DU MPhil PhD in Bio Physics

Topic:- DU_J18_MPHIL_BIOPHY

1) If the sequence of one of the strand of DNA helix is 5' ATCG 3', the sequence of the opposite strand will be: [Question ID = 52638]

1. 5' CGAT 3' [Option ID = 90545]
2. 5' CGTA 3' [Option ID = 90546]
3. 5' TACG 3' [Option ID = 90547]
4. 5' TAGC 3' [Option ID = 90544]

Correct Answer :-

- 5' CGAT 3' [Option ID = 90545]

2) Which of the following organs can be regarded as excretory in function?

[Question ID = 52682]

1. skin [Option ID = 90721]
2. all [Option ID = 90723]
3. lacrimal glands [Option ID = 90722]
4. kidney [Option ID = 90720]

Correct Answer :-

- all [Option ID = 90723]

3) Which of the following is incorrect about classification of microarray data?

[Question ID = 52677]

1. For microarray data, clustering analysis identifies and coregulated but not coexpressed genes [Option ID = 90702]
2. For microarray data, clustering analysis identifies coexpressed but not coregulated genes [Option ID = 90701]
3. For microarray data, clustering analysis identifies coexpressed and coregulated genes [Option ID = 90700]
4. Genes within a category have more similarity in expression than genes from different categories. [Option ID = 90703]

Correct Answer :-

- For microarray data, clustering analysis identifies coexpressed and coregulated genes [Option ID = 90700]

4) The Ramachandran plot displays the values of: [Question ID = 52647]

1. two of the side chain dihedral angles in polypeptides [Option ID = 90581]
2. two of the main chain dihedral angles in polysaccharides [Option ID = 90583]
3. two of the main chain dihedral angles in polypeptides [Option ID = 90580]
4. two of the main chain dihedral angles in polynucleotides [Option ID = 90582]

Correct Answer :-

- two of the main chain dihedral angles in polypeptides [Option ID = 90580]

5) Why does the addition of solutes to water act as an antifreeze? [Question ID = 52681]

1. Additional solute increase the boiling point. [Option ID = 90719]
2. Additional solute increase the freezing point. [Option ID = 90717]
3. Additional solute lowers the freezing point. [Option ID = 90716]
4. Additional solute lowers the boiling point. [Option ID = 90718]

Correct Answer :-

- Additional solute lowers the freezing point. [Option ID = 90716]

6) "Nucleotides" which are the basic building blocks of Nucleic Acids (DNA/RNA) in the living cells are made of: [Question ID = 52637]

1. A pentose sugar, a cyclic Nitrogen containing base, a phosphate group [Option ID = 90543]
2. A pentose sugar, a cyclic Nitrogen containing base, a sulphate group [Option ID = 90542]
3. A hexose sugar, a cyclic Nitrogen containing base, a phosphate group [Option ID = 90540]
4. A hexose sugar, a cyclic Nitrogen containing base, a sulphate group [Option ID = 90541]

Correct Answer :-

- A pentose sugar, a cyclic Nitrogen containing base, a phosphate group [Option ID = 90543]

7) The human genome is currently expected to have about _____ protein coding genes. [Question ID = 52645]

1. 40,000 [Option ID = 90575]
2. 2,000 [Option ID = 90572]
3. 25,000 [Option ID = 90573]
4. 100,000 [Option ID = 90574]

Correct Answer :-

- 25,000 [Option ID = 90573]

8) The genetic code is known to be degenerate with several three letter codons coding for the same amino acid. Which of the following amino acid residues is coded by only ONE specific codon: [Question ID = 52640]

1. Leucine [Option ID = 90554]
2. Glycine [Option ID = 90553]
3. Alanine [Option ID = 90555]
4. Methionine [Option ID = 90552]

Correct Answer :-

- Methionine [Option ID = 90552]

9) The native structure of an antibody contains [Question ID = 52680]

1. Secondary structure [Option ID = 90712]
2. Quaternary Structure [Option ID = 90714]
3. All of these [Option ID = 90715]
4. Tertiary Structure [Option ID = 90713]

Correct Answer :-

- All of these [Option ID = 90715]

