

DU MPhil PhD in Botany

Topic:- DU_J19_MPHIL_BOT

1) Bacteria, living in the tissues of tube worms, synthesize organic compounds using**[Question ID = 122]**

1. Oxides of silicon [Option ID = 488]
2. Hydrogen sulfide [Option ID = 485]
3. Hydrogen peroxide. [Option ID = 487]
4. Sulphur dioxide. [Option ID = 486]

Correct Answer :-

- Hydrogen sulfide [Option ID = 485]

2) Which of the following statements is not true for the process of continuous fermentation?**[Question ID = 152]**

1. Fermentation process never stops in between, and it continues to run for a long period of time with addition of nutrients and harvesting of metabolites at regular interval. [Option ID = 606]
2. Exponential growth of microbes is maintained in the fermenter for a prolonged period of time. [Option ID = 605]
3. It is very useful for processes that involve the production of secondary metabolites. [Option ID = 607]
4. It is an open system. [Option ID = 608]

Correct Answer :-

- Exponential growth of microbes is maintained in the fermenter for a prolonged period of time. [Option ID = 605]

3) Which of the following statements is not true for CRISPR-Cas system?**[Question ID = 110]**

1. It cannot be used for RNA editing. [Option ID = 440]
2. It can be used to generate double stranded nicks in the DNA. [Option ID = 439]
3. It can be used as a vehicle to transfer activators to the target DNA region. [Option ID = 437]
4. It can be used for both genome editing and gene regulation. [Option ID = 438]

Correct Answer :-

- It can be used as a vehicle to transfer activators to the target DNA region. [Option ID = 437]

4) Which of the following statements is not true about the sex chromosomes in Humans?**[Question ID = 139]**

1. A homologous region, called as Pseudo autosomal region, helps in pairing of X and Y chromosomes during meiosis. [Option ID = 553]
2. There are no genes present on Y chromosome. [Option ID = 556]
3. There are palindromes present on Y chromosome. [Option ID = 555]

Correct Answer :-

- A homologous region, called as Pseudo autosomal region, helps in pairing of X and Y chromosomes during meiosis. [Option ID = 553]

5) Which of the following statements is not true for population based (association) mapping in plants?**[Question ID = 140]**

1. It allows for a simultaneous evaluation of multiple alleles. [Option ID = 559]
2. Population used is generated by crossing desired parents. [Option ID = 560]
3. The QTLs identified through association mapping generally have wider applicability. [Option ID = 557]
4. The approach is based on the linkage disequilibrium between loci. [Option ID = 558]

Correct Answer :-

- The QTLs identified through association mapping generally have wider applicability. [Option ID = 557]

6) Which of the following statements about column chromatography is correct?**[Question ID = 118]**

1. In reverse phase chromatography, the protein of interest can be selectively eluted by solutions of different hydrophobicities or ionic strengths. [Option ID = 470]
2. Ion-exchange chromatography separates proteins according to their size. [Option ID = 471]
3. Gel-filtration chromatography separates proteins on their ability to bind to specific groups on the column matrix. [Option ID = 472]
4. Affinity chromatography involves the attachment of ionic groups to the column matrix which bind and separate proteins based on their charge. [Option ID = 469]

Correct Answer :-

- Affinity chromatography involves the attachment of ionic groups to the column matrix which bind and separate proteins based on their charge. [Option ID = 469]

7) Which of the following is not true about AFLP markers?**[Question ID = 109]**

1. AFLP adapters are double stranded. [Option ID = 435]
2. No prior sequence information of the target genomes is required. [Option ID = 436]
3. They show codominant inheritance pattern. [Option ID = 433]
4. They involve double digestion of genomic DNA. [Option ID = 434]

Correct Answer :-

- They show codominant inheritance pattern. [Option ID = 433]

8) Which of the following is not a characteristic feature of necrotrophic pathogens?**[Question ID = 150]**

1. Production of toxins [Option ID = 598]
2. Production of cell wall degrading enzymes [Option ID = 597]
3. Host cell lysis [Option ID = 600]

Correct Answer :-

- Production of cell wall degrading enzymes [Option ID = 597]

9) Which of the following is not suitable as a candidate "transgene" for developing insect-resistant plants?

[Question ID = 148]

1. Cytochrome P450 gene [Option ID = 592]
2. Plant protease inhibitor gene [Option ID = 590]
3. Gene encoding Ribosome Inactivating Protein [Option ID = 591]
4. Bt delta endotoxin gene [Option ID = 589]

Correct Answer :-

- Bt delta endotoxin gene [Option ID = 589]

10) Which of the following is not a Pathogen Associated Molecular Pattern (PAMP)?

