

Total No. of Questions : 6]

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SEAT No. :

[Total No. of Pages : 2

[5019]-101

S.Y.B.Sc.

BIOTECHNOLOGY

Bb - 211 : Genetics and Immunology

(2013 Pattern) (Semester - I)

Time : 3 Hours]

[Max. Marks : 80

Instruction to the candidates:-

- 1) *All questions are compulsory.*
- 2) *Figures to the right indicate full marks.*
- 3) *Draw neat and labelled diagrams wherever necessary.*

Q1) Answer the following in 2-3 sentences.

[10 × 2 = 20]

- a) What is Cis and trans arrangement of genes.
- b) What are the alkalyting agents.
- c) Define bacterial transformation.
- d) Give characteristic features of Edward syndrome.
- e) What is sex-linked dominant inheritance.
- f) State Hardy weinberg law.
- g) Define R - Plasmid
- h) What are supplementary genes.
- i) Give significance of UV-radiation as mutagen.
- j) Define Triploidy.

Q2) Answer the following in 2-3 sentences.

[5 × 2 = 10]

- a) Differentiate between type-I and type-II hypersensitivity reactions.
- b) Give significance of IgE
- c) Hapten
- d) Acquired immune response is MHC restricted-Justify
- e) Define opsonization.

P.T.O.

- Q3)** Attempt any three from the following: **[3 × 5 = 15]**
- a) Explain frame shift mutation with example.
 - b) What is recessive epistasis? Describe with a suitable example.
 - c) Draw ten symbols used in pedigree analysis.
 - d) Explain positive and negative regulation of Lac operon.

- Q4)** Attempt any three **[3 × 5 = 15]**
- a) Describe different types of deletions and write its significance
 - b) Give a detailed account of bacterial transformation.
 - c) Define chromosome interference. How it is calculated? Write its significance.
 - d) Explain co-dominance with a suitable example.

- Q5)** Attempt any one: **[1 × 10 = 10]**
- a) Explain the structure of transposable element in prokaryotes. Describe their mechanism of transposition.
 - b) Give a detailed account of specialized transduction as a means of genetic exchange.

- Q6)** Attempt any two **[2 × 5 = 10]**
- a) Explain various types of T-cells and write their functions.
 - b) Write a note on GALT, BALM and MALT.
 - c) Give a brief account of immunodiffusion.
 - d) Write a short note on conjugated vaccine and Toxoid.



Total No. of Questions : 5]

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[5019]-102

S.Y.B.Sc.

BIOTECHNOLOGY

Bb - 212 : Cell Biology

(2013 Pattern) (Semester - I)

Time : 3 Hours]

[Max. Marks : 80

Instruction to the candidates:-

- 1) *All questions are compulsory.*
- 2) *Figures to the right indicate full marks.*
- 3) *Draw neat and labelled diagrams wherever necessary.*

Q1) Answer the following in short 2-3 sentences.

[10 × 2 = 20]

- a) Why is cholesterol preferred in the plasma membrane.
- b) Define symport with suitable example.
- c) Enlist the functions of Peroxisomes.
- d) Give the importance of signal sequence in protein trafficking.
- e) Comment on the structure of microtubules
- f) Define synapse
- g) Give two examples of receptors of plasma membrane.
- h) How is phagocytosis important for cell functioning.
- i) Give the chemical composition of primary cell wall.
- j) What are gap junctions and give its importance.

Q2) Write short notes on (any three)

[3 × 5 = 15]

- a) Give an account on the working of Na⁺ –K⁺ ATPase.
- b) Functions of smooth endoplasmic reticulum
- c) Protein targeting to mitochondria.
- d) Photorespiration.

P.T.O.

Q3) Answer the following (any three) **[3 × 5 = 15]**

- a) Draw a neat labelled diagram of nuclear Rare complex.
- b) Discuss the stages of meiosis I.
- c) Comment on composition and function of plant vacuoles.
- d) Explain the working of ABC transporters.

Q4) Answer the following. **[7 + 8 = 15]**

- a) Explain the molecular events of mitotic division.
- b) Describe the mechanism of programmed cell death.

OR

- a) Explain in detail characteristics of cancer cells.
- b) What are the check points of cell cycle comment on its regulation.

Q5) Answer the following: **[7 + 8 = 15]**

- a) Describe the electron transport complexes in mitochondria.
- b) Explain the components of extra cellular matrix.

