B. TECH
(SEM -V) THEORY EXAMINATION 2021-22
CONSTITUTION OF INDIA, LAW AND ENGINEERING

Time: 3 Hours *Total Marks: 100*

Note: **1.** Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. **Attempt *all* questions in brief.** **2 x 10 = 20**

a. Explain President Rule.
b. Define Preamble.
c. What is Sole trader?
d. Discuss the Parliament of India.
e. Explain Contract Law.
f. Give two significances of PIL.
g. Describe Digital Signature. Give its importance.
h. Define Trade Mark.
i. Evaluate Case Law.
j. Define Limited Company.

SECTION B

2. **Attempt any *three* of the following:** **10 x 3 = 30**

a. Identify the roles of Engineers in E- Governance.
b. Discuss Lokpal and Lok Ayukta Act 2013.
c. Explain the Fundamental Rights and Duties.
d. Describe appointment procedure to Supreme Courts Judges and High Courts Judges in India.
e. Define the rights of patent holder.

SECTION C

3. **Attempt any *one* part of the following:** **10 x 1 = 10**

(a) Examine Indian Independence Act 1947.
(b) Discuss the salient features of Constitution.

4. **Attempt any *one* part of the following:** **10 x 1 = 10**

(a) Explain the Powers and functions of Indian President.
(b) Evaluate Public Interest Litigation.

5. **Attempt any *one* part of the following:** **10 x 1 = 10**

(a) Examine the sources of Law and its types.
(b) Explain Tribunals in India.

6. **Attempt any *one* part of the following:** **10 x 1 = 10**

(a) Explain briefly Right to Information Act 2005.
(b) Describe Cyber Appellate Tribunal.

7. **Attempt any *one* part of the following:** **10 x 1 = 10**

(a) Define Prospectus. Explain its types.
(b) Describe Company Act. Explain formation of Company.

BTECH
(SEM V) THEORY EXAMINATION 2021-22
FERMENTATION BIOTECHNOLOGY

Time: 3 Hours *Total Marks: 100*

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief. 2 x 10 = 20

Qno.	Question	Marks
a.	What are primary & secondary metabolites? In which phase they are being produced.	2
b.	Name the preservation techniques used for different types of mutants.	2
c.	Differentiate between batch and continuous sterilization.	2
d.	Differentiate between sterilization and pasteurization. Give examples.	2
e.	What do you understand by the term constitutive and inducible enzymes?	2
f.	Give equation for log penetration relationship.	2
g.	Name the microbes which are used for bioleaching.	2
h.	Differentiate between absolute filters and depth filters with example.	2
i.	Discuss the advantages and disadvantages of continuous culture.	2
j.	How are aseptic conditions maintained in a fermentor?	2

SECTION B

2. Attempt any *three* of the following:

Qno.	Question	Marks
a.	What are metabolic end products? Discuss in brief primary and secondary metabolites with their functions.	10
b.	What do you understand by fermentation? Discuss the major developments in fermentation industry.	10
c.	What is the need for over production of metabolites? Discuss the overproduction of metabolites and its control points.	10
d.	What do you understand by Del factor? Discuss continuous sterilization of media in detail.	10
e.	Discuss carbon catabolite repression in detail with suitable example.	10

SECTION C

3. Attempt any *one* part of the following:

Qno.	Question	Marks
a.	Explain thermal death kinetics in detail.	10
b.	Write short notes on i. Medium design ii. Medium optimization	10

4. Attempt any *one* part of the following:

Qno.	Question	Marks
a.	Explain, under what conditions of sugar concentration, yeast cell tends to produce ethyl alcohol.	10
b.	Discuss the process, parameters and materials for the industrial manufacture of antibiotic β-lactum.	10

5. Attempt any *one* part of the following:

Qno.	Question	Marks
a.	Discuss the wet and dry methods for measurement of microbial growth.	10
b.	Discuss the concept of feedback inhibition of a metabolic process with suitable example.	10

6. Attempt any *one* part of the following:

Qno.	Question	Marks
a.	Discuss the process, parameters and materials for the industrial manufacture of ethyl alcohol. Discuss hops in detail.	10
b.	Write short notes on i. Microbial transformations ii. Bioleaching	10

7. Attempt any *one* part of the following:

Qno.	Question	Marks
a.	What do you understand by air sterilization? Discuss design of depth filters.	10
b.	Discuss the methods for preservation and improvement of industrially important microorganisms.	10

