SLR-UK-391

Seat No.	

Set P

M.Sc. (Semester - II) (CBCS) Examination Mar/Apr-2018
Genetics
REGULATION OF GENE EXPRESSION AND DEVELOPMENTAL GENETICS

Time: 2½ Hours Max. Marks: 70

Instructions: 1) Section-I compulsory.
2) Attempt any four from Section-II.
3) All questions carry equal marks.
4) Figures to right indicated full marks.
5) Draw neat and labeled diagrams.

Section – I

Q.1 A) Rewrite the sentence after choosing the correct answer from the given alternatives. **07**

1) _____ is a repeated division of fertilized egg producing cluster of cells.
   a) Cleavage b) Amphimixis
   c) Epigenesis d) Phylesis

2) _____ is a class of helix-turn-helix DNA binding domain and recognize DNA in same way as those bacterial proteins.
   a) Homeodomain proteins b) Gal 5 proteins
   c) Metal proteins d) Bax proteins

3) In splicing the transesterification reaction mediated by a huge molecular machine called _____.
   a) Syngamosome b) Esteriosome
   c) Spliceosome d) Ribosome

4) In Drosophila _____ expressed in seven distinct bands along the anterior-posterior axis, in effect divide embryo 15 segments.
   a) gap genes b) pair rule genes
   c) p53 genes d) Toll genes

5) Lac operon expresses genes whose products catabolise _____.
   a) Maltose b) Phosphate
   c) Sucrose d) Lactose

6) Increase in number of copies of genes is called _____.
   a) Gene amplification b) Gene cloning
   c) Gene duplication d) Gene location

7) The site on DNA where a repressor binds called a _____.
   a) Lariat b) Activator
   c) Promoter d) Operator

B) Answer the following terms. **07**

a) Gastrulation
b) DNA Binding Domain
c) RNA splicing
d) Transcription
e) Regeneration
f) Potency
g) Meristematic tissue.

Section – II

Attempt any four.

Q.2 Explain organization and regulation of *trp* operation in *E.coli*. **14**

Q.3 Discuss the steps of spliceosome mediating splicing reaction. **14**

Q.4 Describe the mechanism of contact and recognition between sperm and egg. **14**

Q.5 **Answer any two of the following.** **14**

a) Explain processes of pattern formation in Drosophila.
b) Explain hormonal control of gene regulation in plants with one example.
c) Explain embryo sac development in plants.

Q.6 **Answer any two of the following.** **14**

a) Explain organization of shoot apical meristem in plants.
b) Explain process of leaf development in plants.
c) Discuss Arabidopsis thaliana, a model plant to study genetics.

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Seat No.	

Set P

M.Sc. (Semester - II) (CBCS) Examination Mar/Apr-2018
Genetics
CONCEPTS OF BIOCHEMISTRY

Time: 2½ Hours Max. Marks: 70

Instructions: 1) Section-I compulsory.
2) Attempt any four from Section-II.

Section – I

Q.1 A) Rewrite the sentence after choosing the correct answer from the given alternatives. **07**

1) The site for oxidative phosphorylation is _____ of mitochondria.
   a) Outer membrane b) Inner membrane
   c) Matrix d) Inter membrane space.

2) De Novo purine nucleotide synthesis begins with _____.
   a) PRPP b) PEP
   c) GAR d) FGAR

3) Transamination is the process where _____.
   a) Carboxyl group is transferred from amino acid
   b) Amino acid breakdown takes place
   c) Amino acid synthesis takes place
   d) Amino group is transferred from amino acid

4) _____ Enzyme converts glucose into glucose 6 phosphate.
   a) Dehydrogenase b) Oxidase
   c) Phosphoglucomutase d) Isomerase

5) Vitamin _____ is soluble in water.
   a) A b) D
   c) C d) E

6) _____ is an example of basic amino acid.
   a) Glycine b) Proline
   c) Alanine d) Arginine

