Total No. of Questions : 3]

SEAT No. :

P2796

[Total No. of Pages : 2

[4836] - 101
M.Sc. (Semester - I)
BIOTECHNOLOGY
BT - 101 : Advanced Biological Chemistry
(2013 Pattern) (Credit System)

Time : 3 Hours] *[Max. Marks : 50*

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***

Q1) Answer any four of the following: **[4 x 5 = 20]**

a) Explain Metabolic Engineering with reference to xenobiotics.

b) Enlist the methods of extraction for secondary metabolites. Explain any one in detail.

c) What is post translational modification? Describe in detail Glycosylation.

d) Peptide bond is rigid and planar. Justify.

e) Discuss the structure and functions of Glycolipids.

f) How mutation in gene affects the protein structure? Explain it in reference with Haemoglobin.

Q2) Write short notes on any four of the following: **[4 x 5 = 20]**

a) Diabetes.

b) Enzymes in diagnostics.

c) Lipoproteins.

P.T.O.

d) Alkaloids and their therapeutic uses.

e) Application of Metabolic engineering.

f) Cytokine receptors.

Q3) Answer any one of the following: **[1 x 10 = 10]**

a) Describe proteosomal ubiquitation pathway of protein degradation.

b) Explain Mevalonate pathway for synthesis of secondary metabolite.

Total No. of Questions : 3]

SEAT No. :

P2797

[Total No. of Pages : 2

[4836] - 102
M.Sc. (Semester - I)
BIOTECHNOLOGY
BT - 102 : Molecular Biology
(2013 Pattern) (Credit System)

Time : 3 Hours] *[Max. Marks : 50*

Instructions to the candidates:

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

Q1) Write self explainatory notes on any four of the following: **[20]**

a) Rolling circle model.

b) Ubiquitination.

c) SOS repair.

d) Homeobox.

e) Regulatory elements in yeast transcription.

f) Capping and tailing of mRNA.

Q2) Attempt any four of the following: **[20]**

a) What is COT curve? Explain its significance.

b) Compare and contrast transition and transversion mutations.

c) Explain bidirectional replication.

d) Describe primosome complex with neat & labelled diagram.

P.T.O.

e) What are signal peptides? Explain their role in protein transports.

f) Write the significance of DNA methylation.

Q3) Attempt any one of the following in 15-20 lines: **[10]**

a) Explain in details the role of ribosomal assembly in prokaryotic and eukaryotic translation.

b) What are pseudogenes? Write their evolutionary significance and add a note on gene families.

Total No. of Questions : 3]

SEAT No. :

P2798

[Total No. of Pages : 2

[4836] - 103
M.Sc. - I (Semester - I)
BIOTECHNOLOGY
BT - 103 : Environmental Biotechnology
(2013 Pattern) (Credit System)

Time : 3 Hours] *[Max. Marks : 50*

Instructions to the candidates:

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

Q1) Attempt any four of the following: **[4 x 5 = 20]**

a) Give an overview of GIS principles.

b) Write a note on Environmental Policies in India.

c) Write down minutes of stockholm conference.

d) Explain biochemical mechanism of composting. Enlist suitable organisms used for the same.

e) Write a note on Genetically modified organisms for soil bioremediation.

f) Explain biotechnology interventions for alternate fuel sources.

Q2) Write notes on any four: **[4 x 5 = 20]**

a) Trickling filters.

b) Bioaugmentation.

c) Air diffusion models.

d) ECO standards.

P.T.O.

e) Application of remote sensing in urban planning.

f) Carbon foot prints.

Q3) Answer any one of the following: **[10]**

a) i) Give overview of The Water Act, 1974. **[8]**

ii) Enlist reactions involved in Biotransformation of Insecticide at cytochrome P450 center in liver. **[2]**

b) i) Elaborate on aerobic biological treatment strategies used for treatment of an Effluent. **[8]**

ii) Dairy industry waste treatment is most often done using anaerobic processes; Enlist scientific reasons. **[2]**

Total No. of Questions : 3]

SEAT No. :

P2799

[Total No. of Pages : 2

[4836] - 104
M.Sc. (Semester - I)
BIOTECHNOLOGY
BT - 104 : Cell Biology
(2013 Pattern) (Credit System)

Time : 3 Hours] *[Max. Marks : 50*

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***

Q1) Answer any four questions: **[4 x 5 = 20]**

a) Discuss briefly the protein transport in mitochondria.

b) Write a short note on ABC transporters.

c) Discuss the mechanism of activation of cyclin dependent kinases.

d) Write a note on functional organisation of Golgi apparatus and its significance.

e) Describe biogenesis of cell wall in plants.

f) Enumerate the role of oncogenes in development of cancer.

