2022

BOTANY

(Honours)

Paper Code : IX - A & B

(New Syllabus)

Full Marks : 80 Time : Four Hours

Paper Code : IX - A

(Marks : 16)

Choose the correct answer.

Each question carries 1 Mark.

1. Which of the following method uses the principle of DNA-DNA hybridization —
   (A) GISH
   (B) ELISA
   (C) Northern blotting
   (D) FRAP
2. Which of the following is used for the preparation of Synthetic seed?
   (A) Sodium alginate
   (B) Sodium carbonate
   (C) Calcium carbonate
   (D) Potassium chloride
3. Most widely used basic tissue culture media is —
   (A) Nutrient Agar media
   (B) Luria broth media
   (C) Morishige-Skoog media
   (D) Yeast Extract Agar media
4. The ‘Pili’ in bacteria is used for —
   (A) Propagation
   (B) Motility
   (C) Conjugation
   (D) Translation

5. Plant with nuclear genome from one parent and chloroplast/mitochondria genome from another parent is a —

   (A) Hybrid

   (B) Heterosis

   (C) Cybrid

   (D) All of the above

6. What is Callus?

   (A) Tissues that grow to form an embryoid

   (B) An unorganized actively dividing the mass of cells maintained in a culture

   (C) An insoluble carbohydrate

   (D) A tissue that grows from an embryo

7. Which of the component serves as 'Mordant' in the Gram staining method —

   (A) Iodine

   (B) Alcohol

   (C) Safranin

   (D) Crystal violet

8. Haploid plants can be obtained from_____.

   (A) Anther culture

   (B) Bud culture

   (C) Leaf culture

   (D) Root culture

9. For a single cell to differentiate into every type of cell of an organism, the cell must show —

   (A) Unipotency

   (B) Pluripotency

   (C) Multipotency

   (D) Totipotency

10. An example of Gram -ve bacilli is —

   (A) *Streptococcus*

   (B) *E. coli*

   (C) *Staphylococcus*

   (D) *Mycobacteria*

11. Creutzfeldt-Jakob Disease (CJD) is caused by —

(A) Virion

(B) Prion

(C) TMV

(D) SARS CoV-2

12. Name the unit of Replication —

(A) Gene

(B) Operon

(C) Replicon

(D) Chromosome

13. Tobacco mosaic virus (TMV) is a —

(A) single-stranded DNA virus

(B) double-stranded DNA virus

(C) single-stranded RNA virus

(D) double-stranded RNA virus

14. The protein coat of viruses that enclose the genetic material is called _____.

(A) Virion

(B) Capsid

(C) Peplomers

(D) Capsomers

15. An example of 'fusogen' which is used in the protoplast fusion technique is —

(A) Poly ethylene glycol (PEG)

(B) Agarose

(C) Mannitol

(D) Glucose

16. *Thermus aquaticus* is the source of _____.

(A) Restriction endonuclease

(B) Primase enzyme

(C) Taq polymerase

(D) Ligase

_____

Paper Code : IX - B

(Marks : 64)

The figures in the margin indicate full marks.
Candidates are required to give their answers in their own words as far as practicable.

Group - A

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

   (i) Describe briefly the lysogenic cycle of Lambda phage with a suitable diagram.

   (ii) Briefly describe the formation of the endospore.

   (iii) Write a short note on viroids and prions.

   (iv) Describe a typical bacterial growth curve.

   (v) What are biopesticides? Explain with examples. 1+3

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

   (i) What are the differences between Achaea and Eubacteria? Enumerate the chemical nature and structure of Gram-positive bacterial cell walls. 4+6

   (ii) Outline the steps involved in the industrial production of Streptomycin. Describe the role of biofertilizers in modern agriculture. 5+5

   (iii) Distinguish between bacterial flagella and pili. Briefly describe the ultrastructure of Gram-negative bacterial flagella. 4+6

   (iv) With a suitable diagram, describe the structural organization and chemistry of TMV. Illustrate the mechanism of plant virus transmission. 5+5

Group - B

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

   (i) What is RNA splicing and mention its significance. 2+2=4

   (ii) Illustrate the process of the somatic embryo produced for plant propagation.

   (iii) Mention the principle and steps of the PCR mechanism.

   (iv) Write a short note on transversion and frame-shift mutation.

   (v) Define restriction endonuclease. What are the different types of restriction endonuclease? 1+3

4. Answer any *two* of the following : 10×2=20

   (i) Illustrate the structure and function of T-DNA. Write down the role of *Agrobacterium* in gene transfer. 4+6

   (ii) Define operon. Describe the structure and function of different components of lac operon. 2+4+4

(iii) Describe the method of Protoplast culture in a plant tissue culture. What is the application of hybrid cell culture? 7+3

(iv) What are the factors for DNA damage? Briefly describe the DNA damage repair mechanism. 3+7

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