7) The total heat content of the system is known as _____.
   a) Free energy b) Standard free energy
   c) Enthalpy d) Entropy

B) Definitions. **07**

a) Enzymes
b) Glycolysis
c) Carbohydrates
d) Entropy
e) Lipids
f) Vitamins
g) Proteins

Section – II

Q.2 Write in detail oxidative phosphorylation reaction mechanism. **14**

Q.3 Describe the process of beta oxidation of saturated fatty acids. Add a note on net energy yield. **14**

Q.4 Discuss in detail primary, secondary, tertiary and quaternary structure of proteins. **14**

Q.5 **Answer any two from the following.** **14**

a) Explain in detail laws of thermodynamics.
b) Describe in detail biological role of thiamine, riboflavin and niacin.
c) Discuss in brief calvin cycle.

Q.6 **Write short notes on. (Any two)** **14**

a) Classification of lipids.
b) Inhibition of enzymes.
c) Biological oxidation reduction reaction.

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Seat No.	

Set P

M.Sc. (Semester - II) (CBCS) Examination Mar/Apr-2018
Genetics
ADVANCED MICROBIAL GENETICS

Time: 2½ Hours Max. Marks: 70

Instructions: 1) Section – I compulsory.
2) Attempt any four questions from Section – II
3) All questions carry equal marks.
4) Figures to right indicate full marks.
5) Draw neat and labeled diagrams.

Section – I

Q.1 A) Rewrite the sentence after choosing the correct answer from the given alternatives. **07**

1) The uptake of DNA fragment from surrounding by a bacterium is termed as _____.
   a) Transfection b) Conjugation
   c) Transduction d) Transformation

2) In yeast the mating type is controlled by alleles of single gene locus referred to as _____.
   a) MAZ loci b) AMP loci
   c) MAP loci d) MAT loci

3) Penicillin was extracted by _____.
   a) Flemming b) Huxley
   c) Lamarck d) Brown

4) Which of the following bacteria is not naturally competent?
   a) E. Coli *b) Bacillus Subtilis*
   c) Streptococcus peumoniae *d) Hemophilus influeanzae*

5) Yeast is an important source of _____.
   a) Vitamin C b) Riboflavin
   c) Sugar d) Protein

6) _____ are formed on media due to the action of lytic phages.
   a) Zones b) Plaques
   c) Colonies d) Spores

7) Transduction is done with the help of _____.
   a) Bacteria b) Fungus
   c) Viruses d) Mycoplasma

B) Answer the following terms. **07**

1) Virulent phages
2) Fluctuation test
3) Electroporation
4) Specialized transduction
5) Sexduction
6) Interupted matting
7) Plasmid

Section – II

Q.2 Explain in brief: discovery of conjugation and its process. **14**

Q.3 Explain temperate phages and its life cycle. **14**

Q.4 Describe yeast mating types switching. **14**

Q.5 **Answer any two from the following.** **14**

a) Explain methods of isolation of autotropic mutants.
b) Explain in detail abortive transduction.
c) Give an account on map of f plasmid.

Q.6 **Answer any two from the following.** **14**

a) Explain in detail temporal mapping.
b) Explain role of fungi and its applications in biotechnology.
c) Explain analysis of mutation in biochemical pathway.

SLR-UK-394

Seat No.		Set	P

M.Sc. (Semester - II) (CBCS) Examination Mar/Apr-2018
Genetics
INDUSTRIAL AND ENVIRONMENTAL BIOTECHNOLOGY

Time: 2½ Hours Max. Marks: 70

Instructions: 1) Section-I compulsory.
2) Attempt any four from Section-II.
3) All questions carry equal marks.
4) Figures to right indicate full marks.
5) Draw neat and labeled diagrams.

