

**NTA - GAT-B And BET April 2022 Examination**  
**(Candidate Response Sheet)**

**Subject : BET SECTION S1 A**

**Question ID:- 597**

An enzyme is governed by Michaelis-Menten Kinetics. The apparent  $K_M$  increases four fold due to the addition of inhibitor but the reaction rate declines by 50%. The substrate concentration in the reaction is:

**Options:-**

- $S = K_M$  , Option ID :- 2385,
- $S = 2 K_M$  , Option ID :- 2386,
- $S = 3 K_M$  , Option ID :- 2387,
- $S = 4 K_M$  , Option ID :- 2388,

**Question ID:- 602**

The melting temperature ( $t_m$ ) of DNA is higher when the content of:

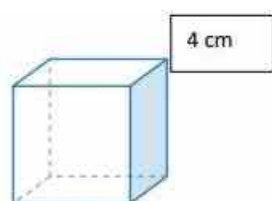
**Options:-**

- A:T base pairs is higher. , Option ID :- 2405,
- G:C base pairs is higher. , Option ID :- 2406,
- A:T base pairs is same as G:C base pairs. , Option ID :- 2407,
- G:C base pairs is lower. , Option ID :- 2408,

**Question ID:- 617**

Which one of these cubes (labelled A – D) will have the highest surface to volume ratio? The length of sides of each cube are given in cm.

**A.**



**B.**

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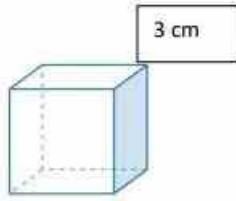
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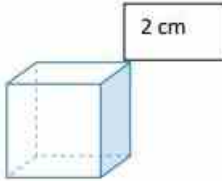
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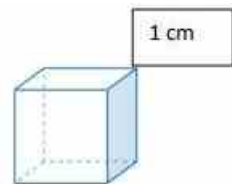
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C.



D.



**Options:-**

- A , Option ID :- 2465,
- B , Option ID :- 2466,
- C , Option ID :- 2467,
- D , Option ID :- 2468,

**Question ID:- 603**

**Gap junctions are absent in:**

**Options:-**

- Brain cells., Option ID :- 2409,
- Cardiac muscle cells., Option ID :- 2410,
- Liver cells., Option ID :- 2411,
- Erythrocytes., Option ID :- 2412,

**Question ID:- 578**

**The introduction of the nonpolar molecule (toluene) into water results in:**

**Options:-**

- a decrease in the entropy of water., Option ID :- 2309,
- an increase in the entropy of water., Option ID :- 2310,
- no change in entropy of water., Option ID :- 2311,
- modest exothermic dissolution., Option ID :- 2312,

Question ID:- 615

If  $x=y^a$ ,  $y=z^b$ ,  $z=x^c$ , find the value of  $abc$ ?

Options:-

- 1, Option ID :- 2457,
- 3, Option ID :- 2458,
- 0, Option ID :- 2459,
- Cannot be determined, Option ID :- 2460,

Question ID:- 607

If you mixed 20 mL of 50 mM sodium acetate (NaOAc) with 30 mL of 25 mM glucose, what would be the concentration of each in the final solution?

Options:-

- 50 mM NaOAc, 25 mM Glucose , Option ID :- 2425,
- 20 mM NaOAc, 15 mM Glucose , Option ID :- 2426,
- 30 mM NaOAc, 20 mM Glucose , Option ID :- 2427,
- 40 mM NaOAc, 10 mM Glucose , Option ID :- 2428,

Question ID:- 588

A ladder leaning against a wall is making an angle of  $60^\circ$  with the ground. If the length of the ladder is 18 m, find the distance of the foot of the ladder from the wall.

Options:-

- $9\sqrt{3}$  m, Option ID :- 2349,
- 9 m, Option ID :- 2350,
- $18/\sqrt{2}$  m, Option ID :- 2351,
- $18\sqrt{3}$  m, Option ID :- 2352,

Question ID:- 608

If the numerator of a fraction is increased by 15% and its denominator is decreased by 8%, the new fraction becomes  $15/16$ . Find the original fraction.

