Graduate Aptitude Test Biotechnology 2021

Topic:- GAT B SET-1 Section A

1) Which colligative property is used to determine the molar mass of proteins?
[Question ID = 508]
1. Osmotic pressure [Option ID = 2029]
2. Elevation in boiling point [Option ID = 2030]
3. Relative lowering of vapour pressure [Option ID = 2031]
4. Depression in freezing point [Option ID = 2032]

Correct Answer :-
- Relative lowering of vapour pressure [Option ID = 2031]

2) The half-life (in seconds) of a first order reaction which takes 4 seconds for 30% completion is: (may use log107=0.845)
[Question ID = 509]
1. 6.65 [Option ID = 2033]
2. 5.45 [Option ID = 2034]
3. 8.95 [Option ID = 2035]
4. 7.77 [Option ID = 2036]

Correct Answer :-
- 5.45 [Option ID = 2034]

3) The total number of structural isomers of C5H11F is:
[Question ID = 510]
1. 6 [Option ID = 2037]
2. 8 [Option ID = 2038]
3. 10 [Option ID = 2039]
4. 9 [Option ID = 2040]

Correct Answer :-
- 8 [Option ID = 2038]

4) Which of the following represents the Heisenberg Uncertainty principle?

[Question ID = 511]
1. $\Delta x\ \Delta px \geq h/4\pi$ [Option ID = 2041]
2. $\Delta x\ \Delta px \leq h/4\pi$ [Option ID = 2042]
3. $\Delta x\ \Delta px = h/4\pi$ [Option ID = 2043]
4. $\Delta x\ \Delta px < h/4\pi$ [Option ID = 2044]

Correct Answer :-
- $\Delta x\ \Delta px = h/4\pi$ [Option ID = 2043]

5) What is the formal charge in Sulphur of SO3?

[Question ID = 512]
1. -1 [Option ID = 2045]
2. -1/2 [Option ID = 2046]
3. +1 [Option ID = 2047]
4. 0 [Option ID = 2048]

Correct Answer :-
- -1 [Option ID = 2045]

6) “The solubility of a gas in a liquid (at constant temperature) is directly proportional to the partial pressure of that gas in equilibrium with the liquid” is best described by:

[Question ID = 513]

1. Raoult’s law

   [Option ID = 2049]

2. Dalton’s law

   [Option ID = 2050]

3. Boyle’s law

   [Option ID = 2051]

4. Henry’s law

   [Option ID = 2052]

Correct Answer :-

- Boyle’s law

  [Option ID = 2051]

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7) The solubility of gases in liquids

[Question ID = 514]

1. Increases with the rise in temperature

   [Option ID = 2053]

2. Decreases with the rise in temperature

   [Option ID = 2054]

3. Increases with lowering the temperature

   [Option ID = 2055]

4. Decreases with lowering the temperature

   [Option ID = 2056]

Correct Answer :-

- Increases with lowering the temperature

  [Option ID = 2055]

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8) In a first order reaction, a straight line is obtained when plotting

[Question ID = 515]

1. [R] vs t

   [Option ID = 2057]

2. ln[R] vs t

   [Option ID = 2058]

3. 1/[R] vs t

   [Option ID = 2059]

4. 1/ln[R] vs t

   [Option ID = 2060]

Correct Answer :-

- ln[R] vs t

  [Option ID = 2058]

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9) Which of the following conditions allow a reaction to be spontaneous?

	ΔHo	**ΔSo**
[Question ID = 516]		
1.	-	+
	[Option ID = 2061]	
2.	+	-
	[Option ID = 2062]	
3.	-	-
	[Option ID = 2063]	
4.	+	+
	[Option ID = 2064]	

Correct Answer :-

- + -

[Option ID = 2062]

10) Which of the following organohalogens contains the largest number of molecules?

[Question ID = 517]

1. 1g of CHB§

[Option ID = 2065]

2. 1g of CH2Br2

[Option ID = 2066]

3. 1g of CHBr3

[Option ID = 2067]

4. 1g of CBr4

[Option ID = 2068]

Correct Answer :-

- 1g of CHBr3

[Option ID = 2067]

11) Which of following reactions has a positive entropy change (ΔSo)?

[Question ID = 518]

1. $HQ_2(l) \rightarrow H2O(s)$ [Option ID = 2069]
2. $2SO2(g) + O2(g) \rightarrow 2SO3(g)$ [Option ID = 2070]
3. $N2(g) + 3H2(g) \rightarrow 2NH3(g)$ [Option ID = 2071]
4. $CaCO3(s) \rightarrow CaO(s) + CO2(g)$ [Option ID = 2072]

Correct Answer :-

- $H2O(l) \rightarrow H2O(s)$ [Option ID = 2069]

$2C4H10 + 13O2 \rightarrow 8CO2 + 10H2O$

What is the amount (in mole) of carbon dioxide formed by the complete combustion of three moles of n-butane?

[Question ID = 519]

1. 24

[Option ID = 2073]

2. 12

[Option ID = 2074]

3. 8

[Option ID = 2075]

4. 4

[Option ID = 2076]

Correct Answer :-

- 8

[Option ID = 2075]

13) In ethanol, C 2H 5OH, there are covalent bonds, hydrogen bonds and van der Waals' forces. Which bonds or forces are broken when ethanol is vaporized?

[Question ID = 520]

1. Only hydrogen bonds [Option ID = 2077]
2. Hydrogen bonds and van der Waals' forces [Option ID = 2078]
3. Covalent bonds and van der Waals' forces [Option ID = 2079]
4. Covalent bonds and hydrogen bonds [Option ID = 2080]

Correct Answer :-

- Covalent bonds and van der Waals' forces [Option ID = 2079]

14) Different structural information about glucose can be derived by reacting it with different reagents. Which of the following is correct?

[Question ID = 521]

1. Reaction with HI confirms the presence of carbonyl groups. [Option ID = 2081]
2. Acetylation with acetic anhydride to confirm the presence of OH groups. [Option ID = 2082]
3. Reaction with bromine water to confirm a straight chain. [Option ID = 2083]
4. Oxidation with nitric acid to confirm the presence of secondary OH groups [Option ID = 2084]

Correct Answer :-

- Acetylation with acetic anhydride to confirm the presence of OH groups. [Option ID = 2082]

15) The half life of a chemical reaction is 1386 seconds. The specific rate constant for the reaction is
[Question ID = 522]
1. 0.5 x 10-2 s-1 [Option ID = 2085]
2. 0.5 x 10-3 s-1 [Option ID = 2086]
3. 0.5 x 10-4 s-1 [Option ID = 2087]
4. 0.5 x 10-5 s-1 [Option ID = 2088]

Correct Answer :-
- 0.5 x 10-3 s-1 [Option ID = 2086]

16) A positive charge +q is located at the center of mass of a cube, sphere and cylinder. The side of the cube is r units, radius of the sphere is r units, and the radius and length of the cylinder are r and 4r units, respectively. The total electric flux through the surface
[Question ID = 523]
1. of the cylinder is maximum [Option ID = 2089]
2. of the cube is maximum [Option ID = 2090]
3. of the sphere is maximum [Option ID = 2091]
4. of all three objects are equal [Option ID = 2092]

Correct Answer :-
- of the sphere is maximum [Option ID = 2091]

17) Electrical energy is transmitted over large distances at high alternating voltages because:
[Question ID = 524]
1. For a given power, there is a lower current, thus less power loss. [Option ID = 2093]
2. For a given power, there is a higher current, thus more efficient transmission. [Option ID = 2094]
3. Transmission lines are better suited to carry high voltage. [Option ID = 2095]
4. The power stations generate power at high voltage and it is convenient to reduce the voltage at the receiving end using step-down transformer [Option ID = 2096]

Correct Answer :-
- For a given power, there is a lower current, thus less power loss. [Option ID = 2093]

18) A far away object approaches a convergent lens from the left of the lens with a uniform speed of 5 m/s and stops at the focus. During this time the image on the right moves:
[Question ID = 525]
1. away from the lens with an uniform speed of 5 m/s. [Option ID = 2097]
2. away from the lens with an uniform acceleration. [Option ID = 2098]
3. away from the lens with a non-uniform acceleration. [Option ID = 2099]
4. towards the lens with a non-uniform acceleration. [Option ID = 2100]

Correct Answer :-
- away from the lens with a non-uniform acceleration. [Option ID = 2099]

19) A vehicle travels half of the total distance (L) with speed V1 and the other half with speed V2, then its average speed over this whole distance is:
[Question ID = 526]
1. (V1+V2)/2 [Option ID = 2101] 2. (2V1+V2)/(V1+V2) [Option ID = 2102] 3. 2V1V2/(V1+V2) [Option ID = 2103] 4. L(V1+V2)/V1V2 [Option ID = 2104]

Correct Answer :-
- 2V1V2/(V1+V2) [Option ID = 2103]

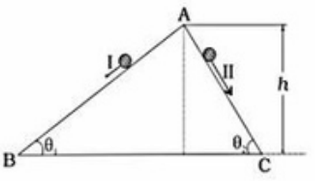
20) A mass of 5 kg is moving along a circular path of radius 1 m. If the mass moves with 300 revolutions per minute, its kinetic energy would be:

[Question ID = 527]
1. $250\,\pi^2$ [Option ID = 2105]
2. $100\,\pi^2$ [Option ID = 2106]
3. $5\,\pi^2$ [Option ID = 2107]
4. 0 [Option ID = 2108]

Correct Answer :-
- $100\,\pi^2$

[Option ID = 2106]

21) Two inclined frictionless tracks, one gradual and the other steep meet at A from where two stones are allowed to slide down from rest, one on each track as shown in the figure below.



