Total No. of Questions : 7]

SEAT No. :

P539

[Total No. of Pages : 2

[5839]-101
M.Sc.
BIOTECHNOLOGY
MBT - 101 : ADVANCED BIOLOGICAL CHEMISTRY
(2019 Pattern) (Semester - I) (CBCS)

Time :3 Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***Q.1 is compulsory.***
2) ***Solve any five questions from Q.2 to Q.7.***
3) ***Questions 2 to 7 carry equal marks.***

Q1) Solve any five of the following: **[10]**

a) What is steady state?

b) Define primary structure of protein.

c) State the role of enzyme phenylalanine ammonia lyase (PAL).

d) What is meant by domain of protein?

e) Define Enzyme activity.

f) What is Metabolic flux?

Q2) a) Explain how protein folding in aided by choperons. **[7]**

b) Discuss about bisubstrate reaction catalysed by enzymes. **[5]**

Q3) a) What are alkaloids and comment on its therapeutic applications. **[7]**

b) Write a note on protein misfolding and its associated diseases. **[5]**

Q4) a) Describe in detail impact of substrate on the rate of enzyme catalysed reaction. **[7]**

b) Differentiate between primary and secondary metabolites. **[5]**

Q5) a) Explain protein-protein interaction with suitable example. **[7]**

b) Describe Mevalonate pathway. **[5]**

P.T.O.

Q6) a) What is Metabolic Engineering? Discuss Xenobiotics in relation with it. **[7]**

b) Explain in detail 'soxhlet method' for extraction of secondary metabolites. **[5]**

Q7) Write short notes on any two of the following : **[12]**

a) Integration of Metabolism.

b) Cholesterol oxidase as Biosensor.

c) Application of Phenolics.

□□□

Total No. of Questions : 7]

SEAT No. :

P540

[Total No. of Pages : 2

[5839]-102
M.Sc. BIOTECHNOLOGY
MBt - 102 Cell & Molecular Biology
(2019 Pattern) (Semester - I) (CBCS)

Time :3 Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***Q.1 is compulsory.***
2) ***Solve any five questions from Q.2 to Q.7.***
3) ***Question 2 to 7 carry equal marks.***

Q1) Solve any five of the following: **[10]**

a) State cell theory.

b) Why are lysosomes called as 'suicidal bags'?

c) What is pinocytosis?

d) Explain significance of 'sigma factor' in prokaryotic transcription.

e) What do you mean by retroposons?

f) Discuss the role of 'enhancers'.

Q2) a) Describe the different types of lipids present in plasma membranes. **[7]**

b) Write a short note on replicative transposons. **[5]**

Q3) a) Explain mechanism of post-transcriptional gene silencing. **[7]**

b) Justify role of TNFR in programmed cell death. **[5]**

Q4) a) Discuss role of G-protein coupled receptors in cell signalling cascade. **[7]**

b) Explain significance of telomerase in eukaryotic replication. **[5]**

Q5) a) Give an account on positive & negative regulation of tryptophan operon system. **[7]**

b) Describe Ca^{++} AT Pase system. **[5]**

P.T.O.

Q6) a) Explain in detail tight junctions. **[7]**

b) Discuss Base excision repair mechanism. **[5]**

Q7) Write short notes on any two. **[12]**

a) RNA editing.

b) Neurotransmitters.

c) Mitosis.

□□□

Total No. of Questions : 7]

SEAT No. :

P541

[Total No. of Pages : 2

[5839]-103
M.Sc. (Biotechnology)
MBT - 103 : Genetics and Immunology
(2019 Pattern) (Semester - I) (CBCS)

Time :3 Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***Q.1 is compulsory.***
2) ***Solve any Five questions from Q.2 to Q.7.***
3) ***Question 2 to 7 carry equal marks.***

Q1) Solve any Five of the following: **[10]**

a) What is inbreeding?

b) Define adaptive landscape.

c) What is epistasis?

d) What are immunogens?

e) State principle of RIA.

f) What are live attenuated vaccines? Give example.

