

CUET PG 2025 PLANT BIOTECHNOLOGY Question Paper

Time Allowed :1 Hour 30 Mins	Maximum Marks :300	Total Questions :75
------------------------------	--------------------	---------------------

General Instructions

Read the following instructions very carefully and strictly follow them:

1. The examination duration is 90 minutes. Manage your time effectively to attempt all questions within this period.
2. The total marks for this examination are 300. Aim to maximize your score by strategically answering each question.
3. There are 75 mandatory questions to be attempted in the Agro forestry paper. Ensure that all questions are answered.
4. Questions may appear in a shuffled order. Do not assume a fixed sequence and focus on each question as you proceed.
5. The marking of answers will be displayed as you answer. Use this feature to monitor your performance and adjust your strategy as needed.
6. You may mark questions for review and edit your answers later. Make sure to allocate time for reviewing marked questions before final submission.
7. Be aware of the detailed section and sub-section guidelines provided in the exam. Understanding these will aid in effectively navigating the exam.

1. Plants having half the somatic chromosome number than found in normal individual are called -

- (A) Monoploid
- (B) Haploid
- (C) Aneuploids
- (D) Monosomics

2. The production of haploids by anther and pollen culture was first demonstrated by -

- (A) Maheswari and Guha
- (B) Ravi and Chan
- (C) Kasha and Kao
- (D) Clausen and Cameron

3. Plants cannot absorb molecular nitrogen from the atmosphere because

- (A) It has double bonds making it highly stable.
- (B) It has triple bonds making it highly stable.
- (C) Its abundance in atmosphere inhibits absorption.
- (D) It has double bonds making it highly unstable.

4. Inducing the formation of various vegetative organs from cells or tissues in plant tissue culture is called -

- (A) Somatic embryogenesis
- (B) Dedifferentiation
- (C) Organogenesis
- (D) Somatic hybridization

5. Production of secondary metabolites require the use of -

- (A) Cell suspension
- (B) Solid agar medium
- (C) Meristem
- (D) Axillary bud

6. Media that contain some chemical with unknown chemical composition is called _____ media.

- (A) Synthetic
- (B) Enrichment
- (C) Complex
- (D) Selective

7. For obtaining pure cultures of bacteria _____ plate method is not used.

- (A) Streak
- (B) Spread
- (C) Pour
- (D) Dip

8. Select the correct statements regarding somaclonal variations

- A. These variations can also result in unwanted traits.**
- B. Somaclones have been developed and proved advantageous in several crops.**
- C. These variations can be used to engineer novel traits.**
- D. Short term invitro callus and cell suspension, cultures results in somaclonal variation.**

Choose the correct answer from the options given below :

- (A) A, C and D Only
- (B) A, B and C Only
- (C) A and B Only
- (D) A and D Only

9. In plant tissue culture formation of organ primordia-like shoot or root in callus cells is called -

- (A) Dedifferentiation
- (B) Redifferentiation
- (C) Somatic embryogenesis
- (D) Regeneration

10. Who is regarded as father of 'Plant Tissue Culture' (P. T. C.)?

- (A) Gottlieb Haberlandt
- (B) Theodor Schwann
- (C) Friedrich J. Haberlandt
- (D) Robert Koch

11. The first androgenic haploid plant product by anther culture was from -

- (A) Soybean
- (B) Datura
- (C) Potato
- (D) Barley

12. The process of combining cytoplasmic genomes of one parent with nuclear

genome of other parent is called -

- (A) Somatic hybridization
- (B) Micropropagation
- (C) Cybridization
- (D) Regeneration

13. _____ Molecules of ATP are required to fix one molecule of nitrogen (N_2) to $2NH_3$.