Which of the following statements is correct?

[Question ID = 528]

1. Both the stones reach the bottom at the same time and the same speed. [Option ID = 2109] 2. Both the stones reach the bottom with the same speed and stone I reaches the bottom earlier than stone II. [Option ID = 2110] 3. Both the stones reach the bottom with the same speed and stone II reaches the bottom earlier than stone I. [Option ID = 2111] 4. Both the stones reach the bottom at different times and with different speeds [Option ID = 2112]

Correct Answer :-

- Both the stones reach the bottom with the same speed and stone I reaches the bottom earlier than stone II. [Option ID = 2110]

22) Assume that the earth is a perfect sphere. If the interior of the earth contained matter which is not of the same density everywhere, then the acceleration due to gravity on the surface of the earth will:

[Question ID = 529]

1. be directed towards the centre but not the same everywhere. [Option ID = 2113]
2. have the same value everywhere but not directed towards the centre. [Option ID = 2114]
3. be same everywhere in magnitude directed towards the centre. [Option ID = 2115]
4. have different values everywhere and not directed towards the centre. [Option ID = 2116]

Correct Answer :-

- be same everywhere in magnitude directed towards the centre. [Option ID = 2115]

23) A copper and a steel wire of the same diameter are connected end to end. A deforming force F is applied to this composite wire which causes a total elongation of 3 cm. The two wires will have

[Question ID = 530]

1. the same stress and different strain. [Option ID = 2117]
2. the same strain and different stress. [Option ID = 2118]
3. the same stress and same strain. [Option ID = 2119] 4.
different stress and different strain. [Option ID = 2120]

Correct Answer :-

- the same stress and different strain. [Option ID = 2117]

24) The equation describing acceleration (a) as a function of displacement (x) for four different particles is given below. Which one of these is executing simple harmonic motion?

[Question ID = 531]

1. a = + 2x [Option ID = 2121]
2. a = + 2x2 [Option ID = 2122]
3. a = - 2x2 [Option ID = 2123]
4. a = - 2x [Option ID = 2124]

Correct Answer :-

- a = - 2x2 [Option ID = 2123]

25) Light waves entering a medium with higher refractive index undergo

[Question ID = 532]

1. Change in velocity and frequency but not wavelength [Option ID = 2125]
2. Change in wavelength and frequency but not velocity [Option ID = 2126]
3. Change in velocity and wavelength but not frequency [Option ID = 2127]
4. Change in velocity, frequency and wavelength [Option ID = 2128]

Correct Answer :-

- Change in velocity and wavelength but not frequency [Option ID = 2127]

26) A battery of emf 1.50 V and internal resistance 0.50 ohm supplies a current of 100 mA. The potential difference across the terminal of the battery will be _____V.

[Question ID = 533]

1. 1.5 [Option ID = 2129]
2. 1.45 [Option ID = 2130]
3. 1.55 [Option ID = 2131]

4. 1 [Option ID = 2132]

Correct Answer :-

- 1.45 [Option ID = 2130]

27) The position of a particle moving along the X-axis as a function of time t (in seconds) is given by X (in meters) = t3 - 9t + 2. The magnitude of the acceleration of the particle at t = 3 seconds is _____ m/s2.

[Question ID = 534]

1. 56 [Option ID = 2133]
2. 36 [Option ID = 2134]
3. 18 [Option ID = 2135]
4. 20 [Option ID = 2136]

Correct Answer :-

- 36 [Option ID = 2134]

28) A solid cylinder and a hollow cylinder of the equal radius and mass start rolling down (without slipping) on a fixed inclined plane from rest at the same time at the same height from the ground. Which of the following statements is correct about the above?

[Question ID = 535]

1. Solid cylinder reaches the ground earlier and with higher velocity than hollow cylinder [Option ID = 2137]
2. Both solid and hollow cylinders reach at the same time with same velocity [Option ID = 2138]
3. Solid cylinder reaches ground at same time but with higher velocity than hollow cylinder [Option ID = 2139]
4. Hollow cylinder reaches ground earlier with higher velocity than solid cylinder [Option ID = 2140]

Correct Answer :-

- Solid cylinder reaches ground at same time but with higher velocity than hollow cylinder [Option ID = 2139]

29) A metal ball weighs 50 g in air and 25 g when dipped in a liquid of density 1.25 g/cm3. The metal ball weighs _____ g when dipped in a liquid of density 1.2 g/cm3.

[Question ID = 536]

1. 24 [Option ID = 2141]
2. 25 [Option ID = 2142]
3. 26 [Option ID = 2143]
4. 28 [Option ID = 2144]

Correct Answer :-

- 24 [Option ID = 2141]

30) A radioactive material has a half life of 10 years. What fraction of radioactive nuclei will remain undecayed with respect to the initial sample after 20 years?

[Question ID = 537]

1. 1/2 [Option ID = 2145]
2. 1/4 [Option ID = 2146]
3. 1/8 [Option ID = 2147]
4. 1/16 [Option ID = 2148]

Correct Answer :-

- 1/8 [Option ID = 2147]

31) Which among the following organs is NOT capable of secreting hormones?

[Question ID = 538]

1. Ovary [Option ID = 2149]
2. Salivary Gland [Option ID = 2150]
3. Thymus [Option ID = 2151]
4. Kidney [Option ID = 2152]

Correct Answer :-

- Thymus [Option ID = 2151]

32) Choose the incorrect statement from the following.

[Question ID = 539]

1. AUG is the initiator codon and also codes for methionine. [Option ID = 2153]
2. UGA is a terminator codon. [Option ID = 2154]
3. A codon is not always a triplet. [Option ID = 2155]
4. Genetic code is universal from protozoa to human. [Option ID = 2156]

Correct Answer :-

- UGA is a terminator codon. [Option ID = 2154]

33) Match the components in List I with those in the List II.

List I	List II
A. Down's Syndrome	I. Autosomal recessive trait
B. Turner Syndrome	II. Point mutation

C. Phenylketonuria	III. Females only
D. Sickle cell anemia	IV. 21 Trisomy

[Question ID = 540]

1. A -I, B-II, C-III, D-IV

   [Option ID = 2157]

2. A-IV, B-III, C-I, D-II

   [Option ID = 2158]

3. A-IV, B-I, C-II, D-I

   [Option ID = 2159]

4. A-I, B-III, C-II, D-IV

   [Option ID = 2160]

Correct Answer :-

- A-IV, B-III, C-I, D-II
  [Option ID = 2158]

34) Which one of the following is a membrane-less structure?

[Question ID = 541]

1. Centrosome

   [Option ID = 2161]

2. Cytochrome

   [Option ID = 2162]

3. Endosome

   [Option ID = 2163]

4. Peroxisome

   [Option ID = 2164]

Correct Answer :-

- Endosome
  [Option ID = 2163]

35) Which of the following statements about lipids is NOT true?

[Question ID = 542]

1. Glycerol and fatty acids make up lipids [Option ID = 2165]
2. Lipids are water insoluble and some even contain phosphorus [Option ID = 2166]
3. Glycerol is a highly complex lipid [Option ID = 2167]
4. Fats are different from oils in their melting point [Option ID = 2168]

Correct Answer :-

- Lipids are water insoluble and some even contain phosphorus [Option ID = 2166]

36) Mendel's discovery in pea plants may be considered incidental since the chosen traits were

[Question ID = 543]

1. mostly tightly linked [Option ID = 2169]
2. only completely dominant [Option ID = 2170]
3. highly epistatic [Option ID = 2171]
4. independently assorted [Option ID = 2172]

Correct Answer :-

- only completely dominant [Option ID = 2170]

37) Height of a human being is a typical example of which mode of inheritance?