Section – I

Q.1 A) Rewrite the sentence after choosing the correct answer from the given alternatives. **07**

1) Name of first organic acid produced by microbial fermentation is ____.
   a) Citric Acid b) Lactic Acid
   c) Acetic Acid d) None of these

2) _____ indicator is used in primary screening for acid producing organism.
   a) pH b) Gas
   c) Electric d) none of these

3) Fluoride pollution mainly affects on _____.
   a) Kidney b) Brain
   c) Heart d) Teeth

4) _____ is a not type of industrial waste.
   a) Oil b) Waste water and Chemicals
   c) Ash d) Paper and plastic bags

5) Solar energy stored in material such as wood, grain, sugar and municipal waste is called _____.
   a) Fossil Fuels b) Geothermal energy
   c) Biomass d) Nuclear energy

6) Fermenters are designed for _____.
   a) Aerobic process b) Anaerobic process
   c) Antirobic process d) Both aerobic and anaerobic

7) Ex situ bioremediation involves the _____.
   a) Degradation of pollutants by microbes directly
   b) Removal of pollutants and collection at a place to facilitate microbial degradation
   c) Degradation of pollutants by genetically engineered microbes
   d) None of these

B) Answer the following terms. **07**

a) Enlist methods of fermentation product recovery.
b) Give methods of media sterilization.
c) Give types of parameters determining the water quality.
d) Concept of ecoplanning for environmental management.
e) Define synthetic and crude media.
f) Enlist methods of solid waste management.
g) Sources of heavy metals.

Section – II

Attempt any four.

Q.2 Give a detailed account of environmental protection acts. **14**

Q.3 Give a detailed account of *In situ* and *Ex Situ* Bioremediation and its applications. **14**

Q.4 Explain steps involved in industrial production of Penicillin. **14**

Q.5 **Answer any two from the following.** **14**

a) Explain methods of Microbial culture preservation.
b) Write a note on mechanical methods of cell disruption.
c) Write applications of Bioindicators and biosensors for detection of pollution.

Q.6 **Write short notes on. (Any two)** **14**

a) Describe removal of microbial cells through downstream process.
b) Explain environmental policies and laws for environmental protection.
c) Explain single cell protein and its application.

SLR-UK-404

Seat No.		Set	P

M.Sc. (Semester - IV) (New) (CBCS) Examination Mar/Apr-2018
Genetics
CANCER GENETICS & STEM CELL RESEARCH

Time: 2½ Hours Max. Marks: 70

Instructions: 1) Section-I is compulsory.
2) From Section-II attempt any four.
3) All questions carry equal marks.
4) Draw neat and labeled diagrams wherever necessary.

Section – I

Q.1 A) Rewrite the sentence after choosing the correct answer from the given. **07**

1) Cancer is often the result of activation of _____ to _____ and the inactivation of _____ genes.
   a) oncogenes, tumor-suppressor genes, proto-oncogenes
   b) proto-oncogenes, oncogenes, tumor-suppressor genes
   c) oncogenes, proto-oncogenes, tumor-suppressor gene
   d) proto-suppressor genes, suppressors, oncogenes

2) About 50% of all human cancers may involve an abnormal or missing
   a) Oncogene b) Proto-oncogene
   c) p53 gene d) BRCA-1 gene

3) Which of the following is not a characteristic of cancer cells?
   a) Loss of cell cycle control b) Transplantability
   c) Loss of contact inhibition d) All are characteristic

4) Which cellular organelles are involved in the initiation of the intrinsic pathway of apoptosis?
   a) Endoplasmic reticulum b) Lysosomes
   c) Mitochondria d) Peroxisomes

5) Organ culture can be performed using _____.
   a) Raft method b) Plasma clot method
   c) Grid method d) All of these

6) The first successfully cloned animal was _____.
   a) Rabbit b) Sheep
   c) Rat d) Dog

7) The method in which the nucleus of a donor cell is relocated to an enucleated target cell is known as _____.
   a) Cell transformation b) Nuclear transplantation
   c) Organ transplant d) All of these

B) Define the term: **07**

a) Tumor suppressor
b) Proto-oncogene
c) Apoptosis
d) Hematopoietic Stem Cells
e) Organ culture
f) Chemotherapy
g) Metastasis