- (A) 4
- (B) 8
- (C) 16
- (D) 20

14. Symbiotic nitrogen fixing bacteria are found in -

- A. Azolla
- B. Gnetum
- C. Anthoceros
- D. Cycas
- E. Riccia

Choose the correct answer from the options given below :

- (A) A, C and D Only
- (B) B, C and E Only
- (C) C, D and E Only
- (D) B, C and D Only

15. Important enzymes involved in nitrogen fixation are -

- (A) Nitrogenase and peptidase
- (B) Nitrogenase and hexokinase
- (C) Hexokinase and dehydrogenase
- (D) Nitrogenase and hydrogenase

16. 'Pomato' a hybrid of potato and tomato was produced through-

- (A) Shoot tip culture
- (B) Anther culture
- (C) Somatic hybridization
- (D) Seed culture

17. Arrange the following steps in the process of nitrogen cycle in correct sequence:

- A. Nitrogen fixation**
- B. Nitrification**
- C. Denitrification**
- D. Assimilation**
- E. Ammonification**

Choose the correct answer from the options given below :

- (A) A, B, C, D, E
- (B) C, D, E, A, B
- (C) A, B, D, E, C
- (D) C, A, B, D, E

18. Virus free plants can be grown by : -

- (A) Embryo culture
- (B) Apical meristem culture
- (C) Callus culture
- (D) Organ culture

19. Match LIST-I with LIST-II

LIST-I		LIST-II	
A.	Somatic hybridization	I.	Cell suspension culture
B.	Parthenocarpy	II.	Fusion protoplasts from somatic cells
C.	Micropropagation	III.	Seedless fruits without fertilization
D.	Single cell production	IV.	Multiplication of plants without sexual reproduction

Choose the correct answer from the options given below:

- (A) A-II, B-IV, C-I, D-III
- (B) A-II, B-III, C-IV, D-I
- (C) A-III, B-II, C-I, D-IV
- (D) A-IV, B-III, C-II, D-I

20. Arrange the following steps for plant tissue culture (P.T.C.) in correct sequence:

- A. Selection of desired material and suitable nutrient media for P. T. C.**
- B. Inoculation of explants**
- C. Surface sterilization of explant**
- D. Transfer of growing cultures**
- E. Transfer of plantlets to soil in pots**

Choose the correct answer from the options given below :

- (A) A, B, C, D, E
- (B) A, C, B, D, E
- (C) A, C, E, B, D
- (D) B, C, A, E, D

21. In nitrogen cycle, Ammonification is the process of generating ammonia from-

- (A) Amino acids
- (B) Nitrates
- (C) Nitrites
- (D) Nitrogen

22. Match LIST-I with LIST-II

LIST-I		LIST-II	
A.	Gene inhibition	I.	Addition of functional gene to their genome to replace missing
B.	Gene editing	II.	Disarm the product of faulty gene
C.	Gene targeting	III.	CRISPR/Cas9
D.	Gene Augmentation therapy	IV.	Replacement of non functional gene with normal gene

Choose the correct answer from the options given below:

- (A) A-III, B-IV, C-II, D-I
- (B) A-II, B-III, C-IV, D-I
- (C) A-I, B-II, C-III, D-IV
- (D) A-IV, B-III, C-I, D-II

23. Conversion of ammonia to nitrates is called -

- (A) Ammonification
- (B) Assimilation
- (C) Nitrification

(D) Denitrification

24. Choose the correct statements regarding plant tissue culture -

- A. Organogenesis is inducing the formation of various vegetative organs from cells or tissues.
- B. Formation of mass of undifferentiation cells from callus redifferentiation.
- C. Cytoplasmic hybrids are prepared by taking the nucleus from one parent and cytoplasm from both the parents.
- D. Relative concentration of growth hormones play important role in organogenesis.

Choose the correct answer from the options given below :

- (A) A, B, and C Only
 - (B) B, C and D Only
 - (C) A and B Only
 - (D) A, C and D Only
-

25. Full form of CRISPR, a term used in genome editing is -

- (A) Clustered regularly inter spaced short palindromic repeats
 - (B) Cumulative routinely inter spaced short palindromic repeats
 - (C) Cumulative regularly inter spaced short palindromic repeats
 - (D) Clustered routinely inter spaced slight palindromic repeats
-

26. Choose the correct statements regarding homozygous diploid plants -

- A. They are produced by doubling the chromosome number of haploids.
- B. Doubling of chromosome enables the recessive traits to express too.
- C. Chromosome doubling is done by Ozone treatment.
- D. Chromosome doubling is done by colchicine treatment.

