

M.Sc. BOTANY
SECOND SEMESTER (REPEAT)
CYTOLOGY, GENETICS & PLANT BREEDING
MSB-203

**SET
A**

[USE OMR SHEET FOR OBJECTIVE PART]

Duration: 3 hrs.

Full Marks: 70

Time: 30 mins.

Marks: 20

(Objective)

Choose the correct answer from the following:

1 × 20 = 20

- The least level of chromosome organization is:
 - 30nm fibre
 - Solenoid
 - Nucleosome
 - None of the above
- The point at which polytene chromosomes appear to be attached together is known as:
 - Centriole
 - Centromere
 - Chromomere
 - Chromocenter
- In which typical stage are Lampbrush chromosomes observed?
 - Meiotic prophase
 - Mitotic metaphase
 - Mitotic prophase
 - Mitotic anaphase
- The _____ state implies the exit of cells from the cell cycle.
 - S
 - G1
 - G2
 - G0
- Synapsis is defined as the pairing of _____.
 - Acentric chromosomes
 - Non homologous chromosomes
 - Anychromosomes
 - Homologous chromosomes
- Test cross determines:
 - Whether two traits are linked or not
 - The genotype of F₂ plant
 - Whether the two species will breed successfully or not
 - Number of alleles in a gene
- Lack of independent assortment of two genes is due to:
 - Recombination
 - Crossing over
 - Linkage
 - Repulsion
- The genes for the seven characters chosen by Mendel are located on:
 - Four chromosomes
 - Five chromosomes
 - Six chromosomes
 - Seven chromosomes
- Which of the following ratio shows complementary gene interaction?
 - 9:7
 - 15:1
 - 1:2:1
 - 9:3:3:1
- Choose the correct ratio, which shows the masking gene interaction.
 - 12:3:1
 - 9:3:4
 - 1:2:1
 - 9:7

11. Which of the following catalyzes the cutting of PIP₂ into 2 moles of IP₃ and diacylglycerol in cell signaling?
 - a. Phosphokinase C
 - b. Phospholipase C
 - c. Lipokinase
 - d. Phosphodiesterase C
12. Which second messenger signals the release of Ca²⁺ from endoplasmic reticulum?
 - a. IP₃
 - b. 1, 2 diacyl glycerol
 - c. cAMP
 - d. cGMP
13. Which base undergoes spontaneous damage under physiological conditions?
 - a. Thymine
 - b. Cytosine
 - c. Uracil
 - d. Guanine
14. Which base is generated due to the deamination of adenine?
 - a. Guanine
 - b. Cytosine
 - c. Uracil
 - d. Hypoxanthine
15. A male bee can't have a _____.
 - a. Mother
 - b. Father
 - c. Grand father
 - d. Grand mother
16. In an entity with genetic composition AA+XXY such as Drosophila will be a normal female. In the case of mammals, it will be?
 - a. Turner
 - b. Klinefelter
 - c. * Normal female
 - d. Normal male
17. This number of Barr bodies are found in a female with XXXX chromosomes.
 - a. Four
 - b. Three
 - c. Two
 - d. One
18. Which of the following statement is NOT true for genetic markers?
 - a. A gene or a DNA sequence
 - b. Associated with a particular trait
 - c. Anything can be used as a genetic marker
 - d. The first genetic map was prepared was of fruit fly
19. Patau syndrome is a result of which of the following?
 - a. Non-disjunction of sex chromosome in female
 - b. Non- disjunction of sex chromosome in male
 - c. Non-disjunction of chromosome 21
 - d. Non-disjunction of chromosome 13
20. If an organism has 14 chromosomes, the number of chromosome generated by nullisomy will be _____.
 - a. 15
 - b. 7
 - c. 13
 - d. 12

(Descriptive)

Time : 2 hr. 30 mins.

Marks : 50

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

1. Explain the various phases of cell cycle. 10
2. Describe the following: 5+5=10
 - a) Dominant epistasis
 - b) Recessive epistasis
3. Write the various methods of sex determination. 10
4. What is mutation? Explain the various types of Point mutation. 1+9=10
5. Explain GPCR signaling and what is the effect of elevated secondary messenger cAMP associated with it. 10
6. Write short notes on *any two*: 5+5=10
 - a) AFLP
 - b) RAPD
 - c) RFLP
 - d) SSR
7. Write short notes on *any two*: 5+5=10
 - i) Extra nuclear inheritance
 - ii) Linkage
 - iii) Crossing Over
 - iv) Supplementary factors
8. Describe briefly the procedure and application of *any one* of the following: 8+2=10
 - i) Mass Selection
 - ii) Bulk selection

= = *** = =