SL.NO:1347 **SUBJECT CODE:17BTCC01**

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E./ B.TECH DEGREE EXAMINATIONS- FEB -2022
BIOTECHNOLOGY

ESSENTIALS OF BIOCHEMISTRY

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 Predict the alcohol produced from the reduction of fructose

2 Predict what are the main characteristics of globular and fibrous proteins? Give an example for each.

3 What is the backbone of the DNA structure. Explain about it.

4 Distinguish between Aldoes and Ketose .

5 Summarize short note on Chitin.

6 What are steroids? Give examples

7 Explain about the bonds responsible for protein structure.

8 What are the basic units of DNA and how are these units arranged?

9 Report the different sources of Fat soluble vitamins.

10 Summarize symptoms Rickets and Scurvy.

Answer **Any FIVE** questions

Part-B (5 x10 =50 Marks)

11 a. Examine and give short notes on
a)Reduction reaction of monosaccharide
Oxidation reaction of monosaccharide

OR

b. Determine the importance of
(a)Cellulose
(b)Glycogen

12 a. Write the functional classification of proteins.

OR

b. Illustrate about the nucleotides and list its importance.

13 a. Report on mineral classification. Explain how minerals are classified and list out their importance.

OR

(p.t.o)

b. Identify the structure and properties of Lecithin.

14 a. Paraphrase carbohydrates and mention their functions.

OR

b. Write the importance of lipids

15 a. Summarize about the structure and function of Cephalin.

OR

b. Explain in detail about a) Myoglobin b) Haemoglobin.

16 a. Discuss the structure of Amino acid.

OR

b. Explain physiochemical properties of nucleic acid.

17 a. Explain in detail about RNA and its types.

OR

b. Discuss the Clover leaf structure of t-RNA

18 a. Differentiate the different types of Minerals. Explain the nutritional importance of Minerals.

OR

b. Discuss about Vitamin D.

Answer ALL questions

PART-C (2 x 15 = 30)

19 a. Illustrate the detailed explanation of derived lipids.

OR

b. Explain . D-Glucose differ from L-Glucose.

20 a. Interpret the stabilizing factors in the protein's 3D structures.

OR

b. Why do people are suffering with Rickets? What is your suggestion to overcome this?

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SL.NO:1336 **SUBJECT CODE:17BTCC17**

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E./ B.TECH DEGREE EXAMINATIONS- FEB -2022
BIOTECHNOLOGY

DOWNSTREAM PROCESSING IN BIOTECHNOLOGY

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 Compare salting-in and salting-out effects of protein.
2 Mention the different elution techniques in chromatography.
3 Give importance of the term Thermolysis in cell disruption.
4 Classify industrial centrifuges with its use.
5 What do you mean by the term Isopycnic sedimentation in bioseparation.
6 Importance of Partition coefficient in chromatography.
7 Outline the downstream processing steps in production of intracellular enzyme.
8 Outline the factors that affect the downstream processing.
9 Write short note on partition chromatography.
10 Define the term plate height.

Answer **Any FIVE** questions

Part-B (5 x10 =50 Marks)

11 a. Elaborate shortly on Flocculation of bioproducts with a neat sketch.

OR

b. Analyze the process involved in precipitation by addition of non-ionic polymers.

12 a. Elaborate on bead mill disruption with a neat schematic diagram.

OR

b. Report any two methods in detail to enhance the filterability to produce pure products.

13 a. Elaborate two methods of protein precipitation in isolating protein molecules.

OR

b. Relate and distinguish the salting-in and salting-out of proteins.

(P.T.O)

14 a. Organize the mode of operation of Gas liquid Chromatography with a neat flow diagram.

OR

b. Explain (a) Batch crystallization (b) Continuous crystallization.

15 a. A wet slab of material weighing 5 kg originally contains 50 percent moisture on wet basis. The slab is 1 m x 0.6. m x 7.5 cm thick. The equilibrium moisture is 5 per cent on wet basis. When in contact with air, the drying rate Is given in the table below. Drying takes place from one face only (a) Plot the drying rate curve and find the critical moisture content.
(b) Find the weight of the dry solid (c) Find the amount of water present in the slab for every drying rate given below

Wet slab Wt, Kg	5.0	4.0	3.6	3.5	3.4	3.06	2.85
Drying rate, $Kg/hr*m^2$	5.0	5.0	4.5	4.0	3.5	2.0	1.0
X, Dry basis	1.0	0.6	0.44	0.4	0.36	0.224	0.14

OR

b. Explain the construction and working of Plate and Frame filter press with a neat sketch.

16 a. Explain - (a) Filter aids (b) Examples of filter aids (c) Coating techniques of filter aids (d) Advantages and Disadvantages of using filter aids.

OR

b. Discuss Langmuir and Freundlich adsorption isotherms in detail.

17 a. Discuss solvent precipitation of bioproducts with its merits and demerits.

OR

b. Demonstrate the procedure of protein precipitation by addition of salts.

18 a. Explain the three stages of lyophilization.

OR

b. Explain the process of Freeze drying in detail.

Answer ALL questions
PART-C (2 x 15 = 30)

19 a. Construct deliberately the physical and rheological characteristics of fermentation broths

OR

b. Elaborate the principle and practice of Aqueous two phase extraction in isolation of proteins.

20 a. Explain any two types of filtering equipments with neat diagram in detail.

OR

b. Compare and contrast the different membrane modules with neat diagram.

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SL.NO:1325 **SUBJECT CODE:17BTPI04**

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E./ B.TECH DEGREE EXAMINATIONS- FEB -2022
BIOTECHNOLOGY

ELECTIVE - BIO-PHARMACEUTICALS

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 Analyze the role of FDA in pharmaceutical industry.
2 Write down the application of radiation in sterilization.
3 Analyze the functions of Alkaloids with example.
4 Interpret about Placebo effect.
5 Articulate the working principal of soxhlet extraction.
6 Define Pharmacology.
7 Recall and write the types of Granulation.
8 Outline the factors which affects the drug metabolism.
9 Outline the different methods of extraction process.
10 List out the merits & demerits of Heroin.

Answer **Any FIVE** questions

Part-B (5 x10 =50 Marks)

11 a. Examine the Economic & Regulatory aspects of drug.

OR

b. Explain about the biotransformation in drug metabolism.

12 a. Categorise the various ways of drug distribution that takes place in the body

OR

b. Simplify the following process A) Microwave assisted extraction b) Ultrasonic assisted Extraction

13 a. Inference about topical applications of drug with suitable example

OR

b. Analyze the ways of preservation of drugs and discuss the factors that affect the preservation.

14 a. Write an essay on the endocrine hormones origin, deficiency symptoms and cure.

OR

(P.T.O)

b. Identify the route of Drug Elimination

15 a. Write short notes on :
a. Wet granulation
b. Dry granulation.

OR

b. Choose the major analytical methods used in pharmaceutical industry

16 a. Recall the fields of pharmacology and their significance in drug development.

OR

b. Recall and Discuss in detail about percolation process

17 a. Discuss in detail about the types of vitamins.

OR

b. Explain in detail about Drug Absorption.

18 a. Write short notes on:
a. Percolation
b. Fractional Distillation.

OR

b. Explain in detail methods of tablet preparation.

Answer ALL questions
PART-C (2 x 15 = 30)

19 a. Examine the various fields of pharmacology and their importance in drug development.

OR

b. Distinguish the types of hormone and explain their role as therapeutic agent.

20 a. Recall the history of Pharmaceutical Industry development.

OR

b. Explain the following process in detail: A) Maceration B) drying process c) Filtration process.

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SL.NO:1318 **SUBJECT CODE:17PHBS02**

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E./ B.TECH DEGREE EXAMINATIONS- FEB -2022
BIOTECHNOLOGY

NANOTECHNOLOGY

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 Draw a quantum wire and what is its dimension theoretically?

2 Explain any two applications of nanotechnology.

3 Identify the reasons for the effect of size on the physical properties in a nanomaterial.

4 Discuss the advantages and disadvantages of Ball milling method.

5 Discuss about Sputtering technique.

6 Discuss shortly about Photo resists.

7 Discuss the types of lithography.

8 Express the term HiPCO.

9 Discuss the information get from SEM.

10 Discuss nano indentation cope.

Answer **Any FIVE** questions

Part-B (5 x10 =50 Marks)

11 a. Determine the various factors which cause toxic and biohazards

OR

b. Determine the functionality and applications of scanning tunnelling microscope.

12 a. Illustrate Physical Vapour Deposition technique with a neat diagram.

OR

b. Illustrate the method of growing thin film using evaporation technique.

13 a. Illustrate the process of etch resist lithography with its application.

OR

b. Illustrate the process of synthesizing CNT by laser ablation method.

14 a. Illustrate the techniques used for surface morphology and explain any one type with neat sketch.

OR

P.T.O

b. Explain the classification of nanostructures materials in the context of Quantum confinement in detail.

15 a. Describe the recent trends in nanoscience and technology in the field of textile, agriculture and medicine.

OR

b. Discuss the effect of size reduction on the various properties of a material with examples.

16 a. Write a note on thin films and multilayered materials. Discuss any two methods of thin film deposition techniques in detail.

OR

b. Explain briefly about dip-pen lithography with its advantages

17 a. Explain electrical property of CNT with an example.

OR

b. Describe SWCNT? Draw its structure and types of SWCNT.

18 a. Describe briefly about x-ray diffraction technique.

OR

b. Explain in detail about the study of surface analysis using scanning probe microscopy.

Answer ALL questions

PART-C (2 x 15 = 30)

19 a. Illustrate the method of growing a thin film using Molecular Beam Epitaxy with its advantages.

OR

b. Discuss the Importance of Nanoscience and Technology in various fields and its application.

20 a. Explain the process of optical lithography with neat diagram with its advantages and disadvantages.

OR

b. Describe Chemical Vapor Deposition technique with a neat diagram with its advantages and disadvantages.

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SL.NO:1318

SL.NO:1317 **SUBJECT CODE:17BTES04**

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E./ B.TECH DEGREE EXAMINATIONS- FEB -2022
BIOTECHNOLOGY

FUNDAMENTALS OF BIOTECHNOLOGY

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 Ilustrate biological pest control.

2 Outline the organisms involved in production of Penicillin.

3 Predict the difference between Antisense and RNAi technology

4 Predict the function of protease.

5 Explain few applications of food biotechnology.

6 Interpret micropropagation.

7 Differentiate between hybrids and Cybrids.

8 Describe an Enzyme.

9 Summarize Gene therapy.

10 Describe in situ bioremediation

Answer **Any FIVE** questions

Part-B (5 x10 =50 Marks)

11 a. Outline protoplast culture.

OR

b. Outline the difference between knockout and chimeric mouse

12 a. List out the importance of biofuels.

OR

b. Outline the importance of solar energy for generation of electricity.

13 a. Apply Protoplasmic fusion to create hybrids.

OR

b. Apply recombinant technology for the production of Insulin

P.T.O

14 a. Detail the Scope and importance of Food Biotechnology.

OR

b. Explain in detail about the technology behind Virus resistant Squash.

15 a. Discuss in detail about Golden Rice.

OR

b. Describe about the biological pest control with examples.

16 a. The causes of somoclonal variation and list its advantages.

OR

b. Describe Animal bioreactor with an example.

17 a. Associate Hybridoma Technique for the production of Monoclonal antibodies.

OR

b. Summarize the use of PCR in clinical diagnosis.

18 a. Discuss Industrial Enzyme production with protease as an example.

OR

b. Define Pollution? Explain in detail about Air pollution.

Answer ALL questions
PART-C (2 x 15 = 30)

19 a. Outline about Biofertilizer with suitable examples and their applications.

OR

b. Examine the possibilities to control soil pollution.

20 a. Discuss the role of genetic engineering in the advancement of food biotechnology.

OR

b. Explain the Bioremediation of industrial waste Treatment of Microbial Indigo.

