DU PhD in Plant Molecular Biology Notes | Biotech

Topic:- PMBB PHD S2

1) In order to align very distantly related protein sequences, one should use
[Question ID = 2356]

1. higher number PAM scoring matrix [Option ID = 9418]
2. lower number PAM scoring matrix [Option ID = 9419]
3. higher number BLOSUM scoring matrix [Option ID = 9420]
4. higher gap penalty [Option ID = 9421]

Correct Answer :-

- higher number PAM scoring matrix [Option ID = 9418]

2) Which of the following file formats can be used to store genome annotations (e.g. gene coordinates)?
[Question ID = 2357]

1. FASTA [Option ID = 9422]
2. FASTQ [Option ID = 9423]
3. GFF [Option ID = 9424]
4. PDB [Option ID = 9425]

Correct Answer :-

- GFF [Option ID = 9424]

3) Which of the following techniques can be used to identify DNA sequences where a particular transcription factor binds?
[Question ID = 2358]

1. ChIP analysis [Option ID = 9426]
2. RNA-seq analysis [Option ID = 9427]
3. Western analysis [Option ID = 9428]
4. RNase protection analysis [Option ID = 9429]

Correct Answer :-

- ChIP analysis [Option ID = 9426]

4) Which of the following is NOT a genome editing technique?
[Question ID = 2359]

1. Transcription activator-like effector nucleases (TALENs) system [Option ID = 9430]
2. CRISPR-Cas system [Option ID = 9431]
3. Zinc finger nuclease (ZFNs) system [Option ID = 9432]
4. Gateway cloning system [Option ID = 9433]

Correct Answer :-

- Gateway cloning system [Option ID = 9433]

5) 'R-Avr interactions' are important in determining resistance of plants against
[Question ID = 2360]

1. Submergence stress [Option ID = 9434]
2. Low temperature stress [Option ID = 9435]
3. Excess Na^+ stress [Option ID = 9436]
4. Pathogen stress [Option ID = 9437]

Correct Answer :-

- Pathogen stress [Option ID = 9437]

6) M. Chalfie, S. Osamu and R.Y. Tsien received Noble Prize for the discovery of one of the following:
[Question ID = 2361]

1. Green fluorescent protein [Option ID = 9438]
2. Restriction endonucleases [Option ID = 9439]
3. DNA Helicases [Option ID = 9440]
4. DNA Ligases [Option ID = 9441]

Correct Answer :-

- Green fluorescent protein [Option ID = 9438]

7) A genomic library is:
[Question ID = 2362]

1. a database where the sequence of an organism's genome is stored. [Option ID = 9442]
2. a collection of clones with different DNA fragments representing genomic DNA of an organism. [Option ID = 9443]
3. a book that describes how to isolate DNA from an organism. [Option ID = 9444]
4. a place where the information of the genetic organization of organisms is stored. [Option ID = 9445]

Correct Answer :-

- [illegible] representing genomic DNA of an organism. [Option ID = 9443]

8) The role of restriction endonucleases in bacterial cells is to:

[Question ID = 2363]

1. degrade the bacterial chromosome into small pieces during replication [Option ID = 9446]
2. degrade the invading phage DNA [Option ID = 9447]
3. produce RNA primers for replication [Option ID = 9448]
4. aid the transcription process [Option ID = 9449]

Correct Answer :-

- degrade the invading phage DNA [Option ID = 9447]

9) Poly A tail is added to the transcript by

[Question ID = 2364]

1. DNA polymerase using DNA as a template [Option ID = 9450]
2. poly A polymerase using DNA as a template [Option ID = 9451]
3. RNA polymerase post-transcriptionally [Option ID = 9452]
4. poly A polymerase post-transcriptionally [Option ID = 9453]

Correct Answer :-

- poly A polymerase post-transcriptionally [Option ID = 9453]

10) Retrotransposons require the following for retrotransposition

[Question ID = 2365]