Q2) a) Describe Hardy weinberg equilibrium and factors affecting it. **[7]**

b) Explain antigen processing and presentation pathway for endogenous antigens. **[5]**

Q3) a) Explain complement activation pathway involved in acquired immunity. **[7]**

b) Explain the law of independent assortment with suitable example. **[5]**

Q4) a) Discuss the genetics of Hypertension. **[7]**

b) Comment on T cell subsets. **[5]**

Q5) a) State principle of ELISA. Elaborate on types and applications of ELISA. **[7]**

P.T.O.

b) The ability to taste PTC is due to single dominant allele "T". You sampled 215 individuals and determined that 150 could detect taste of PTC and 65 could not. Calculate the allelic frequencies and genotype frequencies. **[5]**

Q6) a) Explain Genetic mapping along with it's methods. **[7]**

b) State barriers of innate immunity. **[5]**

Q7) Write short notes on any Two of the following. **[12]**

a) Linkage disequilibrium.

b) Diagnostic tools for genetic disorder.

c) Lympho proliferation assay.

□□□

Total No. of Questions : 5]

SEAT No. :

P542

[Total No. of Pages : 1

[5839]-104
M.Sc. (Part - I) (Biotechnology)
MBT - 105 : ENVIRONMENTAL BIOTECHNOLOGY
(CBCS) (2019 Pattern) (Semester - I)

Time :2 Hours] ***[Max. Marks : 35***

Instructions to the candidates:

1) ***Q.1 is compulsory.***
2) ***Solve any three questions from Q.2 to Q.5.***
3) ***Question 2 to 5 carry equal marks.***

Q1) Answer any five of the following: **[5]**

a) Distinguish between conventional & non conventional energy resources.
b) What is biomethanation?
c) Write any two differences between GIS and Remote sensing.
d) What is environmental audit?
e) Mention significance of antipollution acts.
f) Define Environmental Impact Assesment.

Q2) a) Discuss causes and consequences of climate change. **[6]**
b) Write in brief about carbon foot prints. **[4]**

Q3) a) Why are landfills environmentally harmful? **[6]**
b) Discuss importance of EIA for developing countries. **[4]**

Q4) a) What is biostimulation? Explain various strategies used for it. **[6]**
b) Mention merits & demerits of Environmental protection act 1986. **[4]**

Q5) Write short note on : **[10]**

a) Agenda 21.
b) Phytostabilization.
c) Ozone hole formation.

□□□

Total No. of Questions : 7]

SEAT No. :

P543

[Total No. of Pages : 2

[5839]-105
M.Sc. (Biotechnology)
MBT - 106 : FOOD BIOTECHNOLOGY
(2019 Pattern) (Semester - I) (CBCS)

Time :3 Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***Q.1 is compulsory.***
2) ***Solve any five questions from Q.2 to Q.7.***
3) ***Question 2 to 7 carry equal marks.***

Q1) Solve any five of the following: **[10]**

a) Define prebiotic with 2 examples.

b) What is microbial toxin give 2 examples of mycotoxin.

c) What is GMO explain with 2 examples.

d) Define nutrigenomics.

e) What are intrinsic factors responsible for food spoilage.

f) Define fermentation with 2 examples.

Q2) a) Explain production of Amylase in detail. **[7]**

b) What are nanosensors? How nanosensors are used in detection of pesticides. **[5]**

Q3) a) What are functional foods explain in detail. **[7]**

b) Explain QA with respect to food industry. **[5]**

Q4) a) Describe food borne intoxication by clostridium botulinum. **[7]**

b) Why food safety laws are important. Explain in detail. **[5]**

Q5) a) Describe the production of citric acid in detail along with organisms involved in it. **[7]**

b) Write a note on food waste management. **[5]**

P.T.O.

Q6) a) Explain TQM in detail. **[7]**

b) Describe Bioactive peptides in detail. **[5]**

Q7) Write a note on Any Two **[12]**

a) Food formulation for drought and disaster affected area.

b) FSSAI

c) Traditional fermented foods.

