the respective sections of the syllabus and will carry 9 marks each. Section C will consist of 9 short-answer type questions of 1 mark each which will cover the entire syllabus uniformly and will carry 9 marks in all.

INSTRUCTIONS FOR CANDIDATES

The Candidates are required to attempt two questions from each section A and B and the entire section C.

Theory

Section A

1. History of agriculture, its importance and branches, meaning and scope of Agronomy definition and importance, its relationship with other sciences.
2. Classification of crops, factors affecting crop production, soil and water in relation to crop production.
3. Cropping system- different types of cropping system: intercropping, multiple cropping, mixed cropping, intensive cropping and crop rotation, relay cropping, Alley cropping.
4. Tillage: objectives, types, principle, farm tools, machinery. Modern concept and implements.

Section B

5. Methods of sowing, suitability under different conditions, seeding practices in relation to kind of seed, types of soil, time of sowing, soil moisture.
6. Irrigation: principle and practices, dry land/ rainfed farming.
7. Weeds: Introduction, Characteristics, dissemination, harmful and beneficial effects, classification, crop weed competition, allelopathy and the method of control.
8. Maintenance of soil fertility and productivity: Organic manures, green manuring, fertilizers and their applications

PRACTICAL

Max. Marks: 40 **Time allowed: 3 Hours**

1. Land measurement.
2. Study of tillage implements and their operations.
3. Field preparation and seed bed preparation.
4. Study of seeding equipments.
5. Different methods of sowing.
6. Identification different of manures and fertilizers.
7. Methods of fertilizer application.
8. Identification of weeds.
9. Survey of weeds in crop fields and other habitats.
10. Herbicides their active ingredient and trade names.
11. Identification of field crops and their seeds.
12. Depth of seed sowing in relation to seed size.
13. Harvesting indices and acquaintance with harvesting machinery.

References Books:

1. Cheema S.S., D.K. Dhaliwal and T.S. Sahota. Theory and Digest Agronomy.
2. Chhidda Singh. Modern techniques of raising field crops
3. Ghadekar, S.R. Meteorology.
4. Kakade, J.R. Agricultural climatology
5. Lenka, D. Climate, weather and crops in India
6. Mavi, H.S. Introduction to Agro-meteorology. Oxford and IBH Publishing Co., New Delhi.
7. Moracban, Y. B. Crop Production and Management. Oxford and IBH Publisher Co. Pvt. Ltd., New Delhi Reddy, S. R. Principles of Agronomy. Kalyani Publishers, New Delhi
8. Morachan, Y.B. Crop production and management. Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi.
9. Rajendra Prasad. Field crops
10. Reddy, S.R. Principles of Agronomy. Kalyani Publishers, New Delhi.
11. Singh S.S. Principles and Practices of Agronomy. Kalyani Publishers, New Delhi.
12. Singh, S. S. Crop Management under irrigated and rainfed condition. Kalyani Publishers, New Delhi
13. Vaidya, V.G., K.R. Sahasrabuddhe and V.S. Khuspe. Crop Production and Field Experimentation. Continental Prakashan, Pune.

AGRON-102: INTRODUCTORY AGROMETEROLOGY

Max Marks: 100 **Duration of the Paper: 3 Hour**

Theory: 45 **Practical: 40**

Internal Assessment: 15

INSTRUCTIONS FOR PAPER SETTER

The question paper will consist of three sections A, B and C. Section A and B will have four questions from the respective sections of the syllabus and will carry 9 marks each. Section C will consist of 9 short-answer type questions of 1 mark each which will cover the entire syllabus uniformly and will carry 9 marks in all.

INSTRUCTIONS FOR CANDIDATES

The Candidates are required to attempt two questions from each section A and B and the entire section C.

Theory

Section A

1. Agro-meteorology - definition, practical utility and scope. General climatology. Structure and composition of earth's atmosphere.
2. Elements and factors of weather and climate - temperature, pressure, wind, solar radiation and moisture.
3. Impact of climate on crops and livestock distribution and production.
4. Meteorological factors in photosynthesis, respiration and net assimilation.

Section B

5. Agro-climatic indices - definitions and applications in agriculture. Effect of environmental factors on crop growth.
6. Weather hazards in agriculture. Climatic classifications. Agro-climatic zones of Punjab and agro-ecological zones of India.
7. Basics of field microclimate modification. Introduction to monsoons, crop weather calendar.
8. Elementary aspects of weather forecasting. Agronet advisories and weather forecasting techniques. Climate change and agriculture.

PRACTICAL

Max. Marks: 40 **Time allowed: 3 Hours**

1. Site selection for Agro-meteorological Observatory.
2. Project on setting up, recording and maintenance of instruments in a meteorological observatory.
3. Measurement of temperature, rainfall, evaporation, atmospheric pressure, sunshine duration, solar radiation, wind direction, wind speed and relative humidity.
4. Study of weather forecasting and synoptic charts.
5. Processing, presentation and interpretation of climatic data in relation to crops.
6. Preparation of crop weather colander.

Reference Book:

1. Agriculture Meteorology by A. S. Mavi. Kalyani
2. General Climatology by Critbbfierd & Hewarda. Published by Prentice Hall
3. Introduction to Climatology for the Tropics by J. D. Yeade. Published by John Wiley & Sons
4. The Earth and its Atmosphere by D. R. Bates. Basic Books, Inc., New York USA, 1957.

SOIL-101: FUNDAMENTALS OF SOIL SCIENCE

Max Marks: 100 **Duration of the Paper: 3 Hour**

Theory: 45 **Practical: 40**

Internal Assessment: 15

INSTRUCTIONS FOR PAPER SETTER

The question paper will consist of three sections A, B and C. Section A and B will have four questions from the respective sections of the syllabus and will carry 9 marks each. Section C will consist of 9 short-answer type questions of 1 mark each which will cover the entire syllabus uniformly and will carry 9 marks in all.

