

# DU MPhil PhD in Botany

Topic:- BOT MPHIL S2

1) Which one of the following statements is INCORRECT about *Ginkgo*?

[Question ID = 4476]

1. Leaves show dichotomous venation pattern

[Option ID = 17898]

2. Dwarf shoots are pycnoxylic

[Option ID = 17899]

3. Spermatozoids are motile

[Option ID = 17900]

4. Secondary xylem tracheids show biseriate bordered pits

[Option ID = 17901]

Correct Answer :-

- Dwarf shoots are pycnoxylic

[Option ID = 17899]

2) Cell wall of Archaeobacteria is made up of

[Question ID = 4477]

1. N-acetylglucosamine and N-acetyltalosaminuronic acid that are linked by  $\beta$ -1,3-glycosidic bonds [Option ID = 17902]

2. N-acetylglucosamine and N-acetyltalosaminuronic acid that are linked by  $\beta$ -1,4-glycosidic bonds [Option ID = 17903]

3. N-acetylglucosamine and N-acetylmuramic acid that are linked by  $\beta$ -1,3-glycosidic bonds [Option ID = 17904]

4. N-acetylglucosamine and N-acetylmuramic acid that are linked by  $\beta$ -1,4-glycosidic bonds. [Option ID = 17905]

Correct Answer :-

- N-acetylglucosamine and N-acetyltalosaminuronic acid that are linked by  $\beta$ -1,3-glycosidic bonds [Option ID = 17902]

3) The outer membrane of cell wall in Gram-negative bacteria is attached to the underlying peptidoglycan layer by

[Question ID = 4478]

1. Braun's Lipoprotein [Option ID = 17906]

2. Phospholipids [Option ID = 17907]

3. Proteins [Option ID = 17908]

4. Lipopolysaccharide [Option ID = 17909]

Correct Answer :-

- Braun's Lipoprotein [Option ID = 17906]

4) The sum of areas of all leaves per unit area of ground refers to as

[Question ID = 4479]

1. Specific leaf area [Option ID = 17910]

2. Specific leaf mass [Option ID = 17911]

3. Leaf area index [Option ID = 17912]

4. Average leaf area [Option ID = 17913]

Correct Answer :-

- Leaf area index [Option ID = 17912]

5) The flame photometric method determines the following set of elements

[Question ID = 4480]

1. Sodium, potassium, lithium and phosphorus [Option ID = 17914]

2. Sodium, potassium, lithium and calcium [Option ID = 17915]

3. Sodium, potassium, lithium and magnesium [Option ID = 17916]

4. Sodium, potassium, calcium and magnesium [Option ID = 17917]

Correct Answer :-

- Sodium, potassium, lithium and calcium [Option ID = 17915]

6) Which of the following databases is a repository of (1) large scale genomic variants, and (2) genome-wide association studies, respectively?

[Question ID = 4481]

1. (1):POPSET; (2): dbVar [Option ID = 17918]

2. (1):dbVar; (2): dbGaP [Option ID = 17919]

3. (1):GSS; (2): dbEST [Option ID = 17920]

4. (1):POPSET; (2): GSS [Option ID = 17921]

Correct Answer :-

- (1):dbVar; (2): dbGaP [Option ID = 17919]

7) Spot trains in a 2D gel can be reduced by conducting IEF (isoelectric focusing) at

[Question ID = 4482]

1. 30°C [Option ID = 17922]
2. 40°C [Option ID = 17923]
3. 20°C [Option ID = 17924]
4. 35°C [Option ID = 17925]

Correct Answer :-

- 20°C [Option ID = 17924]

8) Which among the following is an INCORRECT statement about SHOOTMERISTEMLESS gene?