10) In the Periodic Table of elements (chemical) Carbon lies in [Question ID = 52658]

1. Group VIII [Option ID = 90627]
2. Group VII [Option ID = 90626]
3. Group III [Option ID = 90624]
4. Group IV [Option ID = 90625]

Correct Answer :-

- Group IV [Option ID = 90625]

11) The centre of the circle $(x-1)^2 + (y-3)^2 = 1$ is [Question ID = 52672]

1. (1,0) [Option ID = 90681]
2. (1,3) [Option ID = 90683]
3. (0,3) [Option ID = 90682]
4. (0,0) [Option ID = 90680]

Correct Answer :-

- (1,3) [Option ID = 90683]

12) Prokaryotes often exchange genetic material. One such process that involves DNA transfer from one bacterium to another through a virus mediator is known as: [Question ID = 52636]

1. Transformation [Option ID = 90536]
2. Transduction [Option ID = 90537]
3. Conjugation [Option ID = 90538]
4. Translocation [Option ID = 90539]

Correct Answer :-

- Transduction [Option ID = 90537]

13) "Enzyme commission numbers" (EC numbers) is a numerical classification scheme for enzymes. Which of the following statements is INCORRECT regarding EC numbers:

[Question ID = 52646]

1. A protein can sometime have 2 EC numbers [Option ID = 90577]
2. The scheme divides enzymes into 12 main classes [Option ID = 90578]
3. The numbers represent 4 levels of hierarchy [Option ID = 90576]
4. The numbering scheme defines the reaction being catalyzed rather than the enyzme. [Option ID = 90579]

Correct Answer :-

- The scheme divides enzymes into 12 main classes [Option ID = 90578]

14) Adsorption is a phenomenon that takes place [Question ID = 52655]

1. Among the multiple solutes present in a solution. [Option ID = 90615]
2. Between the solute and the solvent of a solution, [Option ID = 90614]
3. At the interface of two phases, [Option ID = 90613]
4. At the bulk of a solution, [Option ID = 90612]

Correct Answer :-

- At the interface of two phases, [Option ID = 90613]

15) Aniline is [Question ID = 52666]

1. An aromatic compound. [Option ID = 90657]
2. an aliphatic compound, [Option ID = 90656]
3. A polycyclic compound. [Option ID = 90659]
4. A heterocyclic compound, [Option ID = 90658]

Correct Answer :-

- An aromatic compound. [Option ID = 90657]

16) The unit of genetic linkage is ? [Question ID = 52639]

1. Gm [Option ID = 90551]
2. bM [Option ID = 90550]
3. Cm [Option ID = 90548]
4. cM [Option ID = 90549]

Correct Answer :-

- cM [Option ID = 90549]

17) The conductance (electrical) of a uniform copper wire is [Question ID = 52657]

1. Inversely proportional to the area of the cross section of the wire. [Option ID = 90621]
2. Inversely proportional to the volume of the wire. [Option ID = 90623]
3. Proportional to the volume of the wire [Option ID = 90622]
4. Proportional to the area of the cross section of the wire [Option ID = 90620]

Correct Answer :-

- Proportional to the area of the cross section of the wire [Option ID = 90620]

18) A radioactive sample has a half-life of 10.0 min. What fraction of the sample is left after 01 hour? [Question ID = 52650]

1. 1/10 [Option ID = 90592]
2. 1/6 [Option ID = 90594]
3. 1/64 [Option ID = 90595]
4. 1/32 [Option ID = 90593]

Correct Answer :-

- 1/64 [Option ID = 90595]

19) Maxwell Boltzmann distribution of kinetic energy of molecules in a chamber of gas assumes that [Question ID = 52665]

1. the molecules are having the same velocity [Option ID = 90652]
2. the molecules interact with each other [Option ID = 90655]
3. the molecular motions are random [Option ID = 90653]
4. the molecular motions are not random [Option ID = 90654]

Correct Answer :-

- the molecular motions are random [Option ID = 90653]

20) In terms of enzyme kinetics, Vmax refers to:

[Question ID = 52653]

