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Test Booklet Series

Serial No.

191998

B

## SCREENING TEST – 2009

SUBJECT : BOTANY

Time Allowed : Two Hours

Maximum Marks : 120

## INSTRUCTIONS

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DO NOT OPEN THIS TEST BOOKLET UNTIL YOU ARE ASKED TO DO SO

SEAL

(For Rough Work)



## Screening Test-2009

### SUBJECT : BOTANY

*Time Allowed : Two Hours ]*

*[ Max. Marks : 120*

1. How many biogeographical realms exist on the earth ?
  - (a) 4
  - (b) 5
  - (c) 6
  - (d) 7
2. Tendrils of *Lathyrus*, *Vitis* and *Smilax* represent :
  - (a) Convergent evolution
  - (b) Divergent evolution
  - (c) Adaptive radiation
  - (d) None of the above
3. Closely related species cannot occupy same ecological niche for indefinite time is :
  - (a) Allen's rule
  - (b) Bergman's principle
  - (c) Gause's principle
  - (d) Stauger's rule
4. What is *correct* ?
  - (a) Angiosperms appeared first and birds later
  - (b) Angiosperms appeared simultaneously with man
  - (c) Angiosperms appeared alongwith first mammals
  - (d) Angiosperms appeared simultaneously with birds
5. The ovules are generally unitegmic or bitegmic. However, in which of the following the ovules lack an integument ?
  - (a) *Liriosoma*
  - (b) *Olax imbricata*
  - (c) *Ptychopetalum*
  - (d) All of the above
6. The hypodermal female archesporial cell divides transversely cutting off parietal cell and an inner sporogenous cell. The parietal cell may undergo a few periclinal divisions so that the sporogenous cell becomes embedded in massive nucellus. Such an ovule is called as :
  - (a) Tenuinucellate
  - (b) Pseudocrassinucellate
  - (c) Crassinucellate
  - (d) Pseudotenuinucellate
7. In majority of the angiosperms meiosis is of successive type. However, in some angiosperms the first meiotic division in megaspore mother cell is followed by cytokinesis, whereas the second meiotic division is not followed by cytokinesis. Thus the micropylar and chalazal dyad cells formed are binucleate. If the embryo sac develops from the chalazal dyad cell the embryo sac development would conform to :
  - (a) Allium type
  - (b) Endymion type
  - (c) Adoxa type
  - (d) Peperomia type



8. The somatic cells in the nucellus directly form an unreduced embryo sac and the diploid egg parthenogenetically develops in an embryo. This type of Agamospermy is known as :
- Adventive embryony
  - Diplospory
  - Apospory
  - All of the above
9. In *Vallisneria spiralis*, which is submerged dioecious plant, the flowers are borne under water. Upon attaining maturity the male flowers get detached from the parent plant and float on the surface of water. The female flowers also develop under water. At the time of pollination they are brought to the surface of water and pollination is done. This type of pollination is known as :
- Anemophily
  - Hydrophily
  - Epihydrogamy
  - Hypohydrogamy
10. The embryological data has played important role in determining taxonomic position of the taxa whose systematic position was under dispute. Which of the following genus wrongly placed in the family Onagraceae by Bentham and Hooker was removed from Onagraceae on the basis of embryological data :
- Trapa*
  - Pantaphragma*
  - Paeonia*
  - None of the above
11. Trachoma an ophthalmic disease is caused by :
- Chlamydea
  - Rickettsia
  - Actinomycetes
  - Mycoplasma
12. Sydney Fox coined the term :
- Biosphere
  - Microsphere
  - Rhizosphere
  - Phyllosphere
13. Oxygen became the part of earths atmosphere around :
- 3,600 Million years ago
  - 3,600 Billion years ago
  - 3,600 Trillion years ago
  - 36,000 Million years ago
14. Binomial nomenclature was first introduced in :
- Genera plantarum
  - Systema naturea
  - Species plantarum
  - Hortus uplandicus
15. Which is the only possible placentation if the gynoecium is multilocular ?
- Marginal
  - Free central
  - Parietal
  - Axile

