

(BOTANY)

- 1) **Basal elaterophore present in the capsule of *Pellia* develops from:**
(A) Elater mother cells (B) Sterile sporogenous cells
(C) Fertile sporogenous cells (D) Amphithecium
- 2) **Which of the following pair is an example of saprophytic liverwort and moss respectively?**
(A) *Cryptothallus mirabilis* and *Buxbaumia aphylla*
(B) *Buxbaumia aphylla* and *Cryptothallus mirabilis*
(C) *Cryptothallus* and *Zoopsis*
(D) *Zoopsis* and *Cryptothallus*
- 3) **Setae are absent in the sporangium of:**
(A) *Anthoceros* and *Corsinia* (B) *Corsinia* and *Tortula*
(C) *Tortula* and *Anthoceros* (D) *Sphagnum* and *Corsinia*
- 4) **Name the earliest land vascular plant discovered from Mid Silurian of Ireland.**
(A) *Cooksonia* (B) *Rhynia* (C) *Aglaophyton* (D) *Psilophyton*
- 5) **Which of the following statement is not true about stele system of pteridophytes?**
(A) Primitive type of stele is found in *Lycopodium*
(B) Stele in which centre is occupied by pith is called siphonostele
(C) A siphonostele perforated by several overlapping leaf gap is called Solenostele
(D) Amphiphloic siphonostele is the condition in which xylem is surrounded on both sides by phloem, pericycle and endodermis
- 6) **In transverse sections of a young stem, if vallecular canals and cranial canals are present, then the plant belongs to:**
(A) Lycopodiales (B) Isoetales (C) Selaginellales (D) Equisetales
- 7) **Which of the following families of the gymnosperms has 1 ovule per scale?**
(A) Pinaceae (B) Araucariaceae (C) Cupressaceae (D) Ginkgoaceae
- 8) **Sago is a starch mostly obtained from pith and cortex of the stem of *Cycas* species:**
(A) *Cycas cercinalis* (B) *Cycas revoluta*
(C) *Cycas pectinata* (D) *Cycas rumphi*
- 9) **A demulcent is a drug that:**
(A) Calms the nerves and induces sleep
(B) Enhances appetite and digestion
(C) Soothes skin and mucous membrane
(D) Increases the discharges of urine
- 10) **Which of the following plant extract has property to cure rheumatism?**
(A) *Azadirachta indica* (B) *Cassia augustifolia*
(C) *Withania somniferum* (D) *Aegle marmelos*

- 11) In which of the following types, the embryo sac has 16 nuclei, with a 3-celled egg apparatus and two polar nuclei?
 (A) *Peperomia* (B) *Penaea* (C) *Drusa* (D) *Fritillaria*
- 12) *Amborella trichopoda* is now widely considered as:
 (A) Oldest known fossils of an angiosperm
 (B) Most primitive living angiosperm
 (C) Most primitive living vascular plant
 (D) Oldest known fossil of a seed plant
- 13) Which of the following algae have nonflagellate coenobia?
 (A) *Eudorina* (B) *Pandorina* (C) *Pediastrum* (D) *Volvox*
- 14) Formation of statospores is a characteristic feature of:
 (A) Chlorophyta Division (B) Chrysophyta Division
 (C) Phaeophyta Division (D) Pyrrophyta Division
- 15) The most important alga used as food in Japan is:
 (A) *Furcellaria fastiagata* (B) *Gleopeltis furcata*
 (C) *Microcystis aeruginosa* (D) *Porphyra tenera*
- 16) Which of the following shows secondary growth by successive cambia?
 (A) *Boerhaavia diffusa* (B) *Aristolochia triangularis*
 (C) *Thunbergia coceinea* (D) *Serjania corrugate*
- 17) Bicollateral vascular bundles are characteristic feature of which of the following genera:
 (A) *Cucurbita* (B) *Helianthus* (C) *Althaea* (D) *Salvia*
- 18) The type specimen is collected from the original material to serve as nomenclature type, when holotype is missing:
 (A) Isotype (B) Lectotype (C) Neotype (D) Topotype
- 19) ICN stands for:
 (A) International code of nomenclature for plants
 (B) International code of nomenclature for algae, fungi and plants
 (C) International code of nomenclature for algae and fungi
 (D) International code of nomenclature for angiosperm only
- 20) Which of the following is a binomial in which genus and species names are identical in spelling?
 (A) Autonym (B) Tautonym (C) Homonym (D) Synonym
- 21) The Genome D present in bread wheat is supposed to have been derived from:
 (A) *Aegilops Squarrosa* (B) *Aegilops Speltoides*
 (C) *Triticum Monococcum* (D) *Triticum vulgare*
- 22) The process involving inspection, fumigation and growing the introduced plant material in isolation is known as