Q2) Answer any four questions: **[4 x 5 = 20]**

a) Discuss the physiological role of plant hormone ethylene.

b) With suitable example discuss signal transduction pathway of a neurotransmitter.

c) Discuss terminal cell differentiation in animals.

P.T.O.

d) Write a note on PCD in plants.

e) What are cell junctions? Briefly discuss their types.

f) What are actin filaments? Describe their role and mechanism of assembly and disassembly.

Q3) Answer any one question: **[1 x 10 = 10]**

a) Discuss in detail the structural and functional organisation of animal cell membrane with help of diagrams.

b) Discuss in detail the energy transformation reactions in mitochondria.

Total No. of Questions : 3]

SEAT No. :

P2800

[Total No. of Pages : 2

[4836] - 201
M.Sc. (Semester - II)
BIOTECHNOLOGY
BT - 201 : Genetic Engineering
(2013 Pattern) (Credit System)

Time : 3 Hours] *[Max. Marks : 50*

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Neat diagrams to be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***

Q1) Answer the following (any 4): **[20]**

a) Describe the principle features of pUC cloning system.

b) Define cloning. In gene cloning experiments, why is cleaved plasmid DNA often treated with alkaline phosphatase prior to ligation step.

c) Discuss the salient features of a *P. pastoris* as a host system for eukaryotic protein expression.

d) Explain automation in the Sanger's method for DNA sequencing.

e) All plasmids replicate semiconservatively and maintain circularity. Justify.

f) Give the role of PCR technique for cDNA synthesis. How is cDNA library different from genomic DNA library.

Q2) Answer the following (any 4): **[20]**

a) Explain the characteristics of Human artificial Chromosome.

b) Differentiate between *In vivo* and *Ex vivo* gene therapy.

P.T.O.

c) Define Origin of replication. Explain the mechanism of regulation of copy number of plasmids.

d) Enlist the methods used for transformation in animals. How are viruses are used as an efficient gene delivery system.

e) Genetic mapping relies on large numbers of polymorphic markers (traits). Justify.

f) Describe the factors affecting a typical polymerase chain reaction mixture.

Q3) Answer the following (any 1): **[10]**

a) Discuss the difficulties encountered during expression of proteins in a host. Provide appropriate solutions to it with suitable example.

b) What are confined field trials. How are GM crops being regulated in India.

Total No. of Questions : 2]

SEAT No. :

P2801

[Total No. of Pages : 1

[4836]-202

M.Sc. (Semester - II)

BIOTECHNOLOGY

BT-202 : Immunology

(2013 Pattern) (Credit System)

Time : 1½ Hours] *[Max. Marks :25*

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Figures to the right indicates full marks.***
3) ***Draw the sketches wherever necessary.***

Q1) Attempt any three of the following : **[15]**

a) Cell-Mediated response is MHC-restricted - Justify.

b) Describe the structure and function of Thymus.

c) Write immunopathogenesis of Multiple Sclerosis.

d) Comment on Nude-Mice and its use in immunology.

e) Give a brief account of Hyperacute rejection of graft.

Q2) Attempt any one of the following : **[10]**

a) What do you mean by Hypersensitivity? Write in detail the four types of Hypersensitive responses with example of each.

b) Explain with a suitable example how chimeric antibodies are produced. Give reason why chimeric antibodies are therapeutically more potent than the monoclonal antibodies produced by Hybridoma technology.

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Total No. of Questions : 3]

SEAT No. :

P2802

[Total No. of Pages : 2

[4836]-203

M.Sc. (Semester - II)

BIOTECHNOLOGY

BT-203 : Principles of Bacteriology and Virology

(2013 Pattern) (Credit System) (4 Credits)

Time : 3 Hours] *[Max. Marks :50*

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***

Q1) Attempt any four out of the following : **[20]**

a) Elucidate the helical symmetry present in virus taking suitable example.

b) Describe the genome organization and replication of any one DNA virus.

c) Compare fluorescent Microscopy and Electron Microscopy as a diagnostic tool for viruses.

d) Explain the significance of heterocyst in Cyanobacteria.

e) Comment on the reliability of colony morphology in the identification of different bacterial species.

f) State the factors which determine the degree of pathogenicity of a microorganism.