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SL.NO:1317

SL.NO:1302 **SUBJECT CODE:17BTCC06**

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E./ B.TECH DEGREE EXAMINATIONS- FEB -2022
BIOTECHNOLOGY

ADVANCED BIOCHEMISTRY

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 Outline about Pompe's disease
2 Identify the irreversible enzymes of glycolysis and key enzymes of gluconeogenesis.
3 Relate anabolism and catabolism
4 Corelate the retection between urea cycle and citric acid cycle?
5 Outline the role of Glycolipid in cell Membrane
6 Interpret about the rate limiting enzymes in fatty acid synthesis and its regulation.
7 Draw the structure of any one purine & pyrimidine.
8 Explain why dUTP is not simply methylated to form dTTP.
9 List the Component that inhibit oxidative phosphorylation
10 List the reactions of electron transport that liberate enough energy to drive the phosphorylation of ADP.

Answer **Any FIVE** questions

Part-B (5 x10 =50 Marks)

11 a. Identify how much energy is generated from ATP through the Krebs cycle?

OR

b. Outline the various oxidative pathways of glucose.

12 a. The Statement "Gluconeogenesis is not a reversal of Glycolysis".

OR

b. Explain the possible reactions of Glycine.

13 a. Discuss the biosynthesis of serine, and cysteine.

OR

b. How cysteine is synthesized from methionine?

14 a. Illustrate the metabolic pathway for Histidine.

OR

b. Discuss the lipolysis of Triglycerides .

15 a. Describe the process of β- oxidation of fatty acid and write its energetics.

OR

b. Construct a metabolic model for LDL and HDL.

16 a. Write the reactions involved in purine nucleotide and pyrimidine nucleotide biosynthesis.

OR

b. Describe about degradation of nucleic acid by exo and endo nucleases.

17 a. Articulate about denovo pathway for Purine Nucleotide synthesis in detail.

OR

b. Give a note on Malate aspartate shuttle.

18 a. Write in detail about bioenergetics and high energy compounds.

OR

b. Model a shuttle system for the transport of reducing equivalents from cytosol to Mitochondria.

Answer ALL questions

PART-C (2 x 15 = 30)

19 a. Explain glycolysis aerobic and anaerobic (EMP pathway) in detail. Also mention energetics and regulation involved in it .

OR

b. Elaborate the formation and metabolism of ketone bodies and ketogenesis.

20 a. Explain Nucleotide biosynthesis pathway in the brain tissue.

OR

b. Draw neatly about the structures of various energy compounds and its energy utilization for various functions of the body.

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SL.NO:1302

SL.NO:1268 **SUBJECT CODE:17MABS07**

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E./ B.TECH DEGREE EXAMINATIONS- FEB -2022
COMMON TO BIOTECH AND PHARMA

BIOSTATISTICS

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 State the limitations of statistics
2 Define primary data
3 Define Tabulation
4 Write the general rules for constructing diagrams
5 Write the elements involved in the process of sampling.
6 Define Non-Probability sampling.
7 What are the test of significance in small samples
8 State any two assumptions of t – test.
9 What are the assumptions made in Randomized Block Design?
10 Write down the ANOVA table for RBD

Answer **Any FIVE** questions

Part-B (5 x10 =50 Marks)

11 a.

(a) Prepare a bar diagram for the following data

India's foreign debt as on 01.04.2000	
Source of borrowing	Amount of loan (In cores of Rs.)
USA	1800
Russia	1200
United Kingdom	800
Japan	600
Germany	500

(b) The regional rainfall indices during the year 2001 to 2003 are given below

Year	Zone				
	West	North	East	South	Centre
2001	78.4	88.9	83.7	89.9	86.5
2002	75.6	62.5	103.6	75.5	77.4
2003	121.2	116.5	107.6	123.9	90.3

Represent the data by a multiple bar diagram

(P.T.O)

OR

b.

(a) Write the difference between primary data and secondary data.
(b) Construct a subdivided bar-diagram and multiple bar diagram for the following data

Species	1 year-old	2 year-old	3 year-old
C-catla	3.5	5.0	7.5
C-carpia	1.5	2.0	3.5
L-rohiter	3.0	4.5	5.0
Totor	2.5	3.0	6.0

12 a. There are two bags. The first bag contains 4 white and 2 black balls; the second contains 5 white and 4 black balls. Two balls are transferred from first bag to the second bag and then one ball is taken from the second bag. What is the probability that it is a white ball?

OR

b. Two dices are tossed. Find the probability of getting an "even number on the first die or a total of 8".

13 a.

Two random samples gave the following results.

Sample	Size	Sample Mean	Sum squares of deviations from the mean
1	10	15	90
2	12	14	108

Test whether the samples come from the same normal population

OR

b. The following table show that the distribution of digit in number chosen at random from a telephone directory

Digits	0	1	2	3	4	5	6	7	8	9
Frequency	1026	1107	997	966	1075	933	1107	972	964	853

Test at 5% level whether the digits may be taken to occur equally frequently in the directory.

(P.T.O)

SL.NO:1268

14 a.

The three samples below have been obtained from normal population with equal variances. Test the hypothesis that the sample means are equal

Samples		
8	7	12
10	5	19
7	10	13
14	9	12
11	9	14

OR

b.

Five doctors, each test 5 treatments for a certain disease and observe the number of days each patients requires to recover. The results are as follows

Doctors	Treatments				
	1	2	3	4	5
A	10	14	23	19	20
B	11	15	24	17	21
C	9	12	20	16	19
D	8	13	17	17	20
E	12	15	19	15	22

Discuss the difference between a) Doctors b) Treatments

15 a.

Construct $\overline{X}$ – Chart and R – Chart for the following data.

Sample No.	1	2	3	4	5	6	7	8	9	10
Mean	14	15	14	13	12	10	16	17	18	20
Range	3	1	2	1	1	1	2	2	3	4

(Given sample size 5).

OR

b.

The following data refers to the visual defects found during the inspection of the first 10 samples of size 50 each from a lot of two-wheelers manufactured by an automobile company

Sample No.	1	2	3	4	5	6	7	8	9	10
No. of defectives	4	3	2	3	4	4	4	1	3	2

Draw a 'P' chart to show that the fraction defective are under control

(P.T.O)

SL.NO:1268

16 a. Construct a control chart for the proportion of defectives obtained in repeated random samples of size 100 from a process which is considered to be under control when the proportion of defective p is equal to 0.20. Draw the control line and upper and lower control limits

OR

b. 10 samples each of size 50 were inspected and the number of defectives in the inspection were: 2,1,1,2,3,5,5,1,2,3.Draw the appropriate control chart for defectives

17 a. Explain in detail restricted Random Sampling with example

OR

b. Discuss about various methods of sampling.

18 a. Random samples of 400 men and 600 women were asked whether they would like to have a fly-over near their residence 200 men 325 women were in favour of it. Test the equality of proportion of men and women in the proposal?

OR

b. The mean produce of wheat from a sample of 100 fields comes to 200kg per acre and another sample of 150 fields gives a mean 220 kg per acre. Assuming the standard deviation of the yield at 11 kg for the universe, test if there is a significant difference between the means of the samples?

Answer ALL questions

PART-C (2 x 15 = 30)

19 a. (a) Write the difference between primary data and secondary data.
(b) Construct a subdivided bar-diagram and multiple bar diagram for the following data

Species	1 year-old	2 year-old	3 year-old
C-catla	3.5	5.0	7.5
C-carpia	1.5	2.0	3.5
L-rohiter	3.0	4.5	5.0
Totor	2.5	3.0	6.0

OR

b. a) A box contains 4 bad and 6 good tubes. Two are drawn out from the box at a time. One of them is tested and found to be good. What is the probability that the other one is also good?
b) State and prove Baye's Theorem

20 a.

(i) A sample of 26 bulbs gives a mean life of 990 hours with a standard deviation of 20 hours .The manufacturer claims that the mean life of bulbs is 1000 hours is the sample not up to the standard.

(ii) Two random samples of sizes 400 and 500 showed mean 10.9 and 11.5 respectively. Can the samples be regarded as drawn from a population with variance 25?

OR

b. A completely randomized design experiment with 10 plots and 3 treatments gave the following results

Plot No.	1	2	3	4	5	6	7	8	9	10
Treatment	A	B	C	A	C	C	A	B	A	B
Yield	5	4	3	7	5	1	3	4	1	7

Analyze the result for treatment effects.

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SL.NO:1268

SL.NO:1302 **SUBJECT CODE:17BTCC04**

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E./ B.TECH DEGREE EXAMINATIONS- FEB -2022
BIOTECHNOLOGY

CLASSICAL AND MOLECULAR GENETICS

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 Explain about the promoters as control sequences.
2 Interpret the heterozygous condition.
3 Construct Col plasmid.
4 Determine the types of crossing over.
5 Interpret the cytological basis of crossing over.
6 Predict the term replicase enzyme.
7 Describe allelomorphism.
8 Describe hetero catalytic function.
9 Review on colour blindness.
10 Summarize the applications of genetic mapping.

Answer **Any FIVE** questions

Part-B (5 x10 =50 Marks)

11 a. Apply the Mendelian laws and correlate with Mendelian inheritance.

OR

b. Experiment with incomplete dominance in plants and animals with example.

12 a. Explain the detailed structure of physical carriers of gene with neat diagram.

OR

b. Construct a cloning vehicle from bacteria and write its importance in genetic engineering.

13 a. Examine about (i) H antigen (ii) M-N S antigen system.

OR

b. Compute the concepts involved in allelomorphs and discuss in detail.

14 a. Infer about the sex linkage in Human beings with examples.

OR

b. Develop a chromosomal map for three genes A, B and C. A is separated from b by 20 map units whereas the distance between A and C is 10 map units.

p.t.o

15 a. Interpret about the Transposons and its mechanism.

OR

b. Utilize the Griffith's experiment of transformation in Streptococcus pneumonia.

16 a. Find which characters were selected by Mendel for his experiments and demonstrate Mendel's monohybrid experiment.

OR

b. Define Chromosome Theory of Inheritance and explain in detail the various Chromosomal Sex-Determination Systems with suitable examples.

17 a. Identify the mechanism of genetic recombination by crossing over and chiasma formation.

OR

b. Identify the different steps involved in prokaryotic gene expression.

18 a. Inspect the Interference and coincidence of linked genes during crossing over.

OR

b. Differentiate the experiments involved in identification of DNA as genetic material.

Answer ALL questions

PART-C (2 x 15 = 30)

19 a. Predict cytoplasmic inheritance with an example of Kappa particles of Paramecium.

OR

b. Demonstrate the crossing over and linkage maps from a test cross of maize.

20 a. Recall the law of Independent assortment with Mendel's Dihybrid inheritance experiment.

OR

b. Describe about sex-linked inherited disorders with examples.

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SL.NO: 1285 **SUBJECT CODE:17BTCC02**

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E./ B.TECH DEGREE EXAMINATIONS- FEB -2022
BIOTECHNOLOGY

CELL BIOLOGY

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 Contrast the role of cytoskeleton
2 Examine the role of Pinocytosis.
3 Illustrate on phospholipids.
4 Criticize enzymatic disaggregation
5 Sketch the internal organelles.
6 Sketch the importance of Cell culture.
7 Outline the function of plasma membrane.
8 Identify the different types of Transport? Give example
9 Explain Autocrine Cell signalling.
10 Illustrate Totipotency.

Answer **Any FIVE** questions

Part-B (5 x10 =50 Marks)

11 a. Categorize the structure of cell wall based on the function.

OR

b. Criticize the structure of Eukaryotic cell.

12 a. Differentiate the role of Calcium ATPase and Proton pump.

OR

b. Outline in detail about the types of cell signaling.

13 a. Distinguish about Exocytosis and Endocytosis.

OR

b. Compare the role of Ion channel and Enzyme linked receptors.

(p.t.o)

14 a. Examine in detail about the types of contamination take place during cell culture.

OR

b. Identify the structure and function of vacuolar membrane.

15 a. Utilize the G-protein-coupled receptors and explain their mechanism

OR

b. Illustrate on G Protein molecule and give their role in Signal transduction.

16 a. Report in detail about the structure and types of Lysosomes.

OR

b. Describe chemical mediated signalling molecules.

17 a. Explain any one of the various responses in different cells mediated by the cAMP – activated protein kinase A.