1. The temperature conditions at which rate of reaction is maximum [Option ID = 90607]
2. The concentration of the substrate at which the rate of reaction is maximum [Option ID = 90604]
3. The rate of enzyme reaction at saturating substrate concentration [Option ID = 90605]
4. The affinity of the enzyme for it substrate when the rate of reaction is maximum [Option ID = 90606]

Correct Answer :-

- The rate of enzyme reaction at saturating substrate concentration [Option ID = 90605]

21) A protein has a molecular weight of 66kD. The DNA segment coding for the gene of this protein is expected to be of what length: [Question ID = 52643]

1. ~ 1800 bases [Option ID = 90564]
2. ~ 180 bases [Option ID = 90567]
3. ~ 6600 bases [Option ID = 90566]
4. ~ 600 bases [Option ID = 90565]

Correct Answer :-

- ~ 1800 bases [Option ID = 90564]

22) During evolution the entropy of a living system [Question ID = 52671]

1. Decreases [Option ID = 90677]
2. Remains 0 [Option ID = 90678]
3. Increases [Option ID = 90676]
4. Both increases & decreases. [Option ID = 90679]

Correct Answer :-

- Decreases [Option ID = 90677]

23) A substance is paramagnetic if it posses [Question ID = 52674]

1. Filled electronic orbitals [Option ID = 90690]
2. None [Option ID = 90691]
3. Spin paired electrons [Option ID = 90688]
4. Spin unpaired electrons [Option ID = 90689]

Correct Answer :-

- Spin unpaired electrons [Option ID = 90689]

24) rRNA is a specific type of RNA found in: [Question ID = 52649]

1. ribosomes of all species [Option ID = 90591]
2. archaeal ribosomes only [Option ID = 90590]
3. eukaryotic ribosomes only [Option ID = 90589]
4. prokaryotic ribosomes only [Option ID = 90588]

Correct Answer :-

- ribosomes of all species [Option ID = 90591]

25) As per the Boltzmann's law the population of electrons excited to energy level ε is given by (where, n_0 is the electronic population at the ground state, k is the Boltzmann constant)

[Question ID = 53373]

1. $n=n_0.(\varepsilon/kT)$ [Option ID = 93479]
2. $n=n_0.(-\varepsilon/kT)$ [Option ID = 93481]
3. $n=n_0\exp(\varepsilon/kT)$ [Option ID = 93478]
4. $n=n_0\exp(-\varepsilon/kT)$ [Option ID = 93480]

Correct Answer :-

- $n=n_0\exp(-\varepsilon/kT)$ [Option ID = 93480]

26) The function $f(t) = \cos(\omega t+\phi)$ is

[Question ID = 52673]

1. a monotonically decreasing function [Option ID = 90685]
2. a monotonically increasing function [Option ID = 90684]
3. an oscillatory function [Option ID = 90686]
4. a fixed value [Option ID = 90687]

Correct Answer :-
- an oscillatory function [Option ID = 90686]

27) Three resistors 10Ω, 20 Ω, 40Ω are combined in parallel. What is the equivalent resistance of the combinations?

[Question ID = 52663]

1. 20/7 Ω [Option ID = 90645]
2. 30/7 Ω; [Option ID = 90646]
3. 40/7 Ω. [Option ID = 90647]
4. 10/7 Ω; [Option ID = 90644]

Correct Answer :-
- 40/7 Ω. [Option ID = 90647]

28) For 1 mole of an Ideal Gas the volume of a single molecule is

[Question ID = 52661]

1. 10 nm^3 [Option ID = 90637]
2. 1 nm^3 [Option ID = 90636]
3. None [Option ID = 90639]
4. 0 nm^3 [Option ID = 90638]

Correct Answer :-
- 0 nm^3 [Option ID = 90638]

29) For a photon the energy is given by

(Where h is the Planck's constant & ν is the frequency of light)

[Question ID = 52664]

1. $\varepsilon = h^2\nu$ [Option ID = 90651]
2. $\varepsilon = h\nu^2$ [Option ID = 90650]
3. $\varepsilon = h\nu$ [Option ID = 90649]
4. $\varepsilon = h/\nu$ [Option ID = 90648]

Correct Answer :-
- $\varepsilon = h\nu$ [Option ID = 90649]