Section – II

Attempt any four of the following:

Q.2 Explain in detail processes of Angiogenesis with suitable diagram. **14**

Q.3 Describe mechanical and chemical disaggregation methods of animal tissue. **14**

Q.4 Explain in detail role of tumor suppressor protein and add a note on P^{53} structure. **14**

Q.5 **Answer any TWO of the following:** **14**

a) Write short note on Cancer Vs Normal cell.
b) Write short note on Hematopoietic stem cell.
c) Add a note Regeneration of Bone and Cartilage.

Q.6 **Answer any TWO of the following:** **14**

a) Explain role of Epigenetic in cancer.
b) Add a note on extra cellular matrix of tissue.
c) Add a note on Stem Cells in Eye Diseases and Disorders.

SLR-UK-405

Seat No.	

Set P

M.Sc. (Semester - IV) (New) (CBCS) Examination Mar/Apr-2018
Genetics
ANALYTICAL INSTRUMENTS AND TECHNIQUES

Time: 2½ Hours Max. Marks: 70

Instructions: 1) Section-I is compulsory.
2) From Section-II attempt any four.
3) All questions carry equal marks.
4) Figures to right indicate full marks.
5) Draw neat and labeled diagrams.

Section – I

Q.1 A) Rewrite the following sentences by using correct alternatives: **07**

1) Distance between front surface of the lens and surface specimen is known as _____.
   a) Working Distance b) Resolving Distance
   c) Focal length d) Focal point

2) _____ is present at the upper end of body tube.
   a) Nosepiece b) Eyepiece
   c) Mechanical stage d) Fine adjustment knob

3) _____ unit used by SI system as unit of radioactivity.
   a) Curie b) Millicurie
   c) Becquerel d) Femtocurie

4) Which of the following isotope has very long half life?
   a) ^{15}N b) ^{20}O
   c) ^{14}C d) ^{36}CI

5) Migration rate under unit potential gradient is known as _____
   a) Mobility b) Absorptivity
   c) Resistivity d) Chtomatography

6) _____ is a stationary phase in paper chromatography.
   a) Ethyl alcohol b) Water
   c) Hydrochloric acid d) Sodium hydroxide

7) _____ spectrum of the substance is a fingerprint for its identification.
   a) UV b) AAS
   c) IR d) VISIBLE

B) Define the following terms: **07**

a) Microscopy
b) SDS-PAGE
c) Becqurel
d) Stationary phase
e) Spectrophotometer
f) Convex lens
g) Resolving power

Section - II

Attempt any four:

Q.2 Explain construction, principle & image formation of compound microscope. **14**

Q.3 Describe in detail visible spectroscopy. **14**

Q.4 Discuss DNA blotting technique. **14**

Q.5 **Answer any Two of the following:** **14**

a) Write a short note on descending chromatographic technique.
b) Describe proportional counter.
c) Explain in brief confocal microscope.

Q.6 **Answer any Two of the following:** **14**

a) Give brief account on LCMS
b) Write a note on Liquid scintillation counter.
c) Explain agarose gel electrophoresis.

SLR-UK-406

Seat No.	

Set P

M.Sc. (Semester - IV) (New) (CBCS) Examination Mar/Apr-2018
Genetics
AGRICULTURE SCIENCE AND SEED TECHNOLOGY

Time: 2½ Hours Max. Marks: 70

Instructions: 1) All question of Section I is compulsory.
2) Attempt any four questions from section –II.
3) All questions carry equal marks.
4) Draw neat and labeled diagrams wherever necessary.

