

SPECIAL PAPER IN BOTANY - 02

1. The protective ozone shield is to be found in the
 - (1) Hydrosphere (2) Ionosphere
 - (3) Stratosphere (4) Troposphere
2. The spread of *Eichhornia* can be checked by
 - (1) Spraying 2, 4-D
 - (2) Allowing cattle to feed on them
 - (3) Introducing insects
 - (4) Clipping off the vegetative buds
3. A collateral host is
 - (1) Crop host
 - (2) Additional plant on which life cycle is completed
 - (3) Grass host other than main host
 - (4) Alternate host
4. Conservation of plant diversity is a/an
 - (1) Aesthetic necessity
 - (2) Economic necessity
 - (3) Genetic necessity
 - (4) Environmental necessity
5. Which one of the following pairs is correctly matched?
 - (1) Chrysanthemum : Natural pyrethroid
 - (2) *Leucaena* : Dye
 - (3) *Acacia* : Essential oil
 - (4) *Casuarina* : Fodder
6. Saffron is obtained from
 - (1) Anthers (2) Styles and stigmas
 - (3) Perianth (4) Petals
7. Which one of the following alga has the potential to be an important source of edible protein ?
 - (1) *Spirulina* (2) *Gracillaria*
 - (3) *Cephaleuros* (4) *Spirogyra*
8. Match List I (plant names) with List II (parts of fruits usually eaten) and select the correct answer using the codes given below the lists :

List I

List II

- | | |
|----------------------------|------------------------|
| A. <i>Pyrus malus</i> | (i). Fleshy aril |
| B. <i>Mangifera indica</i> | (ii). Fleshy thalamus |
| C. <i>Litchi chinensis</i> | (iii). Fleshy mesocarp |
| D. <i>Punica granatum</i> | (iv). Endosperm |
| | (v). Juicy seed coat |

Codes :

- | | A | B | C | D |
|-----|------|-------|-------|-----|
| (1) | (ii) | (iii) | (iv) | (i) |
| (2) | (i) | (ii) | (iii) | (v) |
| (3) | (iv) | (iii) | (i) | (v) |
| (4) | (ii) | (iii) | (i) | (v) |

9. Which one of the following statements is appropriate for the Red Data Book ?
 - (1) It gives data on species threatened with extinction
 - (2) It is a list of plant and animals in Red Sea
 - (3) It provides data on effect of red light on photosynthesis
 - (4) It is the list of red-pigmented plants
10. Which one of the following types of vegetations allows quick absorption of maximum rain water ?
 - (1) Wet evergreen forests
 - (2) Grasslands
 - (3) Scrub forests
 - (4) Deciduous forests
11. Consider the following statements regarding allelopathy :
 - (i) It is the phenomenon of seed dormancy due to the presence of germination inhibitors on the surface of seed coat
 - (ii) It is the phenomenon of the production of organic substances by one plant having harmful effect on the other
 - (iii) It helps proper spacing of the plants to reduce competition
 - (iv) It helps the xerophytes to grow in small groups to reduce the transpiration
 Of these statements :
 - (1) (i), (ii) and (iii) are correct
 - (2) (i) and (iii) are correct
 - (3) (ii) and (iii) are correct
 - (4) (i) and (iv) are correct
12. *Nepenthes khasiana*, a rare and endangered pitcher plant, occurs in India in
 - (1) Meghalaya (2) Madhya Pradesh
 - (3) Kerala (4) Himachal Pradesh