Choose the correct answer from the options given below:

- (A) A, B and D Only
 - (B) A, C and D Only
 - (C) A, B and C Only
 - (D) A, and D Only
-

27. Transgenic plants developed by introducing *Bt* gene in crops like brinjal, maize, cotton etc. provide resistance to:

- (A) insect pests
 - (B) viral infection
 - (C) heat
 - (D) fungal diseases
-

28. Which of the following converts nitrites to nitrates?

- (A) Clostridium
 - (B) Nitrobacter
 - (C) Nitrosomonas
 - (D) Nitrococcus
-

29. San Noeum first successfully cultured gynogenic haploid plants from unfertilized ovaries of -

- (A) Maize
 - (B) Barley
 - (C) Wheat
 - (D) Rice
-

30. Nitrogen fixation occurs with the help of symbiotic bacteria in -

- A. Pea**
- B. Lettuce**
- C. Beans**
- D. Tomato**
- E. Black gram**

Choose the correct answer from the options given below :

- (A) A, B and C Only
 - (B) B, C and D Only
 - (C) B, C and E Only
 - (D) A, C and E Only
-

31. In biological nitrogen fixation conversion of dinitrogen molecule into ammonia is carried out by enzyme.

- (A) Hydrogenase
- (B) Dehydrogenase

- (C) Nitrogenase
 - (D) Nitrate reductase
-

32. Choose the correct statements regarding cytology of haploids -

- A. A haploid in Arabidopsis will have 5 chromosomes.**
- B. Haploids are found as bivalents at metaphase-I of meiosis.**
- C. Haploids are found as univalent at metaphase-I of meiosis.**
- D. The haploids in maize will have 10 chromosomes.**
- E. The haploids in maize will have 20 chromosomes.**

Choose the correct answer from the options given below :

- (A) A, B and C Only
 - (B) A, C and E Only
 - (C) A, C and D Only
 - (D) A, B and E Only
-

33. Haploids can be artificially produced by -

- A. Colchicine doubling**
- B. X-ray treatment**
- C. Pollen culture**
- D. Distant hybridization**
- E. Infrared radiation**

Choose the correct answer from the options given below :

- (A) A, B, and C Only
 - (B) B, C, and E Only
 - (C) A, D, and E Only
 - (D) B, C, and D Only
-

34. Autonomously replicating circular extrachromosomal DNA is called -

- (A) Recombinant DNA
 - (B) Cybrid
 - (C) Plasmid
 - (D) Yeast artificial chromosome
-

35. Nitrogen fixing cyanobacteria *Anabaena* is found in the root pockets of -

- (A) Azolla
 - (B) Pistia
 - (C) Marsilea
 - (D) Salvinia
-

36. The cutting of DNA at specific locations became possible with the discovery of -

- (A) Reverse transcriptase
 - (B) Restriction endonuclease
 - (C) Bacteriophage
 - (D) P. C. R.
-

37. Arrange the basic steps to develop G. M. O. (Genetically modified organisms) in sequence:

- A. Transfer of DNA with desired genes to its progeny**
- B. Identification of DNA with desired genes**
- C. Introduction of the DNA into the host.**
- D. Maintenance of introduced DNA in the host.**

Choose the correct answer from the options given below :

- (A) A, B, C, D
 - (B) B, C, A, D
 - (C) B, A, D, C
 - (D) B, C, D, A
-

38. A microbial biocontrol agent which control butterfly caterpillars in plants is -

- (A) *Bacillus thuringiensis*
 - (B) *Streptococcus* sps.
 - (C) *Saccharomyces cerevisiae*
 - (D) *Trichoderma polysperum*
-

39. What is the function of leghemoglobin present in root nodule of leguminous plants?

- (A) Inhibition of nitrogenase activity
- (B) Removal of oxygen
- (C) Nodule differentiation.