B.TECH.
(SEM-V) THEORY EXAMINATION 2021-22
GENETIC ENGINEERING

Time: 3 Hours ***Total Marks: 100***

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief. **2 x 10 = 20**

Q no.	Question	Marks	CO
a.	Write the role of restriction endonuclease.	2	2
b.	Define DNA foot printing.	2	1
c.	Define gene therapy.	2	1
d.	Define real time PCR and write its application.	2	2
e.	Define DNA sequencing.	2	1
f.	Define AFLP.	2	1
g.	Give the use of Taqman assay.	2	2
h.	Give examples of intracellular signaling proteins.	2	3
i.	Define mutagenesis.	2	1
j.	Define "relay of signals".	2	2

SECTION B

2. Attempt any *three* of the following: ***10 x 3 = 30***

a.	Give the method of introduction of recombinant DNA in to the selected host cell.	10	3
b.	Give the method of formation of yeast artificial chromosomes.	10	3
c.	Explain the principle of Random Amplified Polymorphic DNA.	10	2
d.	Write the significance of therapeutic cloning.	10	2
e.	Write the structure and working of nuclear receptors.	10	2

SECTION C

3. Attempt any *one* part of the following: **10 x 1 = 10**

a.	Define bacteriophage. Write the way through which they are used in the treatment of infections.	10	3
b.	Describe the concept of strain improvement of industrially important organisms.	10	3

4. Attempt any *one* part of the following: **10 x 1 = 10**

a.	Write the process of formation of bacterial artificial chromosomes.	10	3
b.	Describe cloning of insulin gene and other genes of commercial interest.	10	

5. Attempt any *one* part of the following: **10 x 1 = 10**

a.	Describe Maxam Gilbert's and Sanger Coulson's automated methods of DNA sequencing.	10	3
b.	Write the principle and applications of allele specific PCR technology.	10	3

6. Attempt any *one* part of the following: **10 x 1 = 10**

a.	Write the principle of transgenic animals, explain the benefits with examples.	10	2
b.	Explain the ethical issues and prospects for human cloning.	10	4

7. Attempt any *one* part of the following: **10 x 1 = 10**

a.	Explain the mechanism of G-protein coupled receptors.	10	2
b.	Write the mechanism of cell signaling.	10	2

B.TECH
(SEM V) THEORY EXAMINATION 2021-22
NANOBIOTECHNOLOGY

Time: 3 Hours ***Total Marks: 100***

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief. **2 x 10 = 20**

a. What is nanotechnology? Define it.
b. Define Dendrimers.
c. What do you understand by Nanomedicine? Define it with suitable examples.
d. What is Nano-robot? Define it.
e. Write down the application of nanotechnology in tissue engineering.
f. Define Micro – fabrication with suitable example.
g. Define Nano – materials and its classification.
h. Define the role of nanotechnology in Cancer diagnose.
i. What is Lab-on-a-chip process? Define it.
j. Write down any 05 applications of nanotechnology in other than biotechnology.

SECTION B

2. Attempt any *three* of the following: ***10 x 3 = 30***

a. Briefly explain the history, Origin & fundamental concepts of Nano biotechnology in detail.
b. What are Carbon nanotubes? Explain its related structure in detail.
c. Briefly explain the working principle of Atomic force microscopy in detail.
d. What is biomedical polymer? Also describe their different classes.
e. What is Quantam dots technology? Describe it in detail.

SECTION C

3. Attempt any *one* part of the following: **10 x 1 = 10**

(a) Briefly explain Nano fabrications process in detail.
(b) Explain Metal nanoparticles and their types in detail. Also explain their synthesis.

4. Attempt any *one* part of the following: **10 x 1 = 10**

(a) What is the procedure of Scanning tunneling microscopy? Explain it in detail.
(b) Explain the use of biomedical polymer in cardiovascular ophthalmologic orthopedic areas in detail.

5. Attempt any *one* part of the following: **10 x 1 = 10**

(a) Enlist various applications of gold, silver and zinc oxide nanoparticles in Nano - biotechnology.
(b) Explain tumor targeting process through Nanotechnology in detail.

6. Attempt any *one* part of the following: **10 x 1 = 10**

(a) Explain various approaches of Nano- biotechnology in detail.
(b) Briefly explain various drug delivery tools through nanotechnology in detail.

7. Attempt any *one* part of the following: **10 x 1 = 10**

(a) What is Nano-imaging agent? Describe it in detail.
(b) Briefly explain the term "Bioavailability" in detail.

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B.TECH.
(SEM V) THEORY EXAMINATION 2021-22
BIOFUELS AND ALCOHOL TECHNOLOGY

Time: 3 Hours *Total Marks: 100*

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief.