[Question ID = 4483]

1. It is a member of class 1 KNOX gene family [Option ID = 17926]
2. It is expressed throughout the meristem [Option ID = 17927]
3. It codes for a small polypeptide that moves between cells [Option ID = 17928]
4. It is downregulated in organ primordia [Option ID = 17929]

Correct Answer :-

- It codes for a small polypeptide that moves between cells [Option ID = 17928]

9) Which one of the following involves selective removal of cells in order to specifically find out the position dependent, cell-cell interaction processes that require signals from neighbouring cells?

[Question ID = 4484]

1. Ablation studies [Option ID = 17930]
2. The split luciferase complementation assay [Option ID = 17931]
3. Yeast two-hybrid assay [Option ID = 17932]
4. Fluorescent in-situ hybridization [Option ID = 17933]

Correct Answer :-

- Ablation studies [Option ID = 17930]

10) The diamond shaped axial parenchyma with lateral extensions present on one side of the vessels is known as

[Question ID = 4485]

1. lozenge-aliform [Option ID = 17934]
2. paratracheal [Option ID = 17935]
3. vasicentric [Option ID = 17936]
4. confluent [Option ID = 17937]

Correct Answer :-

- lozenge-aliform [Option ID = 17934]

11) Which one of the following is used as a source of energy by chemosynthetic autotrophs for synthesis of organic molecules?

[Question ID = 4486]

1. Hydrogen peroxide [Option ID = 17938]
2. Hydrogen sulfide [Option ID = 17939]
3. di-methyl sulfide [Option ID = 17940]
4. Arsenic sulfide [Option ID = 17941]

Correct Answer :-

- Hydrogen sulfide [Option ID = 17939]

12) Phosphorus can be estimated by

[Question ID = 4487]

1. Ammonium molybdate blue method [Option ID = 17942]
2. Ammonium nitrate method [Option ID = 17943]
3. Stannous chloride method [Option ID = 17944]
4. Silver nitrate [Option ID = 17945]

Correct Answer :-

- Ammonium molybdate blue method [Option ID = 17942]

13) The Hungarian Scientist, Lajos Winkler in 1888, developed a method for estimation of

[Question ID = 4488]

1. Chloride [Option ID = 17946]
2. Dissolved O<sub>2</sub> [Option ID = 17947]
3. Free CO<sub>2</sub> [Option ID = 17948]
4. Hardness of water [Option ID = 17949]

Correct Answer :-

- Dissolved O<sub>2</sub> [Option ID = 17947]

14) Addition of which group to the N-terminus of a protein is the most common form of protein modification?

[Question ID = 4489]

1. Methylation [Option ID = 17950]
2. Adenylation [Option ID = 17951]
3. Acetylation [Option ID = 17952]
4. Phosphorylation [Option ID = 17953]

Correct Answer :-

- Acetylation [Option ID = 17952]

15) In a mass spectrometer, the ions are sorted out by

[Question ID = 4490]

1. accelerating them through electric field only [Option ID = 17954]
2. accelerating them through magnetic field only [Option ID = 17955]
3. accelerating them through both electric and magnetic fields [Option ID = 17956]
4. applying a high voltage [Option ID = 17957]

Correct Answer :-

- accelerating them through both electric and magnetic fields [Option ID = 17956]

16) A RNA:DNA hybrid in which RNA overhangs are present at both 5' and 3' ends can be made blunt ended with the help of

[Question ID = 4491]

1. Reverse Transcriptase [Option ID = 17958]
2. Mung bean nuclease [Option ID = 17959]
3. Klenow Polymerase [Option ID = 17960]
4. T7 RNA Polymerase [Option ID = 17961]

Correct Answer :-

- Mung bean nuclease [Option ID = 17959]

17) The Importance Value Index (IVI) of a woody community is calculated using the formula:

[Question ID = 4492]

1. Relative frequency + Relative abundance + Relative Density [Option ID = 17962]
2. Frequency + Abundance + Density [Option ID = 17963]
3. Frequency + Abundance + Basal area [Option ID = 17964]
4. Relative frequency + Relative abundance + Relative Basal Area [Option ID = 17965]

