Code No. $\quad$ R - 2106

## Entrance Examination for Admission to the P.G. Courses in the Teaching Departments, 2023 <br> CSS <br> GENETICS AND PLANT BREEDING



## General Instructions

1. The Question Paper is having 100 Objective Questions, each carrying one mark.
2. The answers are to be $(\checkmark)$ 'tick marked' only in the "Response Sheet" provided.
3. Negative marking : $\mathbf{0 . 2 5}$ marks will be deducted for each wrong answer .

Time : 2 Hours
Max. Marks : 100

To be filled in by the Candidate

| Register <br> Number <br> Num Figures | in words |  |  |  |  |  |  |  |  |
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Choose appropriate answer from the options in the questions.

$$
\text { (100 × } 1 \text { = } 100 \text { marks) }
$$

1. Which of the following is not a virus symptom in plants.
a) Necrosis
b) Vein clearing
c) Ring spot
d) Damping off

2. An example of a parasitic bacterium
a) Xanthomonas citri
b) Pseudomonas eruginosa
c) Rhizobium leguminosarum
d) Micrococcus denitrificans
3. Which among the following lacks heterocyst
a) Nostoc
b) Oscillatoria
c) Gleotrichia
d) Rivularia
4. Transfer of genetic material from one bacterium to another through the agency of a virus
a) Transformation
b) Transduction
c) Transamination
d) Conjugation
5. Cryophytes are found
a) in fresh water ponds
b) on ice and snow
c) in deep sea
d) on sea shore
6. In volvox the plakea stage is represented by
a) 2 cells
b) 4 cells
c) 8 cells
d) 16 cells
7. Life cycle of Polysiphonia is referred as
a) Haplontic
b) Diplontic
c) Haplo-diplontic
d) None of these
8. Green mould is
a) Penicillium
b) Rhizopus
c) Mucor
d) Cercospora
9. Reindeer Moss is a
a) Fungus
b) Alga
c) Lichen
d) Bryophyte
10. Algae and bryophytes resemble each other in
a) Spermatozoids are biflagellate and both flagella are whiplash type
b) The zygote is not liberated from the plant and does not undergo any resting stage
c) Oogamous type of sexual reproduction
d) Pores or stomata are present
11. The sporophyte of Riccia contains
a) foot, seta and capsule
b) foot only
c) seta only
d) capsule only
12. The medullated protostele is
a) Eustele
b) Solenostele
c) Siphonostele
d) Dictyostele
13. A gymnosperm with vessels
a) Pinus
b) Cycas
c) Gnetum
d) Ephedra
14. Which is not a component of the plant cell wall?
a) Chitin
b) Cellulose
c) Hemicellulose
d) Cutin
15. The irritating substance found in the rhizome of Colocasia
a) Calcium carbonate crystals
b) Calcium oxalate crystals
c) Silica crystals
d) None of these
16. An example of primary meristem
a) Cork cambium
b) Interfascicular cambium
c) Protoderm
d) Medullary rays
17. Stomatal type in which subsidiary cells are indistinguishable from other epidermal cells
a) Anamocytic
b) Anisocytic
c) Paracytic
d) Diacytic
18. Which of the following clearly fits to a monocot root?
a) Vascular bundles are radial, conjoint, collateral and open
b) Radial, polyarch and closed vascular bundles with exarch protoxylem
c) Conjoint collateral and open vascular bundles
d) None of these
19. The loose mass of parenchyma at the base of lenticel
a) Complementary cells
b) Passage cells
c) Subsidiary cells
d) Bulliform cells
20. A persistent calyx that continues to grow as a loose jacket around the fruit
a) Deciduous
b) Acrescent
c) Caducous
d) None of these
21. Prevention of self - pollination by physical barriers in bisexual flowers