1. DNA replication

   [Option ID = 9454]
2. reverse transcription

   [Option ID = 9455]
3. genome editing

   [Option ID = 9456]
4. cut-and-paste of DNA

   [Option ID = 9457]

Correct Answer :-

- reverse transcription

  [Option ID = 9455]

11) Transcriptional elongation involves

[Question ID = 2366]

1. phosphorylation of RNA polymerase II [Option ID = 9458]
2. methylation of 5'end of RNA [Option ID = 9459]
3. removal of first intron [Option ID = 9460]
4. removal of 5' UTR [Option ID = 9461]

Correct Answer :-

- phosphorylation of RNA polymerase II [Option ID = 9458]

12) Proto-oncogenes are

[Question ID = 2367]

1. normal cellular genes [Option ID = 9462]
2. cancer promoting genes [Option ID = 9463]
3. tumor suppressor genes [Option ID = 9464]
4. portable oncogenes [Option ID = 9465]

Correct Answer :-

- normal cellular genes [Option ID = 9462]

13) Mutagenesis by ethidium bromide is brought about by

[Question ID = 2368]

1. incorrect base-pairing [Option ID = 9466]
2. indels following insertion [Option ID = 9467]
3. instability of base-pairing [Option ID = 9468]
4. translesion synthesis during replication [Option ID = 9469]

Correct Answer :-

- translesion synthesis during replication [Option ID = 9469]

14) Which step of translation does not require ATP hydrolysis?

[Question ID = 2369]

1. Peptide bond formation [Option ID = 9470]
2. Elongation of polypeptide chain [Option ID = 9471]
3. Assembly of ribosome subunits at the Shine-Dalgarno sequence [Option ID = 9472]
4. Dissociation of ribosome subunits at stop codon [Option ID = 9473]

Correct Answer :-

- Peptide bond formation [Option ID = 9470]

15) A polymer, which is deposited as an early response to pathogen attack in plants is one of the following:

[Question ID = 2370]

1. Stachyose [Option ID = 9474]
2. Cellulose [Option ID = 9475]
3. Xylose [Option ID = 9476]
4. Callose [Option ID = 9477]

Correct Answer :-

- Callose [Option ID = 9477]

16) Which of the following is NOT a Pathogenesis-Related (PR) protein?

[Question ID = 2371]

1. ß-1,3-glucanase [Option ID = 9478]
2. Proteinase inhibitor [Option ID = 9479]
3. Polyubiquitin [Option ID = 9480]
4. Chitinase [Option ID = 9481]

Correct Answer :-

- Polyubiquitin [Option ID = 9480]

17) Which of the following is an intermediate for the biosynthesis of terpenes?

[Question ID = 2372]

1. Norepinephrine [Option ID = 9482]
2. Phenylalanine [Option ID = 9483]
3. Coumaric acid [Option ID = 9484]
4. Mevalonic acid [Option ID = 9485]

Correct Answer :-

- Mevalonic acid [Option ID = 9485]

18) Which of the following class of compounds is a natural feeding deterrent against herbivores in plants?

[Question ID = 2373]

1. Sterols [Option ID = 9486]
2. Pyrethroids [Option ID = 9487]
3. Defensins [Option ID = 9488]
4. Carotenoids [Option ID = 9489]

Correct Answer :-

- Pyrethroids [Option ID = 9487]

19) Which of the following is a plant antimicrobial protein?

[Question ID = 2374]

1. Leghaemoglobin [Option ID = 9490]
2. Thaumatin [Option ID = 9491]
3. Trypsin [Option ID = 9492]
4. Isothiocyanate [Option ID = 9493]

Correct Answer :-

- Thaumatin [Option ID = 9491]

20) Which of the following is an example of a plant disease resistance gene?

[Question ID = 2375]

1. *virA*

   [Option ID = 9494]
2. *nifA*

   [Option ID = 9495]
3. *Xa21*

   [Option ID = 9496]
4. *nos*

   [Option ID = 9497]

Correct Answer :-

- *Xa21*

[Option ID = 9496]

Which of the following acts as an important component of the signaling pathway during Systemic Acquired Resistance (SAR)?