**B**

16. Lodicules are present in the flower of :
- Sunflower
  - Wheat
  - Datura
  - Pea
17. Twisting of Ovary (resipination) is a distinctive feature of :
- Poaceae
  - Liliaceae
  - Solanaceae
  - Brassicaceae
18. The idea of spontaneous generation was abandoned by :
- Fredi
  - S. L. Miller
  - Louis Pasteur
  - Lazzaro Spallanzani
19. Which of the following mixture was used by Miller in his famous experiment on origin of life ?
- Methane – Ammonia – Hydrogen – Water
  - Methane – Ammonia – Oxygen – Water
  - Methane – Ammonia – Nitrogen – Water
  - Ethane – Ammonia – Hydrogen – Water
20. Taxonomically unrelated taxa occupying same ecological niche represent :
- Convergent evolution
  - Divergent evolution
  - Micro evolution
  - Adaptive radiation
21. Which of the following gymnosperm of Bennettiales (Cycadeodales) was recovered from Rajmahal hills by Prof. Birbal Sahni ?
- Heterangium*
  - Pentoxylon*
  - Williamsonia*
  - Sahnia*
22. Which class of Pteridophyte comprise only fossils ?
- Sphenopsida
  - Psilopsida
  - Lycopsida
  - Psilophytosida
23. Which of the following kinds of bryophytes exhibit simplest gametophyte but complex and much advanced sporophyte ?
- Sphagnum*
  - Riccia*
  - Anthoceros*
  - Pellia*

24. Development of buds for leafy gametophores from protonema is induced by :
- Gibberellin
  - Phytokinin
  - Auxin
  - Bryokinin
25. Mark out the *mismatched* pair :
- Apple scale – *Trichothecium roseum*
  - Downy mildew of grape – *Plasmopera viticola*
  - Blast of rice – *Pilicularia orhizae*
  - Bunt of wheat – *Tilletia caries*
26. Which of the following alga has been utilized as a tool for understanding impact of nucleus on morphogenesis ?
- Chlorella*
  - Anteromorpha*
  - Ulva*
  - Acetabularia*
27. Which algal group is specialised to produce auxospores ?
- Dinoflagellates
  - Diatoms
  - Chrysophytes
  - Sea weeds
28. Anthrax causing bacteria is infamous as a bio-war agent due to :
- Easy availability
  - Gram positive nature
  - Ability to produce endospores
  - Ability to produce exospores
29. A vaccine against AIDS could *not* be produced because :
- HIV is a retrovirus
  - HIV virion is enveloped
  - High mutability of "Env" gene
  - High mutability of "pol" gene
30.  $T_2$  bacteriophage drill bacterial cell wall by piercing its :
- Double stranded DNA
  - Amino terminus of tail fibres
  - Tail pins of lysozyme
  - Head
31. What is *not correct* about *Funaria* ?
- It is acrocarpous
  - It is cleistocarpous
  - It is diplolapidous
  - It is autoceous
32. The antherozoids of fern are :
- bicilliate and curved
  - multicilliate and straight
  - multicilliate and spirally coiled
  - bicilliate and spirally coiled



**B**

33. Virus spreads in plant body via :
- Shoot apices
  - Intercellular spaces
  - Xylem
  - Phloem
34. What is most unfortunate about gymnosperms ?
- Anemophilly
  - Pollen chamber in ovules
  - Endosperm in prefertilization tissue
  - Neither chemotactic nor chemotropic advantage
35. In Pteridophytes :
- Sporophyte is dependant on gametophyte
  - Gametophyte is dependant on sporophyte
  - Both are interdependent
  - None of the above
36. Which of the following is *not* heterosporous ?
- Isoetes*
  - Selaginella*
  - Marselia*
  - Pteris*
37. Which of the following exhibits false indusium ?
- Dryopteris*
  - Gleichinia*
  - Adiantum*
  - Azola*
38. If an aposporous gametophyte of fern undergoes apogamous development of sporophyte then what will be the ploidy status of newly formed sporophyte :
- Haploid
  - Diploid
  - Tetraploid
  - Octaploid
39. An anticancer drug "Taxol" has been obtained from :
- Taxus*
  - Cephalotaxus*
  - Taxodium*
  - Ginkgo*
40. Which gymnosperm inhabits typical desert ?
- Microcycas*
  - Cupressus*
  - Gnetum*
  - Welwitschia*