a) Dichogamy
b) Herogamy
c) Cleistogamy
d) Geitonogamy
22. Select a plant that follows malacophily
a) Colocasia
b) Salvia
c) Musa
d) Callistemon
23. Which of the following is a common ingredient in Farmer's, Carnoy's and Rawlin's formula
a) Chloroform
b) Formalin
c) Chromic acid
d) Glacial acetic acid
24. A non-histone protein present in the chromosome
a) H 1
b) H 2 A
c) H 3
d) Tubulin
25. The substage of prophase-1 of meiosis in which chiasmata appear
a) Leptotene
b) Zygotene
c) Pachytene
d) Diplotene
26. The genotype and phenotype ratios remain the same in
a) Back cross and test cross
b) Incomplete dominance
c) Co dominance
d) Both (b) and (c)
27. Reappearance of ancestral characters in the present generation
a) Attavism
b) Pleiotropism
c) Epistasis
d) Teminism
28. A colourblind man marries a carrier female. What is the percentage of individuals having colour blindness in this cross?
a) $25 \%$
b) $50 \%$
c) $75 \%$
d) $100 \%$
29. Inheritance pattern of ear length in maize is an example of
a) Multiple allelism
b) Co-dominance
c) Polygenic inheritance
d) Dominant epistasis
30. The process of hormonal control of sex determination occurs in
a) Protenor
b) Alligator
c) Drosophila
d) Bonelia
31. An example of total root parasite
a) Rafflesia
b) Santalum
c) Cuscuta
d) Loranthus
32. The process by which organism modify each other's life through competition during succession
a) Reaction
b) Coaction
c) Ecesis
d) Invasion
33. A free floating hydrophyte
a) Nymphaea
b) Nelumbo
c) Trapa
d) Salvinia
34. Diversity within a single community or ecosystem is called
a) Alpha diversity
b) Beta diversity
c) Gamma diversity
d) None of these
35. An ecotourism project of Kerala
a) Mangalavanam
b) Athirappalli
c) Malampuzha
d) All of these
36. The first Earth Summit was held in the year
a) 1990
b) 1992
c) 1999
d) 2000
37. The most important green house gas
a) Carbon monoxide
b) Carbon tetrachloride
c) Chlorofluorocarbon
d) Carbon dioxide
38. The Indian Biodiversity Act was established in
a) 2000
b) 2002
c) 2004
d) 2006
39. An ecologically sensitive locality identified by Western Ghats Ecology Expert Panel (Gadgil Committee) from Kerala
a) Periyar Sanctuary
b) Cardamom Hills
c) Athirappaly-Vazhachal
d) All of these
40. A heterosporous fern
a) Selaginella
b) Marsilea
c) Azolla
d) All of these
41. Radially elongated endodermal cells in the stem of Selaginella
a) Trabeculae
b) Transfusion tissue
c) Raphae
d) Exodermis
42. Heart shaped lamina
a) Ovate
b) Cordate
c) Deltoid
d) Acicular
43. Fusion of carpels along their entire length is seen in
a) Hibiscus
b) Catharanthus
c) Citrus
d) Calotropis
44. The special type of inflorescence of Ocimum
a) Hypanthodium
b) Vertcillaster
c) Thyrsus
d) Cyathium
45. An example of Hesperidium
a) Mango
b) Banana
c) Orange
d) Melon
46. A plant specimen selected to serve as a nomenclatural type so long as the original type specimen is missing
a) Syntype
b) Lectotype
c) Neotype
d) Topotype
47. Botanical gardens where only trees are grown
a) Arboreta
b) Bambuseta
c) Pineta
d) Orchidaria
48. Parthenium argentatum belongs to the family
a) Papilonaceae
b) Asclepiadaceae
c) Asteraceae
d) Euphorbiaceae
49. What is the morphology of useful part of Ragi?
a) Endosperm
b) Seed
c) Fruit
d) Seed coat
50. The patented product 'Jeevani' is obtained from