[Question ID = 151]

1. Lipoteichoic acid [Option ID = 604]
2. Chitooligosaccharides [Option ID = 602]
3. Defensins [Option ID = 603]
4. Flagellin [Option ID = 601]

Correct Answer :-

- Flagellin [Option ID = 601]

11) Which of the following is not a keystone species?

[Question ID = 123]

1. Lions [Option ID = 492]
2. Wolves [Option ID = 491]
3. Starfish [Option ID = 490]
4. Sea Otters [Option ID = 489]

Correct Answer :-

- Sea Otters [Option ID = 489]

12) Which of the following crop plants requires warm temperature for growth and is especially sensitive to low temperature during its microspore formation (i.e., spikelet differentiation phenostage) and anthesis stages?

[Question ID = 141]

1. Maize [Option ID = 561]
2. Barley [Option ID = 563]
3. Rice [Option ID = 564]
4. Wheat [Option ID = 562]

Correct Answer :-

13) Which of the following algal divisions is characterized by possession of Chlorophylls A and B, starch as energy storage material, presence of a cellulosic cell wall and live in freshwater and marine habitats?

[Question ID = 129]

1. Euglenophyta [Option ID = 515]
2. Pyrrophyta [Option ID = 516]
3. Phaeophyta [Option ID = 514]
4. Chlorophyta [Option ID = 513]

Correct Answer :-

- Chlorophyta [Option ID = 513]

14) Which of the following genes has been used in the development of 2nd generation Bt cotton in India?

[Question ID = 147]

1. Cry 2Ac [Option ID = 588]
2. Cry 1Ac [Option ID = 585]
3. Cry 2Ab [Option ID = 586]
4. Cry 1Ab [Option ID = 587]

Correct Answer :-

- Cry 1Ac [Option ID = 585]

15) Which one of the following statements is true for genetic mapping?

[Question ID = 108]

1. Two genes on the same chromosome can exhibit 50% recombination frequency. [Option ID = 429]
2. A LOD score of less than 3 is generally recommended to develop a linkage map. [Option ID = 432]
3. Recombination frequencies are additive. [Option ID = 430]
4. Recombination frequencies are directly proportional to the distance between them. [Option ID = 431]

Correct Answer :-

- Two genes on the same chromosome can exhibit 50% recombination frequency. [Option ID = 429]

16) Which one of the following statements is true for chemotaxis signaling in bacteria?

[Question ID = 112]

1. Phosphorylated Che Y enhances clockwise rotation of flagellar motion. [Option ID = 445]
2. Phosphorylated Che Y enhances anticlockwise rotation of flagellar motion. [Option ID = 447]
3. De-phosphorylated Che Y enhances anticlockwise rotation of flagellar motion. [Option ID = 448]
4. De-phosphorylated Che Y enhances clockwise rotation of flagellar motion. [Option ID = 446]

Correct Answer :-

- Phosphorylated Che Y enhances clockwise rotation of flagellar motion. [Option ID = 445]

[Question ID = 114]

1. Proline residues are synthesized in the ribosome as the *trans* isomer form. [Option ID = 456]
2. It is commonly present in β -turns [Option ID = 455]
3. It is commonly present in collagen. [Option ID = 454]
4. It is found in middle of α -helix of globular proteins [Option ID = 453]

Correct Answer :-

- It is found in middle of α -helix of globular proteins [Option ID = 453]

18) Which one of the following statements is not true for C-value?

[Question ID = 111]

1. It varies during different stages of the cell cycle. [Option ID = 443]
2. The complexity of the organism is proportional to its C-value. [Option ID = 444]
3. It refers to DNA content of the haploid genome. [Option ID = 441]
4. It remains constant in different tissues of an organism. [Option ID = 442]

Correct Answer :-

- It refers to DNA content of the haploid genome. [Option ID = 441]

19) Which one of the following substrates is used for screening blue-white colonies?

[Question ID = 127]

1. 5-Bromo-3-indolyl- β -D-galactopyranoside [Option ID = 505]
2. 5-Bromo-5-chloro-3-indolyl- β -D-glucuronoside [Option ID = 508]
3. 5-Bromo-4-chloro-3-indolyl- β -D-galactoside [Option ID = 506]
4. N-Methyl-3-indolyl- β -D-galactopyranoside [Option ID = 507]

Correct Answer :-

- 5-Bromo-3-indolyl- β -D-galactopyranoside [Option ID = 505]

20) Which one of the following is a calcium ionophore?