□□□

Total No. of Questions : 7]

SEAT No. :

P544

[Total No. of Pages : 2

[5839]-201
M.Sc. (Biotechnology)
MBT - 201 : GENETIC ENGINEERING
(2019 Pattern) (CBCS) (Semester - II)

Time :3 Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) ***Q.1 is compulsory.***
2) ***Solve any Five questions from Q.2 to Q.7.***
3) ***Question 2 to 7 carry equal marks.***

Q1) Solve any Five of the following: **[10]**

a) Define Genetic Engineering.

b) Write role of polynucleotide kinase in rDNA technology.

c) What is hot-start PCR?

d) How adaptors are used in blunt end ligation?

e) What is electroporation?

f) Define biopharming.

Q2) a) Describe the role of PCR in Molecular diagnostic of pathogen. **[7]**

b) Discuss the mechanism for use of shuttle vectors in genetic engineering. **[5]**

Q3) a) Explain the various genetic elements required for construction of Expression vector. **[7]**

b) Gene therapy is used to overcome genetic diseases. Justify. **[5]**

Q4) a) Discuss the automation of DNA sequencing and give its applications. **[7]**

b) Explain DNA are foot printing to study protein-DNA interaction. **[5]**

Q5) a) Describe artificial chromosome vectors with suitable examples. **[7]**

b) Explain SSCP technique in mutation detection. **[5]**

P.T.O.

Q6) a) Compare & contrast between genomic & cDNA Library. **[7]**

b) Explain Baculovirus as expression vector. **[5]**

Q7) Write short notes on any Two of the following. **[12]**

a) Fluorescence in situ hybridization.

b) DNA fingerprinting.

c) Viral & non-viral methods of Gene delivery.

□□□

Total No. of Questions : 7]

SEAT No. :

P545

[Total No. of Pages : 2

[5839]-202
M.Sc. (Biotechnology)
MBT - 202 : Principles of Bacteriology and Virology
(2019 Pattern) (Semester - II) (CBCS)

Time :3 Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***Q.1 is compulsory.***
2) ***Solve any Five questions from Q.2 to Q.7.***
3) ***Question 2 to 7 carry equal marks.***

Q1) Solve any Five of the following: **[10]**

a) Significance of 165 rRNA sequencing.

b) Define endotoxin and state its clinical significance.

c) Define term pre and probiotics.

d) What is nucleocapsid?

e) Define prophage.

f) State Mechanism of Acyclovir.

Q2) a) Explain new approach to bacterial taxonomy give details of any one method. **[7]**

b) Give an account on lysogenic conversion. **[5]**

Q3) a) Explain 'Baltimore classification scheme of viruses'. **[7]**

b) Give structure and function of siderophore. **[5]**

Q4) a) Discuss adaptations in hyper thermophiles and its applications. **[7]**

b) Comment on plant viruses. **[5]**

Q5) a) Explain in vivo methods of cultivations of viruses. **[7]**

b) Draw well labelled diagram of endospore and discuss the structure. **[5]**

P.T.O.

Q6) a) Give an account on 'Quorum sensing'. **[7]**

b) Describe the structure of HIV. **[5]**

Q7) Write short notes on any two of the following. **[12]**

a) Interferon.

b) M13 bacteriophage.

c) Applications of Agrobacterium in agriculture.

□□□

Total No. of Questions : 7]

SEAT No. :

P546

[Total No. of Pages : 2

[5839]-203
M.Sc. (Biotechnology)
MBT - 203 : PLANT BIOTECHNOLOGY
(2019 Pattern) (Semester - II) (CBCS)

Time :3 Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***Q.1 is compulsory.***
2) ***Solve any Five questions from Q.2 to Q.7.***
3) ***Question 2 to 7 carry equal marks.***

Q1) Solve any Five of the following: **[10]**

a) Define somatic embryogenesis.

b) What is cryoprotectant? Give two examples.

c) Define promoter.

d) Distinguish between biotic and abiotic stress.

e) What is marker assisted back-crossing?

f) Give steps involved in protoplast isolation by enzymatic method.

Q2) a) Enlist and explain various stages in micropropagation. Add a note on commercial application of micropropagation. **[7]**

b) Define GM crops. Give advantages and disadvantages of GM crops. **[5]**

Q3) a) Explain with example how production of secondary metabolites can be enhanced using transgenic technology. **[7]**

b) What is suspension culture? Give its application in plant biotechnology. **[5]**

Q4) a) What is MAS? Discuss how MAS cab be used for crop improvement. **[7]**

b) Discuss various types of molecular marker used in plant biotechnology. **[5]**

P.T.O.