INSTRUCTIONS FOR CANDIDATES

Candidates are required to attempt two questions from each section A and B and the entire section C.

Theory

Section A

1. Concept of land, soil and soil science. Composition of earth crust and its relationship with soils.
2. Rocks and minerals. Weathering. Soil forming factors and processes. Soil profile. Soil colour.
3. Elementary knowledge of taxonomic classification of soils. Soil and soil components. Physical properties of soil, soils of Punjab and India.
4. Soil texture– textural classes. Soil structure– classification, soil aggregation and significance, soil consistency, soil crusting, bulk density and particle density of soils and porosity, their significance and manipulation.

Section B

5. Soil colloids– properties, nature, types and significance. Sources of charges in clay minerals.
6. Soil microorganisms. Soil and water pollution. Soil organic matter–decomposition, mineralization and humus.
7. Soil reactions acidic, saline, alkaline and alkali soil and their reclamation. Soil testing for recommendation purpose.
8. Ion exchange, CEC, AEC – factors affecting and adsorption of ions. Carbon cycle, C: N ratio. Soil organisms and their beneficial and harmful roles.

PRACTICAL

Max. Marks: 40 **Time allowed: 3 Hours**

1. Determination of bulk density and particle density.
2. Aggregate size analysis. Soil mechanical analysis.
3. Analytical chemistry– basic concepts, techniques and calculations, collection and processing of soil samples for analysis of organic carbon, pH, EC, available N, P, K and S.
4. Study of a soil profile. Identification of rocks and minerals.
5. Collection of soil sample from the field crop.
6. Determination of pH soil sample.
7. Determination of moisture in given soil sample.
8. Estimation of available nitrogen in given soil sample.
9. Estimation of available phosphorus in given soil sample.
10. Estimation of available potassium in given soil sample.
11. Determination of bulk density and particle density.
12. Study of a soil profile in rocks and minerals.
13. Visit to a soil testing laboratory.
14. Interpretation of soil test reports.

Reference Book:

1. A text book of Soil Science – T.D. Biswas& S.K. Mukherjee Tata McGraw-Hill Publishing Company.
2. Conception,Application of Pedology – J.L. Sehgal.
3. Fundamentals of Soil Science – Indian Society of Soil Science.
4. Fundamentals of Soil Science Wiley Eastern PVT LTD New Delhi, Roth HD and Turk L H.
5. Introduction to soil Physics –D. Hillel.
6. Manures and Fertilizer, Agri/ KA Publishing Co Nagpur, Yawalkar, KS Aggarwal, JP and Bakele S.
7. Soil Physics – B.P.Ghildyal and R.P.Tripathy.
8. Soil theory chemistry and Fertility in tropical Asia, Prentice hall of PVT LTD, New Delhi India Tenhane R.V. Motiramani, DP, Bali VP and Dohhahue Royl.
9. The Nature and properties of Soil Mcmillan publishing Co. New Delhi, Brady, Nylkse CC :
10. The nature and properties of soils-N.C.Brady and Ray R.Weil, Pearson Publications

MICRO-101: AGRICULTURAL MICROBIOLOGY

Max Marks: 100 **Duration of the Paper: 3 Hour**

Theory: 45 **Practical: 40**

Internal Assessment: 15

INSTRUCTIONS FOR PAPER SETTER

The question paper will consist of three sections A, B and C. Section A and B will have four questions from the respective sections of the syllabus and will carry 9 marks each. Section C will consist of 9 short-answer type questions of 1 mark each which will cover the entire syllabus uniformly and will carry 9 marks in all.

INSTRUCTIONS FOR CANDIDATES

Candidates are required to attempt two questions from each section A and B and the entire section C.

Theory

Section -A

1. Definition and its applied areas, discovery of microorganisms and their role in agriculture. Germ theory of disease and protection.
2. Structure of eukaryotic and prokaryotic cell, major groups of eukaryotes, fungi, algae and protozoa.
3. Major groups of prokaryotes, actinomycetes, cyan bacteria, arhaebacteria, rickettsias and Chlamydia, bacterial growth.
4. Metabolism in bacteria, ATP generation, chemoautotrophy, photo-autotrophy, respiration, fermentation, bacteriophages, structure and properties, lytic and lysogenic cycles, viriods, prions, genetic recombinations.

Section -B

5. Microbial groups in soil, microbial transformation of carbon, nitrogen, phosphorus and sulphur, microbes in composting.
6. Microbiology of water and food, beneficial microorganisms in agriculture, bio-fertilizers, microbial pesticides, biodegradation, plant, microbe interactions.
7. Introduction to mushrooms and mushroom growing, edible and poisonous mushrooms, cultivation technology of mushrooms.
8. Biological Nitrogen fixation, role of microorganisms in food, dairy and fermentation industries and waste water treatment, microorganisms as food. Biogas

PRACTICAL

Max. Marks: 40 **Time allowed: 3 Hours**

1. Familiarization with instruments and other materials in a Microbiological laboratory.
2. Practice of aseptic methods on nutrient broth, slants and agar plates.
3. Methods of sterilization and preparation of media and glassware.
4. Sterilization of nutrient broth by filtration. Plating methods for isolation and purification of bacteria.
5. Identification of bacteria by staining methods.
6. Enumeration of bacteria by staining, pour plate and spread plate methods.
7. Cultivation technology of mushrooms.
8. Tissue culture preparation and maintenance of edible fungi.
9. Spawn production for mushroom.