a) Curcuma longa
b) Trichopus zeylanicus
c) Alpinia galalnga
d) Acorus calamus
51. A man with blood group $B$ (heterozygous) marries a woman of blood group $A B$. Which blood group will not appear among their offsprings ?
a) A group
b) B group
c) O group
d) AB group
52. Inheritance of ear length in Maize is an example of
a) Multiple allelism
b) Polygenic inheritance
c) Epistasis
d) Cytoplasmic inheritance
53. Genes that are transmitted directly from father to son and never appear in females are
a) Holandric genes
b) Plasmagenes
c) Pseudogenes
d) Isoalleles
54. The reason behind the reduction of observed double cross overs than the expected in a three-point test cross is
a) Interference
b) Coupling
c) Repulsion
d) Coincidence
55. The "Amber" codon refers to
a) UAG
b) UAA
c) UGA
d) $A \cup G$
56. A chromosome with diffused centromere
a) Polycentric
b) Monocentric
c) Holocentric
d) Telocentric
57. A condition where one chromosome is missing in the haploid set
a) Monoploidy
b) Aneuploidy
c) Nullisomic haploidy
d) Substitution haploidy
58. In humans a trisomy in chromosome 13 results in
a) Edward's syndrome
b) Patau's syndrome
c) Turner's syndrome
d) Klinefelter's syndrome
59. A mutagen that act as an alkylating agent
a) Ethyl methane sulphonate
b) 5-bromouracil
c) Hydroxylamine
d) Acriflavin
60. Function of DNA Polymerase III in DNA replication
a) Removal of RNA primers
b) Synthesis of RNA primers
c) Addition of nucleotides to the 5' end of the growing strand
d) Addition of nucleotides to the 3 ' end of the growing strand
61. Role of single - stranded binding proteins in DNA replication
a) Stabilize the unwound DNA
b) Joining of okazaki fragments
c) Removal of Okazaki fragments
d) Cutting of DNA
62. What will be the effect of a gene located on a chromosome that has undergone inversion
a) Duplication
b) Deletion
c) Translocation
d) Gene will be turned off
63. Which of the following events occurs during the second phase of meiosis
a) Crossing over
b) Separation of homologous chromosomes
c) Separation of sister chromatids
d) Pairing of homologous chromosomes
64. Number chromatids in a tetrad
a) two
b) four
c) $\operatorname{six}$
d) eight
65. The characteristic of TATA box in prokaryotes
a) Located upstream of the transcription start site
b) It is recognized by Sigma factor
c) Involved in alternate splicing
d) Occupy the same position relative to the start site in all genes
66. What is the role of $\operatorname{poly}(A)$ tail on the mRNA molecule during translation in eukaryotes?
a) Signaling start codon
b) Prevent degradation by exonucleases
c) Binding with ribosome
d) Stabilizing mRNA molecule
67. A post-transcriptional modification that occurs in eukaryotic mRNA
a) Polyadenylation
b) Capping
c) Splicing
d) All of these
68. Function of enhancers in gene regulation
a) Bind to transcription factors and modulate gene expression
b) Bind to DNA and promote transcription
c) Bind to mRNA and promote translation
d) Bind to RNA polymerase II and activate transcription
69. The most frequently mutated gene in human cancer is
a) BRCA 1
b) BRCA 2
c) TP53
d) EGFR
70. A virus that causes cancer
a) Influenza virus
b) Measles virus
c) Human papilloma virus
d) All of these
71. Function of electron transport chain in photosynthesis
a) Absorb light energy
b) Produce oxygen
c) Fix carbon dioxide
d) Generate ATP