Q5) a) Describe various physical methods for genetic transformation of plants. **[7]**

b) Explain the mechanism involved in T-DNA transfer to plants. **[5]**

Q6) a) Describe how transgenic technology can be used for abiotic stress tolerant plant. **[7]**

b) Describe the technique of cryopreservation of plant cell cultures. **[5]**

Q7) Write short notes on any Two of the following. **[12]**

a) Molecular farming.

b) Plant viral vector.

c) Methods of protoplast fusion.

□□□

Total No. of Questions : 7]

SEAT No. :

P547

[Total No. of Pages : 2

[5839]-204
M.Sc. (Part - I) (Biotechnology)
MBT - 205 : CLINICAL RESEARCH, DATABASEMANAGEMENT AND IPR
(2019 Pattern) (Semester - II) (CBCS)

Time :3 Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) ***Q.1 is compulsory.***
2) ***Solve any Five questions from Q.2 to Q.7.***
3) ***Questions 2 to 7 carry equal marks.***

Q1) Solve any Five of the following: **[10]**

a) Comment on phase zero of clinical trial.

b) What are the types of blinding?

c) State ethics involved in relation to vulnerable groups.

d) How discovery and invention differs from each other?

e) Comment on Breeder's rights.

f) What is WIPO?

Q2) a) Elaborate different types of IPs with their significance. **[7]**

b) Describe essential documents required after the conduct of clinical trial. **[5]**

Q3) a) Describe different phases of clinical trials involved in drug development process. **[7]**

b) Comment on microbial patent and Budapest treaty. **[5]**

Q4) a) Describe the procedure for obtaining a patent. **[7]**

b) Explain database management system. Comment on query raising and resolution. **[5]**

P.T.O.

Q5) a) Give a brief account on International regulatory authorities of clinical trials. **[7]**

b) What is copyright? Explain different classes of copyright. **[5]**

Q6) a) What is pharmacovigilance? State its significance in risk management. **[7]**

b) Describe Paris convention and Berne convention in detail. **[5]**

Q7) Write short notes on any Two of the following : **[12]**

a) Patentable and non-patentable inventions.

b) Patents for Industrial Design.

c) Roles and responsibility of IRB.

□□□

Total No. of Questions : 7]

SEAT No. :

P548

[Total No. of Pages : 2

[5839]-205
M.Sc.
BIOTECHNOLOGY
MBT - 206 : Medical Biotechnology
(2019 Pattern) (Semester - II) (CBCS)

Time :3 Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) ***Q.1 is compulsory.***
2) ***Solve any Five questions from Q.2 to Q.7.***
3) ***Questions 2 to 7 carry equal marks.***

Q1) Solve any Five of the following: **[10]**

a) Define gene augmentation.

b) What are subunit vaccines?

c) Enlist enzyme markers used in disease diagnosis.

d) What do you mean by genetic counselling?

e) What are infection disorders? Give an example.

f) What are adult stem cells?

Q2) a) What is gene therapy? Discuss various types of vectors in gene therapy. **[7]**

b) What is tissue engineering? Write its applications in medical biotechnology. **[5]**

Q3) a) Discuss how bioartificial organs can be developed. Add a note on two potential uses. **[7]**

b) Describe RNA based probes in disease diagnostics. **[5]**

Q4) a) What are polygenic disorders? Explain with suitable examples. **[7]**

b) Explain the use of monoclonal antibodies in disease diagnostics. **[5]**

P.T.O.

Q5) a) Discuss characteristics, diagnosis and therapy of cystic fibrosis. **[7]**

b) Discuss microarray technology in disease diagnostics. **[5]**

Q6) a) What is sickle cell anaemia? How medical biotechnology tools can be effectively used to diagnose and treat sickle cell anaemia? **[7]**

b) How are genetic diseases classified? Discuss the basis of classification of genetic disorders. **[5]**

Q7) Write short notes on any <u>two</u> of the following : **[12]**

a) Bioartificial organs.

b) DNA based vaccines.

c) Chromosomal disorders.