13. Which of the following pairs are correctly matched?
 (i) Somatic hybridization : Protoplast fusion
 (ii) Industry : Bioreactors
 (iii) Test-tube baby : Artificial fertilization
 (iv) Scid : Gene therapy
 Select the correct answer using the codes given below:
 Codes :
 (1) (ii), (iii) and (iv) (2) (i), (iii) and (iv)
 (3) (i), (ii) and (iv) (4) (i), (ii) and (iii)
14. 'Superbug' a biotechnological feat is useful in the
 (1) Treatment of cancer
 (2) Cleaning oil spillage
 (3) Espionage
 (4) Biodegradation of plastics
15. Which one of the following statements regarding Pomato is correct ?
 (1) It is a product of somatic hybridization
 (2) It is obtained by gene manipulation
 (3) It is a natural hybrid product of sexual reproduction
 (4) It is the fusion product of archegonia and antheridia
16. Which one of the following gases was primarily responsible for the 1984 Bhopal gas tragedy ?
 (1) Methane (2) Methyl cyanide
 (3) Methyl isocyanate
 (4) Hydrogen cyanide
17. Depletion of the Ozone layer in the stratosphere is caused by
 (1) Carbon monoxide (2) Hydrocarbons
 (3) Nitrogen dioxide (4) Polychloro-biphenyls
18. Afforestation with the purpose of environmental, aesthetic and economic development is known as
 (1) Integrated afforestation
 (2) Scientific forest conservation
 (3) Social forestry
 (4) Integrated forest management
19. Afforestation programmes call for the introduction of plants from
 (1) Desert regions as these can withstand adverse conditions
 (2) Arctic environment because of their short stature and sturdiness
 (3) Iso-climatic regions
 (4) An environment of maximum heterogeneity
20. The uniform peeling away of the soil surface by the action of flowing water is called
 (1) Slip erosion
 (2) Rill erosion
 (3) Accelerated erosion
 (4) Sheet erosion
21. When exposed to sulphur dioxide gas, the green colour of the plant leaves will be changed into ?
 (1) Violet (2) Indigo
 (3) Red (4) Yellow
22. Which one of the following aspects will not alter the gene frequency in a population ?
 (1) Selection (2) Mutation
 (3) Random mating (4) Random genetic drift
23. The first intermediate electron carrier molecule formed during the origin of life was
 (1) Chlorophyll (2) Porphyrin
 (3) Phytochrome (4) Protochlorophyll
24. In which type of stele, does phloem surround the xylem both externally and internally ?
 (1) Amphiphloic siphonostele
 (2) Ectophloic siphonostele
 (3) Haplostele
 (4) Actinostele
25. Which one of the following is not concerned with the permanent closure of stomata present on photosynthesizing plant organs in some desert plants?
 (1) The closure is caused by additional thickening and cutinization of the guard cell walls
 (2) Blocking of the sunken stomata from the exterior by the resinous masses
 (3) Increase of turgor pressure in the guard cells of sunken stomata
 (4) Blocking of the stomata by wax layer
26. The nomenclatural type of a specimen selected by the author as substitute of a lost material on which the name of the taxon is based is called
 (1) Syntype (2) Neotype
 (3) Lectotype (4) Paratype
27. Match the taxa in List I with their correct endings in List II and select the correct answer using the codes given below the lists :
- | List I | List II |
|---------------|--------------|
| A. Order | (i) -ineae |
| B. Tribe | (ii) -oideae |
| C. Sub-order | (iii) -ales |
| D. Sub-family | (iv) -eae |
- Codes :
 A B C D
 (1) (iii) (iv) (i) (ii)
 (2) (iii) (ii) (iv) (i)
 (3) (ii) (i) (iii) (iv)
 (4) (iv) (ii) (iii) (i)
28. Which one of the following coniferous members is a 'living fossil' ?
 (1) *Cedrus* (2) *Pinus*
 (3) *Picea* (4) *Metasequoia*

29. Consider the following processes :
- Heterorkaryon formation
 - Diploidization of nuclei
 - Restoration of diploid nuclei to their haploid state (haploidization)

Parasexual cycle in fungi involves

- (1) (i) and (ii) (2) (i) and (iii)
- (3) (ii) and (iii) (4) (i), (ii) and (iii)

30. Which of the following pairs are correctly matched?

- Oscillatoria : Larvicidal
- Nostoc : Hormogonia
- Streptomyces : Actinomycetes
- Albugo : Coenocyte

Select the correct answer from the codes given below:

Codes :

- (1) (i), (ii) and (iii) (2) (i), (ii), (iii) and (iv)
- (3) (i), (iii) and (iv) (4) (ii) and (iv)

31. Transduction is a process which requires

- (1) The incorporation of genetic material from dead bacterial cells into the genetic make up of living bacterial cell
- (2) The transfer of genetic material from one bacterial cell to another via a temperate virus particle
- (3) Cell to cell contact between donor and recipient by the formation of a conjugation canal between two living bacterial cells
- (4) The incorporation of genetic material between two lysed bacterial cells

32. The earliest vascular plants are found in the rocks of

- (1) Early cambrian
- (2) Early Devonian
- (3) Mid-creataceous
- (4) Not until the beginning of quaternary

33. The glyoxylate cycle is a modification of

- (1) TCA cycle
- (2) Calvin cycle
- (3) Oxidative Pentose Phosphate Pathway
- (4) Gycolate Pathway

34. Match List I with List II and select the correct answer using the codes given below the lists :

- | List I | List II |
|-------------|--|
| A. Chloride | (i) Essential for the biosynthesis of indole 3 acetic acid |
| B. Zinc | (ii) Enzyme activator for Photolysis |
| C. Boron | (iii) Necessary for translocation of sugars |

Codes :

- | | A | B | C |
|-----|-------|-------|-------|
| (1) | (i) | (ii) | (iii) |
| (2) | (ii) | (i) | (iii) |
| (3) | (ii) | (iii) | (i) |
| (4) | (iii) | (i) | (ii) |

35. Active transport of ions through cell membranes is brought about by

- (1) Simple diffusion
- (2) Ion exchange
- (3) Carrier molecules
- (4) Donnan equilibrium

36. If one chain of a DNA molecule has the base order 5' ATTGACGT3' ... then the base order of its complementary chain will be

- (1) 3' ATTGACGT 5' ...
- (2) 5' TGCAGTTA 3' ...
- (3) 5' TUUCTGCU 3' ...
- (4) 3' TAACTGCA 5' ...