OR

b. Summarize the techniques involved in cell line generation and application.

18 a. Report on Prokaryotic cell.

OR

b. Demonstrate Mitosis Cell division.

Answer ALL questions
PART-C (2 x 15 = 30)

19 a. Inference between prokaryote and eukaryote.

OR

b. Model about Meiosis cell division with diagram.

20 a. Classify the Membrane bound receptors.

OR

b. Describe in detail about the explant and primary culture.

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SL.NO: 1285

SL.NO:1280 **SUBJECT CODE:17BTCC03**

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E./ B.TECH DEGREE EXAMINATIONS- FEB -2022
BIOTECHNOLOGY

MICROBIOLOGY

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 Analyze on negative staining
2 Explain biofilm.
3 Illustrate Virus with an example.
4 Define obligate aerobes
5 Write short notes on food grading.
6 Write a short note on food storage.
7 Define Microbiology.
8 Explain exponential phase.
9 Define aerobic and anaerobic growth.
10 Describe Aflatoxin.

Answer **Any FIVE** questions

Part-B (5 x10 =50 Marks)

11 a. Differentiate TEM and SEM.

OR

b. Differentiate Disinfectant and Antiseptic.

12 a. Interpret in detail about Benefits of manure derived biogas

OR

b. Explain a detail note on leaching of ores by microbes

13 a. Explain domain, kingdom, phylum and class

OR

b. Outline the classification of algae.

14 a. Write a detail notes on physical factors of microbial growth.

OR

b. Summarize in detail about culturing of anaerobic organisms.

15 a. What are the emerging food borne pathogens?

(P.T.O)

OR

b. Illustrate in detail about the applications of biomaterials

16 a. List the history of microbiology.

OR

b. Explain the importance of Taxonomy.

17 a. Describe in detail the Bacterial transformation. Mention it with a neat sketch.

OR

b. Describe briefly about the Production of Secondary metabolites and their applications.

18 a. Describe with detailed account on the disease caused by Microbial Pollution.

OR

b. Describe Recycling of Biomaterials.

Answer ALL questions

PART-C (2 x 15 = 30)

19 a. Explain in detail about the Electron Microscope

OR

b. Explain in detail about the lysogeny life cycle with a neat sketch.

20 a. Describe the History of Microbiology. Highlight the important events

OR

b. Discuss in detail about the Food spoilage and its preservation with examples.

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SL.NO:1280

SL.NO:1234 **SUBJECT CODE:17BTCC11**

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E./ B.TECH DEGREE EXAMINATIONS- FEB -2022
BIOTECHNOLOGY

PLANT AND ANIMAL BIOTECHNOLOGY

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 Infer on totipotency.
2 Inspect the role of auxin and cytokinin in plant tissue culture.
3 Distinguish the pesticide resistance crop with examples.
4 Categorize morphological markers.
5 Analyze the importance of transgenic animals.
6 List out the importance of growth hormones.
7 Write notes on transformation.
8 Sketch the difference between Oncomouse and Super Mouse.
9 Explain the benefits of plant tissue culture.
10 Describe about adaptation.

Answer **Any FIVE** questions

Part-B (5 x10 =50 Marks)

11 a. Explain in detail how to culture the terminal portion of a shoot comprising the meristem.

OR

b. Inspect on a) aseptic techniques in PTC b) hybrids

12 a. Illustrate about Microprojectile/particle Bombardment (biolistics) and Microinjection with their advantages and disadvantages

OR

b. Explain in detail about a) somatic hybrids b) cybrids.

13 a. Infer in detail about markers based on PCR amplification.

OR

b. Analyze in detail about herbicide resistance in modern agriculture.

14 a. Infer the importance of various techniques used for the diagnosis of genetic diseases.

OR

b. Analyze in detail about the techniques used to improve the productive capabilities of animals. p.t.o

15 a. Categorize the process of grafting organs or tissues between members of different species.

OR

b. Analyze how genes have been inserted into animals' genome by genetic engineering techniques.

16 a. Relate the important functions of growth regulator in PTC.

OR

b. Identify the transgenic plants and their limitation.

17 a. Identify the need of Manipulation of Growth hormones and their functions

OR

b. Paraphrase tissue culture media and give any one of the media composition and preparation

18 a. Infer how pesticide resistances occur.

OR

b. Outline about patenting genetically engineered animals.

Answer ALL questions

PART-C (2 x 15 = 30)

19 a. Analyze in detail why tissue culture is important, give its advantage and disadvantage.

OR

b. Breakdown how Bt approaches can delay insect resistance in plants.

20 a. Identify the types of molecular markers, how do they work and list their application in plant science.

OR

b. Paraphrase tissue culture and explain the types of tissue culture.

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SL.NO:1234

SL.NO:1226 **SUBJECT CODE:17BTEC07**

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E./ B.TECH DEGREE EXAMINATIONS- FEB -2022
BIOTECHNOLOGY

ELECTIVE - GENETICALLY MODIFIED ORGANISMS AND ETHICAL ISSUES

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 Inspect the toxic properties in GMO.
2 Distinguish primary gene pool and secondary gene pool.
3 Identify the genetically modified fish from other normal fishes
4 How are residual DNA used in detection of GMOS
5 Organize the causative agents of induced mutations.
6 Give the different types of polyploidy.
7 Explain genetic modification.
8 Summarize the characteristics of multiple alleles.
9 Rephrase about karyotyping and when is it used?
10 Show how will gamma rays cause mutation?

Answer **Any FIVE** questions

Part-B (5 x10 =50 Marks)

11 a. Compare in detail about product analysis – microbial, biochemical and molecular level.

OR

b. Discuss about a) Chromosomal changes b) Toxicological studies.

12 a. Discuss about ionizing and non- ionizing radiations in mutation.

OR

b. Construct the *E coli* based vectors and their characters.

13 a. Interview about one genetically modified organism and explain the same.

OR

b. Summarize about ZZ-ZO and ZW-ZZ their importance.

14 a. Discuss about karyotyping and explain the procedure involved in it.

OR

b. Opinion on mutation. Explain any two types of mutation with example.

15 a. Construct a note on the gene pool and assess their role in crop breeding.

p.t.o

OR

b. Examine about pedigree analysis with one example.

16 a. Explain how the rDNA technology used for the production of insulin.

OR

b. Elaborate the Functions of residual DNA analysis.

17 a. Illustrate in detail about toxicological evaluation.

OR

b. Rephrase about XX-XY and XX-XO types.

18 a. Examine about population genetics.

OR

b. Explain about speciation, its types and importance.

Answer ALL questions

PART-C (2 x 15 = 30)

19 a. Analyse about Lethality related with Interaction of genes.

OR

b. Amniocentesis: fluid test, diagnostic procedure, Medical uses, their risk and social implications

20 a. Identify whether a trait is dominant or recessive in a pedigree?

OR

b. Explain the Hardy-Weinberg law on the gene pool and gene frequency.

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SL.NO:1203 **SUBJECT CODE:17BTEC23**

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E./ B.TECH DEGREE EXAMINATIONS- FEB -2022
BIOTECHNOLOGY

ELECTIVE-NANOBIOTECHNOLOGY

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 Interpret about nanodot.
2 Predict any two properties of fullerene.
3 Illustrate about homeoepitaxy.
4 Tell the applications of SEM
5 Restate Protein.
6 Explain about transmembrane protein.
7 Pick two examples of Cyanophycin producing organisms.
8 Recognize the function of bacteriorhodopsin.
9 Analyze about medical imaging.
10 Restate nanochip.

Answer **Any FIVE** questions

Part-B (5 x10 =50 Marks)

11 a. Discuss briefly about the emergence of nanotechnology.

OR

b. Discuss about inorganic nanoscale systems for biosystems.

12 a. Recognize about quantum dots.

OR

b. Explain about Top- down approach in nanobiotechnology.

13 a. Enumerate in detail about Transmission Electron Microscopy

OR

b. Explain about the advantages ,applications and disadvantages of scanning Tunneling Microscope.

14 a. Interpret the working principle and functions of Atomic Force Microscope.

OR

b. Discuss how proteins are used as components in nanodevices

p.t.o

15 a. Analyze about transmembrane signaling.

OR

b. Illustrate about i) α-helix and ii) β-sheets.

16 a. Illustrate about the applications of PHA

OR

b. Discuss the functions of Magnetosome .

17 a. Analyze in detail about the structure of S- layer .

OR

b. Explain in detail about electrochemical DNA sensors.

18 a. Discuss the importance of commercializing nanobiotechnology.

OR

b. Explain about nanorobotics .

Answer ALL questions

PART-C (2 x 15 = 30)

19 a. Analyze in briefly about nano techniques.

OR

b. Illustrate the structure and components involved in Scanning Tunneling Microscope.

20 a. Analyze about nanotechnology in cell.

OR

b. Explain about the structure and properties of Alginates.

*****

SL.NO:1197 **SUBJECT CODE:17BTCC18**

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E./ B.TECH DEGREE EXAMINATIONS- FEB -2022
BIOTECHNOLOGY

MASS TRANSFER OPERATIONS

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 Infer the effect of temperature in diffusivity of gases.
2 Distinguish Adsorption and Absorption.
3 Draw the operating line for cocurrent absorption operation.
4 Differentiate stage wise and continuous contact extractors.
5 Examine interphase mass transfer.
6 Mention the characteristics features of tower packing.
7 Give two examples for gas absorption.
8 Investigate the term Distribution Coefficient.
9 Detail adsorption and give its application.
10 Give the limitations of McCabe Thiele method.

Answer **Any FIVE** questions

Part-B (5 x10 =50 Marks)

11 a. Methane diffuses at steady state through a tube containing helium. At point 1 the partial pressure of methane is p_{A1} is 55.5 kPa and at point 2, which is 30 mm apart , the partial pressure of methane is 15 kPa. The total pressure is 101.32 kPa and the temperature is 293 K. At this pressure and temperature the diffusivity is 6.75 x X 10^{-5} m^2/s. Calculate the flux of methane at steady state for equimolal counter diffusion and the partial pressure at 2 cm from point 1.

OR

b. An ethanol (A)-water (B) solution in the form of a stagnant film 2.0 mm thick at 293K is in contact at one surface with an organic solvent in which ethanol is soluble and water is insoluble. Hence N_B=0. At point 1 the concentration of ethanol is 16.8 wt% and the solution density is ρ_1=972.8 kg/m^3. At point 2 the concentration of ethanol is 6.8 wt% and the solution density is ρ_2= 988.1 kg/m^3. The diffusivity of ethanol is $0.740x10^{-9}m^2/s$. Calculate the steady state flux $N_{A.}$

p.t.o

12 a. Batch tests were performed in the lab using solutions of Phenol in Water and particles of granular Activated carbon. The equilibrium data at room temperature are shown. Determine the Isotherm that fits the data.

c, Kg Phenol / m3 solution	0.322	0.117	0.039	0.0061	0.001
q, Kg Phenol / Kg Carbon	0.150	0.122	0.094	0.059	0.045

OR

b. 5000 Kg/hr of a SO_2 - Air mixture containing 5% by volume SO_2 is to be scrubbed with 200,000 Kg/hr of Water in a packed tower. The exit concentration of SO_2 is reduced to 0.15%. The Tower operates at 1 atm. The equilibrium relationship is given by Y = 30X Y = Mole SO2 / Mole Air: X = Mole SO2 / Mole water. If the packed height of the Tower is 420 cm, estimate the height of Transfer unit.

13 a. The following table gives the vapor pressure data at constant pressure of 1 standard atmosphere for mixture of n-heptane and n-octane, which may be expected to form ideal solutions. Calculate the equilibrium mole fraction data for heptane in liquid and vapor (x and y*) for each temperature and calculate the relative volatility for each temperature.(Take P_T =760mm Hg)

Temperature(^oC)	Vapor pressure of heptane P_A, in mm Hg	Vapor Pressure of octane P_B, in mm Hg
98.4	760	333
105	940	417
110	1050	484
115	1200	561
120	1350	650
125.6	1540	760

OR

b. Explain the gravity column extractor with a neat diagram.