□□□

Total No. of Questions : 7]

SEAT No. :

P550

[Total No. of Pages : 2

[5839]-302
MSc. - II
BIOTECHNOLOGY
MBT- 302 : Bioprocess Engineering
(2019 CBCS Pattern) (Semester-III)

Time : 3 Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***Q.1 is compulsory***
2) ***Solve any Five questions from Q.2 to Q.7***
3) ***Questions 2 to 7 carries equal marks.***

Q1) Solve any five of the following. **[10]**

a) Define non-growth linked products.

b) What do you mean by Z-value?

c) Explain Bingham plastic rheology.

d) What are the raw material use for beer fermentation?

e) Write any two regulations on biotech products.

f) Explain reverse osmosis.

Q2) a) Explain scaling up of batch sterilization processes. **[7]**

b) Discuss industrial production of Glutamic acid. **[5]**

Q3) a) Explain measurement and control of dissolved oxygen in fermentation. **[7]**

b) Why would fermentation of yeast biomass and penicillin performed in fed batch manner? Explain. **[5]**

Q4) a) Discuss Richard's rapid method for design of sterilization cycles. **[7]**

b) Explain the criteria for the transfer of inoculum to fermenter. **[5]**

P.T.O.

Q5) a) Explain the factor influencing the choice of carbon source in fermentation media. **[7]**

b) Discuss various types of agitators use to perform mixing. **[5]**

Q6) a) Discuss the various blue-prints for the isolation of hypothetical mutant responsible for over production of intermediate or end product in pathway. **[7]**

b) Explain the assumptions of two-film theory. **[5]**

Q7) Write short notes on any two of the followings. **[12]**

a) Bio-separation methods in (DSP) Down Stream Processing

b) Recovery of Ri famycin

c) SOP and GMP

Total No. of Questions : 7]

SEAT No. :

P551

[Total No. of Pages : 2

[5839]-303
M.Sc.
BIOTECHNOLOGY
MBT - 303 : Bioinformatics and Biostatistics
(2019 Pattern) (CBCS) (Semester-III)

Time : 3 Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***Q.1 is compulsory***
2) ***Solve any Five questions from Q.2 to Q.7***
3) ***Question 2 to 7 carry equal marks.***

Q1) Solve any five of the following. **[10]**

a) Define sequence alignment and enlist its methods.

b) Explain 'Treatment' in design of experiment.

c) What is SMILES in chemoinformatics?

d) Define 'Level of significance'

e) What is ab initio modelling?

f) Calculate Coefficient of skewness (γ_1) if $\mu_2 = 1.11$ and $\mu_3 = 3.48$ comment on your results.

Q2) a) What is multiple sequence alignment? Describe progressive alignment method in detail. **[7]**

b) Describe Mann-Whitney U test **[5]**

Q3) a) Explain structure based drug desiging in detail. **[7]**

b) What is hypothesis testing? Explain t-test in detail. **[5]**

P.T.O.

Q4) a) A researcher wants to known how blood glucose level of a person is related to weight of the person he collected data as follows. **[7]**

Weight (X)	64	75.3	73	82.1
Blood (Y) glucose	108	109	104	102

Fit simple linear regression model for above data.

b) Discuss protein structure prediction by Homology modelling. **[5]**

Q5) a) Explain one-way ANOVA technique. **[7]**

b) Describe pharmacophore modelling. **[5]**

Q6) a) What is biological database? Describe nucleic acid sequence databases in detail. **[7]**

b) Calculate Pearson's correlation coefficient for following data by using. **[5]**

n = 7 Σx = 349, Σy = 366, Σx^2 = 19753,

Σy^2= 21100, Σxy=20343

comment on results

Q7) Write a short notes on any two of the following. **[12]**

a) FASTA

b) Type I & Type II error

c) Gap Penalty & Penalty scheme

Total No. of Questions : 5]

SEAT No. : ____

P552

[Total No. of Pages : 2

[5839]-304
M.Sc. (Biotechnology)
MBT 305 : NANO BIOTECHNOLOGY
(2019 Pattern) (CBCS) (Semester-III)

Time : 2 Hours] ***[Max. Marks : 35***

Instructions to the candidates:

1) ***Q.1 is compulsory.***
2) ***Solve any three questions from Q.2 to Q.5***
3) ***Questions 2 to 5 carry equal marks.***

Q1) Solve any five of the following. **[5]**

a) What are Quantum dots?

b) What is Zeta potential?

c) Define the term Biocompatibility.

d) What are Nanocomposites?

e) Enlist any two reducing agents commonly used in reduction procedure for synthesis of Nanometerials.

f) Define the term Nanobiotechnology.

