B. TECH
(SEM-V) THEORY EXAMINATION 2020-21
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.	What are the characteristics features of a cloning vector?	2	CO1
b.	How can a pure sample of a gene by cloning be obtained?	2	CO1
c.	Define chromosome walking.	2	CO2
d.	What are the steps of genomic library preparation?	2	CO2
e.	What do you understand by site-directed mutagenesis?	2	CO3
f.	What are molecular beacons?	2	CO3
g.	Was Dolly the sheep sterile? Why was Dolly the sheep important?	2	CO4
h.	What are the uses of therapeutic cloning?	2	CO4
i.	Which protein domains are found in nuclear receptor family members? How many nuclear receptors are there?	2	CO5
j.	What are the different types of cell signaling?	2	CO5

SECTION B

2. Attempt any *three* of the following:

Q no.	Question	Marks	CO
a.	Write short note on- i. Prokaryotic and eukaryotic expression host systems ii. Bacteriophage	10	CO1
b.	Describe the process of cDNA library construction.	10	CO2
c.	Explain: i. Real time PCR ii. AFLP-PCR	10	CO3
d.	Explain the process of generating genetically transformed plants using either the *Agrobacterium tumefaciens* (*A. tumefaciens*) and microprojectile bombardment approaches.	10	CO1
e.	Describe the structure and function of G-protein-coupled receptors.	10	CO5

SECTION C

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

Q no.	Question	Marks	CO
a.	Explain the process of introducing DNA into non-bacterial cell.	10	CO1
b.	Explain: i. Transformation ii. Recombinant Screening	10	CO1

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

Q no.	Question	Marks	CO
a.	Describe the techniques used for strain improvement in industries.	10	CO2
b.	What do you understand by artificial chromosomes? How are artificial chromosomes made? Differentiate between YAC and BAC.	10	CO2

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

Q no.	Question	Marks	CO
a.	Describe the Sanger's method of DNA sequencing. Also enlist its uses and limitations.	10	CO3
b.	Differentiate between molecular and biochemical markers. What are the advantages of molecular markers? What do you understand by ISSR technique?	10	CO3

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

Q no.	Question	Marks	CO
a.	Compare the techniques for the creation of transgenic animals: micro-injection, ES Cell Techniques and somatic cell nuclear transfer.	10	CO4
b.	Explain the development, applications and limitations of genetically modified microorganisms as biopesticides and biofertilizers.	10	CO4

Attempt any *one* part of the following:

Q no.	Question	Marks	CO
a.	Explain insulin signaling in detail.	10	CO5
b.	Explain the mechanism of: i. the first messenger, such as epinephrine, can evoke different responses in different target cells ii. the same second messenger such as cAMP, can also evoke different responses in different target cells	10	CO5