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DU MPhil Phd in Zoology

Topic:- DU_J19_MPHIL_ZOO

1) Which of the following cytokines does play a role in terminating inflammatory responses?

[Question ID = 196]

1. IL-4 [Option ID = 782]
2. TGF-β [Option ID = 783]
3. IL-2 [Option ID = 781]
4. IFN-γ [Option ID = 784]

Correct Answer :-

- IL-2 [Option ID = 781]

2) Which of the following is INCORRECT concerning the processing of an antigen, such as a bacterial protein, in the acid compartments of the cell?

[Question ID = 195]

1. Bacterially derived peptides displace a fragment of the invariant chain from the MHC class II binding groove [Option ID = 780]
2. It may lead to the activation of $CD8^+$ T cells [Option ID = 779]
3. It may lead to activation of $CD4^+$ T cells [Option ID = 778]
4. It results in production of potentially immunogenic peptides that associate with MHC class II molecules [Option ID = 777]

Correct Answer :-

- It results in production of potentially immunogenic peptides that associate with MHC class II molecules [Option ID = 777]

3) Which of the following is used to test a particular value of variance or standard deviation present in the population?

[Question ID = 180]

1. Z -test [Option ID = 717]
2. F –test [Option ID = 720]
3. Chi square test [Option ID = 719]
4. t - test [Option ID = 718]

Correct Answer :-

- Z -test [Option ID = 717]

4) Which of the following is a protein structure database?

[Question ID = 176]

1. Genbank [Option ID = 701]

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2. Swiss Prot [Option ID = 702]
3. DDBJ [Option ID = 703]
4. PDB [Option ID = 704]

Correct Answer :-

- Genbank [Option ID = 701]

5) Which of the following is MAJOR advantage of *Xenopus tropicalis* over *Xenopus laevis* ?

[Question ID = 187]

1. Does not require special care [Option ID = 748]
2. Diploid genome [Option ID = 747]
3. Easy artificial fertilization [Option ID = 746]
4. Larger egg [Option ID = 745]

Correct Answer :-

- Larger egg [Option ID = 745]

6) Which of the following is the first biological database?

[Question ID = 177]

1. Atlas of Protein sequence and structure [Option ID = 707]
2. Genbank [Option ID = 705]
3. OMIM [Option ID = 708]
4. DDBJ [Option ID = 706]

Correct Answer :-

- Genbank [Option ID = 705]

7) Which of the following is the correct combination for secretions from islets of Langerhans?

[Question ID = 199]

1. α-cells (Glucagon), β-cells (Insulin), delta-cells (Somatostatin) [Option ID = 794]
2. α-cells (Insulin), β-cells (Glucagon), delta-cells (Somatostatin) [Option ID = 793]
3. α-cells (Somatostatin), β-cells (Glucagon), delta-cells (Insulin) [Option ID = 796]
4. α-cells (Somatostatin), β-cells (Insulin), delta-cells (Glucagon) [Option ID = 795]

Correct Answer :-

- α-cells (Insulin), β-cells (Glucagon), delta-cells (Somatostatin) [Option ID = 793]

8) Which of the following is the best combination if one wishes to align more divergent sequences?

[Question ID = 193]

1. Higher PAM or Lower BLOSUM [Option ID = 772]
2. Higher PAM or Higher BLOSUM [Option ID = 769]
3. Lower PAM or Higher BLOSUM [Option ID = 770]
4. Lower PAM or Lower BLOSUM [Option ID = 771]

Correct Answer :-

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• Higher PAM or higher BLOSUM [Option ID = 760]

9) Which enzyme is used to treat linearised plasmid DNA preventing plasmid dimer formation and recircularisation?

[Question ID = 189]

1. Acid phosphatase [Option ID = 754]
2. PNK [Option ID = 756]
3. Nucleoside phosphate kinase [Option ID = 755]
4. Alkaline phosphatase [Option ID = 753]

Correct Answer :-

• Alkaline phosphatase [Option ID = 753]

10) Which ONE of the following is not a proposition of cognitive-behavioural therapies?

[Question ID = 165]

1. Cognitive activity may be monitored and altered [Option ID = 658]
2. Cognitive activity affects behaviour [Option ID = 657]
3. Desired emotional regulation may be effected through behavioural change [Option ID = 660]
4. Desired behaviour change may be effected through cognitive change [Option ID = 659]

Correct Answer :-

• Cognitive activity affects behaviour [Option ID = 657]

11) Which biological characteristic is NOT commonly found in invasive species?