14 a. A mixture of benzene and toluene containing 40 mole percentage of benzene is to be separated to give top product of 90 mole percentage benzene and bottom product not more than 10 mole percentage benzene. If the operating reflux ratio is 3. Calculate for 100 moles of feed
(i) Quantity of top product and bottom product.

OR

b. Demonstrate the concept of interphase mass transfer and derive an expression relating local and overall mass transfer co-efficient

p.t.o

15 a. Acetic acid is diffusing through a 1 mm thick film of non diffusing water at 20^{o}C. The concentration of acid on one side of the film is 12% (by weight) and on the other side is 5% (by weight). Determine the Rate of diffusion of Acetic acid.
Diffusivity of Acetic acid in the solution = 10.5 x 10^{-10} m^2/sec
Density of 12% Acetic acid at 20^{o}C = 1016 Kg/m^3
Density of 5% Acetic acid at 20 □C = 1008 Kg/m3.

OR

b. An air-ammonia mixture containing 5% ammonia by volume is absorbed in water in a packed column operated at 200^{o}C and 1 atm pressure. So as to recover 98% NH_3. If the inert gas flow rate in the column is 1200 kg/m^2.hr. calculate (i) The minimum mass velocity of water from this column.
(ii) The number of transfer units in the column taking the operating liquid rate to be 1.25 times the minimum.

16 a. Express in detail, the design principles gas absorption.

OR

b. A batch of crude pentane contains 15 mol percentage n-butane and 85 15 mol percentage n-pentane. If a simple batch distillation at atmospheric pressure is used to remove 90 mol percentage of the butane, how much pentane would be removed? What would be the composition of the remaining liquid.

17 a. Construct and Explain the Mixer settler extractor.

OR

b. Elaborate Higbie‘s penetration theory.

18 a. Elaborate on flash distillation.

OR

b. A solution of 5% acetaldehyde in toluene is to be extracted with water in a fivestage co-current unit. If 25 kg of water/100 kg feed is used, find the amount of acetaldehyde extracted and the final concentration.
The equilibrium relation is given by: (kg acetaldehyde/kg water) = 2.20 (kg acetaldehyde/kg toluene).

Answer ALL questions

PART-C (2 x 15 = 30)

19 a. Explain the equilibrium diagram for leaching and in this context explain the single stage leaching with material balance equation.

OR

p.t.o

b. Nicotine in water containing 1% Nicotine is to be extracted with kerosene at 200°C water. Water and kerosene are insoluble. Estimate the percentage extraction of Nicotine for the following cases.
(i) If 100 kg of feed solution is extracted in a single stage with 150 kg of solvent.
(ii) If 100 kg of feed solution is extracted in three theoretical stages using 50kg of fresh solvent in each stage.
Equilibrium data:

X‘	0	0.00101	0.00246	0.00502	0.00751	0.00998	0.0204
Y‘	0	0.00081	0.001962	0.00456	0.00686	0.00913	0.0197

Where X‘ is kg nicotine/kg water and Y‘ is kg nicotine/kg kerosene.

20 a. Demonstrate the principle of fractionating distillation and its applications.

OR

b. Express how will you find out the final composition of the solute in the raffinate for immiscible solvent and diluents in single and multistage cross current extraction.

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SL.NO:1197

SL.NO:1188 **SUBJECT CODE:17BTCC12**

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E./ B.TECH DEGREE EXAMINATIONS- FEB -2022
BIOTECHNOLOGY

GENETIC ENGINEERING

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 Explain the chain terminator used in Sanger's methods
2 Inspect 'Stuffer' fragment.
3 Draw 2µ Yeast plasmid.
4 Define Mutagenesis.
5 Develop a note on Shuttle vectors.
6 Interpret the role of Polyethylene Glycol.
7 State the applications of molecular markers in Recombinant DNA technology
8 Interpret Deletion mutagenesis
9 Name any two Cosmid vectors and their sources
10 Illustrate the applications of Site directed mutagenesis

Answer **Any FIVE** questions

Part-B (5 x10 =50 Marks)

11 a. Discover map of restriction sites in genomic DNA by using blotting techniques

OR

b. Examine the role of on P^{33}molecules to detect specific DNA sequence

12 a. Analyze library to study the entire genetic makeup of an organism

OR

b. Compile a suitable method for screening and selection of Genomic library

13 a. Examine a transgenic animal by delivering the target gene to the embryo of an animal

OR

b. Categorize a recombinant DNA to produce commercially important protease and lipases

14 a. Classify a specific intentional change to the DNA sequence of a gene and any gene product

OR

b. Experiment with cell free amplification technique to obtain multiple identical copies of DNA-Explain

p.t.o

15 a. Build a cloning vehicle from bacterial plasmid with 4,361 bp

OR

b. Develop suitable vectors to construct genomic library

16 a. Classifiy the molecular Markers on the basis of their mechanism of action.

OR

b. Categorize the most suitable method to introduce foreign gene into a plant cell

17 a. Apply the molecule cloning to express a specific protein to balance diabetes

OR

b. Detect growth disorder in children as well as adults by using recombinant DNA technology

18 a. Explain the homologous recombination to modify endogenous gene

OR

b. Write an essay on the most reliable and economic method for screening and selection of Recombinants

Answer ALL questions

PART-C (2 x 15 = 30)

19 a. Analyze a library from fully transcribed mRNA found in the nucleus.

OR

b. Identify the target protein from SDS-PAGE by using specific antibodies

20 a. Identify the transformed DNA by using the substrate 5-bromo-4-chloro-3-indolyl-β-D-galactoside.

OR

b. Explain the rDNA research safety by adopting regulatory frameworks involving pathogenic microorganisms and genes of virulence.

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SL.NO:1188

SL.NO:1180 **SUBJECT CODE:17BTCC07**

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E./ B.TECH DEGREE EXAMINATIONS- FEB -2022
BIOTECHNOLOGY

ENZYME ENGINEERING AND TECHNOLOGY

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 Define Enzymes.
2 Develop a comparison table between Direct and coupled assay
3 Define enzyme kinetics.
4 Identify the significance of K_m and $V_{max.}$
5 Show the various types of reversible inhibitors.
6 Select the supporting media involved in invertase immobilized enzyme preparation.
7 Show the benefits of Fluidized bed reactor.
8 Identify the significance of immobilized biocatalyst.
9 Summarize about enzyme electrodes.
10 Identify the Major Enzymes used in Food Industry

Answer **Any FIVE** questions

Part-B (5 x10 =50 Marks)

11 a. Explain in detail about the factors that affect enzyme activity.

OR

b. Construct a methodology for the production of Enzymes from Microbial sources with a neat sketch.

12 a. Identify the production and purification of Enzymes from Plant and Animal sources.

OR

b. Demonstrate the mechanism of Enzyme action and the concept of Active site.

13 a. Summarize about the kinetics of single substrate reactions.

OR

b. Apply the Lineweaver – Burk plot for the determination of K_m

14 a. Examine K_m using Eadie – Hofstee plot and Hans - Woolf plot.

OR

b. Outline the process of mixed inhibition and Substrate inhibition.

p.t.o

15 a. Identify the industrial application of enzyme inhibition concepts.

OR

b. Examine about Encapsulation, Cross - linking Copolymerization with neat sketch.

16 a. Explain about Enzyme reactors types and their industrial applications

OR

b. Apply the packed beds for the construction of immobilized enzyme reactors

17 a. Illustrate and explain in detail about membrane reactors.

OR

b. Illustrate the principle and design of enzyme electrode.

18 a. Show the industrial and clinical applications of enzyme.

OR

b. Construct the following:
a. Enzyme electrode
b. Medical application of enzyme based biosensors

Answer ALL questions

PART-C (2 x 15 = 30)

19 a. Explain the formation of enzyme substrate that catalyse the reaction to form a product.

OR

b. Explain the different methods of inhibition and its significance.

20 a. Identify the process of controlling the movement of enzyme in a specific environment by physical method.

OR

b. Identify the significance of enzyme in biosensor.

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SL.NO:1178 **SUBJECT CODE:17BTEC06**

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E./ B.TECH DEGREE EXAMINATIONS- FEB -2022
BIOTECHNOLOGY

ELECTIVE - STEM CELL BIOLOGY AND TISSUE ENGINEERING

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 Distinguish the unique properties that make stem cells important for research.

2 Deduce the important factors that lead to dedifferentiation.

3 Discover any four Myths about stem cell

4 Articulate the applications of gene therapy in treating Alzheimer's .

5 Connect the problems using iPSC and strategies for resolving the problem.

6 Build the goals in Tissue Engineering.

7 Identify the advantage of using a bioengineered vessel versus prosthetic material.

8 Outline about the types of Stem cells.

9 Outline on Stem cell niche

10 Report on apheresis

Answer **Any FIVE** questions

Part-B (5 x10 =50 Marks)

11 a. Appraise the importance of Mesenchymal and Hematopoietic stem cells

OR

b. Distinguish between Lymphoid and Myeloid stem cells

12 a. Examine the Advantages and applications of 3-D organoid cultures and tissue scaffolds

OR

b. Appraise the applications of organoid

13 a. Identify the location of adult stem cells and mention its importance.

OR

b. Construct adenovirus mediated gene transfer.

14 a. Choose the potential alternatives to ES cell

OR

P.T.O

b. Develop the pathways of Hematopoietic stem cells

15 a. Articulate about chemokines and complement molecules in graft rejection

OR

b. Experiment on mesenchymal stem cells isolated from adipose tissue

16 a. Construct a method to treat brain injury using stem cell

OR

b. Organize a model to Micro engineering the Embryonic Stem Cell?

17 a. Identify the Ethical issues in using embryonic stem cell.

OR

b. Classify stem cells based on the potency

18 a. Explain about the stem cell in embryonic tissue.

OR

b. Illustrate about scaffolds.

Answer ALL questions
PART-C (2 x 15 = 30)

19 a. Categorize the immune markers

OR

b. Construct the steps in early human reproduction.

20 a. Employ Hematopoieticstem cell therapy for the treatment of primary Immunodeficiency disease with neat sketch

OR

b. Infer how Induced pluripotent stem cells generated and characterized?

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SL.NO:1178

SL.NO:1170 **SUBJECT CODE:17MBHS04**

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E./ B.TECH DEGREE EXAMINATIONS- FEB -2022
COMMON TO BTE,EEE,PHARMA , CSE & MECH

TOTAL QUALITY MANAGEMENT

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 List down the any four advantages of fish-bone diagram.

2 Why is FMEA important?

3 Mention any four features of check sheet.

4 State the responsibilities of Management Representative for implementing quality systems.

5 List any four characteristics of a quality policy statement.

6 Define the term “parameter” in statistics.

7 Define the term maintenance.

8 Define the term “PDSA”.

9 Write short notes on product benchmarking.

10 Give a note on environmental policy.

Answer **Any FIVE** questions

Part-B (5 x10 =50 Marks)

11 a. Explain the roles and responsibility of quality council & senior management for implementing quality in an organisation.

OR

b. Outline the benefits and pitfalls of benchmarking.

12 a. Explain, in what way, the concept of ISO 14000 differs from ISO 9000 series of quality system.

OR

b. Discuss in detail about the dimensions of quality with your own example.

13 a. Enumerate the cost of quality and discuss its components in detail with respect to the service based industry.

OR

b. Discuss the important elements to achieve customer/supplier partnering relationship.

P.T.O

14 a. Write notes on:

(a) Differentiate matrix diagram and matrix data analysis diagram.

(b) Differentiate tree diagram and decision tree diagram.

OR

b. The following table shows the number of point defects on the surface of a bus body on August 2019.

Body No.	No. of defects		Body No.	No. of defects
1	13		11	17
2	15		12	11
3	19		13	7
4	8		14	11
5	6		15	14
6	17		16	6
7	7		17	16
8	9		18	10
9	3		19	2
10	23		20	6

a) Compute the value of $\overline{C}$ and its control limits.

b) Draw C – chart

c) Compute value of $\overline{C}$ and control limits for the future use, if you deem it necessary.

15 a. Describe the term quality statements with suitable illustrations for service organisation.

OR

b. Is customer complaint necessary for an Organization? If yes, list the various tools used for collecting customer complaints.

