2021

# BOTANY (Honours)

## Paper Code : VII - A & B

## [New Syllabus]

### Important Instructions for Multiple Choice Question (MCQ)

- Write Subject Name and Code, Registration number, Session and Roll number in the space provided on the Answer Script.

  **Example :** Such as for Paper III-A (MCQ) and III-B (Descriptive).

  Subject Code : | III | A | & | B |

  Subject Name : |  |

- Candidates are required to attempt all questions (MCQ). Below each question, four alternatives are given [i.e. (A), (B), (C), (D)]. Only one of these alternatives is 'CORRECT' answer. The candidate has to write the Correct Alternative [i.e. (A)/(B)/(C)/(D)] against each Question No. in the Answer Script.

  **Example —** If alternative A of 1 is correct, then write :
  **1. — A**

- There is no negative marking for wrong answer.

## মাল্টিপল চয়েস প্রশ্নের (MCQ) জন্য জরুরী নির্দেশাবলী

- উত্তরপত্রে নির্দেশিত স্থানে বিষয়ের (Subject) নাম এবং কোড, রেজিস্ট্রেশন নম্বর, সেশন এবং রোল নম্বর লিখতে হবে।

  **উদাহরণ** — যেমন Paper III-A (MCQ) এবং III-B (Descriptive)।

  Subject Code : | III | A | & | B |

  Subject Name : |  |

- পরীক্ষার্থীদের সবগুলি প্রশ্নের (MCQ) উত্তর দিতে হবে। প্রতিটি প্রশ্নে চারটি করে সম্ভাব্য উত্তর, যথাক্রমে (A), (B), (C) এবং (D) করে দেওয়া আছে। পরীক্ষার্থীকে তার উত্তরের স্বপক্ষে (A) / (B) / (C) / (D) সঠিক বিকল্পটিকে প্রশ্ন নম্বর উল্লেখসহ উত্তরপত্রে লিখতে হবে।

  **উদাহরণ** — যদি 1 নম্বর প্রশ্নের সঠিক উত্তর **A** হয় তবে লিখতে হবে :

  **1. — A**

- ভুল উত্তরের জন্য কোন নেগেটিভ মার্কিং নেই।

## Paper Code : VII - A

Full Marks : 16 Time : Thirty Minutes

Choose the correct answer.

Each question carries 1 mark.

1. The *rbcL* gene is present in —
   (A) Chloroplast
   (B) Mitochondria
   (C) Ribosome
   (D) Nucleus

2. Keratin are types of —
   (A) Microtubules
   (B) Intermediate filaments
   (C) Actin filaments
   (D) Myosin filaments

3. The sum total of genes in reproductive gametes in a population is called —
   (A) Gene frequency
   (B) Gene pool
   (C) Genetic pool
   (D) Genetic drift

4. Polyploidy is induced through —
   (A) Irradiation
   (B) Mutagenic chemicals
   (C) Ethylene
   (D) Colchicine

5. Non coding sequences in the nucleic acid is called —

(A) Palindromes

(B) CAAT box

(C) Cistron

(D) Introns

6. The crossing of F1 hybrid with the homozygous recessive is called —

(A) Back cross

(B) Test cross

(C) MI cross

(D) All of the above

7. Trisomy is expressed in —

(A) (2n−2)

(B) (2n+2)

(C) (2n−1)

(D) (2n+1)

8. When a cell moves away from the cell cycle and enters into the quiescent stage, then it is called —

(A) $G_1$ Stage

(B) $G_2$ Stage

(C) S Stage

(D) $G_0$ Stage

9. Endomitosis is found in —

(A) Polytene chromosome

(B) Lampbrush chromosome

(C) B-Chromosome

(D) Both (A) and (B)

10. The restorer gene is present in —

(A) Mitochondria

(B) Cytoplasm

(C) Cytoplasm and nucleus both

(D) Nucleus

11. Histones are made up of —

(A) Tryptophan

(B) Lysine

(C) Arginine

(D) Both (B) and (C)

12. In the overlapping gene concept, one or two bases in a codon are utilized by —

(A) Single reading frame of a gene

(B) More than one reading frame of a gene

(C) More than one reading frames of more than one gene

(D) None of the above

13. Which of the following prevents depolymerisation of tubulin subunits —

(A) Colchicine

(B) Ethylene

(C) Taxol

(D) Both (A) and (B)

14. Which of the following subunit is absent in the histone core?

(A) H2A

(B) H4

(C) H1

(D) H2B

15. In a population following Hardy-Weinberg principle, $q^2 = 0.04$, then the frequency of heterozygous (2pq) individuals will be —

(A) 0.45

(B) 0.32

(C) 0.64

(D) 0.48

16. $F_2$ phenotype in dominant Epistasis will be —

(A) 1:2:1

(B) 9:3:4

(C) 9:3:3:1

(D) 12:3:1

2021

# BOTANY (Honours)

## Paper Code : VII - B

## [New Syllabus]

Full Marks : 64 Time : Three Hours Thirty Minutes

*The figures in the margin indicate full marks.*

### Group - A

1. Answer any *three* questions of the following : 4×3=12

   (a) Briefly describe the ultrastructure of chloroplast DNA (cp -DNA) with diagram. 4

   (b) State the functions of Peroxisome. 4

   (c) Compare between Constitutive and Facultative heterochromatin. 2+2=4

   (d) What is nucleosome? Briefly describe the structure of "Nucleosome Core" with a suitable diagram. 1+3=4

   (e) Give a short account on Intermediate filaments. 4

   (f) Distinguish between syngenesis with synapsis with diagram. 2+2=4

2. Answer any *two* questions from the following : 10×2=20

   (a) Describe the structure of Microtubules with suitable diagram. Mention the role of microtubules in the chromosome movement during Anaphase. 6+4=10

   (b) What is meant by Inversion? Differentiate between paracentricinversions with Pericentric inversion with suitable diagrams. Define Amphidiploidy with example. 2+3+3+2=10

(c) Describe the ultrastructure of the Nuclear envelope with labeled sketches. Mention briefly the functions of Golgi bodies. 7+3=10

(d) Describe the check points in cell cycle. Describe the role of Cyclins and protein kinases in cell cycle regulation. 5+5=10

## Group - B

1. Answer any *three* questions of the following : 4×3=12

(a) Briefly mention the different applications of male sterility found in plants. 4

(b) Describe the phenomenon of epistasis with an example. 4

(c) What is meant by Frequency distribution? Write about the different types of frequency distribution? 1+3=4

(d) Describe the XO-YO method of sex determination process observed in plants with example. 4

(e) State the Hardy-Weinberg principle. What is random genetic drift? 3+1=4

(f) Describe the structure of split gene with diagram. 4

2. Answer any *two* questions from the following : 10×2=20

(a) Give an account on the molecular basis of genetic recombination with labeled diagrams (Holliday Model). 10

(b) Give a comparative account on mass selection and pure line selection. Write down the advantages of clonal selection. 6+4=10

(c) What is heterosis? How does it differ from Heterobeltiosis? Give an account on the dominance hypothesis and over dominance hypothesis to explain genetic basis of Heterosis. 2+2+6=10

(d) In a three point test cross (ABC/abc X abc/abc), the following data were obtained :

| | |
|---|---|
| ABC-230 | ABc-138 |
| abc- 240 | abC-142 |
| aBC-96 | aBc-12 |
| Abc-104 | AbC-8 |

Find out the correct linear order of genes and prepare a genetic map. Calculate the coefficient of Coincidence and Interference. 8+2=10