[Question ID = 2376]

1. Chitin [Option ID = 9498]
2. Glucose [Option ID = 9499]
3. Maleic acid [Option ID = 9500]
4. Salicylic acid [Option ID = 9501]

Correct Answer :-

- Salicylic acid [Option ID = 9501]

22) Which of the following pairs is haploid in nature?

[Question ID = 2377]

1. Nucellus and antipodal cells [Option ID = 9502]
2. Antipodal cells and egg cell [Option ID = 9503]
3. Antipodal cells and megaspore mother cell [Option ID = 9504]
4. Nucellus and primary endosperm nucleus [Option ID = 9505]

Correct Answer :-

- Antipodal cells and egg cell [Option ID = 9503]

23) Endosperm is formed during double fertilization by

[Question ID = 2378]

1. an ovum and the male gamete

   [Option ID = 9506]
2. one polar nuclei and one male gamete

   [Option ID = 9507]
3. two polar nuclei and one male gamete

   [Option ID = 9508]
4. two polar nuclei and two male gametes

   [Option ID = 9509]

Correct Answer :-

- two polar nuclei and one male gamete

  [Option ID = 9508]

24) Lateral roots originate from the

[Question ID = 2379]

1. epiblema [Option ID = 9510]
2. cortical cells [Option ID = 9511]
3. endoderm cells [Option ID = 9512]
4. pericycle cells [Option ID = 9513]

Correct Answer :-

- pericycle cells [Option ID = 9513]

25) Long filamentous threads protruding at the end of a young cob of maize are

[Question ID = 2380]

1. anthers [Option ID = 9514]
2. styles [Option ID = 9515]
3. ovaries [Option ID = 9516]
4. hairs [Option ID = 9517]

Correct Answer :-

- styles [Option ID = 9515]

26) Which of the following photoreceptors has homology with DNA photolyases?

[Question ID = 2381]

1. Phototropins [Option ID = 9518]
2. Cryptochromes [Option ID = 9519]
3. Phytochromes [Option ID = 9520]
4. UVR8 [Option ID = 9521]

Correct Answer :-

- Cryptochromes [Option ID = 9519]

27) 'Florigen', the mobile signal involved in transition to flowering in plants is a

[Question ID = 2382]

1. hormone [Option ID = 9522]
2. nucleic acid [Option ID = 9523]

3. [illegible] [Option ID = 9523]
4. [illegible] [Option ID = 9524]

Correct Answer :-

- protein [Option ID = 9524]

28) Which of the following plant hormones employs a two-component sensor-regulator system to regulate gene expression?
[Question ID = 2383]

1. Brassinosteroid [Option ID = 9526]
2. Auxin [Option ID = 9527]
3. Cytokinin [Option ID = 9528]
4. Abscisic acid [Option ID = 9529]

Correct Answer :-

- Cytokinin [Option ID = 9528]

29) The receptor of which of the following hormones is a component of E3 ligase involved in ubiquitin-mediated protein degradation?
[Question ID = 2384]

1. Cytokinin [Option ID = 9530]
2. Auxin [Option ID = 9531]
3. Ethylene [Option ID = 9532]
4. Gibberellin [Option ID = 9533]

Correct Answer :-

- Auxin [Option ID = 9531]

30) The production of which of the following hormones is triggered during invasion of plants by necrotrophs?
[Question ID = 2385]

1. Salicylic acid [Option ID = 9534]
2. Jasmonic acid [Option ID = 9535]
3. Ethylene [Option ID = 9536]
4. Nitric oxide [Option ID = 9537]

Correct Answer :-

- Jasmonic acid [Option ID = 9535]

31) The receptor for brassinosteroid, the steroid hormone present in plants, is localized in the
[Question ID = 2386]