16 a. Is quality management an issue only for management? Do you agree or not. Justify your answer.

OR

b. Describe the Trilogy Cycle of Joseph Juran with neat diagram.

17 a. Define quality audit. enlighten the features and types of quality audit

OR

b. What is meant by Operating Characteristics (OC) Curve? Explain it with the neat diagram.

P.T.O

18 a. Summarize the advantages and limitations of benchmarking.

OR

b. What are the objectives of implementing TPM? Also describe in detail the concept of TPM.

Answer ALL questions
PART-C (2 x 15 = 30)

19 a. Describe seven new tools of quality management with neat diagram of each.

OR

b. Elaborate the Japanese 5S concept as applicable to services and manufacturing company.

20 a. Write the step by step procedure for implementing FMEA of a product.

OR

b. Describe the various elements of ISO 9000 systems.

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SL.NO:1170

SL.NO:1166 **SUBJECT CODE:17BTEC03**

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E./ B.TECH DEGREE EXAMINATIONS- FEB -2022
BIOTECHNOLOGY

ELECTIVE - PRINCIPLES OF BIO-INFORMATICS

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 Identify the importance of the disciplines within Bioinformatics.

2 Construct a note on Lavenshtein Distance.

3 Identify the need for phylogenetic network.

4 Articulate the significance of Distance Matrix Method.

5 Identify the uses of Biochip.

6 What are the significance of amino acids in databases?

7 Explain the types of protocols.

8 Differentiate local and global alignment.

9 Outline about Minimum Evolution

10 Explain Maximum Parsimony.

Answer **Any FIVE** questions

Part-B (5 x10 =50 Marks)

11 a. Build in detail about WWW.

OR

b. Plan the architecture of TCP applications.

12 a. Make use of the Object oriented databases and explain its architecture.

OR

b. Build the aim and scope of structural database.

13 a. Apply the concept of BLAST and mention its various types.

OR

b. Apply the role of FASTA in detail and mention the types.

(p.t.o)

14 a. Identify the importance of
a. Character based method
b. Minimum Evolution

OR

b. Construct in detail about drug designing in pharmacology.

15 a. Utilize Bioinformatics tool in Drug Discovery.

OR

b. Make use of the Bioinformatics application in IT sector.

16 a. Illustrate in detail about the functions of Kernel and Shell in UNIX.

OR

b. Illustrate on
a. PIR
b. Protein Databases

17 a. Illustrate on
a. K-tuple.
b. Similarity

OR

b. Demonstrate on BLAST and FASTA.

18 a. List out the strategies of Multiple alignment.

OR

b. Build the importance of UNIX in detail with neat diagrams.

Answer ALL questions
PART-C (2 x 15 = 30)

19 a. Organize the types of alignment used in the analysis of biological sequences.

OR

b. Apply the concept of phylogenetic analysis and write its significance in current research.

20 a. Construct the role of Bioinformatics in pharmacoviligence.

OR

b. Explain in detail about the role of Bioinformatics in Drug Discovery.

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SL.NO:1155 **SUBJECT CODE:17BTCC10**

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E./ B.TECH DEGREE EXAMINATIONS- FEB -2022
BIOTECHNOLOGY

PRINCIPLES OF CHEMICAL ENGINEERING

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 Predict how many moles of K_2CO_3 will contain 117 Kg potassium?
2 Write the classification of material balance problems.
3 Examine briefly about stoichiometric number.
4 Write how endothermic reaction differ from exothermic reaction?
5 Write the expression for molar heat capacity.
6 Write the applications involved in the fluid statics
7 Cite on the role of chemical engineers in biotechnology industries.
8 Infer about Raoult's law for an ideal solution.
9 Summarize heat capacity.
10 Discuss about Shear stress

Answer **Any FIVE** questions

Part-B (5 x10 =50 Marks)

11 a. A gas mixture has the following composition by volume: ethylene- 30.6%, benzene- 24.5%, oxygen-1.3%, methane-15.5%, ethane-25.0%, nitrogen-3.1%. Caluclate (a) the average molar mass of the gas mixture (b) the composition by mass (c) the density of the mixture in kg/m^3 at NTP.

OR

b. Determine an expression for forced convection process

12 a. A distillation column separates 10000 kg/hr of 50% benzene and 50 % toluene. The product recovered from the top contains 95% benzene and the bottom product contains 96% toluene. The steam entering the condenser from the top of column is 8000 kg/hr. A portion of this product is returned to column as reflux and the remaining withdrawn as top product. Calculate the ratio of amount reflux to product.

OR

b. Ethyl ether at a temperature of 20° C exert a vapor pressure of 442 mm Hg. Calculate the composition of a saturated mixture of nitrogen and ether vapor at a temperature of 20° C and a pressure of 745 mm Hg expressed in the percentage composition by volume.

p.t.o

13 a. Write the mathematical expression of specific and relative humidity.

OR

b. A saturated solution of MgSO4 at 353 K is cooled to 303 K in a crystallizer. During cooling, mass equivalent to 4 % solution is lost by evaporation of water. Calculate the quantity of the original saturated solution to be fed to the crystallizer per 1000kg crystals of $MgSO4.7H_2O$. Solubilities of MgSO4 at 303 K and 353 K are 40.8 and 64.2 kg / 100 kg water respectively.

14 a. Flue gases leaving the stack off boiler at 523K, have following molar composition: Co2=11.31%, H2O=13.04% O2=2.1% and N2= 73.48%. Calculate the heat lost in 1 kmol of gas mixture above 298 k.

OR

b. Determine the relationship between C_p and C_v

15 a. Derive Isothermal friction flow of fluids.

OR

b. Demonstrate the mechanism of Hindered settling processes

16 a. Explain about the dimensions of (a) Specific weight (b) Dynamic viscosity (c) Kinematic viscosity (d) universal gas constant

OR

b. Explain how the Raleigh's method used for dimensional analysis

17 a. Explain briefly on the following a) Recycle ,b) bypass and c)purge

OR

b. A sample of moist air at 1atm and 25°C has a moisture content of 0.01 by volume. Interpret the humidity ratio, the partial pressure of water vapour , the degree of saturation, the relative humidity and dew point temp.-

18 a. Explain about the heat capacities at constant volume and constant pressure.

OR

b. Discuss the compressible fluid flow and multiphase flow concepts.

Answer ALL questions

PART-C (2 x 15 = 30)

19 a. Determine the expression for the drag force on smooth sphere of diameter D, moving with a uniform velocity V in a fluid of density ρ and dynamic viscosity μ.

OR

b. The air in a room is at 26.7°C and a pressure of 101.325kPa and contains water vapour with a partial pressure p_A of 2.76 kPa. Calculate the following: i) Humidity, ii) Saturation Humidity, iii) Percentage humidity,iv) % Relative humidity, The vapour pressure of pure water at 26.7 ° C is 3.5 kPa

p.t.o

20 a. Demonstrate the types and role of compressors in the compressible fluid flow

OR

b. Toluene is heated from 290K to 350K at a rate of 0.25 kg/s. Interpret the heat required to be added to toluene in Kw. C_p for toluene is $1.81+0.812\ T+0.151x10^{-2}\ T^2-0.163\ x10^{-5}T^3$ where C_p is in kJ/kmol.K.

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SL.NO:1155

SL.NO:1150 **SUBJECT CODE:17BTCC16**

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E./ B.TECH DEGREE EXAMINATIONS- FEB -2022
BIOTECHNOLOGY

BIOPROCESS ENGINEERING

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1	List the parameters to control pH in fermenter.
2	Detect the ways you sterilize the air used for fermentation
3	Generalize the account on Fed Batch Fermentation.
4	Generalize the feed strategies in Fed-batch culture.
5	Relate which Agitator is most preferred and what is the optimum design for the Agitator?
6	Demonstrate the ways to control dissolved Oxygen
7	Discuss about the effluent treatment in downstream process.
8	Discuss the note on Batch culture.
9	Discuss out the Factors involved in Scale up.
10	Describe On-line sensor and Off -line sensor.

Answer **Any FIVE** questions

Part-B (5 x10 =50 Marks)

11 a. Categorize the characteristics of good antifoam and its types.

OR

b. Conclude a brief note on Aeration and Agitation.

12 a. Classify online and offline biosensor with suitable example.

OR

b. Outline Polarographic and Galvonic electrodes

13 a. Interpret the parameters to be controlled in a Fermentation process with a diagram.

OR

b. Generalize about the Monod Equation and alternatives to Monod Equation.

14 a. Illustrate various model of growth inhibitors

OR

b. Categorize various monitoring and controlling parts of bioreactor.

15 a. Interpret sulphate oxidation method.

p.t.o

OR

b. Employ the Flow- injection analysis for the measurement of substrates, products and other metabolites.

16 a. Describe about the various historical developments in the Bioprocess Technology.

OR

b. Express the various processes involved in a downstream process.

17 a. Describe the mode of operation in a Fed-batch culture.

OR

b. Determine the methods of Immobilization of enzymes. Explain with diagrammatic representation.

18 a. Correlate the On-line data analysis for the measurement of important Physico-chemical parameters.

OR

b. Express in detail about Microbial colorimeter.

Answer ALL questions

PART-C (2 x 15 = 30)

19 a. Analyze the various parameters for growth inhibitors

OR

b. Interpret the main parameters to be monitored in fermentation process

20 a. Interpret the gassing out technique

OR

b. Demonstrate the working principle of membrane bioreactors

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SL.NO:1138 **SUBJECT CODE:17BTCC14**

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E./ B.TECH DEGREE EXAMINATIONS- FEB -2022
BIOTECHNOLOGY

IMMUNOLOGY

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 Distinguish the localized and generalized hypersensitivity.

2 Expand FACS and its uses.

3 Develop the organization and arrangement of TCR genes

4 List Type–I hypersensitivity reaction.

5 Illustrate the role HLA in transplantation.

6 Analyze the synthetic peptide vaccine.

7 Discuss the structure of lymph node.

8 Relate about the maturation of B-cells.

9 Classify the Active and Passive Immunization.

10 Classify Ag-Ab Interaction.

Answer **Any FIVE** questions

Part-B (5 x10 =50 Marks)

11 a. Criticize the Non protein part acts as a carrier molecule and the compound used in vaccine production.

OR

b. Analzye about Auto immunity system.

12 a. Compare the terms : SLFIA and DELFIA

OR

b. Idenfity about polymorphonuclear leucocytes.

13 a. Categorize the foreign particle able to recognize the antibody to elicit the immune response and its types.

OR

b. Analyze the Type-IV hypersensitivity reactions and its responses.

P.T.O

14 a. Choose the term Cell mediated immunodeficiency diseases.

OR

b. Make use of Immunomics

15 a. Name the types of tests used to diagnose autoimmune diseases.

OR

b. Make use of technique of SDS–PAGE.

16 a. Demonstrate how the macrophages degrade particulate antigen?

OR

b. Interpret the term: a. T Lymphocytes b. B Lymphocytes

17 a. Choose the Immediate type hypersensitivity.

OR

b. Interpret about the clinical manifestation of graft rejection.

18 a. Discuss in detail about the antigen – antibody interaction.

OR

b. Explain detail about complement fixation test.

Answer ALL questions

PART-C (2 x 15 = 30)

19 a. Categorize the classification of autoimmune disease with few examples.

OR

b. Test for thymocytes activation.

20 a. Explain the interdependent ways of innate and adaptive immunity in protecting the host.

OR

b. Apply the different types of ELISA technique.