41. Which of the following fraction is responsible for shifting sand dunes in deserts ?
- Suspension
  - Ground draft
  - Saltation
  - Siltation
42. Arrange the following-break throughs in chronological order :
- Discovery of reverse transcription
  - Noble prize for discovery of ozone hole
  - Discovery of P. C. R.
  - One gene one enzyme hypothesis
- (iv) - (i) - (iii) - (ii)
  - (i) - (ii) - (iv) - (iii)
  - (iii) - (i) - (ii) - (iv)
  - (iv) - (iii) - (i) - (ii)
43. What is *not correct* ?
- Term gene and genetics could be coined after forty years of the proposal of Mendelism
  - While in 1809 Lamarck proposed inheritance of acquired characters, Charles Darwin was born
  - While Mendel died in 1882, Charles Darwin died two years later
  - While in 1935 Stanley crystallized TMV, Tansley coined the term ecosystem
44. India represents 2.4 percent of total land area of the world. How much percentage of world's biodiversity it comprise :
- 2.8 per cent
  - 8.1 per cent
  - 11.2 per cent
  - 4.4 per cent
45. Which alga produces a protonema similar to mosses ?
- Protosiphon
  - Protococcus
  - Chara
  - Zygnema
46. Mark out the *odd-one* :
- Chantansia - *Batrachospermum*
  - Algaozonia - *Cutleria*
  - Palmella - *Volvox*
  - Gongrosira - *Vaucheria*
47. If a Spirogyra filament collected from a pond exhibits zygospor like structures in all of its cells then it suggests that they are :
- Product of Scalariform conjugation
  - Product of Lateral conjugation
  - Product of Parthenogenesis
  - Product of Vegetative reproduction showing akinetes



**B**

48. Which statement is *correct* ?
- (a) Red algae exhibit maximum variations in types of sexual reproduction
  - (b) Green algae exhibit maximum variations in flagellation
  - (c) Yellow green algae exhibit maximum variation in type of food reserve
  - (d) Brown algae exhibit maximum variations in types of Life Cycles
49. Which of the following enjoy benthic, lotic habitat of pools ?
- (a) Phytoplanktons and Zooplanktons
  - (b) Rock weeds
  - (c) Pond silk
  - (d) Stone worts
50. Plectenchyma is edible false tissue in :
- (a) Yeast
  - (b) Mushroom
  - (c) Jack fruit
  - (d) Litchi
51. Which one of the following became popular as molecule of 1989 ?
- (a) Small Nuclear RNA
  - (b) Taq polymerase
  - (c) Reverse transcriptase
  - (d) p-BR-322

52. Mark out the *incorrect* statement :
- (a) Predation is always in long term benefit for prey population
  - (b) Graph of population growth is sigmoid for r-species
  - (c) Two closely related species can not occupy same ecological niche for indefinite time
  - (d) All kinds of adaptive radiations illustrate divergent evolution
53. Which of the following is latest discovery for Indian Biodiversity ?
- (a) New species of Bush Frogs at Western Ghat
  - (b) *Magnolia* found growing in Western Himalayas
  - (c) *Ginkgo biloba* growing in Darjeeling
  - (d) Lemur pollinating *Ravenela* at Lucknow
54. Data for world climate change comes from observatory at :
- (a) Mauna Loa
  - (b) Pune
  - (c) Rio de Janeiro
  - (d) Stockholm
55. World Ozone (Layer protection) day is observed on :
- (a) 16th September
  - (b) 16th October
  - (c) 16th November
  - (d) 16th December

56. How many hot spots have been recognized in the world ?
- 25
  - 34
  - 10
  - 6
57. *Berberis nilghiriensis*, *Bentinckia nicobarica*, *Cupressus cashmeriana* are :
- Critically endangered, Endangered and Vulnerable respectively
  - Endangered, Vulnerable and Critically endangered respectively
  - Vulnerable, Critically endangered and Endangered respectively
  - Endangered, Vulnerable and Rare respectively
58. Blue-Baby syndrome is due to which pollutant :
- Carbon monoxide in air
  - Sulphur dioxide in air
  - Nitrates in water
  - $\text{NO}_2$  in air
59. Mark out the *odd* one :
- Arsenic – Black Foot
  - Mercury – Minimata
  - Cadmium – Itai-Itai
  - Lead – Methamoglobinemia
60. Which of the following is most detrimental S. P. M. for human health ?
- 1.5 nm in Diameter
  - 1.5  $\mu\text{m}$  in Diameter
  - 2.5 nm in Diameter
  - 2.5  $\mu\text{m}$  in Diameter
61. In a fully plasmolysed cell space between shrunken protoplasm and cell wall is occupied by :
- Hypotonic solution
  - Hypertonic solution
  - Isotonic solution
  - Gaseous mixture
62. The shock stimulus movement in "Touch me not" involves :
- $\text{K}^+$  expulsion in pulvinus
  - Differential loss of water
  - Unequal distribution of auxins
  - (a) and (b) both
63. Sucrose transport in plant body is facilitated by :
- Boron
  - Calcium
  - Molybdenum
  - Zinc