30) Van der Waals distance between two molecules in a gas arises due to [Question ID = 52656]

1. Strong attraction between the nuclei of the molecules, [Option ID = 90617]
2. Strong electrostatic attraction between the molecules, [Option ID = 90616]
3. Negligible volume of the molecules. [Option ID = 90619]
4. Non-negligible volume of the molecules, [Option ID = 90618]

Correct Answer :-
- Non-negligible volume of the molecules, [Option ID = 90618]

31) Which of the following are prokaryotes: [Question ID = 52648]

1. Bacteria and Fungi [Option ID = 90585]
2. Bacteria and Algae [Option ID = 90584]

3. Bacteria only [Option ID = 90587]
4. Bacteria and archaea [Option ID = 90586]

Correct Answer :-

- Bacteria and archaea [Option ID = 90586]

32) Which of the following is not a member database of InterPro? [Question ID = 52676]

1. PANTHER [Option ID = 90698]
2. Pfam [Option ID = 90699]
3. HAMAP [Option ID = 90697]
4. SCOP [Option ID = 90696]

Correct Answer :-

- SCOP [Option ID = 90696]

33) Which of the following cell components are found in both the eukaryotic and prokaryotic cells: [Question ID = 52635]

1. mitochondria [Option ID = 90533]
2. ribosomes [Option ID = 90534]
3. peroxisomes [Option ID = 90535]
4. nucleus [Option ID = 90532]

Correct Answer :-

- ribosomes [Option ID = 90534]

34) Which of the following statements is INCORRECT regarding the recently discovered "methylcytosine" in the genomic DNA. [Question ID = 52641]

1. It is often referred to as the fifth base. [Option ID = 90556]
2. its position in the genomes can be mapped through several next generation sequencing technologies. [Option ID = 90559]
3. It is an epigenetic modification [Option ID = 90557]
4. it usually found in bacteria [Option ID = 90558]

Correct Answer :-

- it usually found in bacteria [Option ID = 90558]

35) Which of the following is untrue regarding the predicting interactions based on domain fusion [Question ID = 52678]

1. Predicting protein–protein interactions is called the "Rosetta stone" method [Option ID = 90705]
2. A fused protein often reveals relationships between its domain components [Option ID = 90706]
3. A fused protein doesn't necessarily reveal about the relationships between its domain components [Option ID = 90707]
4. It is based on gene fusion events [Option ID = 90704]

Correct Answer :-

- A fused protein doesn't necessarily reveal about the relationships between its domain components [Option ID = 90707]

36) Which of the thermodynamic parameters determines if a chemical reaction will take place or not? [Question ID = 52660]

1. Heat absorbed. [Option ID = 90635]
2. Internal Energy. [Option ID = 90632]
3. Gibb's Free energy. [Option ID = 90634]
4. Enthalpy. [Option ID = 90633]

Correct Answer :-

- Gibb's Free energy. [Option ID = 90634]

37) The nth term of the series 1,2,4,8..... Is [Question ID = 52668]

1. 2^{n-1} [Option ID = 90666]
2. 2^{n+1} [Option ID = 90667]
3. 2^n [Option ID = 90665]
4. n^2 [Option ID = 90664]

Correct Answer :-

- 2^{n-1} [Option ID = 90666]

38) The alternative forms of a gene are known as [Question ID = 52679]

1. Isomers [Option ID = 90708]
2. translocations [Option ID = 90710]
3. Crossovers [Option ID = 90709]
4. Alleles [Option ID = 90711]

Correct Answer :-

- Alleles [Option ID = 90711]

39) For separating DNA molecules on the basis of size in a gel electrophoresis experiment, which of the following is most commonly used: [Question ID = 52642]

1. SDS gels [Option ID = 90563]
2. polyacrylamide gels [Option ID = 90562]
3. agarose gels [Option ID = 90561]
4. starch gels [Option ID = 90560]

Correct Answer :-

- agarose gels [Option ID = 90561]

40) Which is the point the line given by x/5+y/10 =1 intersects with the x-axis? [Question ID = 52670]

1. (0,10) [Option ID = 90675]
2. (10,0) [Option ID = 90673]
3. (0,5) [Option ID = 90672]
4. (5,0) [Option ID = 90674]