37. Which one of the following pairs is not correctly matched ?

- (1) Morphine : Opium poppy
- (2) Atropine : Black nightshade
- (3) Quinine : Cocoa leaves
- (4) Thein : Tea leaves

38. Which one of the following is labelled with ³H to study RNA biosynthesis ?

- (1) Thymidine
- (2) Uridine
- (3) Cytosine
- (4) Guanosine

39. The bioassay for gibberellins is

- (1) Avena curvature test
- (2) Soyabean callus test
- (3) α -amylase induction test in barely aleurone cells
- (4) Barely leaf-disc test for chlorophylls

40. In germinating oil seeds β -oxidation of free fatty acids takes place in

- (1) Oleosomes
- (2) Glyoxysomes
- (3) Mitochondria
- (4) Cytosol

41. In a population, the Hardy-Weinberg equilibrium would not prevail in the

- (1) Absence of selection
- (2) Presence of random mating
- (3) Absence of immigration or emigration
- (4) Presence of mutation

42. Adaptive radiation means

- (1) Migration of daughter populations to newer localities without losing capacity for example of genes with parental populations
- (2) Formation of sympatric populations that cannot exchange genes
- (3) The ultimate stage in isolation mechanism
- (4) The manifestation of geographical isolation that ultimately leads to reproductive isolation

43. Feulgen staining for DNA is based on the reaction of Schiff's reagent with
- (1) Free aldehyde groups
 - (2) Purines at N-7 positions
 - (3) Deoxyribose at C-2 positions
 - (4) Pyrimidines at N-1 positions
44. Isochromosome refers to the
- (1) Chromosome which has been isolated from the rest of the complement
 - (2) Chromosome which has reached the equatorial plane earlier than the other chromosomes
 - (3) Translocated chromosome having identical arms
 - (4) Lagging chromosome which has not moved either of the poles
45. In specific population of a species, individuals showing $2n + 1$ or $2n - 1$ set of chromosomes are called respectively
- (1) Nullisomics and monosomics
 - (2) Monosomics and trisomics
 - (3) Trisomics and monosomics
 - (4) Nullisomics and trisomics
46. When the dominant alleles (or wild type) say AB are present on one chromosome and its alternative recessive allele (ab) are located on the other homologous chromosome AB/ab, then the linkage is said to be in
- (1) Repulsion phase
 - (2) Coupling phase
 - (3) Neutral phase
 - (4) Dominant phase
47. Sex determination by environmental factors is commonly observed in
- (1) *Drosophila melanogaster*
 - (2) *Melandrium album*
 - (3) *Mirabilis jalapa*
 - (4) *Bonellia viridis*
48. The absence of Y chromosome in human beings causes
- (1) Turner's syndrome
 - (2) Klinefelter's syndrome
 - (3) Down's syndrome
 - (4) No abnormality
49. Directional change in the gene frequency in panmictic population is due to
- (1) Genetic load
 - (2) Genetic code
 - (3) Genetic disorders
 - (4) Genetic drift
50. Lampbrush chromosomes found in certain organisms are directly related to metamorphosis. Which one of the following statements in this regard is incorrect ?
- (1) These are very large chromosomes
 - (2) These are actively engaged in RNA and protein synthesis and accumulation
 - (3) Lampbrush loops recede and these become normal looking chromosomal parts
 - (4) They are compactly packed and have very high DNA content

ANSWERS FOR SPECIAL PAPER – 02

1.	(3)	2.	(3)	3.	(3)	4.	(3)	5.	(1)
6.	(2)	7.	(1)	8.	(4)	9.	(1)	10.	(1)
11.	(3)	12.	(1)	13.	(2)	14.	(2)	15.	(1)
16.	(3)	17.	(2)	18.	(3)	19.	(3)	20.	(4)
21.	(4)	22.	(3)	23.	(4)	24.	(1)	25.	(3)
26.	(2)	27.	(1)	28.	(4)	29.	(4)	30.	(2)
31.	(2)	32.	(2)	33.	(1)	34.	(2)	35.	(3)
36.	(4)	37.	(3)	38.	(2)	39.	(3)	40.	(2)
41.	(4)	42.	(1)	43.	(1)	44.	(3)	45.	(3)
46.	(2)	47.	(4)	48.	(1)	49.	(4)	50.	(3)