- (A) Acclimatization (B) Quarantine
(C) Adaptation (D) Tolerance
- 23) **Heterosis is:**
(A) Superiority of hybrids over their parents
(B) Induction of mutation
(C) Mixture of two or more traits
(D) Spontaneous mutation
- 24) **A type 1 survivorship curve is characteristic of the species with a rapid increase in mortality in old age. This type of curve is:**
(A) Typical of many invertebrates that produce a large number of offspring
(B) Typical of humans and other large mammals
(C) Almost never found in nature
(D) Typical of all species of birds
- 25) **According to McArthur and Wilson's equilibrium theory, which of the following is true?**
(A) Larger islands and islands closer to continent are expected to have more species than smaller and isolated islands
(B) Smaller islands and islands far from the continent are expected to have more species than larger and isolated islands
(C) Smaller islands and islands closer to the continent are expected to have more species than far away and isolated islands
(D) More species are expected on all islands irrespective of their size and distance from continent
- 26) **Wetlands are conserved internationally through an effort called:**
(A) Basei convention (B) Rio convention
(C) Montreal convention (D) Ramsar convention
- 27) **Which of the following fungal group belongs to phylum Straminopila?**
(A) Ascomycota (B) Basidiomycota
(C) Zygomycota (D) Oomycota
- 28) **Which of the following zoosporic fungi has nuclear cap in its zoospores?**
(A) *Blastocladiella emersonii* (B) *Apodachlya brachynema*
(C) *Plasmodiophora brassicae* (D) *Phytophthora infestans*
- 29) **Unicellular stalked teleutospores with papillar thickening is a characteristic feature of the following rust genera?**
(A) Uromyces (B) Puccinia (C) Phragmidium (D) Ravenelia
- 30) **Phenylalanine, a precursor of most of the phenolics in higher plants is a product of which one of the following pathways?**
(A) Shikimic acid pathway (B) Malonic acid pathway
(C) Mevalonic acid pathway (D) Methylerythritol pathway

- 31) **Gibberellic acid (GA) controls seed germination by directing breakdown of the stored starch. In which one of the following tissues of the barley seed, α -amylase gene is induced in response to GA?**
 (A) Endosperm (B) Coleoptile (C) Aleurone layer (D) Embryo
- 32) **How many ATP and NADPH₂ are used in C₃ cycle for net production of one molecule of 3-phosphoglyceraldehyde?**
 (A) 3ATP and 2 NADPH₂ (B) 9ATP and 6 NADPH₂
 (C) 6ATP and 6 NADPH₂ (D) 6ATP and 9 NADPH₂
- 33) **Magnesium, iron and Molybdenum metals are present in enzymes as activators, which are:**
 (A) Cytochrome, Peptidases and Phosphotases respectively
 (B) Phosphatases, Cytochromes and Nitrogenase respectively
 (C) Fructokinase, Cytochromes and Nitrate reductase respectively
 (D) Dehydrogenase, Kinase and Nitrate reductase respectively
- 34) **If the free energy change (ΔG) in a reaction is a negative value, it indicates that the:**
 (A) Reaction releases energy (B) Reaction absorbs energy
 (C) Reaction is in positive direction (D) Reaction is in negative direction
- 35) **Enzyme acts as biological catalyst by increasing rate of reaction by:**
 (A) Increasing activation energy (B) Decreasing activation energy
 (C) Increasing free energy change (D) Increasing entropy
- 36) **During protein synthesis in prokaryotes, the peptidyl transferase activity required for peptide bond formation is due to:**
 (A) Ribosomal proteins (B) 16S ribosomal RNA
 (C) 23S ribosomal RNA (D) Aminoacyl t-RNA
- 37) **Major function of σ -Subunit of *E. coli* RNA polymerase during transcription is to:**
 (A) Initiate transcription and does not fall off during elongation
 (B) Decreases affinity of core enzyme to promoter
 (C) Binds to DNA independent of core enzyme
 (D) Ensure recognition of promoter region by interacting with core enzyme
- 38) **During replication, the RNA primer is degraded by the 5'-3' exonuclease activity of:**
 (A) RNase H1 (ribonuclease H1) (B) FEN-1 (flap endonuclease 1)
 (C) Topoisomerase II B (D) DNA polymerase ϵ
- 39) **Species richness is much pronounced in which type of forests:**
 (A) Tropical rain forest (B) Tropical deciduous forest
 (C) Temperate forest (D) Alpine forest
- 40) **Average annual precipitation and temperature of temperate forest are respectively:**
 (A) 255 cm precipitation and 25°C temperature
 (B) 300 cm precipitation and 15°C temperature
 (C) 100 cm precipitation and 15°C temperature