[Question ID = 113]

1. Quin 2 [Option ID = 451]
2. A23187 [Option ID = 449]
3. BAPTA [Option ID = 452]
4. Cameleon [Option ID = 450]

Correct Answer :-

- A23187 [Option ID = 449]

21) Pollen tube near the micropyle ceases to grow after receiving the signal from

[Question ID = 121]

1. the egg cell alone. [Option ID = 483]
2. the egg and synergid cells. [Option ID = 484]
3. the two synergid cells. [Option ID = 481]

Correct Answer :-

- the two synergid cells. [Option ID = 481]

22) When your data set contains an extreme value or an outlier, what would be your preferred measure of central tendency?

[Question ID = 134]

1. Mean and Mode [Option ID = 536]
2. Mean [Option ID = 533]
3. Mode [Option ID = 534]
4. Median [Option ID = 535]

Correct Answer :-

- Mean [Option ID = 533]

23) Identify the incorrect combination from the following:

[Question ID = 125]

1. *bar* iii.) *Streptomyces hygroscopicus* [Option ID = 499]
2. *hpt* i.) *Escherichia coli* [Option ID = 497]
3. *gusA* iv.) *Aequorea victoria* [Option ID = 500]
4. *Barnase* ii.) *Bacillus amyloliquefaciens* [Option ID = 498]

Correct Answer :-

- *hpt* i.) *Escherichia coli* [Option ID = 497]

24) Two consecutive transverse divisions of the zygote forming 4-celled linear proembryo is observed in

[Question ID = 119]

1. *Tropaeolum majus* [Option ID = 474]
2. *Crotalaria juncea* [Option ID = 475]
3. *Cucumis sativus* [Option ID = 476]
4. *Croton bonplandianum* [Option ID = 473]

Correct Answer :-

- *Croton bonplandianum* [Option ID = 473]

25) Arabidopsis gene *LFY* was cloned using the sequence of

[Question ID = 115]

1. Antirrhinum gene *Deficiens* [Option ID = 459]
2. Antirrhinum gene *Centroradialis* [Option ID = 458]
3. Antirrhinum gene *Floricaula* [Option ID = 457]
4. Antirrhinum gene *Plena* [Option ID = 460]

Correct Answer :-

- Antirrhinum gene *Floricaula* [Option ID = 457]

26) Of the following types, which apical stem cells belong to the diploid generation in Bryophytes?

- a) Chloronema
- b) Gametophore
- c) Caulonema
- d) Leaf
- e) Sporophyte
- f) Rhizoid

[Question ID = 130]

- 1. Leaf and Sporophyte only [Option ID = 517]
- 2. Rhizoid, sporophyte and leaf, only [Option ID = 518]
- 3. Sporophyte and rhizoid only [Option ID = 519]
- 4. Sporophyte only [Option ID = 520]

Correct Answer :-

- Leaf and Sporophyte only [Option ID = 517]

27) During photorespiration, conversion of glyoxylate to glycine takes place in the

[Question ID = 143]

- 1. Cytoplasm [Option ID = 572]
- 2. Peroxisome [Option ID = 570]
- 3. Mitochondria [Option ID = 571]
- 4. Chloroplast [Option ID = 569]

Correct Answer :-

- Chloroplast [Option ID = 569]

28) Serial-secondary endosymbiosis is evidenced in

[Question ID = 144]

- 1. Dinoflagellates [Option ID = 573]
- 2. Cryptophytes [Option ID = 575]
- 3. Chlorarachniophytes [Option ID = 576]
- 4. Haptophytes [Option ID = 574]

Correct Answer :-

- Dinoflagellates [Option ID = 573]

29) Ongoing dispersal can join numerous subpopulations to form one of the following:

[Question ID = 132]

- 1. Population corridor [Option ID = 528]
- 2. Population patch [Option ID = 525]
- 3. Metapopulation [Option ID = 527]
- 4. Habitat patch [Option ID = 526]

Correct Answer :-

30) "The movement of proteins within the membrane is not unrestricted" was revealed by the techniques,

[Question ID = 105]

1. FRAP and Immunogold labelling [Option ID = 420]
2. Fluorescent Resonance Energy Transfer (FRET) and Single Particle Tracking [Option ID = 417]
3. Fluorescent Recovery after Photobleaching (FRAP) and Single Particle Tracking [Option ID = 418]
4. FRET and Immunogold labelling [Option ID = 419]

Correct Answer :-

- Fluorescent Resonance Energy Transfer (FRET) and Single Particle Tracking [Option ID = 417]

31) In *Arabidopsis thaliana*, formation of sporogenous tissue is confined to the inner region of an anther locule due to the interaction between

[Question ID = 120]

1. *WUSCHEL* and *CLAVATA* [Option ID = 477]
2. *NOZZLE* and *BARELY ANY MERISTEM 1* [Option ID = 478]
3. *APETALA 1* and *PISTILLATA* [Option ID = 480]
4. *AGAMOUS* and *WUSCHEL* [Option ID = 479]

Correct Answer :-

- *WUSCHEL* and *CLAVATA* [Option ID = 477]

32) Small interfering RNAs (siRNAs) associate with which of the following enzymes to epigenetically modify cytosine at 5'-CHH-3' sites?