Options:-

- $4/3$ , Option ID :- 2429,
- $15/4$ , Option ID :- 2430,
- $3/4$ , Option ID :- 2431,
- $4/15$ , Option ID :- 2432,

Question ID:- 595

If  $2^x = 3^y = 6^z = K$ , then the relationship between  $x$ ,  $y$ , and  $z$  is given by:

Options:-

- $x+y = z$  , Option ID :- 2377,
- $xy = z$  , Option ID :- 2378,
- $1/x + 1/y = 1/z$  , Option ID :- 2379,
- $x^y=y^x=z$  , Option ID :- 2380,

Question ID:- 575

While measuring the potassium concentration in a drug formulation, the technologist took 10  $\mu\text{l}$  of the sample and mixed it with 90  $\mu\text{l}$  of test buffer. From the resulting solution, he took 5  $\mu\text{l}$  and measured its total potassium content as 25 ng. What would be the concentration of potassium in the drug formulation?

Options:-

- 50 ng/  $\mu\text{l}$ , Option ID :- 2297,
- 25 ng/  $\mu\text{l}$ , Option ID :- 2298,
- 75 ng/  $\mu\text{l}$ , Option ID :- 2299,
- 100 ng/  $\mu\text{l}$ , Option ID :- 2300,

Question ID:- 581

In eukaryotes, nucleosomes comprise of which one of the following histones?

Options:-

- H1, H2A, H2B, and H3 , Option ID :- 2321,
- H2A, H2B, H3, and H4 , Option ID :- 2322,
- H1, H2B, H3, and H4 , Option ID :- 2323,
- H1, H2A, H3, and H4 , Option ID :- 2324,

Question ID:- 572

500 mg of a drug (Molecular weight 100) was intravenously injected into an individual having a blood volume of 5 liter. The drug is neither absorbed by the tissues nor it is excreted. If the drug is metabolized so that half of it is degraded in eight hours, what would be the molar concentration of the drug one day after injection?

Options:-

- 2.5 mM , Option ID :- 2285,
- 1.25 mM , Option ID :- 2286,
- 0.625 mM , Option ID :- 2287,
- 0.0312 mM , Option ID :- 2288,

Question ID:- 614

If 8% of  $x = 4\%$  of  $y$ , then 20% of  $x$  is?

Options:-

- 10% of  $y$ , Option ID :- 2453,
- 16% of  $y$ , Option ID :- 2454,
- 80% of  $y$ , Option ID :- 2455,
- 40% of  $y$ , Option ID :- 2456,

Question ID:- 619

In Reverse Phase chromatography of a mixture of protein and sodium chloride:

Options:-

- The salt will elute before the protein, Option ID :- 2473,
- The salt and protein will co-elute, Option ID :- 2474,
- The salt will elute after the protein, Option ID :- 2475,
- The salt will elute but the protein will not, Option ID :- 2476,

Question ID:- 611

If 48 men can do a piece of work in 25 hours, how much time will it take for 15 men to finish the same task?

Options:-

- 75 hours, Option ID :- 2441,
- 60 hours, Option ID :- 2442,
- 80 hours, Option ID :- 2443,
- 85 hours, Option ID :- 2444,

Question ID:- 609

Identify the sum of  $a+b+c$ , provided the total of each row and each column is same.

11	16	$a$
10	$b$	14
$c$	8	13

Options:-

- 32 , Option ID :- 2433,
- 36 , Option ID :- 2434,
- 27 , Option ID :- 2435,
- 30 , Option ID :- 2436,

Question ID:- 591

The probability that 1<sup>st</sup> of January is a Sunday in at least one of the 3 randomly chosen years is given by:

**Options:-**

- $3/7$  , Option ID :- 2361,
- $1 - (6/7)^3$  , Option ID :- 2362,
- $(3/7)^3$  , Option ID :- 2363,
- $(1 - 3/7)^3$  , Option ID :- 2364,

**Question ID:- 582**

**Match the items in List I with the items in List II**

List I	List II
A. Sucrose	I. $\beta$ -glycosidic link (D-glucose)
B. Lactose	II. $\alpha$ -glycosidic link (D-glucose)
C. Maltose	III. $\beta$ -glycosidic link (D-glucose and D-galactose)
D. Cellobiose	IV. $\alpha$ -1, $\beta$ -2-glycosidic link (D-glucose and D-fructose)

**Choose the correct answer from the options given below:**

**Options:-**

- A-II, B-IV, C-I, D-III , Option ID :- 2325,
- A-I, B-III, C-IV, D-II , Option ID :- 2326,
- A-III, B-II, C-I, D-IV , Option ID :- 2327,
- A-IV, B-III, C-II, D-I , Option ID :- 2328,

**Question ID:- 577**

**You are measuring blood glucose level by glucose oxidase method. Following are the absorbance values that you got for the standard and the test sample. Determine the glucose concentration in the test sample:**

Sample	Concentration	$A_{505}$
Standard 1	0.4 mmol/L	0.120
Standard 2	0.6 mmol/L	0.180
Standard 3	0.8 mmol/L	0.240
Unknown	?	0.210

**Options:-**

- 0.65 mM , Option ID :- 2305,
- 0.70 mM , Option ID :- 2306,
- 0.725 mM , Option ID :- 2307,
- 0.75 mM , Option ID :- 2308,

**Question ID:- 587**

How many words can be formed with the letters of the word 'PATALIPUTRA'?