[Question ID = 161]

1. Optimal local adaptation [Option ID = 641]
2. High reproductive capacity [Option ID = 642]
3. Well-developed dispersal mechanism [Option ID = 644]
4. Broad ecological tolerance [Option ID = 643]

Correct Answer :-

• Optimal local adaptation [Option ID = 641]

12) In Hydra, the key molecule involved in regeneration is

[Question ID = 156]

1. TGF-beta [Option ID = 623]
2. Sonic hedgehog [Option ID = 621]
3. FGF [Option ID = 624]
4. Wnt 3 [Option ID = 622]

Correct Answer :-

• Sonic hedgehog [Option ID = 621]

13) Following are characteristic features of a transcription factor

1. Transactivation domain

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II. DNA binding domain
III. Lucine zipper
IV. Helix loop helix
V. Homeobox domain
VI. Zinc finger
Select the combination of most essential features for a canonical transcription factor

[Question ID = 168]

1. (II), (V) and (VI) [Option ID = 671]
2. (I), (III) and (IV) [Option ID = 670]
3. (I), (III), (IV) and (VI), [Option ID = 672]
4. (I), (II) [Option ID = 669]

Correct Answer :-

- (I), (II) [Option ID = 669]

14) When light is absorbed by the GPCR rhodopsin in rod cells, it gets activated due to change in conformation of its protein moiety opsin. The inactive trimeric G protein transducin now binds to the activated opsin and gets converted to the GTP bound form which causes the $G_{\alpha t}$ subunit to dissociate from the βγ subunits. The $G_{\alpha t}$ subunit activates phosphodiesterase which converts cGMP to GMP. Decrease in cGMP concentration closes the cGMP-gated ion channels in the plasma membrane to close, resulting in hyperpolarization of the membrane. In this GPCR signalling cascade the effector molecule is:

[Question ID = 184]

1. $G_{\alpha t}$ of transducin [Option ID = 736]
2. Phosphodiesterase [Option ID = 735]
3. cGMP [Option ID = 734]
4. Guanylyl cyclase [Option ID = 733]

Correct Answer :-

- Guanylyl cyclase [Option ID = 733]

15) TH2 cells are characterised by ability to secrete

[Question ID = 173]

1. IL-4 [Option ID = 689]
2. IFN-γ [Option ID = 692]
3. IFN-α [Option ID = 691]
4. IL-1 [Option ID = 690]

Correct Answer :-

- IL-4 [Option ID = 689]

16) Population biologists have become particularly interested in the dynamics of metapopulations because

[Question ID = 163]

1. Many populations are becoming restricted to small islands of habitat [Option ID = 651]
2. Metapopulations explain why populations occupying large, contagious areas are vulnerable to extinction [Option ID = 652]
3. Humans exist as a metapopulation [Option ID = 649]

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4. Whooping cranes exist as a metapopulation [Option ID = 650]

Correct Answer :-

- Humans exist as a metapopulation [Option ID = 649]

17) Phosphorylation of protein can modulate interaction/activity of the protein because

[Question ID = 158]

1. Both negative and positive charges are balanced to keep the protein neutral but be at maximum activity [Option ID = 632]
2. Positive charge added by phosphate group induces structural changes [Option ID = 630]
3. Negative charge added by phosphate group induces structural changes [Option ID = 629]
4. No charge is added by modification so protein acts at its full activity [Option ID = 631]

Correct Answer :-

- Negative charge added by phosphate group induces structural changes [Option ID = 629]

18) Most important cell adhesion molecule involved in early embryo

[Question ID = 188]

1. P-cadherin [Option ID = 749]
2. E-cadherin [Option ID = 750]
3. N-cadherin [Option ID = 751]
4. R-cadherin [Option ID = 752]

Correct Answer :-

- P-cadherin [Option ID = 749]

19) Exon skipping is associated with

[Question ID = 154]

1. RNA processing mutations [Option ID = 615]
2. Nonsense mutations [Option ID = 613]
3. Silent mutations [Option ID = 616]
4. Regulatory mutations [Option ID = 614]

Correct Answer :-

- Nonsense mutations [Option ID = 613]

20) In maternal gene mutations, which of the following holds true

[Question ID = 155]

1. Both mother and embryo are defective [Option ID = 619]
2. Mother shows defects [Option ID = 617]
3. Embryo shows defects [Option ID = 618]
4. Neither mother nor embryo shows defects [Option ID = 620]

Correct Answer :-

- Mother shows defects [Option ID = 617]

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21) In the electron transport chain of animal cells the Q cycle regenerates the CoQ which is required for generation of the proton motive force. Identify the statement that is NOT true for the Q cycle.