Q2) Attempt any four out of the following : **[20]**

a) Zoonoses are infectious diseases of animals that can naturally be transmitted to humans. Taking example discuss the modes of transmission and ways to prevent such infection.

b) Give the principles of Epidemiology in regard to Public Health.

c) Comment on the need for Modern Viral Vaccines.

d) What are the adaptations that bacteria undergo to survive in acidic environments.

e) What are the guidelines given by WHO for safe handling of pathogens.

f) Comment on the autotrophic mode of nutrition in bacteria with suitable examples.

P.T.O.

Q3) Attempt any one out of the following : **[10]**

a) 'Genetic and Molecular Analysis has revolutionized the identification and classification of bacteria'. Justify.

b) What are the problems and usefulness associated with the serological detection of viruses. Explain any one in detail with diagram.

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Total No. of Questions : 3]

SEAT No. :

P2803

[Total No. of Pages : 2

[4836]-204

M.Sc. (Semester - II)

BIOTECHNOLOGY

BT-204 : Plant Biotechnology

(2013 Pattern) (Credit System)

Time : 3 Hours] *[Max. Marks :50*

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicates full marks.***

Q1) Answer the following (any four) : **[20]**

a) Tissue culture allows the production and propagation of genetically homogeneous, disease-free plant material. Justify.

b) What are the attempts made for strain improvement in economically important mushroom *Pleurotus*.

c) Explain selection strategies used to achieve transformation in abiotic stress crops.

d) Discuss the barriers to horizontal gene transfer.

e) Explain the non vector based method used to achieve genetic modification in algae *Spiruluna* for production of single cell protein.

f) Give the principle, method and application of *in vitro* androgenesis.

Q2) Answer the following (any four) : **[20]**

a) 'Control of transcription of a transgene in plants is achieved by use of promoters'. Justify.

b) Micropropogation is successful in ornamental plants like Gerbera and Orchids. Discuss.

c) What are the factors that affect induction and development of somatic embryos in cultured cells.

d) Give the importance of fungi in industries. How is product improvement achieved in these fungi.

P.T.O.

e) Explain the importance of Ti plasmid in plant biotechnology. How would you develop a construct for generation of a transgenic.

f) Explain the Indian scenario for development of transgenic in plants. Name few leading Institutes and Industries involved in this work.

Q3) Answer the following (any one) : **[10]**

a) Discuss the strategy for insertion of genes encoding entire non-native metabolic pathways to obtain a transgenic with increased productivity.

b) Toxicological and nutritional testing is an essential part of the safety assessment model for food derived from GM crops. Justify.

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Total No. of Questions : 3]

SEAT No. :

P2804

[Total No. of Pages : 2

[4836]-301

M.Sc. (Semester - III)

BIOTECHNOLOGY

BT-301 : Animal Biotechnology

(2013 Pattern) (Credit System)

Time : 3 Hours] *[Max. Marks :50*

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***

Q1) Answer the following (any four) : **[4 × 5 = 20]**

a) What is cross contamination? Comment on measures to be taken to prevent cross contamination.

b) Give an account of organotypic & histotypic cultures.

c) Write a note on application of cell cultures in cytotoxicity testing.

d) How will you ensure that only immortal Ab^+ hybrid cells (heterokaryons) survive in hybridoma technology?

e) Write importance of animal genomics study.

f) Write a note on long term preservation of embryos.

Q2) Write notes on the following (any four) : **[4 × 5 = 20]**

a) Genetically modified organisms and bioethical consideration.

b) Characterisation of cultured animal cells.

c) Disadvantages of organ culture over monolayer culture.

d) Any one method used for artificial insemination.

e) Methods of generating transgenic animal using in vitro stem cell culture.

f) Serum free media.

P.T.O.