[Question ID = 544]

1. Pleiotropic Inheritance

   [Option ID = 2173]

2. Cytoplasmic Inheritance

   [Option ID = 2174]

3. Multi-allelic Inheritance

   [Option ID = 2175]

4. Polygenic Inheritance

   [Option ID = 2176]

Correct Answer :-

- Multi-allelic Inheritance

  [Option ID = 2175]

38) Which of the following hormones attains the peak of expression in the middle of the menstrual cycle?
[Question ID = 545]
1. Estrogen [Option ID = 2177]
2. Progesterone [Option ID = 2178]
3. LH [Option ID = 2179]
4. FSH [Option ID = 2180]

Correct Answer :-
- Estrogen [Option ID = 2177]

39) Milk is secreted by the alveoli present in the mammary lobes and it reaches up to nipple through the following regions:
a. Lactiferous duct b. Mammary duct c. Ampulla d. Mammary tubule
The correct order of the flow of milk is:
[Question ID = 546]
1. b → c → d → a [Option ID = 2181]
2. d → b → c → a [Option ID = 2182]
3. b → d → c → a [Option ID = 2183]
4. a → b → d → c [Option ID = 2184]

Correct Answer :-
- b → d → c → a [Option ID = 2183]

40) Given below are two statements: one is labelled as Assertion A and another as Reason R.

Assertion A: Most humans pass accurate genetic instructions from one generation to the next.
Reason R: In spite of high mutation rate, the sequence of the human genome changes by only a few nucleotides during division.

In the light of the above statements, choose the correct answer from the options below.

[Question ID = 547]
1. Both A and R are true and R is the correct explanation of A

   [Option ID = 2185]
2. Both A and R are true and R is NOT the correct explanation of A

   [Option ID = 2186]
3. A is true but R is false

   [Option ID = 2187]
4. A is false but R is true

   [Option ID = 2188]

Correct Answer :-
- A is true but R is false
  [Option ID = 2187]

41) The respiratory pathway common to erythrocyte and leucocyte is
[Question ID = 548]
1. oxidation of pyruvate to acetyl-CoA [Option ID = 2189]
2. oxidation of acetyl-CoA [Option ID = 2190]
3. release of ATP by electron transport-linked phosphorylation [Option ID = 2191]
4. substrate level phosphorylation [Option ID = 2192]

Correct Answer :-
- oxidation of acetyl-CoA [Option ID = 2190]

42) Pick the most basic dipeptide from the following:
[Question ID = 549]
1. Gly-Glu [Option ID = 2193]
2. Gly-Lys [Option ID = 2194]
3. Gly-Arg [Option ID = 2195]
4. Gly-His [Option ID = 2196]

Correct Answer :-
- Gly-Lys [Option ID = 2194]

43) Which of the following features distinguishes myoglobin from hemoglobin?

[Question ID = 550]

1. Presence of heme prosthetic group

[Option ID = 2197]

2. Ability to bind to oxygen

[Option ID = 2198]

3. Molecular size and allostery

[Option ID = 2199]

4. Hemoglobin is found only in humans

[Option ID = 2200]

Correct Answer :-

- Molecular size and allostery

[Option ID = 2199]

44) Match the components of List I with those in the List II.

List I	List II
A. Val, Leu	I. Basic
B. Ser, Thr	II. Hydrophobic
C. Arg, Lys	III. Heterocyclic side chain
D. His, Trp	IV. Hydroxyl group in the side chain

Choose the correct answer from the options given below:

[Question ID = 551]

1. A-I, B-II, C-III, D-IV [Option ID = 2201]
2. A-II, B-IV, C-I, D-III [Option ID = 2202]
3. A-II, B-III, C-I, D-IV [Option ID = 2203]
4. A-I, B-III, C-II, D-IV [Option ID = 2204]

Correct Answer :-

- A-I, B-II, C-III, D-IV [Option ID = 2201]

45) Which of the following is NOT a plant hormone?

[Question ID = 552]

1. Brassinosteroids

[Option ID = 2205]

2. Cytokinin

[Option ID = 2206]

3. Cytokine

[Option ID = 2207]

4. Nitric oxide

[Option ID = 2208]

Correct Answer :-

- Cytokine

[Option ID = 2207]

46) What is the chance that a leap year, selected at random, will have 53 Sundays?

[Question ID = 553]

1. 7/53 [Option ID = 2209]
2. 7/52 [Option ID = 2210]
3. 2/7 [Option ID = 2211]
4. 1/7 [Option ID = 2212]

Correct Answer :-

- 2/7 [Option ID = 2211]

47) A bag contains 3 red, 6 white and 7 blue balls. What is the probability that 2 balls drawn are white and blue?

[Question ID = 554]

1. 1/120 [Option ID = 2213]
2. 1/16 [Option ID = 2214]
3. 13/16 [Option ID = 2215]
4. 7/20 [Option ID = 2216]

Correct Answer :-

- 1/16 [Option ID = 2214]

48) Which of the following equation describes a line passing through the point (-2, -3) and parallel to the x-axis?
[Question ID = 555]
1. y = -3 [Option ID = 2217]
2. x = -2 [Option ID = 2218]
3. y-x = 6 [Option ID = 2219]
4. x-y = 6 [Option ID = 2220]

Correct Answer :-
- x = -2 [Option ID = 2218]

49) In a school there are a total of 20 teachers who can teach mathematics or physics. Of these, 12 can teach mathematics and 4 can teach both physics and mathematics. How many can teach physics?
[Question ID = 556]
1. 16 [Option ID = 2221]
2. 8 [Option ID = 2222]
3. 12 [Option ID = 2223]
4. 6 [Option ID = 2224]

Correct Answer :-
- 12 [Option ID = 2223]

50) The cost of 5 oranges and 3 apples is Rs. 35 and the cost of 2 oranges and 4 apples is Rs. 28. What would be the cost of one each of orange and apple?
[Question ID = 557]
1. Orange Rs. 4, Apple Rs. 5 [Option ID = 2225] 2. Orange Re. 1, Apple Rs. 10 [Option ID = 2226] 3. Orange Rs. 2, Apple Rs. 4 [Option ID = 2227] 4. Orange Rs. 4, Apple Rs. 6 [Option ID = 2228]

Correct Answer :-
- Orange Rs. 4, Apple Rs. 5 [Option ID = 2225]

51) A 6.5 m ladder is placed against a wall such that its foot is at a distance of 2.5 m from the wall. The height it would reach on the wall is [Question ID = 558]

1. 3.0 m [Option ID = 2229]
2. 4.0 m [Option ID = 2230]
3. 5.0 m [Option ID = 2231]
4. 6.0 m [Option ID = 2232]

Correct Answer :-
- 5.0 m [Option ID = 2231]

52) A train travels 360 km at a uniform speed. If the speed had been 5 km/h more, it would have taken 1 h less for the journey. What is the speed (in km/h) of the train?
[Question ID = 559]
1. 40 [Option ID = 2233]
2. 30 [Option ID = 2234]
3. 20 [Option ID = 2235]
4. 10 [Option ID = 2236]

Correct Answer :-
- 20 [Option ID = 2235]

53) The highest score of a cricket player in an innings was 3/11th of the total score and the next highest was 3/10th of the remaining. If the difference between the two scores was 24 runs, what was the total score?
[Question ID = 560]
1. 390 [Option ID = 2237]
2. 410 [Option ID = 2238]
3. 420 [Option ID = 2239]
4. 440 [Option ID = 2240]

Correct Answer :-
- 410 [Option ID = 2238]

54) The ratio of the number of girls to the number of boys in a school of 720 students is 3:5. If 18 new boys are admitted in the school, find how many new girls may be admitted so that the ratio of number of girls to the number of boys may change to 2:3?
[Question ID = 561]
1. 21 [Option ID = 2241]
2. 42 [Option ID = 2242]
3. 84 [Option ID = 2243]
4. 168 [Option ID = 2244]

Correct Answer :-

- 42 [Option ID = 2242]

55) A and B together can do a piece of work in 20 days; B and C together can do it in 15 days, C and A together can do it in 12 days. How long will they take to finish the work, working together?

[Question ID = 562]

1. 6 days [Option ID = 2245]
2. 8 days [Option ID = 2246]
3. 10 days [Option ID = 2247]
4. 12 days [Option ID = 2248]

Correct Answer :-

- 10 days [Option ID = 2247]

56) If a student cycles at 10 km/h, he reaches the school late by 4 minutes. If he cycles at 12 km/h, he reaches the school early by 2 minutes. What is the distance of the school from his home?

