10/02/2022

VCD/ SYBT SEM III CELL BIOLOGY & CYTOGENETICS 75 MARKS 2 ½ HRS

NOTE:

1. Attempt **all** questions.
2. **All questions** carry **equal** marks.
3. Draw **neat labeled diagrams** wherever necessary.
4. 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. Define cytoskeleton.
2. Microtubules contain ____ no. protofilament.
3. _____ cytoskeleton does not have any polarity.
4. State whether the following statement is true or false. 'Kinesin moves in the positive direction of microtubules.'
5. Actin has _____ as a motor protein.
6. MTOCs stands for ____.
7. What is microfilament?
8. Define mitosis.
9. Name the protein present in the periplasmic space of gram-negative bacteria in the ABC transporter.
10. Define antiporters.
11. Give any one function of the gap junction.
12. Give any one function of the extracellular matrix.
13. Define the term 'karyotype'.
14. There are ____ major types of proteins associated with DNA in chromatin.
15. State whether the following statement is true or false. 'The least compact form of chromatin shows beads-on-strings appearance.'
16. Name the following. 'The region of chromosomes that show the normal cycle of chromosome condensation and decondensation'.
17. Deletion in the short arm of chromosome number 5 in humans results in _____ syndrome.
18. Give an example of a syndrome that arises due to trisomy-21 condition in the set of chromosomes.
19. In _____ type of sex determination, sex chromosomes play a decisive role in the inheritance and determination of sex.
20. _____ is a place on a homologous pair of chromosomes at which the crossing over takes place.

10/02022

Q 2 A	Describe the nature of cytoskeleton.	08
Q 2 B	Explain the composition & structure of microtubule with help of neat & labelled diagrams.	07
	OR	
Q 2 C	Explain the dynamic function of microtubules.	08
Q 2 D	Explain in detail muscular contractility.	07
Q 3 A	Explain the structure and working of Na + - K + pumps.	08
Q 3 B	Describe passive transport and active transport in prokaryotic cells.	07
	OR	
Q 3 C	Give an account of functions of Cell membrane.	08
Q 3 D	Give an account of structural organisation and functions of tight junctions.	07
Q 4 A	Describe deletion and inversion as ways to change the chromosome structure.	08
Q 4 B	Illustratively explain Morgan's experiment work on *Drosophila* to study genetic linkage.	07
	OR	
Q 4 C	A corn plant known to be heterozygous at three loci is testcrossed. The progeny phenotypes and the numbers are as follows:	08

a^+ b^+ c^+	455
a b c	470
a^+ b c	35
a b^+ c^+	33
a^+ b^+ c	37
a b c^+	35
a^+ b c^+	460
a b^+ c	475
Total	2000

Give the gene arrangement, linkage relationships and map distances.

Q 4 D	Describe the mechanisms of sex determination.	07
Q 5	**Write short note on any three of the following**	15
a	Describe the structure of axoneme with the help of a neat & labelled diagram.	
b	Write a difference between actin & intermediate filament.	
c	Functions of Cell Coat.	
d	Duplication chromosomal mutation	
e	Features of tetrad analysis	