Q3) Explain in detail how a transgenic mouse model can be used to study cancer. **[10]**

OR

Explain the concept of plasticity of stem cells. Add a note on lineage specific markers and explain any one method to purify stem cells. **[10]**

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Total No. of Questions : 3]

SEAT No. :

P2805

[Total No. of Pages : 2

[4836]-302

M.Sc. (Semester - III)

BIOTECHNOLOGY

BT-302 : Bioprocess Engineering & Fermentation Technology

(2013 Pattern) (Credit System)

Time : 3 Hours] *[Max. Marks :50*

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***

Q1) Attempt the following questions in 10-15 lines (any four) : **[4 × 5 = 20]**

a) What are the advantages of non-mechanically agitated fermenters over stirred tank reactors? Describe with the help of neat labelled diagram the principle and working of Air Life fermenters.

b) What is the importance of real time estimation of biomass during fermentation? Describe different methods of real time estimation of biomass during fermentation process.

c) What are the different control mechanisms involved in branched biosynthetic pathways? Explain giving any one example how the knowledge of control mechanisms can improve the yield of a product.

d) 'Use of inducers in fermentation media can improve the yield of a product'. Explain giving examples.

e) Describe the effluent disposal strategies used for textile industry.

f) What is cross flow filtration? Give the application of cross flow filtration in product recovery.

Q2) Attempt the following questions in 10-15 lines (any four) : **[4 × 5 = 20]**

a) What is microbial leaching? How microbes can be used for ore leaching?

b) Explain the following terms :

i) Fixed volume fed batch culture.

ii) Oxygen uptake rate

iii) Del factor

iv) μmax

v) Eddies

P.T.O.

c) How 'Scale down' experiments can help in bioprocess.

d) What are culture collection centres? Enlist the names of 4-5 collection centres. How are lyophilized cultures prepared for such centres?

e) What is the importance of design organism in batch sterilization? Explain the method used for designing batch sterilization process.

f) What is K_{ha}? How does pattern of microbial growth affect K_{ha} in fermentation?

Q3) Answer the following question : **[10]**

Define Biotransformation. What are the advantages of biotransformation over conventional fermentation? Explain with example the process of steroid biotransformation

OR

Define convective mass transfer. Describe in detail the gas liquid mass transfer process and explain its significance in bioprocess.

Total No. of Questions : 2]

SEAT No. :

P2806

[Total No. of Pages : 1

[4836]-303

M.Sc. (Semester - III)

BIOTECHNOLOGY

BT-303 : Data Base Management & Intellectual Property Rights

(2013 Pattern) (Credit System)

Time : 1½ Hours] *[Max. Marks :25*

Instructions to the candidates:

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

Q1) Answer any three : **[3 × 5 = 15]**

a) Describe in brief the procedure for obtaining product patent.

b) Give an account of any two multilateral treaties of which India is a member.

c) Discuss the types of databases relevant to biotechnology.

d) Explain in brief salient features of TRIPS agreement with specific reference to protection of biological materials.

e) Write salient features of protection of plant variety and farmer's right act 2001.

Q2) Answer any one : **[1 × 10 = 10]**

a) Enlist the basic requirements for patenting an invention. Explain in detail the patenting of biological products.

b) What is a database? Write a note on its organization. Explain the application and importance of databases.

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Total No. of Questions : 3]

SEAT No. :

P2807

[Total No. of Pages : 2

[4836]-304

M.Sc. - II (Semester - III)

BIOTECHNOLOGY

BT-304 : Advanced Genetics

(2013 Pattern) (Credit System)

Time : 2½ Hours] *[Max. Marks :38*

Instructions to the candidates:

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

Q1) Answer any two : **[2 × 5 = 10]**

a) State Hardy Weinberg's law. Mention the factors which can cause distortion of it. Add a note on its applications.

b) Discuss briefly the significance of using Drosophila as a model system in genetics.

c) What are somaclonal variations? Discuss the genetic factors underlying these.

d) Discuss the significance of apomixis in plant breeding.

Q2) Answer any four : **[4 × 5 = 20]**

a) Give comment on Trisomy - 21.

b) Describe the various techniques used to detect genetic disorders in human.

c) Define the term inbreeding? How do you calculate inbreeding co-efficient. Give example.

d) 400 children were surveyed for getting allergy to a particular drug. The ability of not getting the allergy (A) is dominant over allele (a) 64 children were found allergic. Calculate the percentage of heterozygons children assuming that the population is in Hardy Weinberg's equilibrium.

e) Write a note on genetic control of cytoplasmic inheritance in plants.

f) Briefly discuss the genetic control of pathways involved in development of androgenic plant.

P.T.O.

Q3) Answer any one : **[1 × 8 = 8]**

a) Discuss in detail the molecular mechanism of sexual incompatibility in plants.

OR

b) Define QTL with example in humans. Explain 'Quantitative Model' used in quantitative genetics with the help of an example.

