

B.Sc. BOTANY
THIRD SEMESTER (REPEAT)
CYTOLOGY & GENETICS
BSB-303
[USE OMR SHEET FOR OBJECTIVE PART]

Duration: 3 hrs.

Full Marks: 70

Time: 30 mins.

(Objective)

Marks: 20

Choose the correct answer from the following:

1×20=20

- Chromosomes are duplicated during which phase of the cell cycle?
 - G1 phase
 - G2 phase
 - S phase
 - Prophase
- Genotype of dominant plant can be determined by:
 - Pedigree analysis
 - Test cross
 - Back cross
 - Dihybrid cross
- Which human chromosomes are involved in Down's syndrome?
 - 6
 - 14 and 21
 - 8 and 12
 - X and Y
- Which one is the correct ratio, when F1 hybrids have dominant recessive alleles at one gene locus and recessive lethal alleles at the second locus?
 - 3:2:5:4
 - 6:4:3:2
 - 6:4:3:4
 - 3:1:6:2
- Colchicine is used to cause.....
 - Mitotic non-disjunction
 - Meiotic non-disjunction
 - Mitotic disjunction
 - Meiotic disjunction
- If the blood group of both the parents is AB, the possible blood group of children will be:
 - A, B, AB and O
 - A and B
 - A, B, O
 - A, B, AB
- Aneuploidy is usually deleterious because:
 - Chromosomal pairing is hampered
 - Size of individual may vary
 - Chromosomal disintegration is increased
 - Gene balance is disrupted
- Given below are two statements.
I: XX-XY type of sex determination is a means of male heterogamety.
II: In birds male heterogamity is seen as males produces two different types of gametes.
 - Both statements I & II are true
 - Statement I is true and statement II is false
 - Both statements I & II are false
 - Statement II is true and statement I is false
- Who discovered the cell and when?
 - Schwann in 1885
 - Tatum in 1664
 - Robert Hooke in 1665
 - De Bary in 1760

10. In pea pure tall plant (TT) is crossed with short plants (tt). What will be the ration of pure tall and short plants in F2 generation?
- | | |
|--------|--------|
| a. 1:1 | b. 1:3 |
| c. 3:1 | d. 2:1 |
11. Cell wall is mainly made up of:
- | | |
|------------|--------------|
| a. Protein | b. Cellulose |
| c. Lipid | d. Starch |
12. In protein synthesis, translocation is initiated with the movement of:
- | | |
|--|-------------------------------|
| a. tRNA from P-site to the A-site | b. tRNA from A-site to P-site |
| c. dipeptidyl tRNA from A-site to P-site | d. tRNA from P-site to E-site |
13. What is the function of the centrosome?
- | | |
|-------------------|--------------------------------|
| a. Osmoregulation | b. Secretion |
| c. Photosynthesis | d. Formation of spindle fibers |
14. On the ribosome, mRNA binds:
- | | |
|-------------------------|-------------------------|
| a. Between the subunits | b. To the small subunit |
| c. To the large subunit | d. None of these |
15. Crossing over occurs in the:
- | | |
|---------------------|--------------------|
| a. Diakinesis stage | b. Anaphse stage |
| c. Pachytene stage | d. Leptotene stage |
16. Eukaryotic mRNA binding to the ribosomes is facilitated by.....
- | | |
|-------------------------------|--------------------------------|
| a. the 7-methyl guanosine cap | b. tRNA |
| c. poly A tail | d. the Shine Dalgarno sequence |
17. Repulsion and coupling are two sides of the same coin:
- | | |
|------------------|--------------|
| a. Crossing over | b. Chiasmata |
| c. Linkage | d. Mutation |
18. What is the length of the DNA double helix, if the total number of bp (base pair) is 6.6×10^9 ?
- | | |
|----------|-------------|
| a. 2.2 m | b. 2.5 m/bp |
| c. 2.5 m | d. 2.2 m/bp |
19. When there is an increase in the condensation of chromatin during the process of cell division:
- | | |
|---|---|
| a. Heterochromatin increases | b. Euchromatin increases |
| c. Differentiation of euchromatin and heterochromatin increases | d. Differentiation of euchromatin and heterochromatin decreases |
20. Which carbon atom is bonded to N-9 of purine?
- | | |
|--------|-----------------|
| a. C-2 | b. C-3 |
| c. C-1 | d. Both B and C |

(Descriptive)

Time : 2 hr. 30 mins.

Marks : 50

[Answer question no.1 & any four (4) from the rest]

- | | |
|---|--------|
| 1. Describe the structure and function of microfilaments and microtubules. | 5+5=10 |
| 2. Write short notes on:
a) Difference between phenotype and genotype.
b) Co-dominance with proper example. | 5+5=10 |
| 3. Write the process of transcription in prokaryotes with proper diagram. | 10 |
| 4. Write a short note on the following:
a) Sex Chromosome
b) Genic balance theory of sex determination in Drosophila. | 5+5=10 |
| 5. Describe briefly about the different chromosomal aberrations. | 10 |
| 6. Write short notes on:
a) Polygenic inheritance with proper examples.
b) Double helical structure of A, B, Z DNA. | 4+6=10 |
| 7. Describe the process of Linkage and Crossing-over and their importance in inheritance. | 5+5=10 |
| 8. Write the process of translation in prokaryotes with proper diagram. | 10 |

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