OR

- a) Discuss the mechanism of light reactions during photosynthetic process.
- b) Explain how nerve impulse transmission occurs in myclinated nerve fibres.



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S.Y.B.Sc.

BIOTECHNOLOGY

Bb - 213 : Environmental Biology & Biotechnology

(2013 Pattern) (Semester - I)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:-

- 1) *All questions are compulsory.*
- 2) *Figures to the right indicate full marks.*
- 3) *Draw neat labelled diagrams wherever necessary.*

Q1) Answer the following in short (2-3 sentences.)

[10 × 2 = 20]

- a) What are pioneer species?
- b) Define pedogenesis.
- c) Give the types of food chains.
- d) Define Ecosystem with an example.
- e) Explain : Azotrophus.
- f) What is EIA?
- g) Write the meaning of xenobiotic compounds.
- h) Explain phytoremediation
- i) Give applications of remote sensing in climate monitoring.
- j) Define Seed Bank.

Q2) Write notes on (any three)

[3 × 5 = 15]

- a) TRAFIC
- b) Microbial degradation of plastic
- c) The gaseous composition and temperature variation in atmospheric layers.
- d) Phosphorus cycle.

P.T.O.

- Q3)** a) Define Bioremediation. Discuss various methods involved in Ex-situ Bioremediation. [8]
b) Give factors responsible for global warming. Explain in detail the Green House Effect? [7]

OR

- a) Explain causes of water pollution and supplement your answer with a note on measures to control it. [8]
b) Give details of natural & anthropogenic factors affecting terrestrial ecosystem. [7]

- Q4)** a) Compare and contrast between In-situ and Ex-situ conservation methods. Explain any one In-situ conservation technique. [8]
b) Explain the working and advantages of Biological treatment for domestic waste water over other treatments. [7]

OR

- a) Write a note on environmental policies in India. [7]
b) Explain the process of ecosystem evolution and add a short note on Hydrosere. [8]

- Q5)** Write notes on (any three) [3 × 5 = 15]
a) Cybernetics of an ecosystem.
b) Wild life protection Act (1972)
c) GIS
d) Soil profile of grassland ecosystem.



Total No. of Questions : 5]

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SEAT No. :

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S.Y.B.Sc.

BIOTECHNOLOGY

**Bb - 221 : Molecular Biology
(2013 Pattern) (Semester - II)**

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:-

- 1) *All questions are compulsory.*
- 2) *Draw neat and labelled diagrams wherever necessary.*
- 3) *Figures to the right indicate full marks.*

Q1) Answer in 2-3 sentences.

[10 × 2 = 20]

- a) Write the findings of Griffith Experiment.
- b) Give salient features of B - form of DNA.
- c) Define : Gene family
- d) What is euchromatin?
- e) What are introns?
- f) Give example of exception to central dogma.
- g) Give the role of DNA polymerase I enzyme.
- h) What is protein glycosylation?
- i) Give two examples of inhibitors of replication.
- j) What are degenerative codons?

Q2) Write short notes on (any three)

[3 × 5 = 15]

- a) mRNA processing in eukaryotes.
- b) Watson and crick model of DNA.
- c) Mitochondrial genome.
- d) Nucleotide excision repair

P.T.O.

Q3) Answer the following (any three) **[3 × 5 = 15]**

- a) Explain the process of protein translocation to chloroplast
- b) Describe lac operon in E-coli.
- c) What are enhancers? State their role in transcription process.
- d) Give an account of histone proteins.

Q4) Describe the process of protein synthesis in eukaryotes. **[15]**

OR

Explain in detail : The process of replication in prokaryotes.

Q5) a) What is RNA splicing? Explain the process of RNA splicing for removal of intron type - I. **[8]**

b) Describe the initiation process of transcription in prokaryotes. **[7]**

OR

a) What is transcription? Explain in detail 'e' dependent termination of transcription in prokaryotes.

b) Give an account of chromosome condensation in eukaryotes.



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SEAT No. :

[Total No. of Pages : 2

[5019]-202

S.Y.B.Sc.

BIOTECHNOLOGY

Bb - 222 : Plant & Animal Development

(2013 Pattern) (Semester - II)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:-

- 1) *All questions are compulsory.*
- 2) *Answers to the two sections should be written on separate answer sheets.*
- 3) *Draw neat diagrams wherever necessary.*
- 4) *Figures to the right indicate full marks.*

SECTION - I

Plant Development

Q1) Answer in 2-3 sentences.