Correct Answer :-

- (5,0) [Option ID = 90674]

41) According to the Second Law of Thermodynamics, for an engine [Question ID = 52654]

1. Work cannot be converted to heat at all. [Option ID = 90611]
2. Work can be converted to heat more than 100%. [Option ID = 90609]
3. Work can be converted to heat less than 100%. [Option ID = 90610]
4. Work can be converted to heat 100%. [Option ID = 90608]

Correct Answer :-

- Work can be converted to heat less than 100%. [Option ID = 90610]

42) The temperature of a gas is the measure of [Question ID = 52662]

1. Average Potential energy of a molecule [Option ID = 90640]
2. Average ion concentration in the gas. [Option ID = 90642]
3. Average Kinetic energy of a molecule [Option ID = 90641]
4. Average composition of a gas. [Option ID = 90643]

Correct Answer :-

- Average Kinetic energy of a molecule [Option ID = 90641]

43) The penetrating powers of the following radiations in a biological material are of the order

[Question ID = 52667]

1. Alpha= beta= gamma [Option ID = 90660]
2. None. [Option ID = 90663]
3. gamma>beta= alpha [Option ID = 90661]
4. gamma=alpha>beta [Option ID = 90662]

Correct Answer :-

- None. [Option ID = 90663]

44) The two helical strands of DNA are held together by

[Question ID = 52683]

1. Phospho-diester bonds [Option ID = 90727]
2. Covalent bonds [Option ID = 90724]
3. Hydrogen bonds [Option ID = 90725]
4. Disulphide bonds [Option ID = 90726]

Correct Answer :-

- Hydrogen bonds [Option ID = 90725]

45) The correct solution for the equation dy/dx= y is

[Question ID = 52669]

1. $y=1-e^x$ [Option ID = 90669]
2. y=x. [Option ID = 90671]
3. $y=e^x$ [Option ID = 90668]
4. $y=e^{-x}$ [Option ID = 90670]

Correct Answer :-

- $y=e^x$ [Option ID = 90668]

46) The primary transcript is much longer than mature mRNA because of the presence of

[Question ID = 52684]

1. Non coding RNA [Option ID = 90729]
2. Introns [Option ID = 90728]
3. Secondary structures between the bases [Option ID = 90730]
4. All of these [Option ID = 90731]

Correct Answer :-

- Introns [Option ID = 90728]

47) The rate kinetics of a chemical reaction A = B is of

[Question ID = 52659]

1. third order. [Option ID = 90631]
2. zero order [Option ID = 90628]
3. first order [Option ID = 90629]
4. second order [Option ID = 90630]

Correct Answer :-

- first order [Option ID = 90629]

48) The freshwater fish often used as a model organism in biology to study vertebrate development is known by the scientific name, is actually a:

[Question ID = 52644]

1. *Danio Rerio* [Option ID = 90571]
2. *Xenopus tropicalis* [Option ID = 90569]
3. *Caenorhabditis elegans* [Option ID = 90568]
4. *Saccharomyces cerevisiae* [Option ID = 90570]

Correct Answer :-

- *Danio Rerio* [Option ID = 90571]

49) You have a 4 M solution of NaCl which needs to be diluted to 0.4 M concentration. How much water do we add to 100ml of such solution to make it correct molarity?

[Question ID = 52652]

1. 100 ml [Option ID = 90600]
2. 90 ml [Option ID = 90601]
3. 1000 ml [Option ID = 90602]
4. 900 ml [Option ID = 90603]

Correct Answer :-

- 900 ml [Option ID = 90603]

50)

You need a protein sample with concentration of 20mg/ml for your experiment. You have 200 µl of sample with present concentration of 1 mg/ml. What would you do to reach the desired concentration?

[Question ID = 52651]

1. Concentrate the sample to 10 µl [Option ID = 90597]
2. Concentrate the sample to 10,000 µl [Option ID = 90596]
3. Concentrate the sample to 1000 µl [Option ID = 90599]
4. Concentrate the sample to 100 µl [Option ID = 90598]

Correct Answer :-

- Concentrate the sample to 10 µl [Option ID = 90597]