Q2) a) Describe Sol-Gel method for Synthesis of metal oxide nanoparticles. **[6]**

b) Discuss use of UV-Vis spectrophotometer in characterisation of Nanometerial. **[4]**

Q3) a) Explain physicochemical properties of Nanometerial which make them potential material for use in diagnostic method. **[6]**

b) Discuss importance and advantages of plant based methods for synthesis of Nanomaterials. **[4]**

P.T.O.

Q4) a) Which characterization methods can be used to determine size of Nanometerials? Explain any one in detail. **[6]**

b) Enlist different types of Nanometerials and state their properties. **[4]**

Q5) Write short notes on any two of the following : **[10]**

a) Applications of Nanometerials in Food industry.

b) Magnetic Nanoparticles.

c) DNA and RNA as nanometerial.

Total No. of Questions : 5]

SEAT No. : ____

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[Total No. of Pages : 2

[5839]-305

M.Sc. - II (Biotechnology)

MBT 306 : AGRICULTURAL BIOTECHNOLOGY

(2019 Pattern) (CBCS) (Semester-III)

Time : 2 Hours] ***[Max. Marks : 35***

Instructions to the candidates:

1) ***Q.1 is compulsory.***
2) ***Solve any three questions from Q.2 to Q.5***
3) ***Questions 2 to 5 carry equal marks.***

Q1) Answer any Five of the following. **[5]**

a) What is plant DNA barcoding?

b) What is flavr savr tomato?

c) What are siderophores?

d) What are triploids?

e) Write two examples of biopesticides.

f) What is chloroplast engineering?

Q2) a) What are plant growth promoting bacteria? Mention their biostimulation abilities in detail. **[6]**

b) Write in brief about use of bioreactors in plant production. **[4]**

Q3) a) What is Real Time PCR assay? Write its 4 applications. **[6]**

b) Comment on Golden Rice. **[4]**

P.T.O.

Q4) a) Which are major pests of horticultural crops? Explain their control by biotechnological methods. **[6]**

b) What is virus indexing? Explain its 3 significance. **[4]**

Q5) Write short notes on : **[10]**

a) Nitrogen tixing microbes

b) CRISPR based technology

c) Microsatellite

Total No. of Questions : 7]

SEAT No. : ____

P554

[Total No. of Pages : 2

[5839]-401
M.Sc. (Biotechnology)
MBT - 401 : GENOMICS AND PROTEOMICS
(2019 Pattern) (CBCS) (Semester-IV)

Time : 3 Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***Q.1 is compulsory***
2) ***Solve any Five questions from Q.2 to Q.7***
3) ***Question 2 to 7 carry equal marks.***

Q1) Solve any five of the following. **[10]**

a) SNP

b) MPRAs

c) EST

d) Structural proteomics

e) MALDI

f) Ampholytes

Q2) a) Explain the use and importance of micro arrays **[7]**

b) Describe pyrosequencing, add a note on its pros & cons. **[5]**

Q3) a) Explain Phage display technique in detail. **[7]**

b) Describe sample preparation in bacterial proteomics. **[5]**

Q4) a) Explain in detail the techniques involved in study of structural genomics. **[7]**

b) Discuss Pharmacogenomics in details. **[5]**

P.T.O.

Q5) a) Explain 2D gel electrophoresis in detail. **[7]**

b) Describe 'DIGE' technique and its significance. **[5]**

Q6) a) Explain giving example the concept of Metagenomics. **[7]**

b) Describe toxicogenomics, giving its application. **[5]**

Q7) Write short notes on any two of the following. **[12]**

a) LC-MS

b) Genome annotation

c) Biomarkers in disease diagnosis.