[Question ID = 563]

1. 4 km [Option ID = 2249]
2. 6 km [Option ID = 2250]
3. 7 km [Option ID = 2251]
4. 8 km [Option ID = 2252]

Correct Answer :-

- 4 km [Option ID = 2249]

57) A boat covers a certain distance downstream in 3 hours and it covers the same distance upstream in 5 hours. What would be the speed of the stream if the speed of the boat in still water is 8 km/h?

[Question ID = 564]

1. 3 km/h [Option ID = 2253]
2. 2.5 km/h [Option ID = 2254]
3. 2 km/h [Option ID = 2255]
4. 1.5 km/h [Option ID = 2256]

Correct Answer :-

- 2 km/h [Option ID = 2255]

58) What is the median of the data given below?

2, 2, 0, 4, 12, 10, 6, 8

[Question ID = 565]

1. 5 [Option ID = 2257]
2. 4.5 [Option ID = 2258]
3. 6 [Option ID = 2259]
4. 5.5 [Option ID = 2260]

Correct Answer :-

- 6 [Option ID = 2259]

59) The ratio of the area of a circle and a square having the same perimeter is

[Question ID = 566]

1. $4:\pi$

   [Option ID = 2261]
2. $2:\pi$

   [Option ID = 2262]
3. $2:\sqrt{\pi}$

   [Option ID = 2263]
4. $4:\pi^2$

   [Option ID = 2264]

Correct Answer :-

- $2:\pi$

  [Option ID = 2262]

60) In an experiment, with increasing number of tosses of a coin the

[Question ID = 567]

1. Ratio of heads to tails approaches 1 and also the differential count between heads and tails declines. [Option ID = 2265]
2. Ratio of heads to tails approaches 1 while the differential count between heads and tails increases. [Option ID = 2266]
3. The ratio of heads to tails remains at 1. [Option ID = 2267]
4. The ratio of heads and tails oscillates around 1 while the differential count between them declines. [Option ID = 2268]

1. only B [Option ID = 5533]
2. A and C [Option ID = 5534]
3. A, B and C [Option ID = 5535]
4. A, C and D [Option ID = 5536]

Correct Answer :-

- A, B and C [Option ID = 5535]

8) Papain digestion of an IgG predominantly results in the formation of
[Question ID = 1385]

1. two Fab fragments and one Fc fragment [Option ID = 5537]
2. one F(ab')2 fragment and several small Fc fragments [Option ID = 5538]
3. one F(ab')2 fragment and one Fc fragment [Option ID = 5539]
4. two Fab fragments and several small Fc fragments [Option ID = 5540]

Correct Answer :-

- one F(ab')2 fragment and several small Fc fragments [Option ID = 5538]

9) Which one of the following statements about central memory T cells is true?
[Question ID = 1386]

1. They reside in the secondary lymphoid organs [Option ID = 5541]
2. They exit the lymph node and circulate in the body [Option ID = 5542]
3. They settle in the peripheral tissue [Option ID = 5543]
4. They reside in the bone marrow [Option ID = 5544]

Correct Answer :-

- They exit the lymph node and circulate in the body [Option ID = 5542]

10) Which organ is used for isolation of activated B lymphocytes (plasma cells) for monoclonal antibody production?
[Question ID = 1387]

1. Bone marrow [Option ID = 5545]
2. Spleen [Option ID = 5546]
3. Lymph node [Option ID = 5547]
4. Liver [Option ID = 5548]

Correct Answer :-

- Lymph node [Option ID = 5547]

11) PSSM stands for
[Question ID = 1388]

1. Position Specific Scanning Matrix [Option ID = 5549]
2. Point Specific Scoring Matrix [Option ID = 5550]
3. Position Specific Scoring Matrix [Option ID = 5551]
4. Point Specific Scanning Matrix [Option ID = 5552]

Correct Answer :-

- Position Specific Scanning Matrix [Option ID = 5549]

12) Which one of the following attribute of a macromolecule is modulated by Molecular dynamics simulations?
[Question ID = 1389]

1. Structure [Option ID = 5553]
2. Temperature [Option ID = 5554]
3. Pressure [Option ID = 5555]
4. Antigenicity [Option ID = 5556]

Correct Answer :-

- Pressure [Option ID = 5555]

13) The only genetically encoded amino acid without a stereoisomer is
[Question ID = 1390]

1. Alanine [Option ID = 5557]
2. Tryptophan [Option ID = 5558]
3. Glycine [Option ID = 5559]
4. Proline [Option ID = 5560]

Correct Answer :-

- Glycine [Option ID = 5559]

14) Disulfide bonds are identified using the distance between the side-chains of which one of the following sulphur-containing residue pairs?
[Question ID = 1391]

1. Cys and Met [Option ID = 5561]
2. Cys and Cys [Option ID = 5562]
3. Met and Met [Option ID = 5563]
4. Met and His [Option ID = 5564]

Correct Answer :-

- Cys and Cys [Option ID = 5562]

15) The two strands in double-helical DNA are held together by hydrogen bonds between
[Question ID = 1392]

1. Phosphate and sugar group [Option ID = 5565]
2. Nitrogenous bases and sugar [Option ID = 5566]
3. Nitrogenous bases and phosphate [Option ID = 5567]
4. Nitrogenous bases [Option ID = 5568]

Correct Answer :-

- Nitrogenous bases and sugar [Option ID = 5566]

16) Which one of the following is a receptor for HIV-1?
[Question ID = 1393]

1. Sialic acid [Option ID = 5569]
2. CD4 [Option ID = 5570]
3. CD81 [Option ID = 5571]
4. Claudin-1 [Option ID = 5572]

Correct Answer :-

- CD81 [Option ID = 5571]

17) A student carried out expression analysis of a gene *(PTEN)* in a cancer cell line using both Northern blotting and Western blotting. He observed a decrease in the Western blotting signal but no change in the Northern blotting signal compared to a normal cell. In this context, which one of the following statements is correct?
[Question ID = 1394]

1. There is a decrease in PTEN protein level but there is no mutation on the *PTEN* DNA sequence in the cancer cell [Option ID = 5573] 2. There is a decrease in PTEN protein level but no change in the *PTEN* mRNA expression in the cancer cell [Option ID = 5574] 3. There is a decrease in *PTEN* mRNA expression but no change in the PTEN protein level in the cancer cell [Option ID = 5575] 4. There is a decrease in PTEN mRNA expression but no mutation on the PTEN DNA sequence in the cancer cell [Option ID = 5576]

Correct Answer :-

- There is a decrease in PTEN protein level but there is no mutation on the *PTEN* DNA sequence in the cancer cell [Option ID = 5573]

18) Which one of the following DNA sequences can act as genetic markers?

[Question ID = 1395]

1. Variable number tandem repeat (VNTR)

   [Option ID = 5577]
2. Long interspersed nuclear elements (LINEs)

   [Option ID = 5578]
3. Short interspersed nuclear elements (SINEs)

   [Option ID = 5579]
4. Long terminal repeats (LTRs)

   [Option ID = 5580]

Correct Answer :-

- Short interspersed nuclear elements (SINEs)
  [Option ID = 5579]

19) Which of the following is NOT a genetic disorder?
[Question ID = 1396]

1. Cystic Fibrosis [Option ID = 5581]
2. Sickle Cell Anaemia [Option ID = 5582]
3. Downs Syndrome [Option ID = 5583]
4. Marasmus [Option ID = 5584]

Correct Answer :-

- Downs Syndrome [Option ID = 5583]

20) Zoonotic viruses are those that can be transmitted
[Question ID = 1397]

1. only in wild animals. [Option ID = 5585]
2. from plants to humans. [Option ID = 5586]
3. from animals to humans. [Option ID = 5587]
4. only in zoo animals [Option ID = 5588]

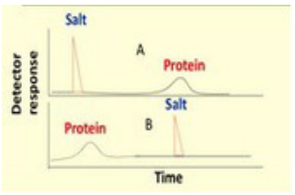
Correct Answer :-

- from plants to humans. [Option ID = 5586]

21) Given the molecular weight of Glycine is 75, what would be the molecular weight of Gly-Gly dipeptide?
[Question ID = 1398]
1. 150 [Option ID = 5589] 2. 250 [Option ID = 5590] 3. 132 [Option ID = 5591] 4. 321 [Option ID = 5592]

Correct Answer :-
- 250 [Option ID = 5590]

22) Identify the form of chromatography [Reverse Phase (RP) or Gel filtration (GF)] as shown in the chromatograms A and B below:



[Question ID = 1399]
1. RP(A) and GF(B) [Option ID = 5593]
2. RP(B) and GF(A) [Option ID = 5594]
3. RP(A) and RP(B) [Option ID = 5595]
4. GF(A) and GF(B) [Option ID = 5596]

Correct Answer :-
- RP(A) and RP(B) [Option ID = 5595]

23) How much will 1 mole of glucose weigh (in grams) on the Earth (E) and on the Moon (M)?
[Question ID = 1400]
1. 180(E) and 180(M) [Option ID = 5597]
2. 180(E) and 90(M) [Option ID = 5598]
3. 170(E) and 100(M) [Option ID = 5599]
4. 180(E) and 30(M) [Option ID = 5600]

Correct Answer :-
- 180(E) and 180(M) [Option ID = 5597]

24) Given three samples (a) L-Tyrosine (b) D-Tyrosine, (c) Equimolar mixture of L- and D-Tyrosine, which one of the following methods can help in the identification of the samples?
[Question ID = 1401]
1. UV absorbance [Option ID = 5601]
2. IR spectroscopy [Option ID = 5602]
3. NMR Spectroscopy [Option ID = 5603]
4. Optical rotation [Option ID = 5604]

Correct Answer :-
- NMR Spectroscopy [Option ID = 5603]

25) What are the number of moles in 100 ml water (density=1 g/ml) and in 100 ml heavy water (density=1.11 g/ml), respectively?
[Question ID = 1402]
1. 5.55 and 5.55 [Option ID = 5605]
2. 5.55 and 4.44 [Option ID = 5606]
3. 4.44 and 5.55 [Option ID = 5607]
4. 4.44 and 4.44 [Option ID = 5608]

Correct Answer :-
- 4.44 and 5.55 [Option ID = 5607]

26) 86. From the table given below, what is the overall protein yield?

Purification Table

procedure or step	fraction volume (mls)	total protein (mg)	activity (units)	specific activity (units/mg)	% yield
crude cellular extract	1,400	10,000	100,000	10	100
ammonium sulfate precipitation	280	3,000	96,000	32	96
ion-exchange chromatography	90	400	80,000	200	80
size-exclusion chromatography	80	100	60,000	600	60

affinity chromatography	6	3	45,000	15,000	45

[Question ID = 1403]

1. 100% [Option ID = 5609] 2. 20.70% [Option ID = 5610] 3. 80% [Option ID = 5611] 4. 70% [Option ID = 5612]

Correct Answer :-

- 20.70% [Option ID = 5610]

27) Calculate the approximate concentration of a solution with molar extinction coefficient = 650 M-1 cm-1, Path length = 1 cm and Absorbance =1.0.

[Question ID = 1404]

1. 1.5 mM [Option ID = 5613]
2. 1.5 µM [Option ID = 5614]
3. 1.5 M [Option ID = 5615]
4. 1.5 nM [Option ID = 5616]

Correct Answer :-

- 1.5 µM [Option ID = 5614]

28) A 5200-bp long cloning vector contains two BamHI sites that are 450-bp apart. In a cloning experiment, a 1200-bp long gene "X" having two BamHI sites at 3'- and 5'-ends was PCR amplified and cloned after complete digestion of the vector with BamHI. What will be the size of the resultant plasmid containing the cloned gene X?

[Question ID = 1405]

1. 5200-bp [Option ID = 5617]
2. 6400-bp [Option ID = 5618]
3. 5950-bp [Option ID = 5619]
4. 6850-bp [Option ID = 5620]

Correct Answer :-

- 5950-bp [Option ID = 5619]

29) Match various nucleases in the List I to their respective functions in List II.

List I	List II
A. DNAse I	I. Degrades single stranded DNA and RNA
B. RNAse H	II. Degrades RNA-DNA hybrid
C. RNAse A	III. Degrades both single and double stranded DNA
D. S1 nuclease	IV. Degrades single strand and double stranded RNA

Choose the correct answer from the options below:

[Question ID = 1406]

1. A-I, B-III, C-II, D-IV [Option ID = 5621]
2. A-II, B-I, C-III, D-IV [Option ID = 5622]
3. A-III, B-I, C-IV, D-III [Option ID = 5623]
4. A-III, B-II, C-IV, D-I [Option ID = 5624]

Correct Answer :-

- A-I, B-III, C-II, D-IV [Option ID = 5621]

30) The difference between a cosmid and a plasmid is the presence of which one of the following additional features in a cosmid?

[Question ID = 1407]

1. a λ phage DNA sequence that includes a cos site [Option ID = 5625]
2. an M13 phage DNA sequence that includes a cos site [Option ID = 5626]

3. a T4 phage DNA sequence that includes a cos site [Option ID = 5627]
4. a T7 phage DNA sequence that includes a cos site [Option ID = 5628]

Correct Answer :-

- a T4 phage DNA sequence that includes a cos site [Option ID = 5627]

31) Nick translation is carried out by
[Question ID = 1408]
1. DNA polymerase I [Option ID = 5629]
2. RNA Polymerase II [Option ID = 5630]
3. Ribosomes [Option ID = 5631]
4. Polynucleotide kinase [Option ID = 5632]

Correct Answer :-

- Ribosomes [Option ID = 5631]

32) A single cell that can divide and give rise to a completely differentiated organism is referred to as
[Question ID = 1409]
1. Unipotent [Option ID = 5633]
2. Pluripotent [Option ID = 5634]
3. Multipotent [Option ID = 5635]
4. Totipotent [Option ID = 5636]

Correct Answer :-

- Pluripotent [Option ID = 5634]

33) Which of the following statements are correct?
A. Mitochondria and chloroplast contain DNA, and are associated with ribosomes along with the enzymatic machinery for protein synthesis.
B. Mitochondria and chloroplast contain DNA but do not make protein.
C. Mitochondrial and chloroplast DNA sequence or ribosomes present are more related to bacteria and cyanobacteria than that of eukaryotes.
D. Mitochondria and chloroplast are distinct entities and can survive outside the host cell.
E. Neither mitochondria nor chloroplast contain all of the genes necessary to specify all the proteins present in these organelles.
Choose the most appropriate answer from the options given below.
[Question ID = 1410]
1. A, C and E [Option ID = 5637]
2. A, C and D [Option ID = 5638]
3. B [Option ID = 5639]
4. A and D [Option ID = 5640]

Correct Answer :-

- A, C and D [Option ID = 5638]

34) An organelle found in the cytoplasm of all eukaryotic cells containing oxidative enzymes capable of energy generation is
[Question ID = 1411]
1. Endoplasmic reticulum [Option ID = 5641]
2. Lysosome [Option ID = 5642]
3. Peroxisome [Option ID = 5643]
4. Golgi body [Option ID = 5644]

Correct Answer :-

- Peroxisome [Option ID = 5643]

35) Which one of the following statements is NOT true about the role of primase enzyme in DNA replication?
[Question ID = 1412]
1. It does not need a primer to function. [Option ID = 5645]
2. It is a specialized polymerase that requires dNTPs. [Option ID = 5646]
3. It is an RNA polymerase using ribonucleoside triphosphates. [Option ID = 5647]
4. It synthesizes primer for both leading and lagging strands. [Option ID = 5648]

Correct Answer :-

- It does not need a primer to function. [Option ID = 5645]

36) During evolution, Mitochondria may have been acquired from
[Question ID = 1413]
1. Commensal Bacteria [Option ID = 5649]
2. Archaebacteria [Option ID = 5650]
3. Endosymbiotic Bacteria [Option ID = 5651]
4. Parasymbiotic Bacteria [Option ID = 5652]

Correct Answer :-

- Endosymbiotic Bacteria [Option ID = 5651]

37) Which of the following statements is NOT true about Adjuvants?

[Question ID = 1414]

1. It increases the immunogenicity of an antigen.

   [Option ID = 5653]
2. Extends the bio availability of an antigen.

   [Option ID = 5654]
3. Creates covalent modifications over the epitope.

   [Option ID = 5655]
4. Helps in antigen presentation and chemokine response.

   [Option ID = 5656]

Correct Answer :-

- Creates covalent modifications over the epitope.
  [Option ID = 5655]

38) The molecular formula for glycine is C2H5O2N. What would be the molecular formula for a linear oligomer made by linking ten glycine molecules together by condensation synthesis?

[Question ID = 1415]

1. C20H50O20N10

   [Option ID = 5657]
2. C20H32O11N10

   [Option ID = 5658]
3. C20H40O10N10

   [Option ID = 5659]
4. C20H68O29N10

   [Option ID = 5660]

Correct Answer :-

- C20H32O11N10
  [Option ID = 5658]

39) Based on the phosphoryl transfer potential, identify which one of the following cannot help in the generation of ATP from ADP?

[Question ID = 1416]

1. Glucose-1-phosphate

   [Option ID = 5661]
2. Creatine phosphate

   [Option ID = 5662]
3. 1,3-bis-phosphoglycerate

   [Option ID = 5663]
4. Phosphoenol pyruvate
   [Option ID = 5664]

Correct Answer :-

- Creatine phosphate
  [Option ID = 5662]

40) Which amino acid(s) can be quantified from the acid hydrolysates of proteins?

[Question ID = 1417]

1. Gln [Option ID = 5665]
2. Gln, Asn [Option ID = 5666]
3. His [Option ID = 5667]
4. Gln, Asn, Trp [Option ID = 5668]

Correct Answer :-

- His [Option ID = 5667]

41) The Messelson and Stahl experiment showed that DNA replication is

[Question ID = 1418]

1. dispersive [Option ID = 5669]
2. conservative [Option ID = 5670]

3. semi-conservative [Option ID = 5671]
4. distributive [Option ID = 5672]

Correct Answer :-

- conservative [Option ID = 5670]

42) The primary enzyme responsible for direct reversal of UV-induced TT dimers are
[Question ID = 1419]
1. glycosylases [Option ID = 5673]
2. photolyases [Option ID = 5674]
3. exonucleases [Option ID = 5675]
4. endonucleases [Option ID = 5676]

Correct Answer :-

- photolyases [Option ID = 5674]

43) Post-translational phosphorylation of proteins usually modify:
[Question ID = 1420]
1. Ser and Phe [Option ID = 5677]
2. Thr and Val [Option ID = 5678]
3. Ser, Thr, and Tyr [Option ID = 5679]
4. Thr, Ala [Option ID = 5680]

Correct Answer :-

- Ser, Thr, and Tyr [Option ID = 5679]

44) Aqueous-organic solvents will have:
[Question ID = 1421]
1. lower ionizing capacity than pure water [Option ID = 5681]
2. higher dielectric constant than pure water [Option ID = 5682]
3. more ionizing capacity than pure water [Option ID = 5683]
4. same dielectric constant as pure water [Option ID = 5684]

Correct Answer :-

- lower ionizing capacity than pure water [Option ID = 5681]

45) If the two disulfide bonds in a protein containing only four Cys residues are broken, and then allowed to reform, how many possible combinations of disulfide bonds are possible?
[Question ID = 1422]
1. 3 [Option ID = 5685]
2. 2 [Option ID = 5686]
3. 4 [Option ID = 5687]
4. 6 [Option ID = 5688]

Correct Answer :-

- 4 [Option ID = 5687]

46) Phenyl isothiocyanate efficiently reacts with amino groups of proteins
[Question ID = 1423]
1. under highly acidic conditions [Option ID = 5689]
2. between pH 2 and pH 4 [Option ID = 5690]
3. in the presence of anhydrous HCl gas [Option ID = 5691]
4. under alkaline conditions [Option ID = 5692]

Correct Answer :-

- in the presence of anhydrous HCl gas [Option ID = 5691]

47) Which class of neurotransmitters would be most affected by a toxin that disrupts microtubules within neurons?
[Question ID = 1424]
1. Amino acid transmitters [Option ID = 5693]
2. Catecholamine transmitters [Option ID = 5694]
3. Membrane-soluble transmitters [Option ID = 5695]
4. Peptide transmitters [Option ID = 5696]

Correct Answer :-

- Catecholamine transmitters [Option ID = 5694]

48) Which of these is a disease of the myelin sheath?
[Question ID = 1425]
1. Polio [Option ID = 5697]
2. Leprosy [Option ID = 5698]
3. Multiple sclerosis [Option ID = 5699]
4. Alzheimer [Option ID = 5700]

Correct Answer :-

- Leprosy [Option ID = 5698]

49) Which of these techniques cannot differentiate between identical twins?
[Question ID = 1426]
1. Whole genome sequencing [Option ID = 5701]
2. High resolution melt curve analysis [Option ID = 5702]
3. Fingerprint comparison [Option ID = 5703]
4. DNA fingerprinting [Option ID = 5704]

Correct Answer :-
- Fingerprint comparison [Option ID = 5703]

50) Which of the following is NOT a component of plasma membrane?
[Question ID = 1427]
1. Phospholipids [Option ID = 5705]
2. Histones [Option ID = 5706]
3. Integral proteins [Option ID = 5707]
4. Cholesterol [Option ID = 5708]

Correct Answer :-
- Phospholipids [Option ID = 5705]

51) A solid which is not transparent to visible light and whose conductivity increases with temperature is formed by:
[Question ID = 1428]
1. covalent bonding [Option ID = 5709]
2. van der Waal's bonding [Option ID = 5710]
3. co-ordinate bonding [Option ID = 5711]
4. ionic bonding [Option ID = 5712]

Correct Answer :-
- co-ordinate bonding [Option ID = 5711]

52) In Transmission Electron Microscope (TEM), a beam of electrons interact with the specimen to form the image as
[Question ID = 1429]
1. Reflection [Option ID = 5713]
2. Shadow [Option ID = 5714]
3. Diffraction [Option ID = 5715]
4. Scattering [Option ID = 5716]

Correct Answer :-
- Diffraction [Option ID = 5715]

53) The concentration of ligand is equal to Kd, when the fraction of the ligand bound to the protein is
[Question ID = 1430]
1. 1 [Option ID = 5717] 2. 1/4 [Option ID = 5718] 3. 1/2 [Option ID = 5719] 4. 1/8 [Option ID = 5720]

Correct Answer :-
- 1/4 [Option ID = 5718]

54) The specific cleavage at Phe, Tyr and Trp amino acids is catalyzed by
[Question ID = 1431]
1. chymotrypsin [Option ID = 5721]
2. trypsin [Option ID = 5722]
3. cyanogen bromide [Option ID = 5723]
4. acetylcholinesterase [Option ID = 5724]

Correct Answer :-
- trypsin [Option ID = 5722]

55) D-Alanine and L-Alanine are technically known as
[Question ID = 1432]
1. anomers [Option ID = 5725] 2. enantiomers [Option ID = 5726] 3. epimers [Option ID = 5727] 4. polymer [Option ID = 5728]

Correct Answer :-
- epimers [Option ID = 5727]

56) In the lac operon, promoter and operator refer to
[Question ID = 1433]

1. binding sites for repressor and RNA polymerase [Option ID = 5729]
2. binding sites for RNA polymerase and repressor [Option ID = 5730]
3. binding sites for repressor and corepressor [Option ID = 5731] 4. two binding sites for RNA polymerase [Option ID = 5732]

Correct Answer :-

- binding sites for repressor and RNA polymerase [Option ID = 5729]

57) The bacterial mRNA binds to ribosomes through the
[Question ID = 1434]
1. Shine-Dalgarno sequence [Option ID = 5733]
2. Kozak sequence [Option ID = 5734]
3. TATA box [Option ID = 5735]
4. non-specific sequence [Option ID = 5736]

Correct Answer :-

- TATA box [Option ID = 5735]

58) EcoR1 enzyme recognizes the sequence GAATTC. A stretch of linear DNA with six sites will give rise to
[Question ID = 1435]
1. 8 fragments [Option ID = 5737]
2. 7 fragments [Option ID = 5738]
3. 6 fragments [Option ID = 5739]
4. 5 fragments [Option ID = 5740]

Correct Answer :-

- 6 fragments [Option ID = 5739]

59) Which one of the following activities is associated with Reverse transcriptase enzyme?
[Question ID = 1436]
1. DNA dependent DNA polymerase [Option ID = 5741]
2. DNA dependent RNA polymerase [Option ID = 5742]
3. RNA dependent DNA polymerase [Option ID = 5743]
4. RNA dependent RNA polymerase [Option ID = 5744]

Correct Answer :-

- DNA dependent RNA polymerase [Option ID = 5742]

60) What is the minimum number of beta-strands that can be twisted and packed to form a beta-barrel structure?
[Question ID = 1437]
1. 4 [Option ID = 5745]
2. 6 [Option ID = 5746]
3. 8 [Option ID = 5747]
4. 10 [Option ID = 5748]

Correct Answer :-

- 6 [Option ID = 5746]

61) In sickle-cell anemia, the negatively charged glutamic acid residue is replaced by which one of the following neutral amino acids?
[Question ID = 1438]
1. glycine [Option ID = 5749]
2. valine [Option ID = 5750]
3. alanine [Option ID = 5751]
4. leucine [Option ID = 5752]

Correct Answer :-

- alanine [Option ID = 5751]

62) At what level of structure do Myoglobin and Hemoglobin differ the most with respect to their function?
[Question ID = 1439]
1. Primary structure [Option ID = 5753]
2. Tertiary Structure [Option ID = 5754]
3. Quaternary Structure [Option ID = 5755]
4. Secondary Structure [Option ID = 5756]

Correct Answer :-

- Primary structure [Option ID = 5753]

63) Hemoglobin's p50 value is about _____ as great as myoglobin's p50 value.
[Question ID = 1440]
1. twice [Option ID = 5757]
2. half [Option ID = 5758]
3. ten times [Option ID = 5759]
4. twenty times [Option ID = 5760]

Correct Answer :-

- ten times [Option ID = 5759]

64) α-D-glucose and ß-D-glucose are
[Question ID = 1441]
1. stereoisomers [Option ID = 5761]
2. enantiomers [Option ID = 5762]
3. epimers [Option ID = 5763]
4. anomers [Option ID = 5764]

Correct Answer :-

- epimers [Option ID = 5763]

65) The major storage form of lipids is:
[Question ID = 1442]
1. sphingolipid [Option ID = 5765]
2. glycolipid [Option ID = 5766]
3. cholesterol [Option ID = 5767]
4. triacylglycerol [Option ID = 5768]

Correct Answer :-

- glycolipid [Option ID = 5766]

66) The dihedral angles φ, ψ are referred to as
[Question ID = 1443]
1. Edman angles [Option ID = 5769]
2. Ramachandran angles [Option ID = 5770]
3. Pauling angles [Option ID = 5771]
4. Watson angles [Option ID = 5772]

Correct Answer :-

- Ramachandran angles [Option ID = 5770]

67) The molarity of pure water is
[Question ID = 1444]
1. 1 [Option ID = 5773]
2. 18 [Option ID = 5774]
3. 55.55 [Option ID = 5775]
4. 54 [Option ID = 5776]

Correct Answer :-

- 55.55 [Option ID = 5775]

68) An oxidizing agent is defined as a
[Question ID = 1445]
1. electron donor [Option ID = 5777]
2. electron acceptor [Option ID = 5778]
3. oxygen acceptor [Option ID = 5779]
4. oxygen donor [Option ID = 5780]

Correct Answer :-

- electron donor [Option ID = 5777]

69) Emulsifier is an agent which
[Question ID = 1446]
1. accelerates the dispersion [Option ID = 5781] 2. homogenizes the emulsion [Option ID = 5782] 3. stabilizes the emulsion [Option ID = 5783] 4. aids the flocculation of emulsion [Option ID = 5784]

Correct Answer :-

- stabilizes the emulsion [Option ID = 5783]

70) The metal atom present in Vitamin B12 is
[Question ID = 1447]
1. Cobalt [Option ID = 5785]
2. Mercury [Option ID = 5786]
3. Iron [Option ID = 5787]
4. Nickel [Option ID = 5788]

Correct Answer :-

- Iron [Option ID = 5787]

71) Fleming's "left hand rule" is associated with the effect of

[Question ID = 1448]

1. electric field on current [Option ID = 5789]
2. magnetic field on magnet [Option ID = 5790]
3. electric field on magnet [Option ID = 5791]
4. magnetic field on current [Option ID = 5792]

Correct Answer :-

- magnetic field on magnet [Option ID = 5790]

72) Match the components of List I with those of List II:

List I	List II
A. Cooperative binding of oxygen by hemoglobin	I. Cesar Milstein
B. Production of monoclonal antibodies	II. John Kendrew
C. X-ray diffraction pattern of myoglobin	III. Victor Henri
D. Formation of E-S complex in catalysis	IV. Archibald Hill

Choose the correct answer from the options given below:

[Question ID = 1449]

1. A-IV, B- II, C-III, D-I [Option ID = 5793]
2. A-I, B-II, C-III, D-IV [Option ID = 5794]
3. A-II, B-III, C-IV, D-I [Option ID = 5795]
4. A-IV, B-I, C-II, D-III [Option ID = 5796]

Correct Answer :-

- A-I, B-II, C-III, D-IV [Option ID = 5794]

73) Which of the following groups consists of analogous organs?

[Question ID = 1450]

1. Nephridia, Malpighian tubules, Keber's organ [Option ID = 5797]
2. Ctenidia, Taenidia, Comb plates [Option ID = 5798]
3. Flame cells, Oxyntic cells, Peptic cells [Option ID = 5799]
4. Amphids, Statocyst, Halteres [Option ID = 5800]

Correct Answer :-

- Flame cells, Oxyntic cells, Peptic cells [Option ID = 5799]

74) The restriction endonuclease which cleaves the given sequence at the indicated site is

(5')G ↓ GATCC(3')

CCTAG ↑ G

[Question ID = 1451]

1. EcoRI

   [Option ID = 5801]
2. BamHI

   [Option ID = 5802]
3. PvuII

   [Option ID = 5803]
4. PstI

   [Option ID = 5804]

Correct Answer :-

- BamHI

  [Option ID = 5802]

75) Choose the correct statement about kelps.

[Question ID = 1452]

1. It is fresh water algae containing starch as stored food. [Option ID = 5805]
2. It attains red colour due to the presence of phycoerythrin. [Option ID = 5806]
3. It is a marine weed possessing fucoxanthin and carotenoids. [Option ID = 5807]
4. The cell wall of kelp contains algin and pectin [Option ID = 5808]

Correct Answer :-

- It attains red colour due to the presence of phycoerythrin. [Option ID = 5806]

76) The term used to describe genes arranged in same order on chromosomes of different species is

[Question ID = 1453]

1. Homology [Option ID = 5809]

2. Similarity [Option ID = 5810]
3. Phylogeny [Option ID = 5811]
4. Synteny [Option ID = 5812]

Correct Answer :-

- Phylogeny [Option ID = 5811]

77) Aroma in rice is due to which of the following compounds?
[Question ID = 1454]

1. Acetylcholine [Option ID = 5813]
2. 2-acetyl-1-pyrroline [Option ID = 5814]
3. 2-ethyl pyrroline [Option ID = 5815]
4. 4-benzyl pyrroline [Option ID = 5816]

Correct Answer :-

- Acetylcholine [Option ID = 5813]

78) Which one of the following techniques can be used to overcome pre-fertilization barrier between two plant species?
[Question ID = 1455]

1. Embryo rescue [Option ID = 5817]
2. Protoplast fusion [Option ID = 5818]
3. Ovary culture [Option ID = 5819]
4. Embryo implantation [Option ID = 5820]

Correct Answer :-

- Ovary culture [Option ID = 5819]

79) A man with AB-blood group marries a woman with a blood group O. What is the probability of having O blood group among the offspring? [Question ID = 1456]

1. 1 out of 4 [Option ID = 5821] 2 out of 4 [Option ID =
2. 5822] 3 out of 4 [Option ID = 5823] No offspring will
3. have O blood group [Option ID = 5824]
4.

Correct Answer :-

- 3 out of 4 [Option ID = 5823]

80) Which of the following subcellular structures are NOT present inside the nucleus?
A. Nucleolus
B. Golgi Body
C. Paraspeckles
D. Mitochondria
E. Endoplasmic reticulum
Choose the most appropriate answer from the options given below:
[Question ID = 1457]

1. A, C and E [Option ID = 5825]
2. B, D and E [Option ID = 5826]
3. A and C [Option ID = 5827]
4. B and D [Option ID = 5828]

Correct Answer :-

- B, D and E [Option ID = 5826]

81) An unknown solution shows distinct peaks at 260 and 280 nm in a UV spectrophotometric analysis. The solution may contain
[Question ID = 1458]

1. Only proteins. [Option ID = 5829]
2. Proteins, DNA and RNA. [Option ID = 5830]
3. DNA and RNA. [Option ID = 5831]
4. DNA only. [Option ID = 5832]

Correct Answer :-

- Proteins, DNA and RNA. [Option ID = 5830]

82) A promoter is a
[Question ID = 1459]

1. Sequence on the DNA recognised by RNA Polymerase to initiate transcription. [Option ID = 5833]
2. Sequence on the RNA where ribosomes bind to initiate translation. [Option ID = 5834]
3. Sequence at the 3’-end for the DNA transcription termination. [Option ID = 5835]
4. Sequence on an RNA for protein binding. [Option ID = 5836]

Correct Answer :-

- Sequence at the 3’-end for the DNA transcription termination. [Option ID = 5835]

83) Match the enzymes in the List I to their respective functions in the List II.

List I	List II
A. DNA primase	I. 3'-end addition of adenosine nucleotide II.
B. RNA Polymerase	Complementary DNA synthesis from RNA III.
C. Reverse Transcriptase	Synthesis of RNA primers during replication IV.
D. Poly(A) polymerase	mRNA synthesis during transcription

Choose the correct answer from the options below.

[Question ID = 1460]

1. A-III, B-IV, C-II, D-I

   [Option ID = 5837]
2. A-II, B-I, C-III, D-IV

   [Option ID = 5838]
3. A-III, B-I, C-IV, D-III

   [Option ID = 5839]
4. A-IV, B-I, C-III, D-II

   [Option ID = 5840]

Correct Answer :-

- A-III, B-IV, C-II, D-I
  [Option ID = 5837]

84) A riboswitch is

[Question ID = 1461]

1. a RNA molecule acting as an enzyme. [Option ID = 5841]
2. a structured regulatory mRNA segment that binds a small molecule. [Option ID = 5842]
3. a non-coding RNA that regulates gene expression. [Option ID = 5843]
4. a RNA molecule that can change its function under new environment [Option ID = 5844]

Correct Answer :-

- a non-coding RNA that regulates gene expression. [Option ID = 5843]

85) One of the limitations of Y-chromosome DNA profiling is that

[Question ID = 1462]

1. genetic variability on Y-chromosome is much more than that on autosomes. [Option ID = 5845]
2. it cannot differentiate between DNA from father, son and male siblings. [Option ID = 5846]
3. Y-chromosome has high recombination frequency. [Option ID = 5847]
4. it is difficult to PCR amplify Y-chromosome STRs. [Option ID = 5848]

Correct Answer :-

- Y-chromosome has high recombination frequency. [Option ID = 5847]

86) Determine the sequence of genes on a chromosome based on the recombination frequencies given below.
M-N = 10 map units; M - O = 26 map units; M - P = 20 map units; N - O = 16 map units ; N - P = 38 map units

[Question ID = 1463]

1. M-N-O-P [Option ID = 5849]
2. P-M-N-O [Option ID = 5850]
3. O-M-P-N [Option ID = 5851]
4. N-P-O-M [Option ID = 5852]

Correct Answer :-

- P-M-N-O [Option ID = 5850]

87) Evolution of life forms had occurred due to use and disuse of organs. This theory was postulated by:

[Question ID = 1464]

1. Jean-Baptiste Lamarck [Option ID = 5853]
2. Hugo de Vries [Option ID = 5854]
3. Charles Darwin [Option ID = 5855]
4. Alfred Wallace [Option ID = 5856]

Correct Answer :-

- Hugo de Vries [Option ID = 5854]

88) Which of the following feature is true about ALL twenty genetically coded amino acids?

[Question ID = 1465]

1. They are optically active [Option ID = 5857]
2. They contain a methylene group in their side chain [Option ID = 5858]
3. They contain Carbon, Hydrogen, Oxygen, and Nitrogen [Option ID = 5859]
4. They are basic in nature [Option ID = 5860]

Correct Answer :-

- They contain Carbon, Hydrogen, Oxygen, and Nitrogen [Option ID = 5859]

89) A DNA sequence has two ends, 5' and 3'. Which of the following statements is correct regarding the nature of the ends?

[Question ID = 1466]

1. The 5' end has a hydroxyl group.

   [Option ID = 5861]
2. The 5' end has a phosphate group.

   [Option ID = 5862]
3. The 3' end has a phosphate group.

   [Option ID = 5863]
4. Any group can be present at any end.

   [Option ID = 5864]

Correct Answer :-

- The 5' end has a hydroxyl group.
  [Option ID = 5861]

90) Telomerase enzyme is a

[Question ID = 1467]

1. DNA dependent DNA polymerase [Option ID = 5865]
2. DNA dependent RNA polymerase [Option ID = 5866]
3. RNA dependent RNA polymerase [Option ID = 5867]
4. Reverse transcriptase [Option ID = 5868]

Correct Answer :-

- RNA dependent RNA polymerase [Option ID = 5867]

91) A log-log graph is plotted of total surface area of organisms versus their body weight. The best fit line will have a slope of

[Question ID = 1468]

1. 1/2 [Option ID = 5869]
2. 2/3 [Option ID = 5870]
3. 3/4 [Option ID = 5871]
4. 1 [Option ID = 5872]

Correct Answer :-

- 3/4 [Option ID = 5871]

92) In an ideal Continuous Stirred Tank Reactor (CSTR) at steady state

[Question ID = 1469]

1. All particles have equal residence time. [Option ID = 5873]
2. Maximum number of particles have residence time equal to average residence time. [Option ID = 5874]
3. Maximum number of particles have residence time close to zero. [Option ID = 5875]
4. Maximum number of particles have residence time close to infinity. [Option ID = 5876]

Correct Answer :-

- Maximum number of particles have residence time equal to average residence time. [Option ID = 5874]

93) Cooling water enters the cooling coil of a fermenter at 7 °C and leaves at 27 °C because it picks up the heat generated due to microbial growth. The culture temperature is 37°C. The average temperature difference which is used to calculate the rate of heat transfer is:

[Question ID = 1470]

1. Arithmetic mean of 10 and 30 [Option ID = 5877] 2.
Geometric mean of 10 and 30 [Option ID = 5878] 3.
Logarithmic mean of 10 and 30 [Option ID = 5879] 4.
Harmonic mean of 10 and 30 [Option ID = 5880]

Correct Answer :-

- Geometric mean of 10 and 30 [Option ID = 5878]

94) Given a constant Power number, the power consumption of an agitator having geometric similarity but twice the diameter of a smaller agitator will consume _____ power at the same RPM as the smaller agitator.

[Question ID = 1471]

1. 4 times. [Option ID = 5881]
2. 8 times. [Option ID = 5882]
3. 16 times. [Option ID = 5883]
4. 32 times. [Option ID = 5884]

Correct Answer :-

- 16 times. [Option ID = 5883]

95) In a batch experiment with cells following Monod growth kinetics, the initial substrate concentration is doubled from SO to 2SO and it is observed that the initial doubling time in the log phase hardly changes. This tells us that

[Question ID = 1472]

1. $S_O >> Ks$

   [Option ID = 5885]
2. SO=Ks (approximately)

   [Option ID = 5886]
3. SO<<Ks

   [Option ID = 5887]
4. The growth in substrate is inhibited.

   [Option ID = 5888]

Correct Answer :-

- SO>>Ks

  [Option ID = 5885]

96) Which one of the following products is obtained by a trans-esterification step starting from sugarcane bagasse?

[Question ID = 1473]

1. Glycerol [Option ID = 5889]
2. Trans-fat [Option ID = 5890]
3. Alcohols [Option ID = 5891]
4. Biodiesel [Option ID = 5892]

Correct Answer :-

- Alcohols [Option ID = 5891]

97) Which of the following is true for single cell protein?

[Question ID = 1474]

1. Algae cannot be used in single cell protein [Option ID = 5893]
2. It is produced through fermentation [Option ID = 5894]
3. It does not contain carbohydrates and vitamins [Option ID = 5895]
4. Its utilization increases environmental pollution [Option ID = 5896]

Correct Answer :-

- It does not contain carbohydrates and vitamins [Option ID = 5895]

98) Select the INCORRECT statement from the following options.

[Question ID = 1475]

1. Biodegradable polymers are not suitable candidates in the recycling of commingled plastics. [Option ID = 5897]
2. Biodegradable polymers are more expensive than ordinary plastics. [Option ID = 5898]
3. Biodegradable polymers are an attractive option for addressing the solid waste and marine pollution. [Option ID = 5899]
4. Polylactic acid cannot be used to make biodegradable plastic products. [Option ID = 5900]

Correct Answer :-

- Biodegradable polymers are more expensive than ordinary plastics. [Option ID = 5898]

99) The Cartagena Protocol regulates trade in

[Question ID = 1476]

1. Endangered species of plants and animals [Option ID = 5901]
2. Genetically modified organisms [Option ID = 5902]
3. Elite varieties of crops [Option ID = 5903]
4. Vaccines [Option ID = 5904]

Correct Answer :-

- Genetically modified organisms [Option ID = 5902]

100) Given below are two statements: one is labelled as Assertion (A) and the other is labelled as Reason (R).
Assertion (A): Biodiversity of the prokaryotes cannot be quantified precisely.
Reason (R): Conventional taxonomic methods are not suitable for the identification and characterisation of all microbes.
In the light of the above statements, choose the most appropriate answer from the options given below.
[Question ID = 1477]

1. Both A and R are correct and R is the correct explanation of A. [Option ID = 5905] 2. Both A and R are correct, but R is not the correct explanation of A. [Option ID = 5906] 3. A is correct, but R is not correct. [Option ID = 5907] 4. A is not correct, but R is correct. [Option ID = 5908]

Correct Answer :-

- A is correct, but R is not correct. [Option ID = 5907]