**B**

80. Photorespiration loss of carbon dioxide takes place in :

- (a) Chloroplast
- (b) Mitochondria
- (c) Peroxysome
- (d) Cytoplasm

81. What will be the number of chromosomes at mitotic anaphase of shoot tip if the sporophytic number is  $2n = 14$  ?

- (a) 7
- (b) 14
- (c) 28
- (d) None of the above

82. In meiosis separation of daughter chromatids takes place at :

- (a) Zygotene
- (b) Anaphase I
- (c) Anaphase II
- (d) Diakinesis

83. Bacterial membranes possess :

- (a) Cholesterol
- (b) Hopanoids
- (c) Ergosterols
- (d) Stigmasterols

84. What is *not correct* about bio-membranes ?

- (a) The proportion of lipids to proteins varies from 1 : 0.8 to 1 : 4
- (b) Quasifluid nature of membrane lipids is due to temperature sensitive motion of fatty acid tails
- (c) Cholesterol is present only in the membranes of animal cells
- (d) Glycocalyx is present on both surfaces of the membrane

85. Middle lamella is absent between :

- (a) Sieve tubes and companion cells
- (b) Guard cells and subsidiary cells
- (c) Guard cells of stomata
- (d) None of the above

86. What is *not correct* about Mendelism ?

- (a) Incomplete dominance further strengthened Mendelism
- (b) Mendel postulated that every character is governed by one pair of factors
- (c) Law of independent assortment is based upon the result of monohybrid cross
- (d) Independent assortment is based upon segregation of maternal and paternal factors



87. The seven characters studied by Mendel are present :
- separately on 7 chromosomes as discovered by Hugo de Vries
  - on 4 chromosomes as discovered by Blixt
  - on 5 chromosomes as discovered by Carl Correns
  - on 6 chromosomes as discovered by Morgan
88. B. T. cotton is :
- G. M. food
  - British cotton
  - Transgenic crop for resistance against insect pest
  - Transgenic cotton resistant against *Bacillus thuringiensis*
89. If a homozygous dominant sex is crossed to a hemizygous recessive sex, then the inheritance pattern in  $F_2$  progeny for a sex linked trait will be :
- 1 : 1
  - 3 : 1
  - 1 : 2 : 1
  - 15 : 1
90. Which is *not* quantitative trait ?
- I. Q. in man
  - Human height
  - Human eye colour
  - Human skin colour
91. The first family in Engler and Prantl system of classification is :
- Salicaceae
  - Magnoliaceae
  - Casuarinaceae
  - Typhaceae
92. "Vrikshaywiveda" was compiled by :
- Vrikshadas
  - Tulsidas
  - Prasara
  - Bulsara
93. Binomial system of nomenclature was introduced by :
- John Ray
  - Carolus Linnaeus
  - Charles Darwin
  - Julian Huxley
94. The peculiar internal organisation of  $C_4$  plants is termed "Kranz anatomy" because :
- It is named after its German discoverer
  - Its bundle sheath resembles a garland
  - Its mesophyll and bundle sheath cells have different ultrastructure
  - None of the above

**B**

95. The elongated axis of a flower between the androecium and gynoecium is called :
- (a) Anthrophore
  - (b) Gynophore
  - (c) Androphore
  - (d) Gynandrophore
96. The phenomenon of geocarpy is common in :
- (a) *Arachis hypogea*
  - (b) *Glycine max*
  - (c) *Artocarpous integrifolia*
  - (d) All of the above
97. The classification of plants based on chromosome number is known as :
- (a) Cytotaxonomy
  - (b) Numerical taxonomy
  - (c) Biochemical taxonomy
  - (d) Karyotaxonomy
98. The stem having several nodes and internodes modified into a flat, fleshy and green leaf like structure, which carries out photosynthesis and stores food is called as :
- (a) Cladode
  - (b) Bulbil
  - (c) Phylloclade
  - (d) Sucker