(D) Expression of nif gene

40. CRISPR-Cas 9 is a gene _____ technique.

- (A) sequencing
 - (B) labelling
 - (C) editing
 - (D) locating
-

41. Choose the correct statements regarding *Agrobacterium tumefaciens* -

- A. It is a gram positive round shaped bacterium
- B. It is a gram negative rod shaped bacterium
- C. It is a photosynthetic spiral bacterium
- D. It is also known as 'Natural genetic Engineer'
- E. It is capable of naturally transferring DNA into plant genome

Choose the correct answer from the options given below :

- (A) A, B and C Only
 - (B) B, D and E Only
 - (C) B, C and D Only
 - (D) A, D and E Only
-

42. Source organism of cry genes is -

- (A) *Bacillus thuringiensis*
 - (B) *Agrobacterium tumefaciens*
 - (C) *Rhizobium*
 - (D) *Staphylococcus*
-

43. Which of the following elements play key role in nitrogen fixation?

- (A) Zinc
 - (B) Copper
 - (C) Molybdenum
 - (D) Manganese
-

44. Which of the following methods/tools is not used for introduction of recombinant DNA into host cell?

- (A) Microinjection
 - (B) Denaturation
 - (C) Gene gun
 - (D) Heat shock method
-

45. Arrange the following steps in the process of somatic hybridization in correct sequence:

- A. Plating of fused protoplasts
- B. Selection of hybrid cells
- C. Protoplast isolation and its treatment with fusion chemical.
- D. Transfer of callus to differentiation medium
- E. Selection of somatic hybrid plants

Choose the correct answer from the options given below :

- (A) A, B, C, D, E
 - (B) C, A, B, D, E
 - (C) B, C, D, A, E
 - (D) A, C, B, D, E
-

46. The correct combination of somaclonal variant released as a new cultivar is -

- (A) Barley - Andro
 - (B) Geranium - Velvet Rose
 - (C) Tomato - DAMA
 - (D) Sugarcane - Scarlet
-

47. K. J. Kasha and coworkers found that following the cross between *Hordeum vulgare* × *Hordeum bulbosum*, chromosomes of *H. bulbosum* were eliminated in early zygotic division, so few days after pollination, embryos can be cultured to get haploids. This method is called as -

- (A) Delayed pollination
 - (B) Distant hybridization
 - (C) Nucellus culture
 - (D) Androgenesis
-

48. Antisense RNA technique is used -

- (A) To silence the gene expression
 - (B) To enhance the gene expression
 - (C) For cell mediated gene transfer
 - (D) For DNA fingerprinting
-

49. Using natural predators for the control of pathogens is known as ____ control.

- (A) Physical
 - (B) Biological
 - (C) Chemical
 - (D) Enzymatic
-

50. Optimum pH for protoplast culture is -

- (A) 6.5 to 7.0
 - (B) 5.5 to 5.9
 - (C) 4.5 to 4.9
 - (D) 7.5 to 7.9
-

51. Match LIST-I with LIST-II

LIST-I (Culture Type)		LIST-II (Use/application)	
A.	Embryo culture	I.	Somatic hybridization
B.	Meristem culture	II.	Production of haploids
C.	Protoplast culture	III.	Shortening of breeding cycle
D.	Anther culture	IV.	Virus free plants

Choose the correct answer from the options given below:

- (A) A-II, B-III, C-IV, D-I
 - (B) A-III, B-IV, C-II, D-I
 - (C) A-II, B-I, C-IV, D-III
 - (D) A-III, B-IV, C-I, D-II
-

52. Prions are the -

- (A) infectious proteinaceous agents
- (B) DNA without protein coat

- (C) RNA without protein coat
 - (D) Protozoans
-

53. What is CPW in protoplast culture method?

- (A) Cell and protoplast washing
 - (B) Cytosol and protoplasm washing
 - (C) Cell and protoplast waste
 - (D) Cell and proteolytic waste
-

54. Arrange the following events in Western Blotting experiment in correct order:

- A. Protein resolution by PAGE**
- B. Primary antibody binding**
- C. Transfer onto nitrocellulose membrane**
- D. Protein denaturation in loading dye.**

Choose the correct answer from the options given below :

- (A) A, C, B, D
 - (B) D, A, C, B
 - (C) B, A, D, C
 - (D) C, B, D, A
-

55. In cyanobacteria nitrogen fixation takes place in -

- (A) Heterocyst
 - (B) Akinetes
 - (C) Nodules
 - (D) Hormogonia
-

56. Synthetic seeds are produced by the encapsulation of somatic embryos with-

- (A) Sodium acetate
 - (B) Sodium chloride
 - (C) Sodium nitrate
 - (D) Sodium alginate
-