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Total No. of Questions : 2]

SEAT No. :

P2808

[Total No. of Pages : 1

[4836]-305

M.Sc. (Part - II) (Semester - III)

BIOTECHNOLOGY

BT-305 : Bioinformatics

(2013 Pattern) (Credit System)

Time : 1½ Hours] *[Max. Marks :25*

Instructions to the candidates:

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

Q1) Solve any three of the following : **[3 × 5 = 15]**

a) Define Bioinformatics & give its importance.

b) Write a short note on BLOSUM.

c) Explain : Structure - Function relationship in proteins.

d) What is immunoinfermatics? Explain basics of epitope prediction.

e) Define motifs of proteins. Explain their role in protein classification.

f) Discuss various methods of protein structure prediction, elaborating on any one.

Q2) Solve any one of the following : **[10]**

a) Explain Ramachandran plot. Comment upon structure prediction using Ramachandran plot of proteins with appropriate example.

b) Describe importance of phylogetic analysis. Explain various methods of phylogenetic tree constructions mentioning their advantages.

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Total No. of Questions : 3]

SEAT No. :

P2809

[Total No. of Pages : 2

[4836]-401

M.Sc. (Semester - IV)

BIOTECHNOLOGY

BT-401 : Genomics & Proteomics

(2013 Pattern) (Credit System)

Time : 3 Hours] *[Max. Marks :50*

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Neat diagrams must be drawn whenever necessary.***
3) ***Figures to the right indicate full marks.***

Q1) Solve any four of the following : **[4 × 5 = 20]**

a) Explain the association between functional genomics and transcriptomics with suitable example.

b) Model organisms play a major role in comparative genomics. Enlist such organisms and elaborate on the role of any one with a mention of its advantages, applications and limitations in genomic studies.

c) Advancement in microarray technology generates a huge quantity of data. Describe the databases and bioinformatic tools available for the storage and analysis of microarray data.

d) Discuss merits and demerits of short gun sequencing and clone by clone approach used in whole genome sequencing.

e) Discuss the solution offered by genomics to overcome the limitations of bacterial cultivation techniques to study microbial diversity.

f) Write explanatory note on :

i) RNA microarray.

ii) Any one technique in genetic mapping.

Q2) Solve any four of the following : **[4 × 5 = 20]**

a) Justify : Study of proteomics gives us more information about expression and functioning of cell than classical techniques.

b) Give role and importance of databases and bioinformatics tools in functional proteomics with suitable example.

P.T.O.

c) Justify : 2D PAGE plays vital role in proteome analysis.

d) Why normalization of microarray data is essential in comparative studies of expression profile in two different conditions? Explain with example.

e) Design a strategy that leads to the discovary of novel protein which can be used in disease diagnosis.

f) Explain with the help of diagram, how phage display can be used to study protein interactions.

Q3) Solve any one of the following : **[1 × 10 = 10]**

a) i) Explain structural genomics. Give goals and any one method to study structural genomics.

ii) What is structural proteomics? Explain its experimental limitations. Give the role of computational tools in structural proteomics.

b) i) How does toxicogenomics solve the problem of variation in individual response to toxins and treatments? Give suitable example.

ii) Older methods for protein sequencing are time consuming and less accurate. Explain modern techniques for protein sequencing and its applications.

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Total No. of Questions : 3]

SEAT No. :

P2810

[Total No. of Pages : 2

[4836]-402

M.Sc. (Semester - IV)

BIOTECHNOLOGY

BT-402 : Advanced Biochemical and Biophysical Techniques

(2013 Pattern) (Credit System) (Credits 4)

Time : 3 Hours] *[Max. Marks :50*

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicates full marks.***
4) ***Assume suitable data, if necessary.***

Q1) Answer the following (any four) : **[4 × 5 = 20]**

a) Explain principle of affinity chromatography. Give examples of group specific ligands commonly used in affinity chromatography.

b) Describe the instrumental features of Mass Spectrophotometer.

c) With the help of schematic diagram, distinguish between light & transmission electron microscope.

d) Discuss the technique of in site localization of antigens in living cells (any one).

e) Define radioactive decay? Explain any two types of radioactive decay.

f) Give the significance of Bragg's Law in X-Ray Diffraction technique.

Q2) Answer the following (any four) : **[20]**

a) Polarity & non-polarity of solvents help in separation of compounds. Justify.

b) Explain the significance of use of IEF & SDS-PAGE in 2-D electrophoresis.

c) Describe freeze-fracture technique for study of cell membrane.

d) Define quenching. Explain principle & working of spectrofluorometer.

e) Give the clinical applications of ELISA.

f) Discuss the principle, working and applications of HPTLC.