Books Recommended:

1.	Davis, B.D. Dullbecco R. Elisena dn Ginsberg H.S. (1990)	:	Microbiology: 4th Ed. Harper & Row, Publishers, Singapore.
2.	Tortora, G.J. Funke, B.R. and case, C.L. (1994)	:	Microbiology : An introduction: 5th Ed. The Benjamin/Cunnings Publishing Company, Inc.
3.	Stainer, R.Y. (1995)	:	General Microbiology. MacMillan Press, London.
4.	Pelezar , M.T. (1995)	:	Microbiology, Tata Mc Graw Hill Publishing, New Delhi.
5.	Schlegel , H.G. (1995)	:	General Microbiology 7th Ed., Cambridge Uni., Press.
6.	Prescott and Dunn (1999)	:	Industrial Microbiology 4th Ed. By S.K. Jain for CBS Publishers & Distributors, New Delhi.
7.	Purobit,S.S. (2000)	:	Microbiology: Fundamental and Applications (6th Ed). Agrobios, (India).
8.	Postagate, J. (2000)	:	Microbes & MAN 4TH Ed, Cambridge Uni., Press.
9.	Tortora G.J. Funke B.R. 2001	:	Microbiology: An introduction. Benjamin Cummings.

ECON-101: FUNDAMENTALS OF AGRICULTURAL ECONOMICS

Max Marks: 100 **Theory: 75**

Duration of the Paper: 3 Hours **Internal Assessment 25**

INSTRUCTIONS FOR PAPER SETTER

The question paper will consist of three sections A, B and C. Section A and B will have four questions from the respective sections of the syllabus and will carry 15 marks each. Section C will consist of 10 short-answer type questions which will cover the entire syllabus uniformly and will carry 1½ marks each.

INSTRUCTIONS FOR CANDIDATES

Candidates are required to attempt two questions from each section A and B and the entire section C.

Theory

Section -A

1. Agricultural economics: Meaning, definition, subject matter, basic economic concepts.
2. Wants: Meaning and characteristics. Theory of consumption– marginal utility analysis.
3. Demand: Meaning, definition, kinds of demand, law of demand, change in demand. Elasticity of demand– various types, degrees, methods of measurement, importance and factors influencing elasticity of demand.
4. Consumer's surplus: meaning definition, importance, welfare Economics, meaning, Pareto's optimality.

Section -B

5. Agriculture production economics-factors-product relationship, factors relationship, product relationship, returns to scale, production function.
6. National Income– concepts, measurement, meaning, definition, importance. Perfect and Imperfect competition– definition, types and characteristics.
7. Public finance: meaning, principle, public resources. Taxes: meaning, classification cannons of taxation.
8. Public expenditure: meaning principles. Inflation – Meaning, definition, kinds of inflation.

Reference Book:

1. Agricultural Economics Reddy and Raghuram Oxford and IBH
2. Dewett, K.K. : Modern Economics Theory, Premier Publishing Co. Delhi.
3. Jather & Berry : Elementary Principles of Economics.
4. Samuelson : Economics & Introductory Analysis, McGraw Hill Book Co., New York.
5. Sen, D.N. : Elementary Economics (Text Book), Calcutta.

ENG-101: ENGLISH

Max Marks: 100 **Theory: 75**

Duration of the Paper: 3 Hours **Internal Assessment 25**

INSTRUCTIONS FOR PAPER SETTER

The question paper will consist of three sections A, B and C. Section A will have Three questions and will carry 30 marks . Section B will consist of four questions and will carry 30 marks. Section C will consist of 15 very short-answers type questions and will carry 15 marks in all.

Section A

Text Prescribed: **Prose Parables. Orient Black Swan, 2013.**

The following stories are not to be studied: 01-08

Testing

1) One essay type question with an internal alternative based on Character, Summary, Significance of the title. 15

2) Short answer questions. Five questions to be attempted out of the given eight in about 50-60 words each. 10

3) Explain with reference to context any one paragraph out of the given two paragraphs. 5

Section B

Text Prescribed: **The Student's Companion:** Wilfred D. Best

Testing:

4) One unseen comprehension passage of about 300 words. The student is expected to attempt all the given five questions pertaining to the passage carrying 2 marks each. 10

5) Correction of Sentences: The student is expected to attempt any 10 sentences out of the given 12. 10

6) Idioms: The student is expected to give the meaning of any 5 idioms out of the given 8 and use them in meaningful sentences. 5

7) Misspelt Words: The student is expected to attempt any 5 words out of the given 8. 5

Section C

Section C will cover the entire syllabus. All 15 questions to be answered in one sentence each. 15x1=15

PUN-101/ BPB-101 : Punjabi

Qualifying subject

To download the Syllabus go to :

www.punjabiuniversity.ac.in → **Important Links → Download Syllabus → Academic Session 2019-20 → Faculty of Languages → Punjabi → Under Graduate → Under Graduate Degree Level Professional Courses Common Syllabus Punjabi or Mudla Gyan or Elementry Punjabi.**

MATH-101- MATHEMATICS (For Medical Students)

Max Marks: 100 Theory: 75

Time allowed: 3 Hours Internal Assessment: 25

INSTRUCTIONS FOR PAPER SETTER

The question paper will consist of three sections A, B and C. Section A and B will have four questions from the respective sections of the syllabus and will carry 15 marks each. Section C will consist of 10 short-answer type questions which will cover the entire syllabus uniformly and will carry 1½ marks each.

INSTRUCTIONS FOR CANDIDATES

Candidates are required to attempt two questions from each section A and B and the entire section C.