[Question ID = 145]

1. DNMT only [Option ID = 577]
2. CMT3 and DRM1 [Option ID = 579]
3. DRM1 only [Option ID = 578]
4. DRM 1 and DRM 2 [Option ID = 580]

Correct Answer :-

- DNMT only [Option ID = 577]

33) Strip cropping is helpful in conserving soil in areas that are

[Question ID = 142]

1. erosion-prone [Option ID = 566]
2. fire-prone [Option ID = 568]
3. drought-prone [Option ID = 565]
4. flood-prone [Option ID = 567]

Correct Answer :-

- drought-prone [Option ID = 565]

34) Floral organ development is controlled by overlapping expression of 'A' class, 'B' class and 'C' class genes in different whorls. In an *Arabidopsis* mutant, the flower had carpel, stamen, stamen and carpels in the four whorls. Mutation in which one of the following is responsible for this phenotype?

[Question ID = 116]

1. 'C' class genes [Option ID = 464]
2. 'B' class genes [Option ID = 462]
3. 'A' class genes [Option ID = 461]
4. 'A' and 'B' class genes [Option ID = 463]

Correct Answer :-

- 'A' class genes [Option ID = 461]

35) In tandem mass spectrometer, the mass selected ions produce daughter ions by

[Question ID = 135]

1. Inert gas activation [Option ID = 539]
2. Collisional activation [Option ID = 537]
3. Thermal activation [Option ID = 540]
4. Evaporational activation [Option ID = 538]

Correct Answer :-

- Collisional activation [Option ID = 537]

36) Agar, a solidifying agent, used in various bacteriological culture media, is produced from algae belonging to the division

[Question ID = 128]

1. Chrysophyta [Option ID = 511]
2. Rhodophyta [Option ID = 512]
3. Phaeophyta [Option ID = 510]
4. Chlorophyta [Option ID = 509]

Correct Answer :-

- Chlorophyta [Option ID = 509]

37) For conducting a western blotting experiment to detect myrosinase protein using anti-myrosinase antibodies raised in mice you would use

[Question ID = 136]

1. Anti-rabbit secondary antibodies raised in mice [Option ID = 541]
2. Anti-rabbit secondary antibodies raised in rabbit [Option ID = 542]
3. Anti-mice secondary antibodies raised in mice [Option ID = 543]
4. Anti-mice secondary antibodies raised in rabbit [Option ID = 544]

Correct Answer :-

- Anti-rabbit secondary antibodies raised in mice [Option ID = 541]

38) What are isobaric tags?

- [Question ID = 117]
1. Molecules of equal mass [Option ID = 466]
 2. Molecules of equal charge [Option ID = 465]
 3. Molecules having equal charge to mass ratio [Option ID = 467]
 4. Fluorescent labels for proteins [Option ID = 468]

Correct Answer :-

- Molecules of equal charge [Option ID = 465]

39) Which one of the following statements about eukaryotic transcription is true?

- i) TFIID contains TATA binding protein and is required for interacting with type II promoter and transcription of mRNA
- ii) Both helicase and kinase activity reside in TFIIH.
- iii) Phosphorylation at carboxy terminal domain of RNA Polymerase II by TFIIS, occurs at Serine residue
- iv) Splice sites are located by SR proteins that bind to Exonic Splice Enhancers (ESE) in pre-mRNA [Question ID = 103]

1. i), iii) and iv) only [Option ID = 409]
2. i) and iv) only [Option ID = 412]
3. i) and ii) only [Option ID = 410]
4. i), ii) and iv) only [Option ID = 411]

Correct Answer :-

- i), iii) and iv) only [Option ID = 409]

40) CENP-A is a variant of the histone

[Question ID = 104]

1. H2A. [Option ID = 415]
2. H2B. [Option ID = 416]
3. H3. [Option ID = 414]
4. H1. [Option ID = 413]

Correct Answer :-

- H1. [Option ID = 413]

41) Hetero-fertilization refers to fertilization of

[Question ID = 137]

1. central cell by two sperm cells from two different male parents [Option ID = 547]
2. egg cell by two sperm cells from two different male parents [Option ID = 548]
3. the egg and central cells of one ovule by two sperm cells from the same parent [Option ID = 546]
4. the egg and central cells of one ovule by sperm cells from two different male parents [Option ID = 545]