Q no.	Question	Marks	CO
a.	What do you understand by Crabtree effect?	2	CO1
b.	What is the difference between wet milling and dry milling of grains?	2	CO2
c.	Describe head in distillation column.	2	CO3
d.	Analyze and list the challenges in commercial production of alcohols.	2	CO3
e.	Describe pretreatment of biomass.	2	CO2
f.	What are the parameters used to monitor the fermentation process?	2	CO3
g.	Broadly classify the raw materials used in alcohol production.	2	CO1
h.	Describe the various biofuels produced from thermochemical conversion of biomass.	2	CO3
i.	Briefly describe Alcoholometry.	2	CO3
j.	Name the different fermentation techniques used in conversion of cellulosic feedstock.	2	CO2

SECTION B

2. Attempt any *three* of the following:

Q no.	Question	Marks	CO
a.	How batch fermentation differs from continuous fermentation? Explain the encillium fermentation process in detail.	10	CO2
b.	Explain crabtree effect. How yeast switch from aerobic respiration to fermentation pathway? Discuss the significance of aerobic respiration in yeast growth?	10	CO1
c.	Give details of storage and handling of raw material for alcohol production.	10	CO2
d.	Define biogas? Explain the steps of anaerobic digestion with a schematic diagram.	10	CO3
e.	By taking molasses as feedstock, explain the process of fermentation with a flow diagram.	10	CO2

SECTION C

3. Attempt any *one* part of the following:

Q no.	Question	Marks	CO
a.	Discuss the modern techniques of fermentation.	10	CO2
b.	Explain the effect of process parameters on fermentation in detail.	10	CO2

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4. Attempt any *one* part of the following:

Qno.	Question	Marks	CO
a.	Illustrate the process of fusel oil separation with a neat sketch.	10	CO2
b.	List the uses of various by-products of alcoholic fermentation.	10	CO3

5. Attempt any *one* part of the following:

Qno.	Question	Marks	CO
a.	Write a short note on yeast production as single protein cell. What are the requirements for yeast growth?	10	CO1
b.	Discuss the management of fermentation in the production of alcohol in detail.	10	CO4

6. Attempt any *one* part of the following:

Qno.	Question	Marks	CO
a.	Illustrate thermal gasification of biomass with suitable example.	10	CO3
b.	Why yeast is so effective for fermentation? Discuss the different yeast strains used in alcoholic fermentation.	10	CO1

7. Attempt any *one* part of the following:

Qno.	Question	Marks	CO
a.	List the various biofuels from thermochemical conversion of biomass. Explain the syngas fermentation in detail.	10	CO3
b.	Explain the ethanol water equilibrium curve. How ethanol is purified to produce the anhydrous ethanol?	10	CO3

B.TECH
(SEM-V) THEORY EXAMINATION 2021-22
BIOINFORMATICS-1st

Time: 3 Hours *Total Marks: 100*

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief. **2 x 10 = 20**

a. Define the term bioinformatics.
b. What do you understand by databases?
c. Write a short note on CLUSTAL W.
d. Define Homologues & Paralogues with suitable example.
e. Define Motif.
f. Write down the full form of EMBL & DDBJ.
g. Write down the difference between similarity & identity.
h. What do you understand by the term "Pileup"? Define it.
i. What is Human Genome project? Write a short note on it.
j. Define Orthologues.

SECTION B

2. Attempt any *three* of the following: ***10 x 3 = 30***

a. Briefly discuss about the term Bioinformatics. Also discuss about different databases.
b. Explain Smith Waterman algorithm with an example.
c. What do you understand by BLAST? Also discuss about its different versions.
d. Describe UPGMA method of phylogenetic analysis.
e. Explain Chou – Fasman method for protein structure prediction in detail.

SECTION C

3. Attempt any *one* part of the following: **10 x 1 = 10**

(a) Explain PHI – PSI method of BLAST in detail.
(b) Briefly discuss about Needleman – Wunch algorithm with suitable example in detail.

4. Attempt any *one* part of the following: **10 x 1 = 10**

(a) Explain the progressive & Iterative method of multiple sequence alignment in detail.
(b) What is Fitch – Margoliash method? Explain it in detail.

5. Attempt any *one* part of the following: **10 x 1 = 10**

(a) Briefly discuss about protein structure prediction in detail.
(b) Explain various automated tools for phylogenetic analysis in detail.

6. Attempt any *one* part of the following: **10 x 1 = 10**

(a) What is homology modeling? Describe it for tertiary structure prediction.
(b) Write down the difference between PAM & BLOSUM in detail.

7. Attempt any *one* part of the following: **10 x 1 = 10**

(a) Explain various structure visualization methods of protein identification in detail.
(b) Write down important applications of bioinformatics in drug discovery and drug designing.