72. Splitting of water during photosynthesis occurs in the
a) Cytoplasm
b) Nucleus
c) Stroma
d) Thylakoid membrane
73. The final electron acceptor in photosynthesis
a) ATP
b) ADP
c) NADP+
d) Chlorophyll
74. The molecule that regenerate RuBP during Calvin cycle
a) Phospho glyceraldehyde
b) Phosphoglycolate
c) Phosphoenol pyruvate
d) Glucose 6 phosphate
75. Which is not a microelement in plant nutrition
a) Boron
b) Manganese
c) Magnesium
d) Copper
76. Aerobic oxidation of pyruvic acid to $\mathrm{CO}_{2}$ and water normally takes place in
a) Chloroplast
b) Mitochondria
c) Ribosome
d) Golgi bodies
77. The amino acid that act as the precursor of ethylene
a) Tryptophan
b) Methionine
c) Phenyl alanine
d) Tyrosine
78. How many ATP molecules are needed for the synthesis of a glucose molecule in Calvin cycle?
a) 8
b) 18
c) 38
d) 16
79. Which among the following has a positive value
a) Osmotic potential
b) Water potential
c) Pressure potential
d) All of these
80. How much energy is released during the complete aerobic oxidation of one molecule of glucose?
a) 684 k cal
b) 686 k cal
c) 786 k cal
d) 586 k cal
81. The site of oxidative phosphorylation in eukaryotes
a) Chloroplast
b) Mitochondria
c) Cytoplasm
d) Peroxisome
82. A protein sequence database
a) GenBank
b) PIR
c) EMBL
d) DDBJ
83. Which among the following is a phylogenetic tree
a) Dendrogram
b) Chronogram
c) Cladogram
d) All of these
84. The complete sequence of human genome was first published in
a) 2000
b) 2001
c) 2003
d) 2004
85. The optimum value of dissolved oxygen (DO) for a good quality water is
a) $1-3 \mathrm{mg} / \mathrm{l}$
b) $4-6 \mathrm{mg} / \mathrm{l}$
c) $8-10 \mathrm{mg} / \mathrm{l}$
d) $10-12 \mathrm{mg} / \mathrm{l}$
86. Si RNA are produced by
a) RNA damage
b) RNA damage
c) Enzymatic reaction
d) None of these
87. RNA interference was discovered using the model organism
a) Drosophila
b) Caenorhabditis
C) Arabidopsis
d) Meloidogyne
88. The RNA polymerase required for the synthesis of mRNA in eukaryotes is
a) RNA Polymerase I
b) RNA Polymerase II
c) RNA Polymerase III
d) None of these
89. A transcription factor in prokaryotes
a) rho factor
b) delta factor
c) gamma factor
d) epsilon factor
90. Which of the following is not a pulse
a) Green gram
b) Black gram
c) Rice
d) Peas
91. Pearl millet is
a) Pennisetum
b) Eleusine
c) Panicum
d) Paspalum
92. An ethernet port connects the computer with
a) a network
b) a key board
c) a printer
d) a monitor
93. A terrestrial alga
a) Chara
b) Trentepholia
c) Spirogyra
d) Sargassum
94. 'Peat moss' is
a) Lycopodium
b) Sphagnum
c) Cladonia
d) Funaria
95. Blast disease of paddy is caused by
a) Pyricularia oryzae
b) Phytophthora palmivora
c) Tapioca mosaic virus
d) Xanthomonas citri
96. A modified dihybrid ratio
a) $9: 7$
b) $15: 1$
c) $12: 3: 1$
d) All of these
97. The distance between two consecutive nitrogen bases in Z DNA is
a) $2.56 \mathrm{~A}^{\circ}$
b) $3.4 \mathrm{~A}^{\circ}$
c) $\quad 3.71 \mathrm{~A}^{\circ}$
d) $3.5 \mathrm{~A}^{\circ}$
98. 5 bromouracil in its keto form substitute for
a) Adenine
b) Thymine
c) Guanine
d) Cytosine
99. An allopolyploid possess
a) 2 genomes
b) 3 genomes
c) 4 genomes
d) none of these
100. The genotype of the mother dictates the phenotype of the offspring in
a) Incomplete dominance
b) Co dominance
c) Cytoplasmic inheritance
d) All of these