Theory

Section- A

1) Mensuration: Mensuration of rectangles, easy examples of garden paths, cost of planting trees and fencing gardens. Area of right angled triangles area and height of isosceles and equilateral triangles, area of triangles in terms of sides, rent of field. Area of parallelograms, rhombus, quadrilateral and trapenoid. Regular polygons with emphasis on hexagon and octagon. Simple cases of similar figures. Circumference and area of circles. Circular rings. Cost of fencing circular fields and paths.

2) Mensuration: Volumes of cubes and rectangular solids. Cubic contents of tanks and cisterns. Volumes of triangular and rectangular prisms, right circular cylinders and segments of cylinders. **(N. B.** Easy numerical examples bearing on Science of agriculture only to be set. Proofs of formulae not required.)

3) Algebra: Solution of quadratic equations and of those reducible to quadratic equation. (One variable). Theory of quadratic equations. Relation between roots and co-efficients.

Section- B

4) Algebra: Series: nth terms sum to n terms of an A. P. and G. P. nth term of an H. P. (excluding means and problems on numbers). Permutation and combinations: simple problems only. (Proofs of formulae not required). Binomial theorem, statement for any

index: Expansion particular term coefficient of n, summation of simple infinite series evaluation cube root etc. correct to a certain place of decimal.

5) Co-ordinate Geometry:

(1) The point-distance and section formulae area of a triangle.

(2) The straight line equation in the following standard forms:

$x=a,\ y=b,\ y=mx,\ y=mx+c,\quad \frac{x}{a}+\frac{y}{b}=1,$

$$y-y'=m\,(x-x')\ \frac{x-x'}{x''-x}\ \frac{y-y'}{y''-y'}$$

Reduction of equation ax+by+c=0: to (a) slope x cos ϴ+y sin ϴ= p (b) intercept form (c) perpendicular form (only method of reduction and not proof); point of intersection and, concurrence, Angle of intersection of lines y=m x+c, $Y=m_2x+c_2$, and equations of line (a) parallel and (b)^2 perpendicular to a given line and passing through a given point.

(6) The circle- equation when (i) centre and radius given. (ii) Passes through three points (iii) extremities of a diameter given; the equation $x^2+y^2+2qx+2cy+c=0$ represents circle, center and radius, equations of the tangents and normal at any point of circle (only use formula no proof).

Reference Books

1. Algebra by D. C. Kapoor & Gurbax Singh
2. Algebra by T. N. Nagpal & K. K. Gupta.
3. Comprehensive Calculus by R. S. Dehiya.
4. Mensuration by Pic Point.
5. New Style Calculus for T. D. C. – I.
6. New Style Co-ordinator Geometry by R. K. Sondhi
7. Trignometry by Jiwan

BOT-101- BASIC BOTANY (For Non-Medical Students)

Max Marks: 100 **Duration of the Paper: 3 Hour**

Theory: 45 **Practical: 40**

Internal Assessment: 15

INSTRUCTIONS FOR PAPER SETTER

The question paper will consist of three sections A, B and C. Section A and B will have four questions from the respective sections of the syllabus and will carry 9 marks each. Section C will consist of 9 short-answer type questions of 1 mark each which will cover the entire syllabus uniformly and will carry 9 marks in all.

INSTRUCTIONS FOR CANDIDATES

The Candidates are required to attempt two questions from each section A and B and the entire section C.

Section –A

1. Classification and introduction to different groups of the plant kingdom, a general outline of the studies of an angiosperm, Life cycle of a flowering plant; annuals, biennials and perennials.

   Morphology: Structure of seeds of: Gram, Maize, and their germination; types of germination.
2. **Anatomy:** An elementary account of the various tissues and their functions, internal structure of a stem (Dicot and Monocot), root and leaf.
3. **Roots:** External characters and functions, types of root systems and their bearing on agriculture practices. Major modifications of root systems and their significance.

   Stem: External characters and functions, Major modifications of stem.

   Leaf: Parts of a typical leaf and their functions; simple and compound leaves and their functions, venation and modifications of leaves; uses of leaves.
4. **Inflorescence:** Elementary knowledge of simple and special types of inflorescences.

   Flower: Structure and functions of floral parts, modifications, floral diagram, floral formulae and vertical section of a flower, structure of the thalamus and insertion of the floral appendages on the thalamus, placentation.

Section –B

5. **Pollination:** Types of pollinations, agencies responsible (Anemophily and Entomophily) for pollination, contrivances for cross pollination.

   Fertilization: Fertilization and seed formation.

   Structure of Orthotropus, and Anatropous ovule, Embryo in Capsella only.

   Reproduction in Plants: Vegetative, and sexual reproduction their merits and demerits. Natural and Artificial methods.
6. **Fruits:** Elementary knowledge of fruits, dispersal of seeds and fruits with examples from Punjab what so ever is possible.
7. **Classification:** Diagnostic characters (floral) and economic importance of following families with reference to the type mentioned (taxonomy of the other genera is beyond the scope of this paper).

A. Cruciferae: *Brassica, Raphanus*
B. Malvaceae: *Gossypium, Hibiscus*
C. Rutaceae: *Citrus*
D. Rosaceae: *Rose,*

8. **Classification:** Diagnostic characters (floral) and economic importance of following families with reference to the type mentioned (taxonomy of the other genera is beyond the scope of this paper)

A. Leguminosae: *Pisum, Cassia, Acacia*
B. Cucurbitaceae: *Luffa*
C. Compositae: *Helianthus*
D. Solanaceae: *Capsicum, Petunia*
E. Graminaeae: *Triticum*

PRACTICAL

Max. Marks: 40 **Time allowed: 3 Hours**

1. Study of the form and structure of seeds, stems, leaves and buds of important field and garden crops. (According to those in Theory).
2. Study of the structure of flower and main types of inflorescences.
3. Study of the fruits dispersal of Agricultural importance.
4. Microscopic examination of roots, stem and leaf (slides).
5. Study of the characters of the important plants covered in the theory.