[Question ID = 182]

1. Two protons are transferred across Complex III for each pair of electrons [Option ID = 726]
2. CoQ semiquinone anion is formed in the Qi site of Complex III [Option ID = 728]
3. The $CoQH_2$ binds to the Qo site in Complex III and releases two protons into the intermembrane space [Option ID = 727]
4. The Q cycle occurs in $CoQH_2$-cytochrome c reductase [Option ID = 725]

Correct Answer :-

- The Q cycle occurs in $CoQH_2$-cytochrome c reductase [Option ID = 725]

22) In the GPCR signalling cascade that has phospholipase C as an effector, which second messengers lead to the activation of PKC?

[Question ID = 185]

1. PIP_2 and IP_3 [Option ID = 737]
2. $Ca^{2+}$and IP_3 [Option ID = 739]
3. DAG and Ca^{2+} [Option ID = 738]
4. DAG and IP_3 [Option ID = 740]

Correct Answer :-

- PIP_2 and IP_3 [Option ID = 737]

23) NK cells initiate killing of target cells via delivery of molecules that could induce targetcell damage directly. Which of the following is the most likely molecule?

[Question ID = 198]

1. Lysozyme [Option ID = 791]
2. Granzyme [Option ID = 792]
3. Peroxynitrite [Option ID = 790]
4. Interleukin-2 [Option ID = 789]

Correct Answer :-

- Interleukin-2 [Option ID = 789]

24) Nucleotide sequence duplications in a gene cause severe effects on its function in some cases. Which of the following duplication events would most likely result in the synthesis of a non-functional protein?

[Question ID = 201]

1. Three base pairs are inserted in the coding region near the translation initiation site [Option ID = 804]
2. Three base pairs are inserted just before the translation initiation site [Option ID = 802]
3. A base pair is inserted just before the translation initiation site [Option ID = 801]
4. A base pair is inserted in the coding region near the translation initiation site [Option ID = 803]

Correct Answer :-

- A base pair is inserted just before the translation initiation site [Option ID = 801]

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25) Transmembrane proteins have sequences containing

[Question ID = 160]

1. Mostly serine and threonine which are embedded in membrane [Option ID = 639]
2. Polar residues which are required for embedding in the membrane [Option ID = 637]
3. Hydrophilic residues which are embedded in membrane [Option ID = 638]
4. Hydrophobic residues which are embedded in membrane [Option ID = 640]

Correct Answer :-

- Polar residues which are required for embedding in the membrane [Option ID = 637]

26) A competitive inhibitor

[Question ID = 200]

1. Is structural analogue of the substrate [Option ID = 797]
2. Is structural analogue of the active site of the enzyme [Option ID = 798]
3. Binds to a site other than active site of the enzyme [Option ID = 800]
4. Is not at all related to the substrate [Option ID = 799]

Correct Answer :-

- Is structural analogue of the substrate [Option ID = 797]

27) A coding region of a gene consists of 738 base pairs counting from start to stop codon. Calculate the theoretical molecular mass of the protein coded from this gene. The average molecular mass of thefree amino acid in this protein is assumed to be 122. Five disulfide bonds are also present in the protein.

[Question ID = 202]

1. 25,498 [Option ID = 806]
2. 25,488 [Option ID = 805]
3. 29,890 [Option ID = 807]
4. 30,012 [Option ID = 808]

Correct Answer :-

- 25,488 [Option ID = 805]

28) Habituation and imprinting illustrate that behaviours are made up of

[Question ID = 164]

1. Both innate and learned components [Option ID = 653]
2. Simple responses to complex stimuli [Option ID = 655]
3. Unchanging responses to preset stimuli [Option ID = 656]
4. Reversible stimulus-response learning [Option ID = 654]

Correct Answer :-

- Both innate and learned components [Option ID = 653]

29) Infection with *Mycobacterium tuberculosis* primarily evokes which of the following cytokine profiles?