## ANSWER SHEET

|  | A | B | C | D | E | 26 | A |  | B | C D |  | E |  | A | A B | C | D |  |  |  | 6 | A B | C | D | E |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 2 | A | B | C | D | E | 27 | A | A ${ }^{\text {a }}$ | B | C D | D | E | 52 | A | A B | C | D |  | E | 77 | A | A B | C | D | E |
| 3 | A | B | C | D | E | 8 | A | A | B | C D | D | E | 53 | A | A B | C | D |  | E | 78 | A | A B | C | D | E |
| 4 | A | B | C | D | E | 9 | A |  | B | C D | D | E | 4 | A | A B | C | D | D | E |  | A | A B | C | D | D |
| 5 | A | B | C | D | E | 30 | A |  | B | C D | D | E | 5 | A | A B | C | D |  | E |  | A | A B | C | D | E |
| 6 | A | B | C | D | E | 31 | A | A | B $C$ | C D | D | E | , | A | A B | C | D | D | E | 81 | A | A B | C | D | E |
| 7 | A | B | C | D | E | 32 | A | A | B $C$ | C D | D | E |  | A | B | C | D | D |  |  | 2 | A B | C | D | E |
| 8 | A | B | C | D | E | 3 | A | A | B | C D | D | E |  | A | B | C | D | D |  |  | A | A | C | D | E |
| $9$ | A | B | C | D | E | 34 | A | B | B | C D |  | E |  | A | B | C | D | D |  |  | A | A B | C | D | E |
|  | A | B | C D | D | E | 35 | A |  | B $C$ | C D | D | E |  | A | A B | C | D | D |  |  | A | A B | C | D | E |
|  | A | B | C | D | E | 36 | A | B | B $C$ | C D | D | E |  | A | A B | C | D |  |  |  | A | A B | C | D | D |
|  | A | B | C | D | E | 37 | A | A | B | C D |  | E | 62 | A | A B | C | D |  |  |  | A | A B | C | D | E |
|  | A | B | C | D | E | 38 | A | B | B ${ }^{\text {C }}$ | C D |  | E | 63 | A | A B | C | D |  |  | 88 | A | A B | C | D | E |
|  | A | B | C | D | E | 39 | A | B | B | C D |  | E | 64 | A | A B | C | D | D | E | 89 | A | A B | C | D | E |
|  | A | B | C | D | E |  | A | B | $B$ | C D |  | E |  | A | A B | C | D | D |  | 90 | A | A B | C | D | E |
|  | A | B | C | D | E |  | A | B | B | C D |  | E |  | A | A B | C | D | D |  |  | A | A B | C | D | E |
|  | A | B | C | D | E |  | A |  | B C | C D |  | E |  | A | A B | C | D | - | E | 92 | A | A B | C | D | E |
|  | A | B | C | D | E |  | A |  | B | C D |  | E |  | A | A B | C | D | D | E | 93 | A | A B | C | D | E |
|  | A | B | C | D | E |  | A |  | B | C D |  | E |  | A | A B | C | D |  | E |  |  | A B | C | D | E |
|  | A | B | C | D | E |  |  |  | B C | C D |  | E |  | A | A $\mathrm{B}^{\prime}$ | C | D |  |  | 95 |  | A B | C | D | E |
|  | A | B | C | D | E | 46 |  |  | B C | C D |  | E |  | A | A B | C | D |  |  | 96 |  | A B | C | D | E |
|  | A | B | C | D | E |  | A | B | B | C D |  | E |  | A | A B | C | D |  |  | 97 | A | A B | C | D | E |
|  | A | B | C | D | E |  | A |  | B | C D |  | E |  | A | A $\mathrm{B}^{\prime}$ | C | D |  |  | 98 | A | A B | C | D | E |
|  | A | B | C | D | E |  | A | B | B C | C D |  | E |  | A | A B | C | D |  |  | 99 | A | A B | C | D | E |
|  | A | B | C | D | E |  |  |  | B C | C D |  | E |  |  | A ${ }^{\text {B }}$ | C | D |  |  |  | 0 | A B | C | D | E |