[5 × 2 = 10]

- a) Define enclosperm
- b) Enlist types of ovules
- c) What is embryo sac?
- d) Define competence.
- e) Give significance of organ culture in plant development.

Q2) Answer any four of the following:

[4 × 5 = 20]

- a) Write a note on RAM.
- b) Describe microsperogenesis and development of male gametophyte.
- c) Explain developmental events leading to apoptosis in plants.
- d) Give role of any two plant growth regulators with reference to development.
- e) Discuss significance of Arabidopsis as a model system in plant development.
- f) Enlist and explain genes involved in embryo development.

P.T.O.

- Q3) Attempt any one:** **[1 × 10 = 10]**
- a) With the help of neat, labelled diagrams, explain development of embryo in dicotyledons.
 - b) Explain in detail, floral patterning in plants.

SECTION - II

Animal Development

- Q4) Answer the following:** **[5 × 2 = 10]**
- a) What is the role of Hensen's node formation during chick embryo development.
 - b) Differentiate between superficial and discoidal cleavage.
 - c) Define terms : Fatemap, Epiboly
 - d) Write the characteristics of progenitor cells
 - e) Define the term commitment.

- Q5) Attempt the following (any 4)** **[4 × 5 = 20]**
- a) Describe the process of oogenesis.
 - b) Describe the process of fertilisation and give its significance.
 - c) With the help of model system drosophile/any other system (animals explain the role of maternal genes in patterning.
 - d) Describe the cleavage patterns on the basis of quantity and distribution of yolk.
 - e) Write a note on ageing
 - f) Explain the morphological changes during spermeiogenesis.

- Q6) Attempt any one of the following:** **[1 × 10 = 10]**
- a) Describe the process of gastrulation in chick embryo.
 - b) Write short notes on
 - i) Apoptosis
 - ii) Teratogenesis



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[Total No. of Pages : 1

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S.Y.B.Sc.

BIOTECHNOLOGY

Bb - 223 : Scientific Writing and Communication

(2013 Pattern) (Semester - II)

Time : 2 Hours]

[Max. Marks : 40

Instructions to the candidates:-

- 1) *All questions are compulsory.*
- 2) *Figures to the right indicate full marks.*

Q1) Answer in brief :

[5 × 2 = 10]

- a) What is meant by literature survey?
- b) What is an abstract?
- c) Give the difference between conference and workshop.
- d) Give the uses of simple past tense.
- e) Define acronym and give one example.

Q2) Write short notes on (any 4)

[4 × 5 = 20]

- a) Components of discussion in research article
- b) Interpretation of Results
- c) Schematic representation of deductive and inductive reasoning.
- d) Factors affecting speed and clarity during oral presentation.
- e) Tautology.
- f) Significance of t - test

Q3) Attempt any one of the following:

[1 × 10 = 10]

What is scientific method? Explain in detail design of experiment.

OR

Prepare a CV for the post of technician in PTC industry.



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SEAT No. :

[Total No. of Pages : 1

[5019]-204

S.Y. B.Sc. (Semester - II)

BIOTECHNOLOGY

Bb - 224 : Metabolic Pathways

(2013 Pattern)

Time : 2 Hours]

[Max. Marks : 40

Instruction to the candidates:-

- 1) *All questions are compulsory.*
- 2) *Figures to the right indicate full marks.*
- 3) *Draw neat diagrams wherever necessary.*

Q1) Answer in 2-3 sentences :

[5 × 2 = 10]

- a) What is the significance of K_m .
- b) What is the role of PLP as a coenzyme.
- c) What do you mean by coupling of reaction.
- d) What are ketogenic amino acids? Give an example.
- e) Write the reaction catalyzed by Rubisco enzyme.

Q2) Attempt any four

[4 × 5 = 20]

- a) Write the reactions of oxidative phase of HMP pathway. What is their significance.
- b) What are ketone bodies? Discuss the synthesis of ketone bodies by liver.
- c) Describe the process of glycogen synthesis.
- d) Write the reactions unique to glyoxylate pathway. Give the significance of this pathway.
- e) Describe light reactions of photo synthesis.
- f) Discuss Cori cycle and its significance.

Q3) Attempt any one:

[1 × 10 = 10]

- a) Discuss in detail, urea cycle and its connection with TCA cycle.
- b) Explain Fatty acid synthase complex and write reactions of fatty acid biosynthesis.