Reference Books

1. L. D. Dutta: *Text Book of Botany* (Latest Ed.)
2. Vidyarthi: *Text Book of Botany* Part – I.
3. Widge & Bhatia: *Introduction of Botany*.

PATH-101- FUNDAMENTALS OF PLANT PATHOLOGY

Max Marks: 100 **Duration of the Paper: 3 Hour**
Theory: 45 **Practical: 40**
Internal Assessment: 15

INSTRUCTIONS FOR PAPER SETTER

The question paper will consist of three sections A, B and C. Section A and B will have four questions from the respective sections of the syllabus and will carry 9 marks each. Section C will consist of 9 short-answer type questions of 1 mark each which will cover the entire syllabus uniformly and will carry 9 marks in all.

INSTRUCTIONS FOR CANDIDATES

The Candidates are required to attempt two questions from each section A and B and the entire section C.

Theory

Section A

1. Definition, objectives, history, terms and concept of plant pathology.
2. General characters of fungi, bacteria, fastidious bacteria, nematodes, phytoplasmas, spiroplasmas, viruses, viroids, algae, protozoa and phanerogamic parasites.
3. Survival and dispersal of plant pathogens, Phenomenon of infection.
4. Study of Xanthomonas, Pseudomonas, Meloidogyne and Anguina. Defence mechanisms in plants. Plant disease epidemiology and forecasting.

Section B

5. Study of genera Pythium, Phytophthora, Albugo, Sclerospora, Peronosclerospora, Pseudoperonospora, Peronospora, Plasmopara, Bremia, Mucor, Rhizopus, Oidium,Erysiphe, Phyllactinia, Uncinula, Podosphaera, Puccinia, Uromyces, Hemileia, Sphacelotheca,
6. Study of Ustilago, Tolyposporium, Agaricus, Pleurotus, Ganoderma, Septoria, Colletotrichum, Pestalotia, Pyricularia, Aspergillus, Penicillium, Trichoderma, Fusarium, Drechslera, Alternaria, Stemphyllium, Cercospora, Phaeoisariopsis, Rhizoctonia, Sclerotinia, xanthomonas, pseudomonas, meloidogyne and anguina.
7. Defence mechanism in plants, Plant disease epidemiology and forecasting. General principles of plant disease management, Plant quarantine and inspection.
8. Genetic, cultural, biological, physical and chemical methods of plant disease management. Integrated plant disease management.

PRACTICAL

Max. Marks: 40 **Time allowed: 3 Hours**

1. Acquaintance to plant pathology laboratory equipments.
2. Preparation of culture media for fungi and bacteria.
3. Isolation techniques and preservation of plant disease samples.
4. Study of important plant pathogenic genera.
5. Demonstration of Koch's postulates.
6. Study of different groups of fungicides and antibiotics.
7. Bio-control of plant pathogens.

Reference Books

1. Alexopolues, : *Introductory Mycology*
2. *B.P. Pandey* : *Plant Pathology*
3. Chattopadhyaya, SB
4. *G.L. Chopra* : *Fungi*
5. Mundkur, C.T. B.B. & : *Fungi and Plant Diseases*
6. *R.P. Singh* : *Plant Pathology*
7. Singh, RS : *Plant Diseases*

HORT-101-FUNDAMENTALS OF HORTICULTURE

Max Marks: 100 **Duration of the Paper: 3 Hour**
Theory: 45 **Practical: 40**
Internal Assessment: 15

INSTRUCTIONS FOR PAPER SETTER

The question paper will consist of three sections A, B and C. Section A and B will have four questions from the respective sections of the syllabus and will carry 9 marks each. Section C will consist of 9 short-answer type questions of 1 mark each which will cover the entire syllabus uniformly and will carry 9 marks in all.

INSTRUCTIONS FOR CANDIDATES

The Candidates are required to attempt two questions from each section A and B and the entire section C.

Theory

Section A

1. Horticulture-Its definition and branches, importance and scope. Horticultural and botanical classification; climate and soil for horticultural crops.
2. Plant propagation-methods and propagating structures; Natural and artificial methods of plant propagation.
3. Principles and methods of training and pruning.
4. Pollination, pollinizers and pollinators; fertilization and parthenocarpy.

Section B

5. Juvenility and flower bud differentiation, unfruitfulness.
6. Kitchen gardening; garden types and parts; lawn making.
7. Use of plant bio-regulators in horticulture. Irrigation & fertilizers application-method and quantity.
8. Principles of orchard management, soil culture, quality and its management for orchard plantation. Effect of soil organic matter on physico- chemical characteristics of the soil.

PRACTICAL

Max. Marks: 40 **Time allowed: 3 Hours**

1. Identification of garden tools.
2. Identification of horticultural crops.
3. Preparation of seed bed/nursery bed.
4. Practice of sexual and asexual methods of propagation.
5. Layout and planting of orchard plants.
6. Training and pruning of fruit trees.
7. Transplanting and care of vegetable seedlings.
8. Making of herbaceous and shrubbery borders.
9. Preparation of potting mixture, potting and repotting.
10. Fertilizer application in different crops.
11. Visits to commercial nurseries/orchard.