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[Question ID = 197]

1. IL-12, IL-2, and IFN-γ [Option ID = 786]
2. IL-4 and IL-10 [Option ID = 785]
3. IL-5 and IL-6 [Option ID = 787]
4. IL-1, IL-4, and IFN-γ [Option ID = 788]

Correct Answer :-

- IL-4 and IL-10 [Option ID = 785]

30) Protein degradation inside cell is different from protein digestion because

[Question ID = 159]

1. Both require different cofactors [Option ID = 635]
2. Both processes are meant for maintaining protein quality [Option ID = 634]
3. Both processes require different signal sequences on all proteins [Option ID = 636]
4. Degradation in cell requires energy but digestion does not require energy [Option ID = 633]

Correct Answer :-

- Degradation in cell requires energy but digestion does not require energy [Option ID = 633]

31) MTT assay measures the

[Question ID = 167]

1. GAPDH activity [Option ID = 665]
2. SDH activity [Option ID = 668]
3. Mitochondrial cytochrome C oxidase [Option ID = 666]
4. NADPH oxidoreductase [Option ID = 667]

Correct Answer :-

- GAPDH activity [Option ID = 665]

32) As the size of the prokaryotic genome increases, the number of paralogs would

[Question ID = 192]

1. Increase [Option ID = 766]
2. Decrease [Option ID = 765]
3. Have no effect [Option ID = 767]
4. Have random changes [Option ID = 768]

Correct Answer :-

- Decrease [Option ID = 765]

33) Human limb abnormality is caused by alteration in signaling of which of the following genes?

[Question ID = 157]

1. TGF-Beta [Option ID = 626]
2. Sonic hedgehog [Option ID = 627]
3. Engrailed [Option ID = 628]
4. Beta-catenin [Option ID = 625]

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Correct Answer :-

- Beta-catenin [Option ID = 625]

34) Implantation of human blastocyst occurs on

[Question ID = 172]

1. 4th day [Option ID = 685]
2. 6th day [Option ID = 687]
3. 5th day [Option ID = 686]
4. 7th day [Option ID = 688]

Correct Answer :-

- 4th day [Option ID = 685]

35) For disinfection in a microbial lab, which concentration of ethanol is utilized?

[Question ID = 166]

1. 90% ethanol [Option ID = 664]
2. 70% ethanol [Option ID = 663]
3. 50% ethanol [Option ID = 662]
4. 30% ethanol [Option ID = 661]

Correct Answer :-

- 30% ethanol [Option ID = 661]

36) All of the following are protein sequence databases EXCEPT

[Question ID = 178]

1. PSD [Option ID = 710]
2. SWISS PROT [Option ID = 711]
3. EMBL [Option ID = 712]
4. PIR [Option ID = 709]

Correct Answer :-

- PIR [Option ID = 709]

37) All of the following are true about acute phase proteins EXCEPT

[Question ID = 194]

1. They include complement proteins [Option ID = 774]
2. They include C-reactive protein [Option ID = 773]
3. They are mainly produced in the liver [Option ID = 775]
4. They are not induced by cytokines [Option ID = 776]

Correct Answer :-

- They include C-reactive protein [Option ID = 773]

38) A triple stranded DNA intermediate occurs during

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[Question ID = 191]

1. Excision repair [Option ID = 763]
2. DNA recombination and double strand break [Option ID = 762]
3. Thymidine dimer photoreactivation [Option ID = 764]
4. Eukaryotic DNA replication [Option ID = 761]

Correct Answer :-

- Eukaryotic DNA replication [Option ID = 761]

39) Hapten is an

[Question ID = 174]

1. Auto-antibody [Option ID = 696]
2. Allergen [Option ID = 695]
3. Antigen [Option ID = 693]
4. Immunogen [Option ID = 694]

Correct Answer :-

- Antigen [Option ID = 693]

40) The extracellular matrix of epithelial tissue is organized as basal laminae. Its ubiquitous components are the sheet forming Type IV collagen, the multiadhesive matrix laminin and the proteoglycan perlecan. Laminins also form a two dimensional network in the basal lamina and have collagen IV binding domains. What would be the consequence of mutation in these domains on the structure of the basal lamina?

[Question ID = 183]

1. Laminin will form a two dimensional network [Option ID = 732]
2. Type IV collagen will form sheets [Option ID = 729]
3. Fibrillar collagens would be expressed in the basal lamina [Option ID = 730]
4. The organization of the epithelial tissue would be affected [Option ID = 731]

Correct Answer :-

- Type IV collagen will form sheets [Option ID = 729]

41) The 5′ un-translated region (UTR) in E.coli mRNA that is complementary to the 3′ end of 16s rRNA is known as ribosome binding sequence. It is also known as

[Question ID = 203]

1. Shine-Delgarno sequences [Option ID = 812]
2. Goldberg Hogness boxes [Option ID = 811]
3. Pribnow boxes [Option ID = 809]
4. TATA boxes [Option ID = 810]