- (D) 300 cm precipitation and 25°C temperature
- 41) Subalpine forest and tropical thorn forest are dominated with following plant species:
- (A) *Dichanthium* and *Abies* (B) *Ilex* and *Pinus*
 (C) *Abies* and *Acacia* (D) *Dipterocarpus* and *Acacia*
- 42) The apple scab disease is caused by:
- (A) *Xanthomonas citri* (B) *Venturia inaequalis*
 (C) *Colletotrichum falcatum* (D) *Curvularia prasadii*
- 43) The 'Tundu' disease of wheat is caused by:
- (A) *Anguina tritici* and *Corynebacterium tritici*
 (B) *Anguina tritici*
 (C) *Anguina tritici* and *Erwinia dissolvens*
 (D) *Globodera tritici*
- 44) The "Great Bengal Famine" in 1943 was the result of which of the following:
- (A) Bunt of wheat caused by *Tilletia*
 (B) *Helmithosporium* blight of rice
 (C) Blast of rice caused by *Pyricularia*
 (D) Late blight of potato caused by *Phytophthora*
- 45) Standard deviation of a sample is 240 and number of individuals of the sample are 64. Find out the Standard error of mean (SEM)?
- (A) 30 (B) 50 (C) 20 (D) 60
- 46) Choose the correct relation among arithmetic mean (AM), geometric mean (GM) and harmonic mean (HM):
- (A) GM > AM > HM (B) HM > AM < GM
 (C) AM > GM > HM (D) HM > AM > GM
- 47) Which of the following is a non parametric test?
- (A) Chi square test (B) F-test
 (C) T-test (D) ANOVA test
- 48) The genetically modified tomato 'Flavr Savr' with delayed ripening was the result of:
- (A) Over expression of Antisense gene for *polygalacturonase*
 (B) Gene silencing by antisense RNA
 (C) Over expression of gene for ethylene biosynthesis
 (D) Over expression of gene for ACC synthase
- 49) Glyphosate-based herbicides, such as Roundup, target which pathway of the plants?
- (A) Mevalonic acid pathway
 (B) Shikimate pathway enzyme 5-enolpyruvylshikimate 3-phosphate (EPSP) synthase
 (C) Methyl erythritol pathway
 (D) Malonic acid pathway

50) Which of the following genetic engineering method is best suited for addition of gene into plants?

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|---------------------------------|--------------------|
| (A) Plasmid method | (B) Vector method |
| (C) Biolistic (gene gun) method | (D) Microinjection |

x-x-x

Panjab University, Chandigarh

M.Phil./PHD - 2019

ANSWERS / KEY

Subject: Botany(Ph.D. & M.Phil.)

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

Note: An 'X' (if any) in the key indicates that either the question is ambiguous or it has printing mistake. All candidates will be given credit for this question