Correct Answer :-

- Relative frequency + Relative abundance + Relative Basal Area [Option ID = 17965]

18) The index to find species similarities is

[Question ID = 4493]

1. Shannon-Wiener [Option ID = 17966]
2. Simpson's [Option ID = 17967]
3. Sorensen's [Option ID = 17968]
4. Pielou's [Option ID = 17969]

Correct Answer :-

- Sorensen's [Option ID = 17968]

19) A specimen derived from a non-original collection that is selected to serve as the type is called

[Question ID = 4494]

1. Holotype [Option ID = 17970]
2. Lectotype [Option ID = 17971]
3. Paratype [Option ID = 17972]
4. Neotype [Option ID = 17973]

Correct Answer :-

- Neotype [Option ID = 17973]

20) A name spelled exactly like a validly published name for a taxon of the same rank based on different type is called

[Question ID = 4495]

1. Autonym [Option ID = 17974]
2. Basionym [Option ID = 17975]
3. Homonym [Option ID = 17976]
4. Synonym [Option ID = 17977]

Correct Answer :-

- Homonym [Option ID = 17976]

21) The slope and intercept obtained from (1/Rate) against (1/Substrate concentration) of an enzyme catalyzed reaction are 600 and  $2 \times 10^5$ , respectively. The Michaelis-Menten constant of the enzyme in this reaction is

[Question ID = 4496]

1.  $12 \times 10^7$  [Option ID = 17978]
2.  $3.33 \times 10^2$  [Option ID = 17979]
3.  $1.5 \times 10^{-3}$  [Option ID = 17980]
4.  $3 \times 10^{-3}$  [Option ID = 17981]

Correct Answer :-

- $3 \times 10^{-3}$  [Option ID = 17981]

22) Tyrosine contains an aromatic R group and has  $pK_1=2.2$ ,  $pK_2=9.1$  and  $pK_R=10.9$ . Its calculated isoelectric point (pI) is [Question ID = 4497]

1. 7.4 [Option ID = 17982]
2. 10 [Option ID = 17983]
3. 5.65 [Option ID = 17984]
4. 6.55 [Option ID = 17985]

Correct Answer :-

- 5.65 [Option ID = 17984]

23) Which one of the following statements is INCORRECT for Two Component Signaling (TCS)? [Question ID = 4498]

1. Osmo-sensing in *E. coli* operates via a canonical TCS [Option ID = 17986]
2. CRE1 was the first TCS system to be discovered in plants [Option ID = 17987]
3. Hybrid type TCS are operational in plants [Option ID = 17988]
4. Chemo-sensing in *E. coli* involves multiple response regulators [Option ID = 17989]

Correct Answer :-

- CRE1 was the first TCS system to be discovered in plants [Option ID = 17987]

24) Which one of the following statements is FALSE for RILs (Recombinant Inbred Lines) [Question ID = 4499]

1. RILs comprise individuals that are homozygous at most loci [Option ID = 17990]
2. Only loci polymorphic between the two parents can be mapped using RILs [Option ID = 17991]
3. Dominant markers will segregate in a 3:1 ratio in the RIL population [Option ID = 17992]
4. Developing RILs is more time consuming than generating  $F_2$  populations [Option ID = 17993]

Correct Answer :-

- Dominant markers will segregate in a 3:1 ratio in the RIL population [Option ID = 17992]

25) Which one of the following statements is INCORRECT for the *E. coli* lactose operon? [Question ID = 4500]

1. cAMP concentration in the cell is affected by amount of glucose. [Option ID = 17994]
2. CAP-cAMP complex is essential for the induction of the operon. [Option ID = 17995]
3. CAP-cAMP complex binds to the operator of lac operon. [Option ID = 17996]
4. The operon is induced in presence of lactose only when glucose is absent. [Option ID = 17997]

Correct Answer :-

- CAP-cAMP complex binds to the operator of lac operon. [Option ID = 17996]

