

**VIT**Vellore Institute of Technology
(Deemed to be University under section 3 of UGC Act, 1956)**SCHOOL OF BIO SCIENCES AND TECHNOLOGY****Continuous Assessment Test -2 (CAT-II) Fall Semester (2023-24)**

Course Name & code:

CELL BIOLOGY AND GENETICS

BBIT204L

Programme Name & Branch:

B Tech, Biotechnology

Class Number:

VL2023240101987 & VL2023240101985

Slot: B1+TB1

Faculty Name:

Abul Kalam Azad Mandal & Rajasekaran C

Exam Duration: 90 Min

Maximum Marks: 50

General instruction(s):

Answer ALL the questions

Draw neat diagram wherever necessary

Q. No.	Question	Max Marks	CO	BL
1.	In mammals, based on the distance a signalling molecule travel to direct cellular activities, the signalling is classified into three types. Mention the names and <u>compare</u> these three types of signalling. <i>draw table</i>	10	CO3	BL2
2.	A single signalling molecule usually has different effects on different types of target cells. Explain with suitable examples <i>acetylcholine, muscle, heart, salivary glands</i>	10	CO3	BL3
3.	If a G protein coupled receptor (GPCR) in hepatic cell receives noradrenaline (norepinephrine) as a signaling molecule, what proteins/enzymes will be activated? It will regulate metabolism of which molecule inside the cell? Discuss the entire pathway. <i>3 parts in q</i>	10	CO3	BL4
4.	In a breeding experiment, Mendel had collected the following phenotypic and genotypic data from F2 population (consider allele T is dominant over allele t): Phenotypic data -Number of tall plants – 300 and dwarf plants – 100. Genotypic data – genotype TT in 100 number of plants, genotype Tt in 200 number of plants, and genotype tt in 100 number of plants. a. What was the phenotype and genotype in F1 population in this experiment? b. What are the hypothesis Mendel proposed from this experiment? Explain in detail <i>→ give another eg of detail (Laws I + II)</i>	10	CO4	BL4
5.	In humans, the ABO blood groups are controlled by three alleles (only two of which occur in any one individual): the alleles for A and B are co-dominant toward each other, and both are dominant to the allele O. If a person with type AB blood group marries someone with type O blood group, what will be the possible phenotypes of their offspring? Explain in detail	10	CO4	BL5

***** BEST WISHES *****