Section – I

Q.1 A) Multiple choice questions: **07**

1) Gibberellins are derivatives of _____.
   a) Monoterapenes b) Sesquiterpenes
   c) Di terpenes d) Tri terpenes

2) NSC means _____.
   a) National Carrier Services b) National Seed Certificate
   c) National Seed Corporation d) National Saving Certificate

3) A horizon of Soil designated as _____.
   a) Eluviated horizon b) Top soil horizon
   c) Both a & b d) None of these

4) Credit for discovery of cell goes to _____.
   a) Robert brown b) Robert Hook
   c) Von Mohl d) Robertion

5) Fluid mosaic Model of cell membrane was proposed by _____.
   a) Danielli- Devson b) Singer and Nicolson
   c) Robertson d) None of these

6) Ribosomes associated with _____.
   a) Photosynthesis b) Protein synthesis
   c) Respiration d) Photo respiration

7) Which of the following is not a physiological effect of Auxin in higher plants?
   a) Apical dominance b) Cell elongation
   c) Root initiation d) None of these

B) Answer the following terms. **07**

a) Bio fertilizer
b) Define Seed
c) Essential nutrients (Examples)
d) Auxin Function
e) Protoplasm
f) Surface tension
g) Gibberellin function

Section – II

Attempt any four:

Q.2 What is bio composting and explain all the steps involved in Bio-composting? **14**

Q.3 Which are essential plant nutrients? And explain its function. **14**

Q.4 How Auxin transportation takes place in plant? **14**

Q.5 **Answer any two of the following:** **14**

a) Physical and chemical properties of protoplasm.
b) External factors affecting absorption of water.
c) Biosynthesis of cytokinin.

Q.6 **Answer any two of the following:** **14**

a) Biosynthesis of Auxin IPA pathway
b) Mechanism of stomatal transpiration
c) Breeds of indigenous and exotic sheep

SLR-UK-407

Seat No.	

Set P

M.Sc. (Semester - IV) (New) (CBCS) Examination Mar/Apr-2018
Genetics
RESEARCH METHODOLOGY AND SCIENTIFIC REPORT WRITING AND IPR

Time: 2½ Hours Max. Marks: 70

Instructions: 1) Section-I is compulsory.
2) From Section-II attempt any four.
3) All questions carry equal marks.
4) Draw neat and labeled diagrams wherever necessary.

Section – I

Q.1 A) Rewrite the following sentences by using correct alternatives: **07**

1) Sampling is advantageous as it _____.
   a) Helps in capital-saving b) Saves time
   c) Increases accuracy d) Both a & b

2) Random sampling is helpful as it is _____.
   a) An economical method of data collection
   b) Free from personal biases
   c) Reasonably accurate
   d) All the above

3) _____ cannot be exploited by assigning or by licensing the rights to others.
   a) Patents b) Designs
   c) Trademark d) All of the above

4) _____ is (are) included in Geographical indications of goods.
   a) Handicraft b) Foodstuff
   c) Manufactured d) All of the above

5) The term 'Intellectual property Rights' cover _____.
   a) Copyrights b) Know-how
   c) Trade dress d) All of the above

6) Hall Mark is _____.
   a) Trademark b) Certification Mark
   c) Collective Mark d) Both a) and b)

7) Plant variety protections are required _____.
   a) To get higher yield
   b) To get more paste resistant plant
   c) To promote research and development
   d) All the above

B) Answer the following terms. **07**

a) Research
b) Give data collection methods
c) Give different types of sampling
d) IMRAD system
e) Advantages and disadvantages of PBR
f) IPR
g) Difference between primary and secondary data

Section – II

Attempt any four:

Q.2 Write an account on Power point presentation and poster presentation in scientific conferences and workshops. **14**

Q.3 Write an account on steps involved in thesis writing. **14**

Q.4 Give an account on Intellectual Property Rights. **14**

Q.5 **Answer any two of the following:** **14**

a) Write a note on Research Design and Formulation of Hypothesis.
b) Data collection methods
c) Computer application in Research, Use of internet in search of Reference.

Q.6 **Answer any two of the following:** **14**

a) Selection and Formulation of Research Problem
b) Preparation of manuscripts for publication in national and international journals.
c) Explain characteristics and types of research.