Reference Books

1. Adams, C.R. and M. P. Early. 2004. Principles of horticulture. Butterworth –Heinemam, Oxford University Press.
2. Bansil. P.C. 2008. Horticulture in India. CBS Publishers and Distributors, New Delhi. Kumar, N.1997. Introduction to Horticulture, Rajalakshmi Publication, Nagercoil.
3. Bhattacharjee.S.K. 2006. Amenity Horticulture, Biotechnology and Post harvest technology. Pointer publishers. Jaipur
4. Chadha, K.L. 2001, Handbook of Horticulture, ICAR, New Delhi.
5. Chandra, R. and M. Mishra. 2003. Micropropagation of horticultural crops. International Book Distributing Co., Lucknow.
6. Chattopadhyaya, P.K.2001. A text book on Pomology (Fundamentals of fruit growing) Kalyani Publication, New Delhi
7. Christopher, E.P. 2001. Introductory Horticulture, Biotech Books, New Delhi
8. Edmond, J.B. T.L.Senn, F.S. Andrews and P.G.Halfacre, 1975. Fundamentals of Horticulture, Tata MC. Graw Hill Publishing Co.New Delhi
9. George Acquaah, 2002, Horticulture-principles and practices. Prentice-Half of India pvt. Ltd., New Delhi.
10. Hartman, H.T. and Kester, D.E. 1986. Plant propagation – Principles and Practices – Prentice Hall of India Ltd., New Delhi.

FOR-101: INTRODUCTORY FORESTRY

Max Marks: 100 **Duration of the Paper: 3 Hour**

Theory: 45 **Practical: 40**

Internal Assessment: 15

INSTRUCTIONS FOR PAPER SETTER

The question paper will consist of three sections A, B and C. Section A and B will have four questions from the respective sections of the syllabus and will carry 9 marks each. Section C will consist of 9 short-answer type questions of 1 mark each which will cover the entire syllabus uniformly and will carry 9 marks in all.

INSTRUCTIONS FOR CANDIDATES

The Candidates are required to attempt two questions from each section A and B and the entire section C.

Theory

Section A

1. Introduction – definitions of basic terms related to forest cover of India and world, objectives of silviculture, forest classification, salient features of Indian Forest Policies.
2. Forest regeneration, Natural regeneration - natural regeneration from seed and vegetative parts, coppicing, pollarding, root suckers; Artificial regeneration – objectives, choice between natural and artificial regeneration, essential preliminary considerations.
3. Crown classification. Tending operations – weeding, cleaning, thinning – mechanical, ordinary, crown and advance thinning.
4. Forest mensuration – objectives, diameter measurement, instruments used in diameter measurement.

Section B

5. Non instrumental methods of height measurement - shadow and single pole method; Instrumental methods of height measurement –
6. Geometric and trigonometric principles, instruments used in height measurement; tree stem form, form factor, form quotient, measurement of volume of felled and standing trees, age determination of trees.
7. Agroforestry – definitions, importance, criteria of selection of trees in agroforestry, different agroforestry systems prevalent in the country, shifting cultivation, taungya, alley cropping, wind breaks and shelter belts, home gardens.
8. Cultivation practices of the important agrofrestry tree species of the region.

PRACTICAL

Max. Marks: 40 **Time allowed: 3 Hours**

1. Identification of tree-species.
2. Diameter measurements using calipers and tape, diameter measurements of forked, buttressed, fluted and leaning trees.
3. Height measurement of standing trees by shadow method, single pole method and hypsometer.
4. Volume measurement of logs using various formulae.
5. Nursery lay out, seed sowing, vegetative propagation techniques.
6. Forest plantations and their management.
7. Visits of nearby forest based industries and nuseries of forest department.

Reference Books

1. Agroforestry In India by K G Tejwani.
2. Forest Resources & Sustainable Development by Kailash Chandra Bebarta.
   Indian Forestry By S.Prabhu.
3. Planning For Forest Resources And Bio Diversity Managment by Kailash Chandra Bebarta

GPB-101: PRINCIPLES OF GENETICS

Max Marks: 100 **Duration of the Paper: 3 Hour**

Theory: 45 **Practical: 40**

Internal Assessment: 15

INSTRUCTIONS FOR PAPER SETTER

The question paper will consist of three sections A, B and C. Section A and B will have four questions from the respective sections of the syllabus and will carry 9 marks each. Section C will consist of 9 short-answer type questions of 1 mark each which will cover the entire syllabus uniformly and will carry 9 marks in all.

INSTRUCTIONS FOR CANDIDATES

The Candidates are required to attempt two questions from each section A and B and the entire section C.

Theory

Section – A

1. Study of chromosome structure, morphology, number and types, Karyotype and Idiogram.
2. Mendel's laws of inheritance, types of gene action, qualitative and quantitative traits. Multiple factor hypothesis, cytoplasmic inheritance.
3. Mutations, methods of inducing mutations and detection of sex linked and autosomal mutations, ClB technique.
4. Crossing over and factors affecting it. Mechanism of crossing over and cytological proof of crossing over, linkage and estimation of linkage.

Section – B

5. Gene expression and differential gene activation, Lac and Trp operon and fine structure of gene.
6. Mitosis and meiosis. DNA and RNA: its structure, function, types, modes of replication.
7. Transcription, translation, genetic code and outline of protein synthesis.
8. Numerical and structural chromosomal aberrations. Evolution of different crop species like cotton, wheat and *Brassicas*.

PRACTICAL

Max. Marks: 40 **Time allowed: 3 Hours**

1. Microscopy. Preparation and use of fixatives and stains for light microscopy.
2. Identification of various stages of mitosis and meiosis.
3. Monohybrid, Dihybrid and Trihybrid ratios and their modifications.
4. Chi–square analysis and Interaction of factors.
5. Epistatic factors, additive factors and Inhibitory factors.
6. Linkage– two point and three point test cross.

