2 1/2 Hours

Total Marks: 75

1. Attempt **all** questions.
2. **All questions** carry **equal** marks.
3. Draw **neat labeled diagrams** wherever necessary.
4. Use of **log tables** and **non-programmable calculator** is **allowed**.

Q.1 a. Define the following: (any three) **03**

1. Effector .
2. Nuclear receptors.
3. Autocrine signalling.
4. Calmodulin .
5. GPCR.
6. DAG.

Q.1 b. Give an account of: (any two) **12**

1. Endocrine signalling in comparison with synaptic signalling.
2. Role of Nitric Oxide as a signalling molecule.
3. Mechanism of RTK functioning.
4. The response of different cells to acetylcholine with the help of a suitable diagram.

Q.2 a. Name the following: (any three) **03**

1. Cells that have a high level of mitotic activity.
2. Ability of a cancerous cell to form secondary tumours.
3. The death of a cell by injury.
4. A gene that limits the formation of tumour.
5. Process where clusters of cancer cells dislodge from a tumor and invade the blood vessels.
6. Mitotic phase in which the chromosome move to the opposite ends of the cell.

Q.2 b. Explain the following: (any two) **12**

1. What is MPF? Explain its role in regulation of cell cycle.
2. What are Caspases? Explain their functioning with respect to their targets.
3. Malignant tumours and their classification.
4. Give the mechanism of receptor mediated pathway of apoptosis.

Q.3 a. Do as instructed: (any three) **03**

1. Give one example of a synthetic drug.
2. Fill in the blank - _____ are Gram negative bacteria devoid of cell wall.
3. State true / false – During antibiotic treatment, patient's normal flora are also getting exposed to the effects of the antibiotic.

4. Explain the term selective toxicity.
5. Name a genetic element other than the plasmids on which antibiotic resistant genes are located.
6. State an example of antiviral drug used in treatment of Herpes infection.

Q.3 b. Elaborate on the following questions:(any two) **12**

1. Mechanism of drug resistance with examples.
2. Mode of action of cephalosporins.
3. Rational design of an antimicrobial agent.
4. Mechanism of action of aminoglycosides with example.

Q.4 a. Do as directed: (any three) **03**

1. Calculate degree of freedom for a series if number of observations is 10.
2. Which are the two types of t- test?
3. State true or false: Z test is used to test significant difference between the means for sample size more than 30
4. If Variance is 16 what will the standard deviation.
5. Fill in the blank: Chi-square value is _____ skewed (positively, negatively)
6. What is Null hypothesis?

Q.4 b. Attempt the following questions: (any two) **12**

1. Perform regression to estimate x when y = 2.5 from the following table:

x	**1**	**2**	**3**	**4**	**5**
y	**2**	**4**	**6**	**8**	**10**

2. Solve: Mr. Macdonald immunized the cows in his farm for cattle foot disease. Following results were obtained. Comment on the effectiveness of the immunization programme. **($X^2_{, 0.05, 1}$= 3.84)**

	Died	Survived	Total
Immunized	2	10	12
Non Immunized	8	5	13
Total	10	15	25

3. How would you represent your project data using frequency distribution diagrams and graphs? Explain any two of them.
4. Explain with suitable example arithmetic mean, median and mode.

Q. 5 Write short notes on: (any three) **15**

a. Types of extracellular messengers.
b. Role of Arrestins in desensitization.
c. Significance of apoptosis.
d. Types of correlation.
e. Bacitracin – mode of action.
f. Use and misuse of antimicrobial agents.