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SL.NO:1145 **SUBJECT CODE:17BTCC15**

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E./ B.TECH DEGREE EXAMINATIONS- FEB -2022
BIOTECHNOLOGY

FOOD PROCESSING TECHNOLOGY

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 Compare salting and dehydration

2 Classify the use of glass as a packaing material

3 Identify the microbes isolated from vegetables

4 Demonstrate Meat processing and curing

5 Identify various contaminants of food

6 Make use of acids based food additives in food industry

7 Illustrate role of rapid freezing methods in food preservation

8 Make use of compensated vaccum technique in MAP

9 Explain souring

10 Illustrate radurization

Answer **Any FIVE** questions

Part-B (5 x10 =50 Marks)

11 a. Categorize any 4 food borne intoxications

OR

b. Classify various types of alcoholic beverages

12 a. Function of organic acids, sulphur and nitrogen compounds in food preseravation

OR

b. Use of microorganisms present in the milk and milk products

13 a. Identify microorganisms present in the meat and meat products

OR

b. Identify various preservation techniques involved in preservation of milk and milk products

14 a. Identify various factors influencing food spoilage and shelf life

OR

P.T.O

b. Identify the principles and factors involved in high temperature sterilization

15 a. Make use of various drying method of preservation in food industry

OR

b. Apply various labeling instructions involved in processing of foods

16 a. Identify various types freezing methods use in food industry

OR

b. Identify different varieties of packaging materials.

17 a. Utilize the advancements in packaging technologies

OR

b. Illustrate on safety assessment of biodegradable food packaging materials

18 a. Intrepret the thermal death curve of microorganisms.

OR

b. Classify various biopreseration techniques.

Answer ALL questions
PART-C (2 x 15 = 30)

19 a. Classify various types of pasteurization techniques

OR

b. Utilization of irradiation and biopreservation in food industry

20 a. Demonstrate in detail about cryopreseration

OR

b. Outline on various food processing methods

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SL.NO:1123 **SUBJECT CODE:17BTCC13**

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E./ B.TECH DEGREE EXAMINATIONS- FEB -2022
BIOTECHNOLOGY

THERMODYNAMICS FOR BIOTECHNOLOGY

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 Define an isolated system, Give examples.
2 Define potential energy with formula.
3 What is adiabatic process?
4 What is a compressibility chart?
5 Write the equation of effect of pressure on chemical potential.
6 What is an activity co-efficient?
7 What is raffinate and extract?
8 List four different consistency tests for experimental Vapour Liquid Equilibria data.
9 What is the criterion of chemical reaction equilibria?
10 What is the importance of reaction coordinate?

Answer **Any FIVE** questions

Part-B (5 x10 =50 Marks)

11 a. From vapour – liquid equilibrium measurement for ethanol – benzene system at 318 k and 40.25 kPa. It is found that the vapour in equilibrium with liquid containing 38.4% ethanol contained 56.6% benzene. The system forms an azeotrope at 318K. At this temperature, the vapour pressures of ethanol and benzene are 22.9 and 29.6 kPA respectively. Determine the composition and total pressure of the azeotrope. Assume that Van Laar equation is applicable for the system.

OR

b. A certain gas of volume 0.4m^3 pressure of 4.5bar and temperature of 130^{o}C is heated in a cylinder to 9 bar when the volume remains constant. Calculate a)Temperature at the end of the process,b)Heat transfer c)Change in internal energy d)Work done by the gas e)Change in enthalpy f) Mass of the gas. Assume Cp=1.005KJ/Kg.K and Cv=0.71KJ/KgK

12 a. State Zeroth Law of Thermodynamics and explain the concept of temperature measurement.

OR

b. Explain about compressibility factor and principle of corresponding states.

p.t.o

13 a. What is meant by the activity of a pure fluid? Explain the effect of pressure and temperature on activity.

OR

b. Explain and derive the process involving ideal gases for the case of constant volume, constant pressure, constant temperature and polytrophic process.

14 a. Derive equations for heat transfer,work done, change in internal energy and enthalphy with an ideal gas and present the same equations applying to Isothermal Process.

OR

b. Briefly explain Partial Molar Properties and Properties of Solution.

15 a. What is meant by the activity of a pure fluid? Explain the effect of pressure and temperature on activity.

OR

b. Explain any three methods for estimating the fugacity of a prone gas.

16 a. Show that pressure approaching to zero the fugacity is equal to the pressure

OR

b. Deduce the clapeyron equation using the criterion of equilibrium in equation dG=0 at constant T and P.

17 a. What are azeotropes? With proper phase diagrams, distinguish between maximum and minimum boiling azeotropes.

OR

b. What is the relation between standard free energy change and equilibrium constant?

18 a. How would you predict the feasibility of a reaction from the value of the standard free energy change?

OR

b. Derive equation for calculation of workdone and entropy for polytropic process.

Answer ALL questions

PART-C (2 x 15 = 30)

19 a. A vapour mixture containing 18% ethane, 17% propane, 62% isobutene and the rest n-butane is subjected to partial condensation so that 75% of the vapour is condensed. If the condenser temperature is 300 K, determine the pressure

OR

b. Deduce from fundamentals, the first law of thermodynamics for flow process.

20 a. What are different types of thermodynamic diagrams? Explain the method of construction of any two thermodynamic diagrams.

OR

b. Show that ideal gases Cp – Cv = R (ii) Prove that $[dc_{p/}d_p]T = -T\,[d^2v / dT^2]_P$

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SL.NO:1123

SL.NO:1119 **SUBJECT CODE:17PHBS05**

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E./ B.TECH DEGREE EXAMINATIONS- FEB -2022
COMMON TO ALL

SMART MATERIALS

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 Demonstrate, how the Metallic glasses can be used for transformer core materials?

2 Explain briefly about transformation temperature in SMA.

3 Distinguish between Type I and Type II Superconductors.

4 Interpret unit cell.

5 Demonstrate top-down and bottom-up approach for producing nanoparticles.

6 Interpret any two techniques for the synthesis of nanophase materials.

7 Explain briefly about top-down approach.

8 Describe coercivity and retentivity.

9 Explain briefly about soft magnetic materials.

10 Identify the reason, why the superconductor exhibits the property of diamagnetism?

Answer **Any FIVE** questions

Part-B (5 x10 =50 Marks)

11 a. Categorize metallic glasses? Give examples. Mention the properties of metallic glasses.

OR

b. Draw the unit cells of SC, BCC, FCC and HCP structures

12 a. Examine the effects of temperature, magnetic field and current on the superconductivity.

OR

b. Schedule the following for SC, BCC, FCC and HCP structures

13 a. Explain the properties of diamagnetic materials with neat diagram.

OR

b. Explain two characteristics of SMA with neat diagrams.

14 a. Explain the properties of Ni-Ti alloy.

p.t.o

OR

b. Express the outline of magnetic and electrical properties of metallic glasses. Mention any two applications of metallic glasses.

15 a. Describe the following (i) unit cell (ii) coordination number (iii) nearest neighbour distance (iv) packing factor

OR

b. Explain the advantages, disadvantages and applications of ball milling method.

16 a. Explain Carbon Nano Tubes? How are they classified? Explain.

OR

b. Explain in detail about any one of the methods of fabrication of CNT.

17 a. Differentiate the properties of dia, para and ferromagnetic materials

OR

b. Discuss the properties of superconductors.

18 a. Describe about Type – I super conductor. Write down its characteristics.

OR

b. Discuss Isotope Effect and Meissner effect.

Answer ALL questions

PART-C (2 x 15 = 30)

19 a. Categorize hard and soft magnetic materials? Mention their applications.

OR

b. Generalize the properties of metallic glasses.

20 a. Illustrate sol-gel method of preparing nanophase materials and mention its advantages.

OR

b. Illustrate hysteresis on the basis of domain theory.

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S.No.1118 **SUB CODE:17PCBS02**

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- FEB - 2022
COMMON TO ALL
PHYSICAL SCIENCES

(Candidates admitted under 2017 Regulations-SCBCS)

Time : 1 1/2 Hours Maximum Marks:50 Marks

PART A - ENGINEERING PHYSICS

Answer **ALL** questions

Part-A (5 x 2 =10 Marks)

1 Tell about population inversion.
2 Schedule any two applications of laser in industrial field.
3 Report about step index fiber.
4 Tell about the characteristics of graded index multimode fiber.
5 Interpret about X-ray Fluoroscopy.

Answer **Any FIVE** questions

Part-B (2 x12 =24 Marks)

6 a. Predict the applications of laser in communication, military and chemical fields.

OR

b. Recognize the following terms: population inversion, pumping process and laser action.

7 a. Express the various types of fibers based on refractive index profile.

OR

b. Express the characteristics of penetrant.

Answer ALL questions

PART-C (1 x 16 = 16)

8 a. Demonstrate the construction and working of semiconductor laser with necessary diagram.

OR

b. Illustrate the working of X-ray radiography.

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P.T.O

PART A - ENGINEERING CHEMISTRY

(Candidates admitted under 2017 Regulations-SCBCS)

Time : 1 1/2 Hours Maximum Marks:50 Marks

Answer **ALL** questions

Part-A (5 x 2 =10 Marks)

1 Brief the terms electrolytic and electrochemical cell.
2 What is helmholtz's electrical double layer?
3 Show the structure of EDTA and Ca-EDTA complex.
4 Mention the causes of boiler corrosion
5 Write a note on solar energy

Answer **Any FIVE** questions

Part-B (2 x12 =24 Marks)

6 a. Explain standard electrode potential in detail.

OR

b. Calculate the emf of the cell Mg/Mg^{2+} $//Cd^{2+}$ (aq) /Cd(s) at 25^0C where, $[Cd^{2+}]$=0.7M, $[Mg^{2+}]$ =1.0M and E^0cell =1.97 V.

7 a. Discuss in detail dry corrosion with mechanism.

OR

b. Describe producer gas in detail.

Answer ALL questions

PART-C (1 x 16 = 16)

8 a. Explain the working principle of H_2-O_2 fuel cell with reactions.

OR

b. Elaborate the non-conventional energy sources.

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S.No.1118

SL.NO:1106 **SUBJECT CODE:17BTEC28**

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E./ B.TECH DEGREE EXAMINATIONS- FEB -2022
BIOTECHNOLOGY

ELECTIVE - ENVIRONMENT FRIENDLY PRACTICES IN CIVIL ENGINEERING

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 What are the elements of resolution?
2 List down the environmental impacts of brick manufacturing.
3 Write the importance of energy conservation.
4 Define Remote sensing.
5 What are all the application of remote sensing?
6 State Stefan Boltzmann law?
7 What is cement?
8 How to calculate the embodied the energy of masonry easily?
9 What are the disadvantages of bioremediation?
10 Summarise the process of solidification.

Answer **Any FIVE** questions

Part-B (5 x10 =50 Marks)

11 a. Briefly explain about the various image classification methods.

OR

b. What are the environmental impact of brick manufacturing?

12 a. Explain the process of reusing demolished concrete.

OR

b. Describe the elements of Remote Sensing.

13 a. Explain in detail about the different types of sensor based on orbit, energy source and data capture.

OR

b. Explain the process of brick Manufacturing.

14 a. Define embodied energy and write the guidelines for reducing it.

OR

b. Explain in detail about Incineration process.

(p.t.o)

15 a. Explain in detail about the Airborne and space bar TIR and Microwave sensor.

OR

b. Explain the types of building materials used in construction.

16 a. Explain the embodied energy of alternative materials.

OR

b. Name some recycled biomass fibers and write their advantages.

17 a. What are the importance of Environmental Geology?

OR

b. Identify the various causes and effects of sea erosion. Add a detailed note on coastal protection measures.

18 a. List out the various geological factors to be considered for the construction of Reservoirs? Explain in detail with examples.

OR

b. Explain Briefly about Bioremediation and its types.

Answer ALL questions

PART-C (2 x 15 = 30)

19 a. Explain manufacturing of cement in detail.

OR

b. Explain the top ten sustainable building materials.

20 a. Discuss the use of geospatial techniques for disaster management. Enumerate your answer with case studies on landslide mitigation adopted in the Himalayan region.

OR

b. i List out the advantages of phytoremediation process.
ii Describe in detail different processes involved in a phytoremediation process.
iii. Discuss in detail Electro kinetic remediation of contaminated soil.

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SL.NO:1105 **SUBJECT CODE:17BTCC08**

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E./ B.TECH DEGREE EXAMINATIONS- FEB -2022
BIOTECHNOLOGY

BIOINSTRUMENTATION

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 Analyze the effects of different stains in electrophoresis techniques.
2 Infer that quantitative data can be obtained from dsc curves
3 Demonstrate the effect of slit width on resolution.
4 Interpret the role of infrared spectroscopy in forensics.
5 Determine the crystal structure using peak shape in XRD.
6 Explain Wave number and Velocity.
7 Relate the role of computers in an analytical instrument.
8 Explain Beer–Lambert law and write the derivations
9 Cite examples for the materials used in Differential Thermal Analysis.
10 Summarise flue gas and their properties.