1. cytoplasm [Option ID = 9538]
2. nucleus [Option ID = 9539]
3. plasma membrane [Option ID = 9540]
4. cell wall [Option ID = 9541]

Correct Answer :-

- plasma membrane [Option ID = 9540]

32) Which of the following proteins is NOT in the same superfamily having seven closely packed transmembrane helices as the other three?
[Question ID = 2387]

1. Bacteriorhodopsin [Option ID = 9542]
2. Channelrhodopsin [Option ID = 9543]
3. G-protein-coupled receptor [Option ID = 9544]
4. Aquaporin [Option ID = 9545]

Correct Answer :-

- Aquaporin [Option ID = 9545]

33) Which of the following is NOT a common second messenger in cell signaling?
[Question ID = 2388]

1. Ca^{2+} [Option ID = 9546]
2. Cyclic adenosine monophosphate [Option ID = 9547]
3. Diacylglycerol [Option ID = 9548]
4. Tyrosine [Option ID = 9549]

Correct Answer :-

- Tyrosine [Option ID = 9549]

34) Which of the following events normally activates a GTP-binding protein?
[Question ID = 2389]

1. GTP hydrolysis by the protein [Option ID = 9550]
2. Activation of an upstream GTPase-activating protein [Option ID = 9551]
3. Activation of an upstream guanine nucleotide exchange factor [Option ID = 9552]
4. Phosphorylation of a bound GDP by an upstream phosphorylase [Option ID = 9553]

Correct Answer :-

- [illegible] factor [Option ID = 9552]

35) Consider visual transduction in rod photoreceptors in the vertebrate retina. Which of the following steps does NOT normally amplify the signal in this pathway?
[Question ID = 2390]

1. Activation of transducin by active rhodopsin [Option ID = 9554]
2. Blockage of Na + influx by cation-channel closure [Option ID = 9555]
3. Cation-channel closure due to cGMP depletion [Option ID = 9556]
4. Depletion of cGMP by active cGMP phosphodiesterase [Option ID = 9557]

Correct Answer :-

- Cation-channel closure due to cGMP depletion [Option ID = 9556]

36) Gibberellic acid (GA) signaling initiates by binding of GA to its receptor
[Question ID = 2391]

1. DELLA [Option ID = 9558]
2. GID1 [Option ID = 9559]
3. GA oxidase [Option ID = 9560]
4. PIF [Option ID = 9561]

Correct Answer :-

- GID1 [Option ID = 9559]

37) What would you need to know to determine quantum yield of photosynthesis accurately?
[Question ID = 2392]

1. Amount of CO_2 fixed and O_2 released [Option ID = 9562]
2. Amount of CO_2 fixed and light absorbed [Option ID = 9563]
3. Amount of starch synthesized [Option ID = 9564]
4. Amount of 3-phosphoglycerate synthesized [Option ID = 9565]

Correct Answer :-

- Amount of CO_2 fixed and light absorbed [Option ID = 9563]

38) The statistical test to determine 'goodness of fit' is:
[Question ID = 2393]

1. t-test [Option ID = 9566]
2. Chi-square test [Option ID = 9567]
3. z-test [Option ID = 9568]
4. f-test [Option ID = 9569]

Correct Answer :-

- Chi-square test [Option ID = 9567]

39) Expression levels of a gene can be monitored using following two techniques:
[Question ID = 2394]

1. Southern hybridization, quantitative RT-PCR [Option ID = 9570]
2. Quantitative RT-PCR, nuclear run-on assay [Option ID = 9571]
3. Southern hybridization, nuclear run-on assay [Option ID = 9572]
4. Quantitative PCR and DNase footprinting assay [Option ID = 9573]

Correct Answer :-

- Quantitative RT-PCR, nuclear run-on assay [Option ID = 9571]

40) Neoisoschizomers are the restriction endonucleases that have
[Question ID = 2395]

1. different recognition and cleavage sites [Option ID = 9574]
2. different recognition and similar cleavage sites [Option ID = 9575]
3. same recognition and different cleavage sites [Option ID = 9576]
4. same recognition and cleavage sites [Option ID = 9577]