57. In plant tissue culture higher concentration of cytokinin generally promotes-

- (A) Root regeneration
 - (B) Shoot regeneration
 - (C) Leaf primordia
 - (D) Flower initiation
-

58. Chemical most widely used for chromosome doubling in haploid culture is-

- (A) Sorbitol
 - (B) Mannose
 - (C) Colchicine
 - (D) Mannitol
-

59. Which combination of strategies forms the basis of in vivo haploid induction technologies in plants?

- A. induction of parthenogenesis**
- B. culture of anthers or ovules**
- C. use of paternal inducer lines**
- D. uniparental genome elimination**

Choose the correct answer from the options given below:

- (A) A, B and C only
 - (B) B, C and D only
 - (C) A, C and D only
 - (D) B, and D only
-

60. Match LIST-I with LIST-II

LIST-I		LIST-II	
A.	Biological nitrogen fixation	I.	Nitrobacter
B.	Conversion of ammonia to nitrite	II.	Paracoccus
C.	Conversion of nitrite to nitrate	III.	Rhizobium
D.	Denitrification	IV.	Nitrosomonas

Choose the correct answer from the options given below:

- (A) A-II, B-III, C-IV, D-I
- (B) A-III, B-IV, C-I, D-II
- (C) A-I, B-III, C-II, D-IV

(D) A-I, B-II, C-III, D-IV

61. Select the correct combination of protoplast isolation enzyme and its most popular source -

- (A) Cellulase - *Helix pomatia*
- (B) Hemicellulase - *Trichoderma viride*
- (C) Macerozyme R - 10 - *Rhizopus arrhizus*
- (D) Zymolyase - *Aspergillus niger*

62. Match LIST-I with LIST-II

LIST-I (Biocontrol)		LIST-II (Example)	
A.	Bacterium	I.	Bacillus thuringiensis
B.	Fungus	II.	Clostridium
C.	Insect	III.	Trichoderma
D.	Biopesticide	IV.	Cotton aphid

Choose the correct answer from the options given below:

- (A) A-IV, B-II, C-III, D-I
- (B) A-II, B-IV, C-III, D-I
- (C) A-II, B-III, C-IV, D-I
- (D) A-III, B-II, C-I, D-IV

63. Copies of DNA strands generated during a polymerase chain reaction are known as -

- (A) Multicons
- (B) Polycons
- (C) Amplicons
- (D) Monocons

64. Which gene in shoot apical meristem (SAM) negatively regulate WUS expression?

- (A) CLV
- (B) STM
- (C) AP1

(D) TAB1

65. Match LIST-I with LIST-II

LIST-I (Organism)		LIST-II (use in biotechnology)	
A.	<i>Thermus aquaticus</i>	I.	Cry proteins
B.	<i>Agrobacterium tumefaciens</i>	II.	DNA polymerase
C.	<i>E. coli</i> DH5a	III.	epsps gene
D.	<i>Bacillus thuringiensis</i>	IV.	DNA cloning

Choose the correct answer from the options given below:

- (A) A-I, B-II, C-IV, D-III
- (B) A-II, B-III, C-IV, D-I
- (C) A-II, B-I, C-IV, D-III
- (D) A-IV, B-III, C-II, D-I

66. Match LIST-I with LIST-II

LIST-I (Technique)		LIST-II (used for)	
A.	Northern blotting	I.	To detect specific proteins in this sample of tissue homogenate
B.	Southern blotting	II.	Detection of specific post translation modification of proteins.
C.	Western blotting	III.	To detect specific RNA molecule in mixture of RNA.
D.	Eastern blotting	IV.	To detect specific DNA in a mix of samples.