Total No. of Questions : 7]

SEAT No. :

P555

[Total No. of Pages : 2

[5839]-402
M.Sc.
BIOTECHNOLOGY
MBT - 402 : Advanced Bio-Analytical Techniques
(2019 Pattern) (CBCS) (Semester-IV)

Time : 3 Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***Q.1 is compulsory***
2) ***Solve any Five questions from Q.2 to Q.7***
3) ***Question 2 to 7 carry equal marks.***

Q1) Solve any five of the following. **[10]**

a) Define flourescence

b) What is emPCR?

c) Significance of Flourescence in situ hybridization.

d) Define isoelectric point.

e) What is immunoprecipitation.

f) Give principle of gas chromotography.

Q2) a) Explain the construction and working of scanning electron Microscope. **[7]**

b) Comment on capillary electrophoresis. **[5]**

Q3) a) Comment on principle and types of affinity chromatography. **[7]**

b) Describe procedure of indirect ELISA **[5]**

Q4) a) Explain the working principle and instrumentation of UV-Vis spectroscopy. **[7]**

b) Comment on Image processing methods used in Microscopy. **[5]**

P.T.O.

Q5) a) Discuss the use of Western flotting and its procedure in detail. **[7]**

b) Give the applications of Electron spin Resonance Spectroscopy. **[5]**

Q6) a) Comment on the ingrediants used in a typical PCR reaction Add a note on multiplex PCR. **[7]**

b) Explain the freeze fracture methods used in electron microscopy. **[5]**

Q7) Write short notes on any two of the following. **[12]**

a) NGS data Processing.

b) Applications of 2D electrophoresis.

c) Physical basis of Infrared spectroscopy.

Total No. of Questions : 7]

SEAT No. :

P556

[Total No. of Pages : 2

[5839]-403
M.Sc.
Biotechnology
MBT - 404 : BIO-ENTREPRENEURSHIP & START UP DESIGNING
(2019 Pattern) (CBCS) (Semester-IV)

Time : 3 Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***Q.1 is compulsory***
2) ***Solve any Five questions from Q.2 to Q.7***
3) ***Question 2 to Q7 carry equal marks.***

Q1) Solve any five of the following. **[10]**

a) What is market assessment?

b) Define market survey

c) Enlist the barriers to entrepreneurship

d) Give the significance of a business plan

e) Defien pricing policy

f) Write any two competitive strategies.

Q2) a) Elaborate the concept of Entrepreneurial personality with example. **[7]**

b) Explain Business incubation in detail. **[5]**

Q3) a) Discuss the entrepreneur values with example. **[7]**

b) Explain the evolution and growth of Entrepreneurship in India. **[5]**

Q4) a) What is a competitor? Explain their types and their analysis **[7]**

b) Explain the porter's 5-Force model with case study. **[5]**

P.T.O.

Q5) a) What is business opportunity? Explain its sources. **[7]**

b) Discuss factors affecting Entrepreneurship growth. **[5]**

Q6) a) Discuss the strategies to appraise project. **[7]**

b) Explain role of Entrepreneur in economic development. **[5]**

Q7) Write short notes on any two of the following. **[12]**

a) Woman Entrepreneur

b) SWOT analysis

c) Working Capital Management

Total No. of Questions : 7]

SEAT No. : ____

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[Total No. of Pages : 2

[5839]-404
MSc. - II
BIOTECHNOLOGY
MBT - 405 : Pharmaceutical Biotechnology and Drug Designing
(2019 Pattern) (CBCS) (Semester-IV)

Time : 3 Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***Q.1 is compulsory***
2) ***Solve any Five questions from Q.2 to Q.7***
3) ***Questions 2 to 7 carry equal marks.***

Q1) Solve any five of the following. **[10]**

a) Explain pharmacokinetics and pharmacodynamics.

b) Define Drug and prodrug.

c) What is toxicophore?

d) What is IND and NDA in clinical trials?

e) Describe insulin secretagogues.

f) Explain drug licensing.