Correct Answer :-

- Pribnow boxes [Option ID = 809]

42) The computational methodology that tries to find the best matching between two molecules is called

[Question ID = 179]

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1. Molecular docking [Option ID = 714]
2. Molecular matching [Option ID = 713]
3. Molecular fitting [Option ID = 715]
4. Molecular affinity checking [Option ID = 716]

Correct Answer :-

- Molecular matching [Option ID = 713]

43) The effect of keystone predator within a community may be to

[Question ID = 162]

1. Increase the relative abundance of the most competitive prey species [Option ID = 647]
2. Encourage the coevolution of predator and prey adaptations [Option ID = 648]
3. Maintain species diversity by preying on the prey species that is the dominant competitor [Option ID = 646]
4. Competitively exclude other predators from the community [Option ID = 645]

Correct Answer :-

- Competitively exclude other predators from the community [Option ID = 645]

44) The correct order (lower to higher) of sensitivity of the techniques used for detection and quantification of pesticide residue analysis is

[Question ID = 186]

1. HPLC, GLC and TLC [Option ID = 742]
2. TLC, GLC and HPLC [Option ID = 744]
3. TLC, HPLC and GLC [Option ID = 741]
4. GLC, HPLC and TLC [Option ID = 743]

Correct Answer :-

- TLC, HPLC and GLC [Option ID = 741]

45) The part of the human brain which is an important relay station for the sensory impulses and also is the origin of many of the involuntary acts of the eye such as the narrowing of the pupil in bright light is the

[Question ID = 171]

1. Midbrain [Option ID = 682]
2. Cerebellum [Option ID = 684]
3. Hypothalamus [Option ID = 681]
4. Corpus callosum [Option ID = 683]

Correct Answer :-

- Hypothalamus [Option ID = 681]

46) The phagocytic white blood cells are

[Question ID = 170]

1. Neutrophils and lymphocytes [Option ID = 678]
2. Neutrophils and macrophages [Option ID = 677]
3. Lymphocytes and macrophages [Option ID = 679]
4. Eosinophils and lymphocytes [Option ID = 680]

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Correct Answer :-

- Neutrophils and macrophages [Option ID = 677]

47) The permeability of the cell membrane depends on each of these with the EXCEPTION of

[Question ID = 169]

1. Size of the molecules [Option ID = 673]
2. Presence of carrier molecules in the membrane [Option ID = 676]
3. Presence of glycolipids in the membrane [Option ID = 675]
4. Ionic charge [Option ID = 674]

Correct Answer :-

- Size of the molecules [Option ID = 673]

48) The following statements are relevant to splicing of nuclear pre-mRNA introns
i. The intron is released as a lariat-like structure
ii. ATP is used in the two transesterification reactions
iii. The branch point A is essential for lariat formation
iv. 65 kDa subunit of U2AF binds to the pyrimidine-rich region
Which statements are true for nuclear pre-mRNA splicing?

[Question ID = 181]

1. i, ii, iii [Option ID = 721]
2. i, iii, iv [Option ID = 723]
3. i, ii, iii, iv [Option ID = 724]
4. ii, iii, iv [Option ID = 722]

Correct Answer :-

- i, ii, iii [Option ID = 721]

49) The ligand for CD28 is

[Question ID = 175]

1. CD1 [Option ID = 700]
2. CTLA-4 [Option ID = 697]
3. CD86 [Option ID = 698]
4. MHC-II [Option ID = 699]

Correct Answer :-

- CTLA-4 [Option ID = 697]

50) A certain purified DNA sample was cut with two restriction endonucleases BamHI and Hind III. The following results were obtained from agarose gel electrophoresis.
-Sample cut with E1 alone: two bands of size 6 kb and 3 kb.
-Sample cut with E2 alone: one band of size 9 kb.
-Cut with both E1 and E2: three bands of size 5 kb and 3 kb and 1kb
From this data it can be inferred that:

[Question ID = 190]

1. Two sites for E1 and one site for E2 and the original DNA is circular [Option ID = 759]

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2. Two sites for E1 and one site for E2 and the original DNA is linear [Option ID = 757]
3. Two site each for E1 and E2 and the original DNA is linear [Option ID = 760]
4. One site for E1 and two sites for E2 and the original DNA is circular [Option ID = 758]

Correct Answer :-

- Two sites for E1 and one site for E2 and the original DNA is linear [Option ID = 757]

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