26) Which of the following statement is NOT true about SSR markers? [Question ID = 4501]

1. They are tandemly repeated sequences. [Option ID = 17998]
2. They are analyzed using primers complementary to their hyper variable flanking regions. [Option ID = 17999]
3. They are co-dominant. [Option ID = 18000]
4. SSRs are present in both coding and noncoding regions of the genome. [Option ID = 18001]

Correct Answer :-

- They are analyzed using primers complementary to their hyper variable flanking regions. [Option ID = 17999]

27) Which one of the following statements is INCORRECT about pseudogenes? [Question ID = 4502]

1. They are derived from mRNA sequences by reverse transcription. [Option ID = 18002]
2. They arise due to accumulation of mutations in functional genes. [Option ID = 18003]
3. They appear as intron-less versions of another existing gene. [Option ID = 18004]
4. They possess poly A tract at the 3' end. [Option ID = 18005]

Correct Answer :-

- They arise due to accumulation of mutations in functional genes. [Option ID = 18003]

28) Which one of the following is a monotypic family? [Question ID = 4503]

1. Nymphaeaceae [Option ID = 18006]
2. Aristolochiaceae [Option ID = 18007]
3. Amborellaceae [Option ID = 18008]
4. Winteraceae [Option ID = 18009]

Correct Answer :-

- Amborellaceae [Option ID = 18008]

29) 'Jaculators' are a characteristic feature of

[Question ID = 4504]

1. Apocynaceae [Option ID = 18010]
2. Acanthaceae [Option ID = 18011]
3. Asteraceae [Option ID = 18012]
4. Myrtaceae [Option ID = 18013]

Correct Answer :-

- Acanthaceae [Option ID = 18011]

30) Stigmatic exudate produced on wet stigma is NOT responsible for

[Question ID = 4505]

1. pollen-pistil interaction [Option ID = 18014]
2. excessive evaporation and wetting [Option ID = 18015]
3. protection against pathogens and insects [Option ID = 18016]
4. the formation of pellicle components [Option ID = 18017]

Correct Answer :-

- the formation of pellicle components [Option ID = 18017]

31) Which one of the following events is accompanied by pollen tube entry inside the synergid cell?

[Question ID = 4506]

1. Degeneration of one of the synergids [Option ID = 18018]
2. Disruption of plasma membrane [Option ID = 18019]
3. Impaired DnaJ chaperonin expression in mitochondria [Option ID = 18020]
4. Accumulation of  $Ca^{++}$  in the synergid [Option ID = 18021]

Correct Answer :-

- Impaired DnaJ chaperonin expression in mitochondria [Option ID = 18020]

32) Polar distribution of  $Ca^{++}$  in the pollen tube tip can be disrupted by

[Question ID = 4507]

1. Fluphenazine [Option ID = 18022]
2. Gadolinium [Option ID = 18023]
3. FURA 2 [Option ID = 18024]
4. Quin 2 [Option ID = 18025]

Correct Answer :-

- Gadolinium [Option ID = 18023]

33) Match the name of genes mentioned in Column I with their source in Column II:

Column I	Column II
A. gfp	I. <i>Bacillus thuringiensis</i>
B. bar	II. <i>Escherichia coli</i>
C. gus	III. <i>Streptomyces hygrosopicus</i>
D. btgene	IV. <i>Aequorea victoria</i>

Choose the correct answer from the options given below:

[Question ID = 4508]

1. A - III, B - IV, C - II, D - I  
[Option ID = 18026]
2. A - II, B - III, C - IV, D - I  
[Option ID = 18027]
3. A - IV, B - III, C - II, D - I  
[Option ID = 18028]
4. A - IV, B - I, C - II, D - III  
[Option ID = 18029]

Correct Answer :-

- A - II, B - III, C - IV, D - I  
[Option ID = 18027]

34) Select the appropriate group of markers that can be used for evaluating the genetic fidelity of plants?