Correct Answer :-

- same recognition and different cleavage sites [Option ID = 9576]

41) Homopolymer tailing of cDNA can be achieved with one of the following:

[Question ID = 2396]

1. Klenow polymerase

   [Option ID = 9578]
2. Terminal deoxynucleotidyl transferase

   [Option ID = 9579]
3. T4 DNA ligase

Correct Answer :-

- Terminal deoxynucleotidyl transferase

[Option ID = 9579]

42) Which of the following factors does not influence electrophoretic mobility?

[Question ID = 2397]

1. Molecular weight [Option ID = 9582]
2. Shape of molecule [Option ID = 9583]
3. Size of molecule [Option ID = 9584]
4. Stereochemistry of molecule [Option ID = 9585]

Correct Answer :-

- Stereochemistry of molecule [Option ID = 9585]

43) Function of Beta-mercaptoethanol in SDS-page is

[Question ID = 2398]

1. to give negative charge to amino acids in the proteins [Option ID = 9586]
2. for oxidation of disulfide bonds in the proteins [Option ID = 9587]
3. for reduction of disulfide bonds in the proteins [Option ID = 9588]
4. for breaking hydrogen bonds in the proteins [Option ID = 9589]

Correct Answer :-

- for reduction of disulfide bonds in the proteins [Option ID = 9588]

44) Mass spectrometer separates ions on the basis of which of the following?

[Question ID = 2399]

1. Mass [Option ID = 9590]
2. Charge [Option ID = 9591]
3. Molecular weight [Option ID = 9592]
4. Mass to charge ratio [Option ID = 9593]

Correct Answer :-

- Mass to charge ratio [Option ID = 9593]

45) Which of the following sequencing technologies is capable of delivering read-lengths of more than 10 kb?

[Question ID = 2400]

1. ABI [Option ID = 9594]
2. Illumina [Option ID = 9595]
3. Pac-bio [Option ID = 9596]
4. SOLiD [Option ID = 9597]

Correct Answer :-

- Pac-bio [Option ID = 9596]

46) Which of the following approach is utilized by sequence alignment tool 'BLAST' to search sequence databases?

[Question ID = 2401]

1. Global sequence alignment

   [Option ID = 9598]
2. Pair-wise sequence alignment

   [Option ID = 9599]
3. Multiple sequence alignment

   [Option ID = 9600]
4. All of these

   [Option ID = 9601]

Correct Answer :-

- Pair-wise sequence alignment

[Option ID = 9599]

47) In biochemical reactions, which of the following proteins can be used as a chaperone?

[Question ID = 2402]

1. transporters [Option ID = 9602]
2. heat shock proteins [Option ID = 9603]
3. ubiquitins [Option ID = 9604]
4. transcription factors [Option ID = 9605]

Correct Answer :-
- Check option [Option ID = 9605]

48) The selectable marker gene *nptII* encodes for a

[Question ID = 2403]

1. phosphotransferase

   [Option ID = 9606]
2. kinase

   [Option ID = 9607]
3. phosphatase

   [Option ID = 9608]
4. methylase

   [Option ID = 9609]

Correct Answer :-
- phosphotransferase

  [Option ID = 9606]

49) In a biochemical reaction, which one can cleave proteins?

[Question ID = 2404]

1. Ligase [Option ID = 9610]
2. RecA [Option ID = 9611]
3. RecBCD [Option ID = 9612]
4. DNA polymerase [Option ID = 9613]

Correct Answer :-
- RecA [Option ID = 9611]

50) Which of the following plants is commonly used for production of bioethanol?

[Question ID = 2405]

1. Jatropha [Option ID = 9614]
2. Brassica [Option ID = 9615]
3. Sugarcane [Option ID = 9616]
4. Pongamia [Option ID = 9617]

Correct Answer :-
- Sugarcane [Option ID = 9616]