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 <u>not true</u> 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 :-

- It is very useful for processes that involve the production of secondary metabolites. [Option ID = 607]

3) Which of the following statements is <u>not true</u> 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 cannot be used for RNA editing. [Option ID = 440]

4) Which of the following statements is <u>not true</u> 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]
4. MSY is only present on Y chromosome. [Option ID = 554]

Correct Answer :-

- There are no genes present on Y chromosome. [Option ID = 556]

5) Which of the following statements is <u>not true</u> 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 :-

- Population used is generated by crossing desired parents. [Option ID = 560]

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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 :-

- In reverse phase chromatography, the protein of interest can be selectively eluted by solutions of different hydrophobicities or ionic strengths. [Option ID = 470]

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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]

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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]
4. Formation of haustorium for absorption of nutrients from host cell [Option ID = 599]

Correct Answer :-

- Formation of haustorium for absorption of nutrients from host cell [Option ID = 599]

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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 :-

- Cytochrome P450 gene [Option ID = 592]

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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 :-

- Defensins [Option ID = 603]

11) Which of the following <u>is not</u> 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 :-

- Lions [Option ID = 492]

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 :-

- Rice [Option ID = 564]

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 2Ab [Option ID = 586]

15) Which one of the following statements <u>is true</u> 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]

17) Which one of the following statements is not true for the amino acid, Proline?

[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 :-

- The complexity of the organism is proportional to its C-value. [Option ID = 444]

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–glucronoside [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-4-chloro-3-indolyl-β-D-galactoside [Option ID = 506]

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]
4. a synergid and the central cell. [Option ID = 482]

Correct Answer :-

- a synergid and the central cell. [Option ID = 482]

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 :-

- Median [Option ID = 535]

23) Identify the <u>incorrect</u> 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 :-

- *gusA* iv.) *Aequorea victoria* [Option ID = 500]

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 :-

- *Tropaeolum majus* [Option ID = 474]

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]

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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 :-

- Sporophyte only [Option ID = 520]

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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 :-

- Peroxisome [Option ID = 570]

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28) Serial-secondary endosymbiosis is evidenced in

[Question ID = 144]

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

Correct Answer :-

- Dinoflagellates [Option ID = 573]

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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 :-

- Metapopulation [Option ID = 527]

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 Recovery after Photobleaching (FRAP) and Single Particle Tracking [Option ID = 418]

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 :-

- *NOZZLE and BARELY ANY MERISTEM 1* [Option ID = 478]

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 :-

- DRM 1 and DRM 2 [Option ID = 580]

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 :-

- erosion-prone [Option ID = 566]

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 :-

- Rhodophyta [Option ID = 512]

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-mice secondary antibodies raised in rabbit [Option ID = 544]

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 mass [Option ID = 466]

39) Which one of the following statements about eukaryotic transcription is <u>true</u>?

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), ii) and iv) only [Option ID = 411]

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 :-

- H3. [Option ID = 414]

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 :-

- single stranded positive RNA. [Option ID = 595]

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 :-

- 2-10%. [Option ID = 426]

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-bromo-4-chloro-3 indolyl-beta-D-galactoside [Option ID = 502]

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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-annular aperture-condenser-stage-objective-phase shifting plate-eye piece [Option ID = 422]

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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]

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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 :-

- Obligate xenogamous [Option ID = 552]

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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 :-

- RNA dependent RNA polymerase [Option ID = 582]

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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 1,500 vascular plants as endemics and has lost 70% of its area [Option ID = 495]

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 :-

- Somewhat similar BLASTN with word size of 7 [Option ID = 529]