[Question ID = 4509]

1. SCoT, RAPD, ISSR [Option ID = 18030]
2. RFLP, HPLC, SS [Option ID = 18031]
3. SCoT, SRAP, HPTLC [Option ID = 18032]
4. SSR, RAPD, TLC [Option ID = 18033]

Correct Answer :-

- SCoT, RAPD, ISSR [Option ID = 18030]

35) Which one of the following enzymatic antioxidants is localized in the endoplasmic reticulum?

[Question ID = 4510]

1. Superoxide dismutase [Option ID = 18034]
2. Catalase [Option ID = 18035]
3. Guaiacol peroxidase [Option ID = 18036]
4. Glutathione reductase [Option ID = 18037]

Correct Answer :-

- Guaiacol peroxidase [Option ID = 18036]

36) Which one of the following is NOT required for natural selection?

[Question ID = 4511]

1. Genetic Drift [Option ID = 18038]
2. Differential survival and reproduction [Option ID = 18039]
3. Heritability of trait under selection [Option ID = 18040]
4. Variation [Option ID = 18041]

Correct Answer :-

- Genetic Drift [Option ID = 18038]

37) Which of the following is the correct order of geologic time intervals from the most ancient to the most recent?

[Question ID = 4512]

1. Paleozoic, Cenozoic, Mesozoic [Option ID = 18042]
2. Hadean, Archaen, Proterozoic [Option ID = 18043]
3. Silurian, Ordovician, Cambrian [Option ID = 18044]
4. Silurian, Carboniferous, Devonian [Option ID = 18045]

Correct Answer :-

- Hadean, Archaen, Proterozoic [Option ID = 18043]

38) Which one of the following statements is NOT true for Maturation Promoting Factor (MPF)?

[Question ID = 4513]

1. MPF activity drives somatic cells into mitosis. [Option ID = 18046]
2. MPF activity dephosphorylates condensin and nucleoporin. [Option ID = 18047]
3. MPF activity drives oocytes into meiosis. [Option ID = 18048]
4. MPF is a heterodimer containing CDK1 and cyclin B. [Option ID = 18049]

Correct Answer :-

- MPF activity dephosphorylates condensin and nucleoporin. [Option ID = 18047]

39) During expansion of a cell, which of the following bonds in cell walls are affected by expansin proteins?

[Question ID = 4514]

1. Covalent bonds [Option ID = 18050]
2. Electrovalent bonds [Option ID = 18051]
3. Hydrogen bonds [Option ID = 18052]
4. van der Waals forces [Option ID = 18053]

Correct Answer :-

- Hydrogen bonds [Option ID = 18052]

40) The technique, Fluorescence (Förster) Resonance Energy Transfer (FRET), is used to study

[Question ID = 4515]

1. lateral mobility of lipids/proteins within membranes. [Option ID = 18054]
2. existence of lipid rafts within membranes. [Option ID = 18055]
3. presence of supramolecular complexes within membranes. [Option ID = 18056]
4. domain structure of lipids within membranes. [Option ID = 18057]

Correct Answer :-

- presence of supramolecular complexes within membranes. [Option ID = 18056]

41) What is the approximate length of linker DNA present between two nucleosomes, if it has (i) 20 base pairs or (ii) 60 base pairs?

[Question ID = 4516]

1. (i) 68 Å or (ii) 204 Å [Option ID = 18058]

- (i) 68 nm or (ii) 204 nm [Option ID = 18059]
- (i) 6.8 Å or (ii) 20.4 Å [Option ID = 18060]
- (i) 6.8 µm or (ii) 20.4 µm [Option ID = 18061]

Correct Answer :-

- (i) 68 Å or (ii) 204 Å [Option ID = 18058]

42) Golgi stain, advent and use of which resulted in universal acceptance of Cell theory, makes use of

[Question ID = 4517]