Q2) a) Elaborate on drug toxicity evaluation in preclinical studies. **[7]**

b) Comment on role of vitamins as biotherapeutic agents. **[5]**

Q3) a) Comment on drug target identification. **[7]**

b) Justify use of animal models in drug development process. **[5]**

Q4) a) Elaborate on isolation of bioactive compounds in the process of drug development. **[7]**

b) Discuss significance of phase IV clinical trial in determining the launch of new chemical entity as drug. **[5]**

P.T.O.

Q5) a) Elaborate on in-silico approach of drug designing. **[7]**

b) Explain mechanism of action of fluoroquinalone antibiotics. **[5]**

Q6) a) What is docking? Elaborate on any two docking softwares used in drug designing. **[7]**

b) Comment on use of small molecule libraries in structure based drug design. **[5]**

Q7) Write short notes on any two of the following. **[12]**

a) Virtual High throughput screening.

b) Drug potency bioassays.

c) Quantitative structure -activity relationship.

Total No. of Questions : 7]

SEAT No. :

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[Total No. of Pages : 2

[5839]-405

M.Sc. (Biotechnology)

MBT 406 : RESEARCH METHODOLOGY AND SCIENTIFIC COMMUNICATION

(2019 Pattern) (CBCS) (Semester - IV)

Time : 3 Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***Q.1 is compulsory.***
2) ***Solve any five questions from Q.2 to Q.7***
3) ***Question 2 to 7 carry equal marks.***

Q1) Solve any five of the following. **[10]**

a) What is h-Index?

b) What is URKUND?

c) Define Journal Impact Factor.

d) What is deductive reasoning?

e) Explain power analysis.

f) Write names of two Literature references style.

Q2) a) Discuss various research philosophies. **[7]**

b) Discuss various plagiarism detection software. **[5]**

Q3) a) Explain in detail methods of primary data collection. **[7]**

b) Explain parametric data and its analysis in detail. **[5]**

Q4) a) Discuss the importance of Ethics in scientific communication. **[7]**

b) Describe hypothesis formulations of Research Projects. **[5]**

P.T.O.

Q5) a) Discuss various statistical software package. Used for research data processing and analysis. **[7]**

b) Write a note on Human experimentation ethics. **[5]**

Q6) a) Explain in detail various modes of Scientific Communications with suitable example. **[7]**

b) What is scientific miscounduct. aslo. Write preventive measures for it. **[5]**

Q7) Write short notes on any <u>two</u> of the following. **[12]**

a) Write a note on patenting of Biological inventions and products.

b) Importance of Lab work book, Add a note on Data tabulation.

c) Discuss various citation indices. Explain in detail any one of them.

Total No. of Questions : 7]

SEAT No. : ____

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[Total No. of Pages : 2

[5839]-406
MSc. - II
BIOTECHNOLOGY
MBT - 407 : Quality Control, Biosafety and Bioethics
(2019 Pattern) (CBCS) (Semester-IV)

Time : 3 Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***Q.1 is compulsory***
2) ***Solve any Five questions from Q.2 to Q.7***
3) ***Question 2 to 7 carry equal marks.***

Q1) Solve any five questions from the following. **[10]**

a) Write the elements of containment

b) Write any two role of GEAC.

c) Define validation and state two advantages of validation.

d) Write any two ethical issues of GMOs.

e) Define biohazard

f) Define Risk.

Q2) a) Explain the functions of RCGM. **[7]**

b) What is physical containment? **[5]**

Q3) a) Describe in detail RDAC. **[7]**

b) Describe principles of biosafety. **[5]**

Q4) a) Classify the pathogens by risk group analysis. **[7]**

b) Explain in detail stages of drug review. **[5]**

P.T.O.

Q5) a) What is CPCSEA? Aslo explain ethical guidelines that should be followed in research involving animals. **[7]**

b) What is Plagiarism? **[5]**

Q6) a) Enlist the licenses need to set up pharmaceutical company for market distribution and explain any one of them. **[7]**

b) Describe environmental release issues of GMOs. **[5]**

Q7) Write short notes on any <u>two</u> of the following. **[12]**

a) Biopiaracy and biowarfare

b) Consent to publication.

c) Sequences of qualification of equipment.