Q. P. Code: 23082

2 ½ Hours

Total Marks: 75

1. Attempt **all** questions.
2. **All questions** carry **equal** marks.
3. Draw **neat labelled 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) **15**

1. Give any one property of a Microtubule.
2. The motor proteins of the cell convert chemical energy into _____energy.
3. State the role of Dynein head.
4. Microfilaments are composed of _____ protein.
5. Define: Treadmilling.
6. Give any one example of proteins found in Skeletal Muscles.
7. State true or false: Type II myosins are also called unconventional myosins.
8. Give one example of Glycosaminoglycans.
9. Define: Lectins.
10. State true or false: In an active transport, solute molecules move across a membrane without undergoing chemical modification.
11. State the role of Desmosome.
12. Fill in the blank: The cell coat can be stained with _____ for visualization under a light microscope.
13. Define: Group translocation.
14. The unit of mapping distance is called _____.
15. What is a paracentric inversion?
16. How would you calculate barr body if the individual is XXY?
17. Define: - Polyploidy.
18. An Individual is doubly heterozygous for the w and m alleles. Arrange the alleles in cis- configuration.
19. What is a three point test cross in a diploid organism?
20. Name the fungal strain used for tetrad analysis.

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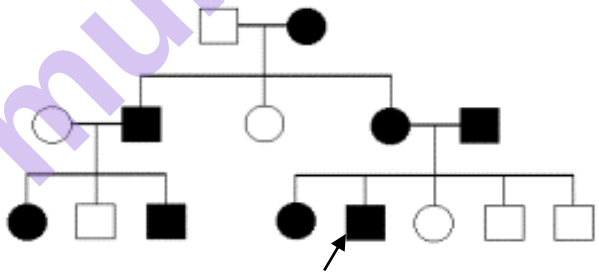
Q 2 A	Elaborate on Types and Functions of Intermediate Filaments.	**08**
Q 2 B	Explain: Microtubules as Agents of Intracellular Motility.	**07**
	OR	
Q 2 C	Describe Assembly and Disassembly of an Intermediate Filament.	**08**
Q 2 D	Explain the structure, mechanism and function of Dynein.	**07**
Q 3 A	Give an account of structural organisation and functions of tight junctions.	**08**
Q 3 B	Elaborate on the types of ionophores with the help of suitable examples. Add a note on its significance.	**07**
	OR	
Q 3 C	Describe active transport in a prokaryotic cell using a suitable example.	**08**
Q 3 D	Explain the various theories proposed for cell-cell adhesion.	**07**
Q 4 A	i. What is Pedigree analysis? Give its significance.	**04**
	ii. Observe the pedigree and answer the questions below:-	**04**



a. What is the mode of inheritance?
b. Number the generations and the individuals for the given pedigree.
c. Which is the index case?
d. What would be the genotype of the index case (consider allele A)?

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Q 4 B Discuss XX-XY mechanism of sex determination. **07**

OR

Q 4 C Give the cytogenetics and general characteristics of Klinefelter and Turner syndrome. **08**

Q 4 D i. *Neurospora* strain $ad^+ leu^+$ was crossed with $ad^- leu^-$ the following data was obtained answer the following questions:-

	ASCI			
	I	II	III	IV
Spore pair 1.	$ad^+ leu^-$	$ad^+ leu^+$	$ad^+ leu^+$	$ad^+ leu^+$
Spore pair 2.	$ad^+ leu^-$	$ad^- leu^-$	$ad^- leu^+$	$ad^+ leu^+$
Spore pair 3.	$ad^- leu^+$	$ad^+ leu^-$	$ad^- leu^-$	$ad^- leu^-$
Spore pair 4.	$ad^- leu^+$	$ad^- leu^+$	$ad^+ leu^-$	$ad^- leu^-$

a. Identify the first division segregation and second division segregation asci for adenine gene. **02**

b. Identify the PD, NPD and TT tetrads. **02**

ii. Give the classification of chromosomes on the basis of position of the centromere. **03**

Q 5 Write Short notes on **any three** of the following:- **15**

a Functions of Cytoskeleton.

b Proteoglycans.

c Functions of cell coat.

d Cri-du-chat syndrome.

e Euchromatin and heterochromatin.