Correct Answer :-

- the egg and central cells of one ovule by sperm cells from two different male parents [Option ID = 545]

42) Genomes of the majority of plant viruses consist of

[Question ID = 149]

1. double stranded RNA. [Option ID = 594]
2. double stranded DNA. [Option ID = 593]
3. single stranded negative RNA. [Option ID = 596]
4. single stranded positive RNA. [Option ID = 595]

Correct Answer :-

- double stranded DNA. [Option ID = 593]

43) The percentage of structural glycoproteins present in Type II cell walls varies from

[Question ID = 107]

1. 10-20%. [Option ID = 425]
2. 2-10%. [Option ID = 426]
3. 1-2%. [Option ID = 428]
4. 30-50%. [Option ID = 427]

Correct Answer :-

- 10-20%. [Option ID = 425]

44) The chromogenic substrate used for X-gal is

[Question ID = 126]

1. 5-chloro-5-bromo-3 indolyl-beta-D-galactoside. [Option ID = 503]
2. 5-chloro-4-bromo-3 indolyl-beta-D-galactoside. [Option ID = 501]
3. 5-bromo-4-chloro-3 indolyl-beta-D-galactoside [Option ID = 502]
4. 5-bromo-5-chloro-3 indolyl-beta-D-galactoside. [Option ID = 504]

Correct Answer :-

- 5-chloro-4-bromo-3 indolyl-beta-D-galactoside. [Option ID = 501]

45) The correct arrangement of the various components in optical path of a Phase Contrast microscope is

[Question ID = 106]

1. Light source-condenser-annular aperture-stage-objective-phase shifting plate-eye piece [Option ID = 421]
2. Light source-condenser-annular aperture-stage-phase shifting plate-objective- eye piece [Option ID = 423]
3. Light source-annular aperture-condenser-stage-objective-phase shifting plate-eye piece [Option ID = 422]
4. Light source- annular aperture-condenser- stage- phase shifting plate-objective-eye piece [Option ID = 424]

Correct Answer :-

- Light source-condenser-annular aperture-stage-objective-phase shifting plate-eye piece [Option ID = 421]

46) The equilibrium model of Island biogeography is a balance between one of the following:

[Question ID = 131]

1. Extinction and species isolation [Option ID = 524]
2. Extinction and emigration [Option ID = 523]
3. Immigration and emigration [Option ID = 522]

4. Immigration and extinction [Option ID = 521]

Correct Answer :-

- Immigration and extinction [Option ID = 521]

47) The pollen to ovule ratio of 5000 indicates that the species is**[Question ID = 138]**

1. Facultative autogamous [Option ID = 550]
2. Facultative xenogamus [Option ID = 551]
3. Cleistogamous [Option ID = 549]
4. Obligate xenogamous [Option ID = 552]

Correct Answer :-

- Cleistogamous [Option ID = 549]

48) The role of which of the following was revealed in gene silencing by the analysis of *quelling* deficient (*qde1*) mutant of *Neurospora crassa* ?**[Question ID = 146]**

1. RNA dependent RNA polymerase [Option ID = 582]
2. DNA dependent RNA polymerase [Option ID = 583]
3. DNA dependent DNA polymerase [Option ID = 581]
4. Reverse transcriptase [Option ID = 584]

Correct Answer :-

- DNA dependent DNA polymerase [Option ID = 581]

49) A region is identified as a 'Biodiversity Hotspot' if it harbors**[Question ID = 124]**

1. at least 1,500 vascular plants as endemics and has lost 70% of its area [Option ID = 495]
2. at least 1,500 vascular plants as endemics and has lost 30% of its area. [Option ID = 496]
3. at least 2000 vascular plants as endemics and has lost 30% of its area. [Option ID = 493]
4. at least 1,000 vascular plants as endemics and has lost 70% of its area. [Option ID = 494]

Correct Answer :-

- at least 2000 vascular plants as endemics and has lost 30% of its area. [Option ID = 493]

50) You are interested to identify the most divergent homologous sequence of a gene (DNA) sequence. Which is the most appropriate combination of BLASTN tool with word size to identify most divergent homologous sequence from the choices given below?**[Question ID = 133]**

1. Somewhat similar BLASTN with word size of 7 [Option ID = 529]
2. Somewhat similar BLASTN with word size of 23 [Option ID = 532]
3. Somewhat similar BLASTN with word size of 15 [Option ID = 530]
4. Somewhat similar BLASTN with word size of 9 [Option ID = 531]

Correct Answer :-