99. What is *not correct* ?
- (a) Old world deserts are populated with Euphorbias while new world deserts are populated with cacti
  - (b) Metalicolous plants represents natural selection
  - (c) Resistance in mosquitoes for D.D.T. represent natural selection
  - (d) Cauliflower, cabbage, knol-khol and Brussel's sprout are outcome of artificial selection
100. Which of the following is Endosymbiont organelle ?
- (a) Nucleolus in nucleus
  - (b) Ribosome in the mitochondria and plastids
  - (c) Mitochondria in a Eukaryotic cell
  - (d) Chromosome in the nucleus
101. In vivo occurrence of androgenic haploids has been reported in :
- (a) *Solanum nigrum*
  - (b) *Tectona grandis*
  - (c) *Datura innoxia*
  - (d) *Nicotiana*
102. Interspecific crosses are generally successful, whereas intergeneric crosses are rarely successful. Which of the following methods would you suggest to obtain intergeneric hybrids ?
- (a) Grafting
  - (b) Recombinant DNA technology
  - (c) Tissue culture
  - (d) Protoplast fusion

103. The first synthetic seed was produced in vitro by :
- Kitto and Janick, 1982
  - Kitto and Janick, 1981
  - Kitto and Janick, 1983
  - Kitto and Janick, 1985
104. In a concentric vascular bundle if the xylem is surrounded by phloem the vascular bundle is known as :
- Leptocentric
  - Bicollateral
  - Amphivasal
  - Amphicribal
105. The roots of epiphytic orchids possess an outer spongy tissue for absorbing moisture from the atmosphere. This tissue is known as :
- Mesophyll
  - Tylose
  - Velamen
  - Lenticel
106. In a stele when phloem occurs on the outer and inner side of the xylem, the stele is known as :
- Solenostele
  - Endophloic
  - Ectophloic siphonostele
  - Amphiphloic siphonostele
107. The stomata remain surrounded by a limited number of cells which cannot be distinguished from other epidermal cells. Thus the subsidiary cells are absent. This type of stomata are called as :
- Anisocytic
  - Paracytic
  - Anomocytic
  - Mesoperigenous
108. During seed germination the hypocotyl grows first and pushes the cotyledonary node and all other parts of seed out of the soil. This mode of germination is known as :
- Hypogeal
  - Epigeal
  - Geocarpy
  - Vivipary
109. Higher concentration of auxins favours :
- Photosynthesis
  - Sporogenesis
  - Xylogenesis
  - Leptogenesis



**B**

110. The association of an organism with another organism where both the organisms are neither benefitted nor harmed is called as :
- Commensalism
  - Neutralism
  - Parasitism
  - Ammensalism
111. Normally in nuclear type of endosperm development wall formation is centripetal and the whole endosperm cavity gets filled with cells. However, the degree of cellularization varies. In which of the following the cellularization is confined to micropylar region only and chalazal part remains nuclear :
- Phaseolus*
  - Crotollaria*
  - Grevillea*
  - All of the above
112. During the development of anther wall layers the outer and inner secondary parietal layers divide periclinally producing middle layers. This type of anther wall development conforms to :
- Monocot type
  - Dicot type
  - Basic type
  - Reduced type
113. If the cell *Ca* of 2-celled proembryo divides vertically and cell *Cb* plays minor role or none in the subsequent development of embryo proper, the embryo development would conform to :
- Solanad type
  - Chenopodiad type
  - Caryophyllad type
  - Onagrad type
114. The remnant of nucellus which has not been completely consumed during seed development is known as :
- Endosperm
  - Perisperm
  - Raphe
  - None of the above
115. How many meiotic divisions are required to produce 121 female gametophytes in an angiosperm ?
- 31
  - 32
  - 30
  - 121
116. In a bisexual flower self pollination is prevented through which of the following ?
- Self sterility
  - Herkogamy
  - Dichogamy
  - All of the above

117. The uninucleate pollen grains seem to have the potential of adopting any one of the following modes of development depending upon the temperature :
- (a) Under normal conditions they would form male gametes
  - (b) Under special conditions they may form female gametophyte
  - (c) In *in vitro* conditions on appropriate nutrient medium they may form apogamous sporophytes
  - (d) All of the above
118. The most popular and commonly used nutrient medium in plant tissue culture was proposed by :
- (a) Nitsch and Nitsch, 1956
  - (b) P. R. White, 1963
  - (c) Murashige and Skoog, 1962
  - (d) Lloyd and McCown, 1980
119. Haploid plants may be produced *in vitro* through :
- (a) Anther and pollen culture
  - (b) Culture of ovules from unfertilized ovaries
  - (c) Culture of unpollinated ovaries
  - (d) All of the above
120. The most popular auxin for the induction of somatic embryogenesis is
- (a) 2, 4 -dichlorophenoxy acetic acid
  - (b) 2,4, 5 -trichlorophenoxy acetic acid
  - (c) Naphthalene acetic acid
  - (d) Decamba

(For Rough Work)





The Group 7

SEAL



Adda247