Choose the correct answer from the options given below:

- (A) A-II, B-III, C-IV, D-I
- (B) A-III, B-IV, C-I, D-II
- (C) A-III, B-IV, C-II, D-I
- (D) A-I, B-II, C-III, D-IV

67. In general, the cytoplasmic male sterility (CMS) causing genes are transcribed in which plant cell organelle?

- (A) Nucleus
- (B) Peroxisome
- (C) Mitochondria
- (D) Chloroplast

68. Match the LIST-I with LIST-II

LIST-I		LIST-II	
A.	Karl Ereky	I.	Invented DNA 'Fingerprinting'
B.	Joshua Lederberg	II.	Coined the term 'Biotechnology'
C.	Kary Mullis	III.	Discovered plasmids
D.	Sir Alec Jefferys	IV.	Developed polymerase chain reaction

Choose the correct answer from the options given below:

- (A) A-II, B-III, C-IV, D-I
 - (B) A-III, B-IV, C-I, D-II
 - (C) A-IV, B-III, C-II, D-I
 - (D) A-I, B-II, C-III, D-IV
-

69. Match LIST-I with LIST-II

LIST-I		LIST-II	
A.	Protoplast	I.	Ability of cell to develop into a new plant
B.	Explant	II.	Unorganized mass of cells
C.	Totipotency	III.	Naked cell
D.	Callus	IV.	Any plant tissue used to regenerate new tissue/organ/plant in vitro

Choose the correct answer from the options given below:

- (A) A-II, B-III, C-IV, D-I
 - (B) A-III, B-II, C-I, D-IV
 - (C) A-III, B-IV, C-I, D-II
 - (D) A-I, B-II, C-III, D-IV
-

70. Match the LIST-I with LIST-II

LIST-I		LIST-II	
A.	Auxin	I.	undifferentiated mass of cell
B.	Protoplast	II.	6-Furfuryl amino purine
C.	Callus	III.	Indole-3 Acetic Acid
D.	Cytokinin	IV.	Pectinase

Choose the correct answer from the options given below:

- (A) A-I, B-II, C-III, D-IV
- (B) A-I, B-III, C-II, D-IV
- (C) A-III, B-I, C-IV, D-II
- (D) A-III, B-IV, C-I, D-II

71. Match LIST-I with LIST-II

LIST-I		LIST-II	
A.	Gynogenesis	I.	Callus culture
B.	Culturing in liquid medium	II.	Ovary culture
C.	Androgenesis	III.	Suspension culture
D.	Culturing on agar medium	IV.	Pollen culture

Choose the correct answer from the options given below:

- (A) A-II, B-III, C-IV, D-I
- (B) A-III, B-IV, C-II, D-I
- (C) A-II, B-IV, C-I, D-III
- (D) A-I, B-II, C-III, D-IV

72. Which of the following will be present in the F₁ multicellular embryo, derived from a cross of female plant (A) with male plant B, through "bulbosum method"?

- (A) Chromosomes of A
- (B) Homologous chromosomes of A and B
- (C) Chromosomes of B
- (D) recombinant chromosomes of A and B

73. Arrange the steps in PEG induced protoplast fusion in correct sequence -

- A. Treatment of protoplast mixture with 28-50% PEG for 15-30 minutes.
- B. Protoplast aggregation.
- C. Washing of protoplast (alkaline medium pH 9-10), and high Ca²⁺ concentration
- D. Selection of protoplasts of different strains / species.

Choose the correct answer from the options given below :

- (A) A, B, C, D
- (B) D, A, B, C
- (C) C, D, B, A
- (D) D, B, C, A

74. Match LIST-I with LIST-II

LIST-I (Scientist)		LIST-II (Landmark discovery)	
A.	Van Overbeek	I.	Transgenic Bt-cotton
B.	White	II.	Introduced coconut water as a media component
C.	Went	III.	First synthetic plant tissue culture medium
D.	Monsanto	IV.	First plant growth hormone ie IAA

Choose the correct answer from the options given below:

- (A) A-III, B-II, C-IV, D-I
 (B) A-I, B-II, C-IV, D-III
 (C) A-III, B-IV, C-II, D-I
 (D) A-II, B-III, C-IV, D-I

75. Match LIST-I with LIST-II

LIST-I		LIST-II	
A.	Sea weeds	I.	Isolation of DNA from gel.
B.	Staining of DNA	II.	Gel electrophoresis
C.	Elution	III.	Source of agarose
D.	Separation of DNA fragments	IV.	Ethidium bromide

Choose the correct answer from the options given below:

- (A) A-III, B-IV, C-II, D-I
 (B) A-III, B-IV, C-I, D-II
 (C) A-II, B-IV, C-I, D-III
 (D) A-III, B-II, C-IV, D-I