P.T.O.

Q3) Answer any one of the following : **[10]**

a) Elaborate upon the strategic use of spectroscopic techniques for structure determination of biomolecules.

b) Comment on the methods used for fixation and staining techniques for electron microscopy.

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Total No. of Questions : 2]

SEAT No. :

P2811

[Total No. of Pages : 1

[4836]-403

M.Sc. (Semester - IV)

BIOTECHNOLOGY

BT-404 : Nanobiotechnology

(2013 Pattern) (Credit System)

Time : 1½ Hour] *[Max. Marks :25*

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Neat diagram must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***

Q1) Answer the following (any three) : **[3 × 5 = 15]**

a) Discuss the applications of nano wires.

b) What do you mean by band gap? How it varies with size of nanoparticles.

c) Explain the method for characterization of nanoparticles to identify its magnetic & electrical properties.

d) Comment on the antibacterial and antifungal properties of nanoparticles.

e) Discuss the advantages of chemical synthesis over biological synthesis of nanoparticles.

Q2) Answer the following (any one) : **[10]**

a) Enlist the physical vapor deposition techniques used for synthesis of nanostructures. Explain the sputtering method in detail.

b) What is biofunctionalization of nanoparticles? Explain with an suitable example.

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Total No. of Questions : 3]

SEAT No. :

P2812

[Total No. of Pages : 2

[4836]-404

M.Sc. (Semester - IV)

BIOTECHNOLOGY

BT-405 : Animal Development & Stem Cell Technology

(2013 Pattern) (Credit System)

Time : 3 Hours] *[Max. Marks :50*

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Neat labelled diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***

Q1) Attempt the following questions in 10-15 lines (any four) : **[4 × 5 = 20]**

a) Explain the process of oogenesis and justify that it is discontinuous.

b) With the help of a diagram explain the pattern of cleavage and blastola in human embryo.

c) Write a note on homeotic genes in early development.

d) Write a note on tissue regeneration with appropriate example.

e) Enlist and explain different morphogenetic movements.

f) Write a note on "neurulation".

Q2) Attempt the following questions in 10-15 lines (any four) : **[4 × 5 = 20]**

a) Write a note on loss of cell cycle regulation in cancer stem cells.

b) Explain the theropeutic application of stem cells during diabetes treatment.

c) Write a note on sperm hyperactivation.

d) What are induced pleuripotent stem cells? Give their advantage and application over embryonic stem cells.

e) Define cell lineage. Add a note on 'neuronal cell lineage tracing.

f) Write a note on retroviral method of gene manipulation in stem cells.

P.T.O.

Q3) Answer any one : **[1 × 10 = 10]**

Explain in detail Alzheimer's mouse model.

OR

Give a comparitive account of different trans gene insertion methods.

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Total No. of Questions : 3]

SEAT No. :

P2813

[Total No. of Pages : 2

[4836]-405

M.Sc. (Semester - IV)

BIOTECHNOLOGY

BT-406 : Agricultural Biotechnology

(2013 Pattern) (Credit System)

Time : 3 Hours] *[Max. Marks :50*

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) Attempt any four of the following : **[4 × 5 = 20]**

a) Compare and contrast between somaclonal and gametoclonal variations.

b) Write a note on triploid production. Discuss applications of triploids in agriculture.

c) Explain with a suitable example, quality improvement in a cereal crop through biotechnology.

d) Discuss the types and applications of microsatellites in mapping.

e) Highlight various methods available for inducing polyembryony.

f) Write a note on risks associated with production and release of transgenic crops.

Q2) Attempt any four of the following : **[4 × 5 = 20]**

a) Define virus indexing. Discuss methods used to eradicate viruses and comment on success of these methods in agriculture.

b) Explain different methods involved in homozygous plant production through anther culture.

c) Discuss various factors critical for commercial plant production using bioreactors.

d) Write a note on production of transgenic plants resistant to temperature stress.

P.T.O.

e) Discuss with suitable examples, the concept of future crops.

f) How transgenic technology is used to develop plants resistant to fungi?

Q3) Answer <u>any one</u> of the following : **[1 × 10 = 10]**

a) Define QTLs. Explain in detail construction of genetic maps using QTLs.

b) Justify role of chloroplast transformations in molecular pharming.

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