Answer **Any FIVE** questions

Part-B (5 x10 =50 Marks)

11 a. Inspect the principle and working of nephelometer to measure the concentration of suspended particulates in a liquid or gas colloid.

OR

b. Experiment the Mechanism of Size Exclusion Chromatography for protein folding and refolding studies.

12 a. Analyze how specific proteins in a tissue sample can determine using Western blot method.

OR

b. Illustrate the skills required, the need to dry samples and standards prior to analysis for the quick and accurate determination of the mass of a sample using an analytical balance.

13 a. Determine the Instrumentation of Gel documentation with neat diagrams.

OR

b. Apply colorimeter for environmental analysis of water quality.

(p.t.o)

14 a. Predict the concept of centrifugation in research and development.

OR

b. State the application of Thermal Analysis in point of Material Research.

15 a. Determine the chemical content and structure of any molecule using X-ray diffraction method.

OR

b. Write the principle and applicability of gas Analysers for O_2 and CO_2

16 a. Classify the basic concepts of instrumentation with neat sketch.

OR

b. Classify the wave properties of electromagnetic radiation and illustrate the design and components of spectroscopy.

17 a. Sketch the instrumentation and principle of Auger electron spectroscopy with suitable examples

OR

b. Describe the instrumentation and operation of Thermo gravimetry.

18 a. Explain in detail how BOD and COD in waste waters are measured.

OR

b. Exemplify the principle, working and applications of immunoblotting.

Answer ALL questions

PART-C (2 x 15 = 30)

19 a. Infer that ion exchange chromatography is an effective method for water purification

OR

b. Interpret the particle size measurement using Turbidimetric methods.

20 a. Identify how DTA is designed to produce quantitative results in terms of energy and/or any other physical parameter.

OR

b. Explain the basic techniques and working of XRD.

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SL.NO:1098 **SUBJECT CODE:17MABS03**

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E./ B.TECH DEGREE EXAMINATIONS- FEB -2022
COMMON TO PHARMA & BIOTECH

MATHEMATICS FOR BIO-ENGINEERING

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 Differentiate $\left(x^2-4\right)\left(2x^2-7\right)$ with respect to x.

2 If $z=x^3+y^3-3axy$,Find the second order partial derivatives of z

3 Integrate $\int \cos 4x \cos x\, dx$

4 Integrate $\int\left(\frac{\cos 2x}{\cos^2 x \sin^2 x}\right)dx$

5 Write down the order and degree of the differential equation $\left[1+\left(\frac{dy}{dx}\right)^2\right]^{\frac{1}{2}}=\frac{d^2y}{dx^2}$

6 Solve $\frac{d^2y}{dx^2}-6\frac{dy}{dx}+13y=0$

7 Determine mode for the following 0 , 2 , 5 , 6 , 9 , 5 , 6 , 14 , 7 , 15 , 5 , 6 , 5

8 Define Skewness.

p.t.o

9 Write the differences between correlation and regression

10 If $r_{12}=0.5,\ r_{13}=0.3,\ r_{23}=0.45$ find $R_{3.12}$

Answer **Any FIVE** questions

Part-B (5 x10 =50 Marks)

11 a. (i)If $y=e^{ax}\sin bx$ prove that $\frac{d^2y}{dx^2}-2a\frac{dy}{dx}+(a^2+b^2)y=0$

(ii)If $y=x^{\tan x}+\sin x^{\cos x}$, *Find* $\frac{dy}{dx}$

OR

b. One end of a ladder 17 feet along is leaning against a wall. If the foot of the ladder be pulled away from the wall at the rate of 3ft/min. Show how fast is the top of the ladder descending when the foot is 8 ft from the wall?

12 a. (i) Integrate $\int x^2e^{2x}dx$

(ii) Integrate $x\log(1+x)$ with respect to 'x'

OR

b. Integrate $\int(4x+11)\sqrt{x^2+4x+5}dx$

13 a. Integrate $\int(\log x)^2dx$

OR

b. Solve $\cos(x+y)\,dy=dx$ by variable separable method

14 a. Solve $(D^2+2D+1)y=\sin 2x\cos x$

p.t.o

OR

b. (i) Form the differential equation from $y = a\cos(\log x) + b\sin(\log x)$

(ii)Form the differential equation of all circles touching the axis of y at the origin and having centres on the x-axis.

15 a. Solve $xdy - ydx = \sqrt{x^2 + y^2}\,dx$

OR

b. For the following data, Find the missing frequencies if N=100 and Median = 90

Interval	0-20	20-40	40-60	60-80	80-100	100-120	120-140	140-160	160-180
Frequency	6	9	?	14	20	15	?	8	7

16 a. Calculate coefficient of skewness by Karl Pearson's method

Profit	10-20	20-30	30-40	40-50	50-60
No. of components	18	20	30	22	10

OR

b. The first four moments of a distribution about the value 4 of the variables are -1.5, 17, -30 and 108. Find the moments about mean, β_1 and β_2. Also find the mean.

17 a. Calculate the mean and standard deviation for the following frequency distribution.

x	6	7	8	9	10	11	12
f	3	6	9	13	8	5	4

OR

p.t.o

b.

Obtain the multiple linear regression equation of X_1 and X_2 and X_3 from the following data relating to three variables given below.

X_1	4	6	7	9	13	15
X_2	15	12	8	6	4	3
X_3	30	24	20	14	10	4

18 a.

The ranking of 10 students in two subjects A and B are as follows.

A	3	5	8	4	7	10	2	1	6	9
B	6	4	9	8	1	2	3	10	5	7

Find the rank correlation.

OR

b.

(i) If $r_{12}=0.60,\ r_{13}=0.70,\ r_{23}=0.65$ *and* $S_1=1.0$, *find* $S_{1.23}, R_{1.23}$ *and* $r_{12.3}$

(ii) If $r_{12}=0.80,\ r_{13}=-0.56,\ r_{23}=0.40$ *then obtain* $R_{1.23}$ *and* $r_{12.3}$

Answer ALL questions

PART-C (2 x 15 = 30)

19 a.

Examine for maxima and minima of the function $f(x,y)=x^4+y^4-2x^2+4xy-2y^2$

OR

b.

Integrate $\int \frac{x^2+1}{(x^2-1)(2x-1)}dx$

20 a.

Solve : $(D^2-7D+12)y=e^{5x}+\cos 2x$

OR

p.t.o

5

b.

Ten competitors in a beauty contest are ranked by three judges in the following order.

Judge I	1	6	5	10	3	2	4	9	7	8
Judge II	3	5	8	4	7	10	2	1	6	9
Judge III	6	4	9	8	1	2	3	10	5	7

Use rank correlation coefficient to discuss which pair of judges has the nearest approach to common tastes in beauty.

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SL.NO:1098

SL.NO:1080 **SUBJECT CODE:17BTCC05**

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E./ B.TECH DEGREE EXAMINATIONS- FEB -2022
BIOTECHNOLOGY

UNIT OPERATIONS IN PROCESS INDUSTRIES

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 Indicate the significance of unit operations in industrial biotechnology.
2 Demonstrate bound moisture
3 Illustrate the heat conductivity of air.
4 Demonstrate unsteady state heat transfer.
5 Choose the parameters to be considered for evaporator design.
6 Discuss Reynolds number (Re). What is its significance?
7 Discuss co-current flow.
8 Classify the different cross sections of pitches used in tube sheets.
9 Write about Fourier's law of conduction.
10 Write a note on Evaporation.

Answer **Any FIVE** questions

Part-B (5 x10 =50 Marks)

11 a. Illustrate in brief about optimum thickness of insulation and draw the graph indicating optimum point of insulation with respect to costs involved.

OR

b. A furnace wall is constructed of 114 mm layer of sil-o-cel brick, with a thermal conductivity of 0.138 W/mK backed by 229 mm layer of common brick, of conductivity 1.38 W/mK. The temperature of the inner surface of wall is 1033 K and that of the outer surface is 349 K

12 a. Thermic fluid at a rate of 5000 kg/h is to be cooled from 423 K to 363 K by circulating water at a rate of 15000 kg/h. If the water is available at 303 K, find the outlet temperature of water. Data: Specific heat of thermic fluid Cpt is 2.72 kJ/kg K and specific heat of water Cpw is 4.187 kJ/kg K

OR

p.t.o

b. An orifice meter with flange taps is to be installed in a 100 mm line to measure the flow of water. The maximum flow rate is expected to be $50m^3/h$ at 15^oC. The monometer is used to measure the differential pressure is to be filled with mercury and water is to fill the leads above the surface of the mercury. The water temperature will be 15^oC throughout. If the manometer reading is to be 1.25m, what diameter to the nearest millimeter, should be specific for the orifice.

13 a. Illustrate in detail with drawing about constant pressure filtration.

OR

b. Classify mechanical separation process and illustrate any one in detail.

14 a. Develop an expression for conduction through a hollow cylinder

OR

b. Write the differences between drop wise condensation and film wise condensation.

15 a. Discuss with a neat diagram working of a) Bourdon type pressure gauge & b) Diaphragm pressure gauge.

OR

b. Demonstrate the working of a fluidized bed dryer with necessary sketches.

16 a. Define boiling. Explain the mechanism and types of boiling.

OR

b. What are the types of extended surface heat exchangers and discuss in detail.

17 a. Discuss critical moisture content, equilibrium moisture content and hold up in rotary drier.

OR

b. Apply and discuss about the dimensionless analysis number involved in convection.

18 a. Develop a model Shell and Tube heat exchanger with neat sketch.

OR

b. Describe about the nature of fluids and its properties.

Answer ALL questions

PART-C (2 x 15 = 30)

19 a. A thick walled cylindrical tubing of hard rubber having an inside radius of 5 mm and outside radius of 20 mm is being used as a temporary cooling coil in a bath. Ice water is flowing rapidly inside and the inside wall temperature is 274.9 K. the outside temperature is 291.7K. a total of 14.65 W must be removed from the bath by cooling coil. How many meter of tubing are needed? (thermal conductivity at 0^oC (273 K) is k = 0.151 W/m.k it can be used in the range upto 300 K)

OR

p.t.o

b. A 50 kg bath of granular solids containing 25 % moisture is to be dried in a tray dryer to 12% moisture by passing a stream of air at 363 K tangentially across its surface at a velocity of 1.8 m/s. If the constant rate of drying under these conditions is 0.0008 kg moisture / m^2.s and the critical moisture content is 10 %, calculate the drying time. The surface area available for drying is 1.0 m^2.

20 a. Demonstrate laws of black body radiation and concept of a black body in detail.

OR

b. In a counter flow double pipe heat exchanger, oil is cooled from 85°C to 55°C by water entering at 25°C.The mass flow rate of oil is 9,800 kg/hr and specific heat of oil is 2000 J/kg K. The mass flow rate of water is 8,000kg/hr and specific heat of water is 4180 J/kg K. Determine the heat exchanger area and heat transfer rate for overall heat transfer co-efficient of 280 W/m^2K.

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SL.NO:1080

SL.NO:1071 **SUBJECT CODE:17BTP106**

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E./ B.TECH DEGREE EXAMINATIONS- FEB -2022
BIOTECHNOLOGY

ELE-WASTE MANAGEMENT

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 Differentiate 4Rs in waste management.
2 Explain the term combustion.
3 Explain short notes on recycling agro waste.
4 Illustrate a bio-hazard and Cytotoxic hazard symbol.
5 Distinguish hazardous and non hazardous waste.
6 Explain the term incineration.
7 Define waste hierarchy.
8 Define resource.
9 Summarize energy conservation in the textile industry.
10 Explain waste handling.

Answer **Any FIVE** questions

Part-B (5 x10 =50 Marks)

11 a. Analyse in detail about conversion methods used to recover energy from waste.

OR

b. Explain in detail about waste minimization techniques in paper industries.