Reference Book:

1. Fundamentals of Genetics -B. D. Singh Kalyani Publisher
2. Genes - B. Lewin Jones and Bartlett Publishers.
3. Genetics - M. W. Strickberger (McMillan, New York)
4. Genetics Gupta PK. Rastogi Publications.
5. Principles of Genetics - E. J.Gardner, M. J.Simmons and D. P. Snustad
6. Principles of Genetics - E.W.Sinnott, L.C.Dunn, T.Dobzhansky

BIOCHEM-101: FUNDAMENTALS OF BIOCHEMISTRY

Max Marks: 100 **Duration of the Paper: 3 Hour**

Theory: 45 **Practical: 40**

Internal Assessment: 15

INSTRUCTIONS FOR PAPER SETTER

The question paper will consist of three sections A, B and C. Section A and B will have four questions from the respective sections of the syllabus and will carry 9 marks each. Section C will consist of 9 short-answer type questions of 1 mark each which will cover the entire syllabus uniformly and will carry 9 marks in all.

INSTRUCTIONS FOR CANDIDATES

The Candidates are required to attempt two questions from each section A and B and the entire section C.

Theory

Section A

1. Biochemistry Introduction, Scope and importance. Cell organelles and their function.
2. Water and its properties. Biomolecules, structure, function and properties of carbohydrates, lipids and fatty acid.
3. Biomolecules: structure, function and properties of Amino acids, protein and nucleic acid.
4. Enzyme-Classification, factors affecting activity, immobilization and other industrial application.

Section B

5. Metabolism– basic concepts, Glycolysis. Citric acid Cycle, Pentose phosphate pathway.
6. Oxidative phosphorylation, fatty acid oxidation. General reaction of amino acid degradation.
7. Biosynthesis– Carbohydrates, lipids, proteins and nucleic acids.
8. Metabolic regulation Secondary metabolites– terpenoids, alkaloids, phenolics and their applications in food and pharmaceutical industries.

PRACTICAL

Max. Marks: 40 **Time allowed: 3 Hours**

1. Amino acid models (Atomic) Paper electrophoresis for the separation of plant pigments.
2. Protein denaturation. Protein estimation.
3. Enzyme kinetics, Estimation of nucleic acids. Extraction of oil from oilseed.
4. Characterization of lipids by Thin Layer Chromatography.
5. Estimation of fatty acids by Gas Liquid Chromatography Models of sugars.
6. Quantitative determination of sugars Paper chromatography for the separation of sugars.
7. Determination of phenols.

Reference Book:

1. Berg, J.M., Tymoczko, J.C. and Stryer, L. (2002). Biochemistry. W.H. Freeman & Co., New York.
2. Conn, E.C., Stumpf, P.K., Bruening, G and Doi, R.H. (2005). Outlines of Biochemistry. John Wiley & Sons (Asia) Pvt. Ltd., Singapore
3. Jain, J.L. (2000) Fundamentals of Biochemistry Chand & Co., New Delhi.
4. Moran, L.A., Horton, R.A., Scrimgeour, G. and Perry, M. (2012). Principles of Biochemistry 5th edition, Pearson Prentice Hall.
5. Nelson, D.L. and Cox, M.M. (2006) Lehingers Principles of Biochemistry. W.H. Freeman & Co., New York.
6. Powar, C.B. and Chatwal, G.R. (1986). Biochemistry. Himalaya Publishing House, New Delhi.
7. Rao, K.R. (1986). Text book of biochemistry.

ENG-102: ENGLISH

Max Marks: 100 **Theory: 75**

Duration of the Paper: 3 Hours **Internal Assessment 25**

INSTRUCTIONS FOR PAPER SETTER

The question paper will consist of three sections A, B and C. Section A will have three questions and will carry 30 marks in all. Section B will have four questions and will carry 30 marks in all. Section C will consist of 15 very short-answer type questions and will carry 15 marks in all.

Text Prescribed: **The Poetic Pallette. Orient Black Swan, 2013.**
Poems 1-10.

Section A

1) One essay type question with an alternative choice based on main ideas/summary of the poem. 15

2) One stanza out of two to be explained with reference to context. 5

3) Short answer type questions. Five questions to be attempted out of the given eight in about 50-60 words. 5 X 2=10

Section B

Text prescribed: **The Written Word:** Vandana R Singh
The Student's Companion: Wilfred D. Best

1) Resume writing 10

2) Letter writing (Personal and official letter) 10

3) Paragraph Writing 5

4) Antonyms, Synonyms 5

Section C

This section will cover the entire syllabus. All 15 very short answer type questions to be attempted in one sentence. 15x1=15

Pun-102/ BPB-102: Punjabi

Qualifying subject

To download the Syllabus go to :

www.punjabiuniversity.ac.in → **Important Links → Download Syllabus → Academic Session 2019-20 → Faculty of Languages → Punjabi → Under Graduate → Under Graduate Degree Level Professional Courses Common Syllabus Punjabi or Mudla Gyan or Elementry Punjabi.**

DA-101: DRUG ABUSE: PROBLEM, MANAGEMENT AND PREVENTION

Qualifying subject

COMMON FOR ALL UNDERGRADUATE DEGREE COURSES PART-I (SEMESTER-II) QUALIFYING SUBJECT-DRUG ABUSE: PROBLEM, MANAGEMENT AND PREVENTION

MATH-102: MATHEMATICS-II (For Medical Students)

Max Marks: 100 **Theory: 75**

Time Allowed : 3 Hrs **Internal Assessment: 25**

INSTRUCTIONS FOR PAPER SETTER

The question paper will consist of three sections A, B and C. Section A and B will have four questions from the respective sections of the syllabus and will carry 15 marks each. Section C will consist of 10 short-answer type questions which will cover the entire syllabus uniformly and will carry 1½ marks each.

