

VDC-17/10/19 Cell Biology.

Q.P. Code:

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)**

15

1. Give an example of one drug targeting microtubule.
2. Explain the term – nucleation.
3. State true / false: the movement of dynein on a microtubular track is retrograde.
4. What is the function of profilin?
5. Give the significance of tau protein.
6. \_\_\_\_\_ is a nucleating protein of actin filament.
7. Name the protein associated with actin filaments.
8. Define facilitated diffusion.
9. \_\_\_\_\_ protein is present in periplasmic space of gram-negative bacteria in ABC transporter.
10. Define antiporters.
11. Give any one function of tight junction.
12. Name the adhesion protein involved in the formation of hemidesmosomes.
13. Give any one function of gap junction.
14. Give any one function of extracellular matrix.
15. How would you calculate interference value if the coefficient of coincidence is 0.76?
16. Define aneuploidy.
17. An individual is doubly heterozygous for the w and z alleles. Arrange the alleles in a trans configuration.
18. How would you calculate Barr body if the individual is XXY?
19. Name a syndrome caused due to nondisjunction.

20. State true or false. An individual with a Turner syndrome is phenotypically a female.

Q. 2 A State the different functions of cytoskeleton. 08

Q. 2 B Elaborate on the polymerization of intermediate filaments. 07

OR

Q. 2 C Elaborate on the structure and function of Kinesin. 08

Q. 2 D Give an account on the on and off rates and critical concentration in microfilament polymerization. 07

Q. 3 A Describe passive transport and active transport in prokaryotic cell. 08

Q. 3 B Explain the structure and working of  $\text{Na}^+$ - $\text{K}^+$  pump. 07

OR

Q. 3 C Explain anchoring junction and elaborate on different forms of anchoring junctions. 08

Q. 3 D Explain in detail about cell coat. 07

Q. 4 A Define chromosomal mutation? Explain chromosomal structure mutations with an example each. 08

Q. 4 B Discuss the cytogenetics and general characteristics of Trisomy 21 and Cri-du-Chat syndrome. 07

OR

Q. 4 C What is polyploidy? Describe its types. 08

Q. 4 D From a *Drosophila* testcross, the number of each phenotype obtained was as follows: 07

|       |       |       |          |
|-------|-------|-------|----------|
| $w^+$ | $m$   | $f^+$ | 218      |
| $w$   | $m^+$ | $f$   | 236      |
| $w^+$ | $m^+$ | $f$   | 168      |
| $w$   | $m$   | $f^+$ | 178      |
| $w^+$ | $m$   | $f$   | 95       |
| $w$   | $m^+$ | $f^+$ | 101      |
| $w^+$ | $m^+$ | $f^+$ | 3        |
| $w$   | $m$   | $f$   | <u>1</u> |
| Total |       |       | 1,000    |

- Find the parental genotype of the *Drosophila*.
- Make a map of these genes, showing their order and the distances between them.
- Derive the coefficient of coincidence for interference between the given genes.

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

15

- Extracellular matrix.
  - MTOCs.
  - Structure of microtubule.
  - Y-linked inheritance.
  - Euchromatin and heterochromatin.
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