12 a. Explain in detail about waste handling and transport methods in pharmaceutical industries.

OR

b. Write in detail about e-waste management.

13 a. Briefly explain about waste to energy

OR

b. Explain about methods used in handling and disposal in sugar industries.

14 a. Write in brief about the recovery of energy.

OR

b. Explain in detail about waste hierarchy in waste management.

15 a. Summarize techniques used to minimize waste in health care centre. p.t.o

OR

b. Summarise advantages and disadvantages of waste disposable techniques.

16 a. List out types and classification of waste.

OR

b. List out the techniques employed in waste minimization in developed countries.

17 a. What are the methods used in handling, transport, and disposal in breweries industries?Discuss.

OR

b. Briefly explain about Resource efficiency.

18 a. Explain in detail about waste generation from health care centre and pharmaceutical sectors.

OR

b. Explain in detail about landfills and types of landfills techniques used in waste management.

Answer ALL questions

PART-C (2 x 15 = 30)

19 a. Write about waste to energy and Explain in detail about conversion methods used to recover energy from waste

OR

b. Explain the adverse health and environmental impacts due to improper handling of solid waste.

20 a. Briefly explain about waste water treatment techniques in Textile industries.

OR

b. List the type of Incinerators. With a neat sketch, explain any one.

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SL.NO: 1055 **SUBJECT CODE:17BTEC26**

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E./ B.TECH DEGREE EXAMINATIONS- FEB-2022
BIOTECHNOLOGY

ELECTIVE - ECO-FRIENDLY MULTI- STOREY BUILDING

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 What is the need of ventilation in building?

2 What is hydrological resources?

3 What is a geochemical environment?

4 What is the role of green chemistry in our environment?

5 What are the social impacts of construction?

6 What are the factors to be considered to enhance the energy efficiency in a building?

7 What is the design of sewage treatment?

8 How is architecture important to society?

9 What are the modern construction materials?

10 What are the five basic elements of green buildings?

Answer **Any FIVE** questions

Part-B (5 x10 =50 Marks)

11 a. Explain in details about rules and Clearance for Construction Projects?

OR

b. How can construction sites can prevent from pollution?

12 a. What are the types of pollution that can be observed at the construction site?Explain any two types.

OR

b. What are the different types of pollutants used in construction activities?

13 a. Explain in detail about wind driven ventilation and stack ventilation with neat sketch.

OR

b. What are the advantages and disadvantages of natural ventilation?

(p.t.o)

14 a. What are the advantages and disadvantages of mechanical ventilation systems?

OR

b. What are the impacts of bioremediation?

15 a. What are the three stages of wastewater treatment?

OR

b. What is importance of hydrology?What are the factors that impact the hydrology?

16 a. What are the charcteristics of Green Architecture?

OR

b. What are the benefits of green building?

17 a. What are the Sources of Sustainable materials?

OR

b. what are the merits and demerits of Sustainable building?

18 a. What types of actions can be taken to make buildings more sustainable?

OR

b. What are the factors affecting durability?

Answer ALL questions

PART-C (2 x 15 = 30)

19 a. What is mechanical ventilation? Explain in detail about types of mechanical ventilation?

OR

b. What are some energy efficient technologies used in building?

20 a. What are three things that impact architecture?

OR

b. What are the sustainable construction methods?

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SL.NO: 1054 **SUBJECT CODE:17BTCC09**

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E./ B.TECH DEGREE EXAMINATIONS- FEB-2022
BIOTECHNOLOGY

MOLECULAR BIOLOGY

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 List some chemical properties of DNA Molecule

2 Examine wobble hypothesis

3 Analyze the Thyamine dimmer and its effect.

4 Identify the function of introns

5 Write short notes on folding of Proteins.

6 State the functions of Lac A.

7 Summarize the difference between Nucleotides and Nucleosides

8 Summarize the functions of rRNA

9 Mention any two enzymes involved in Protein folding pathway.

10 Explain point mutation.

Answer **Any FIVE** questions

Part-B (5 x10 =50 Marks)

11 a. Simplify the mechanism of DNA replication.

OR

b. Write notes on a) Primary structure of DNA b) Secondary structure of DNA c)Replication inhibitors

12 a. Write notes on a) Promoters b) Enhancers c) Inhibitors

OR

b. Examine in detail on Post translational modifications.

13 a. Analyze the correlation of gene and polypeptide

OR

b. Infer about Gal operon with a neat sketch.

(p.t.o)

14 a. Explain Spontaneous and Induced mutations with suitable examples

OR

b. Inspect any two types of DNA repair mechanism with examples.

15 a. Identify different inhibitors involved in replication process

OR

b. Generalize about Post transcriptional modifications.

16 a. Demonstrate the Trp operon with a neat sketch.

OR

b. Explain the following
a. Frame shift b. Point mutation

17 a. Explain the steps involved in replication process in Prokaryotic cell.

OR

b. Classify various types of RNA

18 a. Give an account of Operon model for regulation of gene activity.

OR

b. Interpret, why Missense mutation is phenotypically silent? Explain your answer.

Answer ALL questions
PART-C (2 x 15 = 30)

19 a. Classify replication inhibitors and its mode of action

OR

b. Analyze the relationship between gene and polypeptide

20 a. Identify the structures of RNA and its functions

OR

b. Outline the mechanism of translation process with neat diagram

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SL.NO: 1047 **SUBJECT CODE:17BTEC16**

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E./ B.TECH DEGREE EXAMINATIONS- FEB-2022
BIOTECHNOLOGY

ELECTIVE - CANCER BIOLOGY

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 Give short notes on ATR and ATM.

2 Relate angiogenesis and tumor invasion.

3 What are endogenous carcinogens?

4 List the stages of carcinogenesis

5 Which tumor suppressor gene is called “Guardian of Genome” and why?

6 What is PSA? Give its use.

7 Give an account on stages of carcinogenesis theory.

8 Expand and explain ATM and CHEK2.

9 Give a note on metastatic suppressors.

10 Define gene therapy and give its applications.

Answer **Any FIVE** questions

Part-B (5 x10 =50 Marks)

11 a. What is the mechanism of UVA and UVB radiation carcinogenesis?

OR

b. Illustrate about RTK and its signalling pathway.

12 a. Develop a note on circulating tumour cell arrest and Extravasation.

OR

b. Enumerate the mechanism of cancer.

13 a. Describe the method of detection of oncogene.

OR

b. Explain in detail on basement membrane disruption.

14 a. Explain the detection of cancer and advances in cancer detection method.

OR

(p.t.o)

b. Elaborate the cell cycle Check point.

15 a. What are the different forms of cancer? Write notes on diet and cancer.

OR

b. Explain broadly about chemical carcinogens.

16 a. Write an account on theory of carcinogenesis and types of carcinogens.

OR

b. What are the metabolic changes in the oncogenesis?

17 a. Write note on signal targets and cancer.

OR

b. Write detailed note on metastatic and tumorigenicity

18 a. How do you detect cancer and predicts its aggressiveness of cancer?

OR

b. Write brief notes on chemotherapy and applications.

Answer ALL questions

PART-C (2 x 15 = 30)

19 a. Appraise the molecular diagnostic tool for cancer

OR

b. Correlate retrovirus in promoting cellular transformation

20 a. Explain how the cell cycle is regulated with respect to the action of the different cyclin dependent kinases (CDK)?

OR

b. Associate gene therapy in cancer treatment studies and also discuss about social and ethical issues

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SL.NO:1016 **SUBJECT CODE:17BTEC11**

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E./ B.TECH DEGREE EXAMINATIONS-FEB - 2022
BIOTECHNOLOGY

ELECTIVE- PROTEIN ENGINEERING

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 List two examples of hydrophilic amino acids.
2 Categorize and name the forces that involved in Protein folding.
3 Explain the two types of β-sheets.
4 Importance of Peptide mapping in determining the protein structure.
5 List the importance of Ionic bond.
6 Tell about the Cro repressor and its functions
7 Illustrate on transcription factors.
8 Outline the Protein Disulfide Isomerase importance
9 Outline a note about Leucine zipper.
10 List the role of Site directed mutagenesis in Protein engineering.

Answer **Any FIVE** questions

Part-B (5 x10 =50 Marks)

11 a. List the Requirements in the translation of nucleotide sequences into amino acid sequences and 3 steps of initiation of protein synthesis

OR

b. Survey an account on Nucleotide binding folds.

12 a. Analyze how HLH motif is involvedin homodimer and heterodimer associations?

OR

b. Compare how the Eukaryotic protein synthesis differs from prokaryotic protein synthesis

13 a. Defend about the methods to determine the C terminal of primary structure of protein.

OR

b. Justify how molecular chaperons prevent improper protein folding

14 a. Determine the applications of designed proteins with examples

OR

b. Relate the different domains found in Protein structure

p.t.o

15 a. Recall and write note on the following: Protein Denaturation, Protein Renaturation with reactions

OR

b. With schematic diagram of docking the trp repressor to DNA, illustrate the mechanism of Trp repressor HTH.

16 a. Explain in detail about any five Post translational modifications.

OR

b. Demonstrate on Super secondary structure of Proteins.

17 a. Explain about Protein Folding Pathways.

OR

b. Infer a detailed account on Peptide Mapping.

18 a. Infer on the DNA binding domain of Lambda Cro repressor and lambda repressor

OR

b. Explain the PCR-site directed mutagenesis and give its application.

Answer ALL questions

PART-C (2 x 15 = 30)

19 a. Articulate Insulin Biosynthesis, Secretion, Structure, and Structure-Activity Relationships

OR

b. Determine the order of the “trypsin fragments” in the original polypeptide chain and how Disulfide Bonds Located

20 a. Recall the salient features required for catalytic action of serine proteinases and give the topological diagram of chymotrypsin domains

OR

b. Explain the Modular nature and Formation of complexes in Quaternary structures.

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SL.NO:1016

SL NO:1012 **SUBJECT CODE:17BTEC04**

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E./ B.TECH DEGREE EXAMINATIONS- FEB 2022
BIOTECHNOLOGY

DIAGNOSTICS AND THERAPEUTICS

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 What is meant by Septicemia.
2 How to collect specimen for viral culture.
3 Differentiate bacterial and viral infection?
4 Draw the structure of streptococci and coliform bacteria?
5 Differentiate Neonatal and Prenatal diagnosis.
6 Give the strategies for gene therapy in cancer treatment.
7 Give an account on nucleic acid labeling?
8 Expand RFLP?
9 Explain about DNA sequence
10 Explain about GLP

Answer **Any FIVE** questions

Part-B (5 x10 =50 Marks)

11 a. Describe about the factors predisposing to microbial pathogenicity.

OR

b. Write short notes on Normal microflora of
a) Skin
b) The Intestinal tract

12 a. Enumerate Protozoan blood parasites in detail

OR

b. How are clinical samples collected, transported and Processed.

13 a. Discuss in detail about diagnostic methods of bacterial infection?

OR

b. . Write short notes on
a. Amoebiasis
b. Leishmaniasis

p.t.o

14 a. CTCF as a Master Genome Organizer – Explain

OR

Write short notes on
a. Duchenne muscular dystrophy
b. b. Sickle cell disease
c. Neurofibromatosis

15 a. Write a detailed note on Genetic counseling.

OR

b. In detail explain the maternal inheritance through mitochondrial DNA analysis.

16 a. Discuss in detail about the methods involved in nucleic acid purification?

OR

b. Give detailed account on PCR and its applications?

17 a. Discuss in detail about PCR based molecular typing?

OR

b. In detail elaborate the techniques to find the crimes.

18 a. Write short notes on
a) Level of containment – I
b) Level of containment – II

OR

b. Explain about Microarray technique and its applications.

Answer ALL questions
PART-C (2 x 15 = 30)

19 a. Identify how to differentiate
(a)Modes of transfusion of diseases
(b)Parasite relationship

OR

b. Paraphrase in detail (a)Amoebiosis (b) Malaria

20 a. Justify the following
A.Pre-natal disease diagnostics
B.Gender identification
C.Neonatal and Pre-natal disease

OR

b. Interpret in detailautomated DNA sequenceing

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SL NO:1012