Options:-

- $11!/2! 3!$ , Option ID :- 2345,
- $11!/2! 2! 3!$ , Option ID :- 2346,
- $11!/3! 1! 2!$ , Option ID :- 2347,
- $11!/3!$ , Option ID :- 2348,

Question ID:- 612

A 100 m long train is running at a speed of 68 km/h. A man is also running in the same direction with a speed of 8 km/h. In what time will the train overtake the running man?

Options:-

- 6 sec, Option ID :- 2445,
- 9 sec, Option ID :- 2446,
- 6 min, Option ID :- 2447,
- 9 min, Option ID :- 2448,

Question ID:- 600

During signal transduction, one molecule of phosphatidylinositol 4,5-bisphosphate (PIP<sub>2</sub>) is cleaved into one molecule each of inositol triphosphate (IP<sub>3</sub>) and diacylglycerol (DAG) by the enzyme:

Options:-

- Lipolyase C , Option ID :- 2397,
- Phosphatase C , Option ID :- 2398,
- Phosphodiesterase C , Option ID :- 2399,
- Phospholipase C , Option ID :- 2400,

Question ID:- 590

The function  $y = f(x) = x^2 - 6$  is plotted along with its inverse function  $y = f^{-1}(x)$ , where essentially the x & y axis are interchanged. These two curves will intersect at:

Options:-

- (0, 0) , Option ID :- 2357,
- (2, 3) , Option ID :- 2358,
- (2, 2) & (3, 3) , Option ID :- 2359,
- (-2, -2) & (3, 3) , Option ID :- 2360,

Question ID:- 571

In the Table given below, the column (A) lists three eukaryotic RNA

**Polymerases and column (B) lists group of genes they transcribe. Identify the correct match from the options below:**

A	B
i. RNA polymerase I	a. mRNA, miRNA, snRNA genes
ii. RNA polymerase II	b. tRNA and 5S rRNA genes
iii. RNA polymerase III	c. rRNA genes

**Options:-**

- i & c; ii & b; iii & a , Option ID :- 2281,
- i & b; ii & c; iii & a , Option ID :- 2282,
- i & b; ii & a; iii & c , Option ID :- 2283,
- i & c; ii & a; iii & b , Option ID :- 2284,

**Question ID:- 620**

**What is the concentration of D<sub>2</sub>O in heavy water (density 1.11 g/ml)?**

**Options:-**

- 0.5 M , Option ID :- 2477,
- 5.0 M , Option ID :- 2478,
- 50.0 M , Option ID :- 2479,
- 55.5 M , Option ID :- 2480,

**Question ID:- 580**

**You are preparing a 500 ml solution containing 50 mM Tris (FW 120) buffer, 10 mM NaCl (FW 58.5), 5 mM EDTA (supplied solution is 500 mM). The quantity of each of the ingredients would be:**

**Options:-**

- 6.0 g Tris, 2.92 g NaCl, 5 ml EDTA, Option ID :- 2317,
- 3.0 g Tris, 0.292 g NaCl, 5 ml EDTA, Option ID :- 2318,
- 1.5 g Tris, 0.292 g NaCl, 5 ml EDTA, Option ID :- 2319,
- 0.75 g Tris, 0.029 g NaCl, 5 ml EDTA, Option ID :- 2320,

**Question ID:- 601**

**Identify the INCORRECT statement for a competitive reaction.**

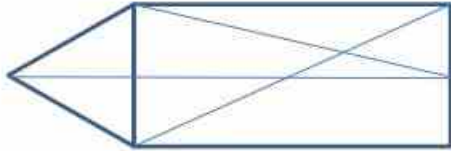
**Options:-**

- The  $V_{max}$  is unchanged. , Option ID :- 2401,
- The dissociation constant ( $K_d$ ) is increased. , Option ID :- 2402,
- $K_m$  will increase. , Option ID :- 2403,
- The intercept on the x-axis will shift towards the left in the Lineweaver-

Burk plot. , Option ID :- 2404,

Question ID:- 616

Find the number of triangles in the given figure:



Options:-

- 12, Option ID :- 2461,
- 13, