IIT JAM BT 2026
(IFAS SOLVED PAPER)

Q.1 The abundant phospholipid in E. coli plasma is
1. phosphatidyl choline
2. phosphatidyl inositol
3. phosphatidyl serine
4. phosphatidyl ethanolamine

Q.2 Which of the following is NOT a second messenger in mammalian cells?
1. Diacylglycerol
2. Potassium ion
3. Cyclic AMP
4. Calcium ion

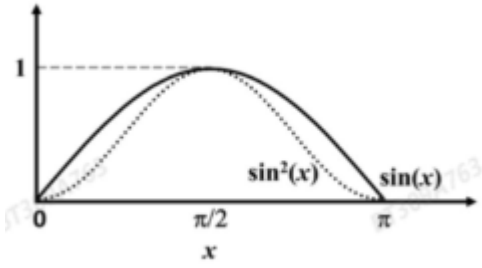
Q.3 Which one of the following is the correct decreasing order for the magnitude of Electron Gain Enthalpy ($\Delta E_{eg}AH$) for the elements given below?
1. $Cl > Br > I > At$
2. $Br > Cl > At > I$
3. $At > Br > Cl > I$
4. $I > Br > CI > At$

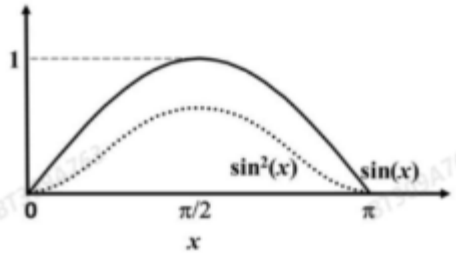
Q4 If $y(x) = 15\cos(x) - 13\sin(x)$, then $\frac{d^2y}{dx^2}$ will be
1. -y
2. $\frac{\pi}{y}$
3. 2
4. $\frac{y^2}{x}$

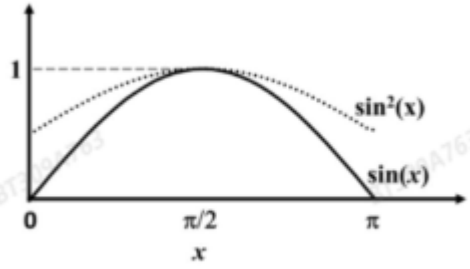
Q.5 The derivative of $x\log_e(x)$ is
1. e^x
2. 1
3. 0
4. $1 + \log_e(x)$

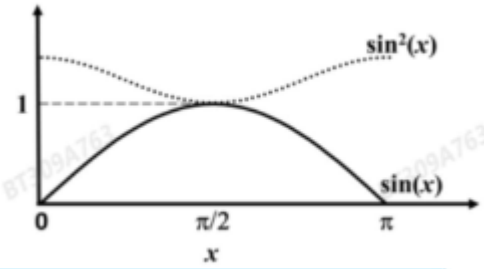
Q.6 Which one of the following is the correct graphical representation for functions, sin(x) and $\sin^2(x)$ for $0 \leq x \leq \pi$?

1.



2. 

3. 

4. 

Q.7 Which one of the following classes of membrane protein requires ATP for transport of some specific ions or molecules across the cellular membranes?

1. Pumps
2. Antiporters
3. Symporters
4. Ion channels

Q.8 enzyme A is a co-factor of vitamin

1. pyridoxine
2. riboflavin
3. pantothenic acid
4. folic acid

Q.9 Which one of the following processes causes the 'Founder effect" in a population?

1. Genetic recombination
2. Mutations
3. selection
4. Genetic drift

Q.10 Which one of the following is NOT an essential amino acid?
1. Tryptophan
2. Valine
3. Threonine
4. Tyrosine

Q.11 Which one of the following characteristics is ABSENT in Archaea?
1. Circular chromosome
2. peptidoglycan
3. Pseudomurein
4. Paracrystalline surface layer (S-layer)

Q.12 Which one of the following is a characteristic of apoptosis?
1. Endocytosis
2. DNA fragmentation
3. Cell migration
4. Uncontrolled cell proliferation

Q.13 In the context of the nitrogen cycle in plants, identify the correct match between the nitrogen compound and the Oxidation state of nitrogen

Nitrogen compound	oxidation state of nitrogen
(i) N_2	(p) +1
(ii) NO	(q) +4
(iii) N_2O	(r) 0
(iv) NO_2	(s) +2

1. (iv)-(q)
2. (iii)-(r)
3. (ii)-(p)
4. -(s)

Q.14 If a simple pendulum has length I and time period 7 then a pendulum of length 2I will have a time period of
1. $\sqrt{2}T$
2. $\frac{1}{2\pi}T$
3. $\frac{1}{\sqrt{2}}T$
4. $2\pi T$

Q.15 Which one of the one of the following vector types is suitable to clone 2000 kb DNA insert?
1. Cosmid
2. Yeast artificial chromosome
3. Bacteriophage
4. Bacterial plasmid

Q.16 Which one of the following statements regarding plant Photosystems is NOT true?
1. Photosystem II is present in stacked thylakoid membrane
2. Photosystem I is present in unstacked thylakoid membrane
3. Photosystem I is responsible for water splitting
4. Photosystem I absorbs light of 700 nm wavelength

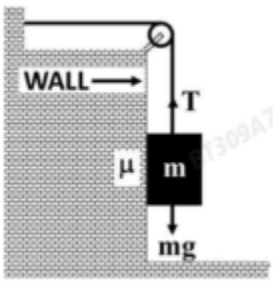
Q.17 Which one of the following statements is NOT correct?
1. Average temperature in Tundra is above 30 °C
2. the vegetation in Tundra is predominantly herbaceous
3. The dominant trees in the Northern Hemisphere are deciduous
4. In the Northern Hemisphere many mammals hibernate in winter

Q.18 Identify the INCORRECT statement about the immunoglobulins (Ig)
1. IgA forms dimer
2. IgE is a associated with allergic reactions
3. IgD is the most abundant immunoglobulin
4. IgM forms pentamer

Q.19 Which one of the following animal viruses contains double stranded RNA as genetic material?
1. Reovirus
2. Rous sarcoma virus
3. Influenza virus
4. Polio virus

Q.20 Which one of the following a (sigma) factors is responsible for the transcriptional regulation of nitrogen assimilation?
1. σ 70
2. σ 54
3. σ 24
4. σ 28

Q.21 Consider a block of mass "m" hanging using a string and pulley arrangement, as shown in the figure. The weight "mg' and tension "T" are working on the block in such a way that the block is not moving and the string is parallel to the perfectly vertical wall. If the block is just in contact (but not attached/fixed) with the wall and the coefficient of static friction is 'μ', then the static frictional force acting on the block is



1. 0
2. μmg
3. μT
4. $\frac{(mg+T)}{2}$

Q.22 Which one of the following bonds is formed at the branch point in glycogen?
1. β-1,6 glycosidic bond
2. α-1, 6 glycosidic bond
3. α-1, 4 glycosidic bond
4. β-1, 4 glycosidic bond

Q.23 The repulsive interaction between different types of electron pairs increases in the order of
1. bond pair-bond pair < lone pair - bond pair < lone pair - lone pair
2. lone pair-lone pair < bond pair-bond pair < lone pair-bond pair
3. lone pair - lone pair < lone pair-bond pair < bond pair - bond pair
4. lone pair-bond pair < lone pair - lone pair < bond pair-bond pair

Q.24 The correct gas phase acidity order for alcohols $FCH_2OH, CH_3OH, ClCH_2OH$ and $BrCH_2OH$
1. $ClCH_2OH > BrCH_2OH > FCH_2OH > CH_3OH$
2. $FCH_2OH > BrCH_2OH > ClCH_2OH > CH_3OH$
3. $ClCH_2OH > BrCH_2OH > CH_3OH > FCH_2OH$
4. $CH_3OH > FCH_2OH > BrCH_2OH > ClCH_2OH$

Q.25 Bacterial conjugation
1. involves the transfer of genetic material from virus to bacteria
2. requires direct contact between two bacterial cells through pilus
3. occurs through the uptake of free DNA from environment
4. a form of asexual reproduction

Q.26 Which one of the following is NOT an auxin?
1. Indole-3-butyric acid
2. Phenylacetic acid
3. Abscisic acid
4. dole-3-acetic acid

Q.27 Identify the correct match between the vitamins and their deficiency

Vitamins	Symptoms
(i) Vitamin A	(p) Night blindness
(ii) Vitamin D	(q) Anemia
(iii) Vitamin B6	(r) Bone softening
(iv) Vitamin C	(s) Delayed wound healing
(v) Vitamin K	(t) Prolonged bleeding

1. (i) − (p), (ii) − (q), (iii) – (r), (iv) − (t), (v) − (s)

2. $(i)-(q),(ii)-(p),(iii)-(r),(iv)-(s),(v)-(t)$
3. $(i)-(p),(ii)-(r),(iii)-(q),(iv)-(s),(v)-(t)$
4. $(i)-(p).(ii)-(q),(iii)-(t),(iv)-(r),(v)-(s)$

Q.28 In the genetic code, 61 codons code for 20 amino acids. How many types of aminoacyl tRNA synthetases are required for correct matching of tRNAs to their corresponding amino acids?
1. 20
2. 40
3. 64
4. 62

Q.29 Consider the differential equation $\frac{dy}{dx}+4x=0$. The solution of this equation for the particular case of y = 1, at x = 0 is
1. $y=\log(x)+4x$
2. $y=1-2x^2$
3. $y=-4x^2+1$
4. $y=4x$

Q.30 The correct relation between equilibrium constants, K_C (forward direction) and K'_C (reverse direction) of the reaction given below, at the same temperature,

$$H_2(g)+I_2(g)\underset{K'_C}{\overset{K_C}{\rightarrow}}2HI(g)$$

1. $K_C=K'_C$
2. $K_C=-K'_C$
3. $K_C=\frac{1}{K'_C}$
4. $K_C=\sqrt{K'_C}$

Q.31 Which of the following is/are present in the human brain?
1. Astrocytes
2. Oligodendrocytes
3. Podocytes
4. Microglial cells

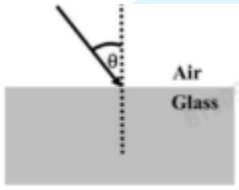
Q.32 Which of the following statements is/are true about phenoxide ions?
1. C-alkylation disrupts aromatic conjugation of phenoxide ions
2. Phenoxides undergo extensive C-alkylation in trifluoroethanol
3. Phenoxides undergo O-alkylation in ethers
4. Ethers make strong hydrogen bonds with the oxygen atom of phenoxide ions to improve solvation

Q33 Which of the following is/are true for the data given below?
15, 8, 10, 6, 11, 9, 15, 7, 14, 5, 17, 14, 8, 14, 12
1. Median is 14
2. Mode is 11

3. Median is 11
4. Mode is 14

Q.34 In a protein, trypsin catalyzes the hydrolysis of peptide bonds with carbonyl group contributed by
1. arginine
2. asparagine
3. glutamine
4. lysine

Q.35 If a light beam (solid arrow in the shown figure) is entering from Air medium to Glass medium (having refractive index of 1.5), then while entering



1. light will bend (deviate from original path) if $\theta \neq 0$
2. Bed of light will increase
3. light will undergo total internal reflection
4. speed of light will decrease

Q.36 In circular dichroism (CD) spectroscopy, the difference in molar extinction coefficients ($\Delta\varepsilon$) is plotted as a function of wavelength λ. (in nm). In a CD spectrum of an alpha helical protein, $\Delta\varepsilon$ will have a
1. positive value at 195 nm
2. negative value at 195 nm
3. negative value at 210 nm
4. negative value at 220 nm

Q.37 Select the value(s) of x for which the determinants, $\begin{vmatrix} 2 & 4 \\ 5 & 1 \end{vmatrix}$ and $\begin{vmatrix} 2x & 6 \\ 4 & x \end{vmatrix}$ are equal
1. 3
2. $-\sqrt{3}$
3. $\sqrt{3}$
4. -1

Q.38 Which of the following methods is/are used for local alignment of nucleotide sequences?
1. BLAST
2. Needleman-Wunsch algorithm
3. Neighbour-joining method
4. Smith-Waterman algorithm

Q.39 The capacitance of a parallel plate capacitor will get doubled if
1. the area of each plate is halved
2. the distance between the plates is doubled
3. the distance between the plates is halved
4. the area of each plate is doubled

Q.40 Which of the following statements is/are true for sterilization?
1. Autoclaving at 121 °C for 20 minutes destroys endospores
2. Gamma radiation sterilizes heat-sensitive medical equipment
3. Filtration through 0.22 µm membrane removes viruses from liquid
4. Dry heat sterilization requires higher temperature and longer time than moist heat sterilization

Q.41 The value of $\lim_{x\to 3} \frac{x^3-3x^2}{x^2-5x+6}$ is _____ . (in integer)
Answer: -9

Q.42 The volume of 4M NaOH (in ml) required to make 350 ml solution of 1.2M NaOH is _____.(in integer)
Answer: 105

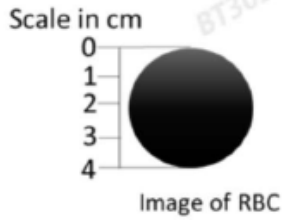
Q.43 A ball is thrown vertically upward with a speed of 19.6 m/s. The value of acceleration due to gravity at that place is $9.8\ m/s^2$. The maximum height (in cm) that the ball reaches is ____. (in integer)
Answer: 20

Q.44 The nucleotide sequence of one of the DNA strands is GCTGTAACGATAGCACGC.
The GC content (in %) of the double stranded DNA will be _____.
(round off to two decimal places)
Answer: 55.56

Q.45 Assuming atomic mass number of C = 12, N = 14, O=16, H= 1, the molecular mass (in Daltons) of a tripeptide made up of only glycine amino acids is ____. (in integer)
Answer: 330

Q.46 A photon has energy of $3.1 \times 10^{-19}\ J$. Its wavelength (in Å) is _____(round off to one decimal place)
(Consider Planck's constant, $h = 6.6 \times 10^{-34}\ J\ s$; speed of light in vacuum, $c = 3\ \times 10^{10}$ cm/s)
Answer: 0.6

Q.47 If the real diameter of an RBC is 8 um, then the magnification of its image given below is _____. (in integer)

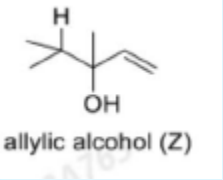


Answer: 1000

Q.48 Consider that M, L, and T indicate mass, length and time, respectively. If $[\mathrm{ML}^2\mathrm{T}^{-\mathrm{n}}]$ is the dimensional formula for the physical quantity Torque, then the value of n is ____. (in integer)
Answer: 1

Q.49 In a geometric progression, the 3rd term is 36 and the 5th term is 324. The 7th term of the same progression will be _____.(in integer)
Answer: 2916

Q.50 The number of double bonds present in the isohypsic transformation product of allylic alcohol (Z) is _____. (in integer)

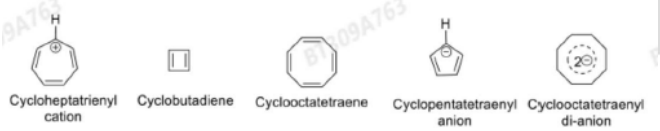


Answer: 1

Q.51 During anaerobic glycolysis in muscle, each mole of glucose is converted into two moles of lactate, yielding two moles of ATP. Assume molar mass of glucose is 180 g/mol. If 1 kg of glucose undergoes complete conversion to lactate, the number of moles of ATP produced is _____. (round off to one decimal place)
Answer: 11.1

Q.52 Consider a spherical epithelial cell (CI) of diameter 20 µm and a cubic shaped liver cell (C2) of side 20 µm. The ratio of the surface areas of C1: C2 is _____. (round off to two decimal places)
Answer: 0.52

Q.53 Applying the Hückel rule, the number of aromatic compounds among the following is _____. (in integer)



Answer: 3

Q.54 A particular animal population has 4400 individuals with annual per capita birth rate of 0.035 and the annual per capita death rate of 0.02. Net change in the population size in a year will be _____.(in integer)
Answer: 4466

Q.55 If a weak acid HA is 0.1% ionized (dissociated) in a 0.2M solution, its pH will be _____. (round off to one decimal place)
Answer: 6.95
Q.56 Consider an ATP synthase having twelve C-rings to sense proton motive force. The average number of protons required per ATP synthesis is _____ (in integer)
Answer: 4

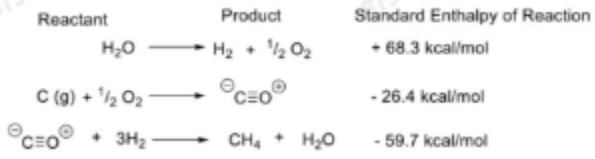
Q.57 The number of distinct products formed after the nitration of tetralone in the presence of HNO_3 and H_2SO_4 is _____ (in integer)



Tetralone

Answer: 3

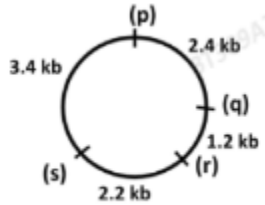
Q. 58 The standard enthalpy of formation of methane (CH_4), using the standard enthalpy of reaction values from the following reaction steps, is -x kcal/mol. The value of x is _____ (round off to one decimal place)



Answer: -17.8

Q.59 Consider that 120 cells of bacteria are inoculated in a nutrient rich media. If the doubling time of the bacteria is 20 minutes and assuming no cell death, the number of bacterial cells present after 2 hours will be _____ (in integer)
Answer: 7680

Q.60 A 9.2 kb plasmid DNA shown below has four BamHI sites (p), (q), (r), (s). If a mutation results in the loss of BamHI site (r), assuming the complete digestion by BamHI, the number of DNA fragments seen in agarose gel after electrophoresis will be _____ (in integer)



Answer: 2