INSTRUCTIONS FOR CANDIDATES

Candidates are required to attempt two questions from each section A and B and the entire section C.

Theory

Section – A

1) Trigonometry: Sexagensimal, centesimal and circular measure of an angle. Definitions of T-ratio's and the relations connecting them. T-ratio's of 0, 6, 45, 60, 90 (no proofs). Evaluation of T-ratio's of allied angles and 2A, 3A (no proofs) and easy identities based on them and identities based on the formulae for sin P + sin Q and cos P – cos Q and their converse conditional identities, relations between the sides and the angles of a triangle i.e. sine cosine, and projections formulae, logarithm and their applications (based on the use of tables only) to simplification of fractions solution of right angled triangles. Solution of oblique angled triangles when (i) three sides are given (ii) two angles and a side are given (iii) two sides and an angle are given, graphs of sin x and cos x and reading from graphs.

2) Elementary Calculus: Idea of function and limit, evaluation of the limit algebric, functions, Lt and Lt sin c. Differentiation of simple algebric trigonometric, inverse trigonometric, exponential and logarithmic (Proofs of

$$\frac{d}{dx}\log(ax+b)=\frac{a}{(ax+b)} \quad \text{and} \quad \frac{d}{dx}(e^x)=e^x$$

Theorems on differentiation of the sum, difference, the product & the quotient of functions. The further differentiation of a simple function of function, differentiation of parametric functions and of one function with regard to another function (use of transermation excluded).

Section B

3) Integration of the standard forms as inverse of differentiation.

x^n, $(ax+b)^n$, $\frac{1}{ax+b}$ sin x, cosx, $\sec^2 x$, $\frac{1}{a^2-x^2}$

and $\frac{1}{a^2+x^2}$ and easy, examples based in their applications,

easy applications of the following:

$\int f^n(x)\, f(x)\, dx$ $\int \frac{f'(x)}{f(x)} dx$ $\int \tan x\, dx$

$\int \cot x\, dx$, $\int \sec x\, dx$ $\int \cos x\, dx$

4) Elements of Matrices and determinants. Kinds, Properties of determinants, adjoint of matrix, Inverse of matrix, Solutions of simultaneous equations; Cramer's rule, matrix methods.

Reference Books

1. Algebra by D. C. Kapoor & Gurbax Singh
2. Algebra by T. N. Nagpal & K. K. Gupta.
3. Comprehensive Calculus by R. S. Dehiya.
4. New Style Calculus for T. D. C. – I.
5. New Style Co-ordinator Geometry by R. K. Sondhi
6. Trignometry by Jiwan
7. Mensuration by Pic Point.

ZOO-101: BASIC ZOOLOGY (For Non Medical Students)

Max Marks: 100 **Duration of the Paper: 3 Hour**

Theory: 45 **Practical: 40**

Internal Assessment: 15

INSTRUCTIONS FOR PAPER SETTER

The question paper will consist of three sections A, B and C. Section A and B will have four questions from the respective sections of the syllabus and will carry 9 marks each. Section C will consist of 9 short-answer type questions of 1 mark each which will cover the entire syllabus uniformly and will carry 9 marks in all.

INSTRUCTIONS FOR CANDIDATES

The Candidates are required to attempt two questions from each section A and B and the entire section C.

Theory

Section – A

1. Introduction to Zoology, characteristics of living organisms. Elementary knowledge of typical cell, distinction between animal and plant cells, mitotic and meiotic division in cells, Elementary knowledge of animal tissues. DNA, RNA structure.
2. Zoological nomenclature and principles of classification. General survey of animal kingdom upto Phylum in Invertebrates and upto Classes in Vertebrates with habits, and economic significance of important examples. Amoeba, Entamoeba, Sycon, Plasmodium, Fasciola, Tapeworm, Ascaris, Hirudina, Pharetima, Grasshopper, Locust, Silkworm, Beetle, Red Cotton, Honey Bee, Bug, Mosquito, House fly, Unio, Catla, Rohu, Frog, Owl, Snake, Egret, Woodpecker, Hoope, Parrot, Goat, Horse, Sheep, Rat, Rabbit, (Same specimens included in practical for general survey).

Section – B

3. Rabbit as a type for brief study of external characters and brief account of functional anatomy: digestive, circulatory, respiratory, urino-genital, nervous systems. Animals of economic importance to agriculture.

4. Physiology of respiration, composition of blood and its functions, reproduction and lactation, structure of skin and heat regulations, elementary account of endocrine glands – their secretions and functions, sensory organs, their structure and function, immunity.

PRACTICAL

Max. Marks: 40 **Time allowed: 3 Hours**

1. Study of microscope, its parts and working, study of the prepared slides (microscope) of: An animals cell, cell division, simple tissue, histology of different organs, smears of human blood, of mammalian skin. General survey of the animal kingdom. Identification of local fauna. Study of external characters of rabbit. Study of external characters of Pigeon and its adaptations for aerial mode of life. Identification of important skeletal parts of Rabbit.

Note: Only oral examination should be conducted for the skeletal parts of Ox, Goat and Horse. Study of stomach of goat, dissection of heart and kidney of goat. Collection of local fauna and its preservation.

Reference Books

1. Physiology of Farm Animals by Marshall
2. Physiology of Domestic Animals by H. H. Duke.
3. Anatomy of Domestic Animals by Blsson.
4. General Zoology by Sterer.
5. Text Book of Zoology by Vidyarthi.
6. Agricultural Zoology by Dhami.