

2 ½ 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.
5. For Q 2, Q 3 and Q 4 attempt A and B OR C and D.

Q 1 Do as directed (Any fifteen)

1. Give any one property of Microfilaments.
2. What is a protofilament?
3. Give the role of Motor proteins.
4. Define: *Dynactin*.
5. In case of microtubules, the initial stage in filament formation is called _____.
6. Define: Myofibrils.
7. Give the role of Actin Binding Proteins.
8. State true or False: Diffusion involving carrier proteins is called as passive diffusion.
9. Define: Symport.
10. Name one energy-dependent transport process used by microbes for uptake of nutrients.
11. Give one example of mobile ion carrier.
12. State the role of adherens junctions.
13. Fill in the blanks: _____ are the MIP channels in bacteria which transport water.
14. State true or False: In *Drosophila melanogaster* the sex of the fly is not the consequence of the presence or absence of Y chromosome.
15. State true or False: Female with a Turner syndrome are aneuploid females with 45 X chromosome complement.
16. How would you calculate interference value if the coefficient of coincidence is 0.67?
17. Define: Karyotype.

15

18. An Individual is doubly heterozygous for the w and m alleles. Arrange the alleles in trans- configuration.
19. Give one example of constitutive heterochromatin.
20. What is a nucleosome?

Q 2 A Explain the structure, mechanism and functions of Dynein. 08

Q 2 B Write a brief note on structure and properties of Microfilaments. 07

OR

Q 2 C Explain the structure, mechanism and functions of Kinesin-08

Q 2 D Describe Assembly and Disassembly of an Intermediate Filament. 07

Q 3 A Give an account of structural organisation and functions of gap junctions. 08

Q 3 B Explain group translocation in bacterial cells using a suitable example. 07

OR

Q 3 C Describe the mechanism of cellular interactions in *Dictyostelium discoideum*. 08

Q 3 D Give the functions of cell coat. 07

Q 4 A Solve: - A *Neurospora* strain that required leucine (leu) and tryptophan (trp) for growth was mated to a wild type strain (leu + and trp+) following products were obtained. 08

	1	2	3	4
Spore pair 1	leu trp	leu +	leu trp	leu trp
Spore pair 2	leu trp	leu +	leu +	+ trp
Spore pair 3	+ +	+ trp	+ trp	leu +
Spore pair 4	+ +	+ trp	+ +	+ +
TOTAL	45	5	15	8

	5	6	7
Spore pair 1	leu trp	leu +	+ trp
Spore pair 2	+ +	+ trp	+ +
Spore pair 3	leu trp	leu +	leu trp
Spore pair 4	+ +	+ trp	leu +
TOTAL	12	10	5

- a. Compute the distance between the centromere and two genes.
 b. What are PD, NPD and TT tetrads? Identify PD, NPD and TT tetrads.

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Q 4 B What are chromosomal aberrations? Diagrammatically explain Deletion, Duplication and Inversion with a suitable example. 07

OR

Q 4 C Give the cytogenetics and any four characteristics of Trisomy 21 and Trisomy 18. 08

Q 4 D Elaborate on Dosage compensation and Barr body. 07

Q 5 Write Short notes on any three of the following. 15

- a Structure and Composition of a Microtubule.
- b Desmosomes.
- c Glycosaminoglycans.
- d ZZ-ZW mechanism of sex determination.
- e Pedigree analysis and its importance.