- Copper [Option ID = 18062]
- Gold [Option ID = 18063]
- Silver [Option ID = 18064]
- Iron [Option ID = 18065]

Correct Answer :-

- Silver [Option ID = 18064]

43) Mutations in genes encoding E-cadherins in *Pectinophora gossypiella* led to resistance against Bt cotton Bollgard 1 producing the endotoxin

[Question ID = 4518]

- Cry 1Ac  
[Option ID = 18066]
- Cry 1Ab  
[Option ID = 18067]
- Cry 2Ac  
[Option ID = 18068]
- Cry 2Ab  
[Option ID = 18069]

Correct Answer :-

- Cry 1Ac

[Option ID = 18066]

44) Which one of the following techniques is NOT a part of Integrated Pest Management?

[Question ID = 4519]

- Pheromone mediated mating disruption [Option ID = 18070]
- "Push and Pull" strategy [Option ID = 18071]
- Biological control [Option ID = 18072]
- Sterile Insect Production [Option ID = 18073]

Correct Answer :-

- Sterile Insect Production [Option ID = 18073]

45) The association of *Crotalaria sativa*-*Utethesia ornatrix*-*Nephila clavipes* is a representation of

[Question ID = 4520]

- insects feeding on a legume  
[Option ID = 18074]
- vectors of viral diseases of a legume crop  
[Option ID = 18075]
- host plant-pest-predator interaction  
[Option ID = 18076]
- host plant-insect-predator interaction  
[Option ID = 18077]

Correct Answer :-

- host plant-insect-predator interaction

[Option ID = 18077]

46) The Cre-lox recombination system is a characteristic feature of

[Question ID = 4521]

- Sulfolobus islandicus* rod-shaped virus 1  
[Option ID = 18078]
- Escherichia virus P1*  
[Option ID = 18079]

3. *Cryphonectria hypovirus 1*

[Option ID = 18080]

4. *Acanthamoeba polyphaga mimivirus*

[Option ID = 18081]

Correct Answer :-

- *Escherichia virus P1*

[Option ID = 18079]

47) Which single-stranded DNA virus associated with epidemics of tomato leaf curl disease is documented as a natural recombinant molecule?

[Question ID = 4522]

1. Tomato yellow leaf curl virus-Israel [Option ID = 18082]

2. Tomato leaf curl Sardinia virus [Option ID = 18083]

3. Tomato leaf curl New Delhi virus [Option ID = 18084]

4. Tomato leaf curl Malaga virus [Option ID = 18085]

Correct Answer :-

- Tomato leaf curl Malaga virus [Option ID = 18085]

48) Resistance being inherited as an autosomal recessive trait, the development of cross-resistance in targeted cotton pests to Bt delta endotoxins incorporated into artificial diets can best be evaluated from estimates of

[Question ID = 4523]

1.  $LC_{01}$  [Option ID = 18086]

2.  $LC_{50}$  [Option ID = 18087]

3.  $LC_{90}$  [Option ID = 18088]

4.  $LC_{100}$  [Option ID = 18089]

Correct Answer :-

- $LC_{50}$  [Option ID = 18087]

49) Which of the following alga is a commercial source of  $\beta$ -carotene?

[Question ID = 4524]

1. *Oscillatoria sp.*

[Option ID = 18090]

2. *Monodopsis subterranean*

[Option ID = 18091]

3. *Dunaliella salina*

[Option ID = 18092]

4. *Scenedesmus obliquus*

[Option ID = 18093]

Correct Answer :-

- *Dunaliella salina*

[Option ID = 18092]

50) The phenomenon of "red snow" is exhibited in polar regions by which of the *Chlamydomonas* species?

[Question ID = 4525]

1. *C. nivalis*

[Option ID = 18094]

2. *C. coccifera*

[Option ID = 18095]

3. *C. media*

[Option ID = 18096]

4. *C. reticulata*

[Option ID = 18097]

Correct Answer :-

- *C. nivalis*

[Option ID = 18094]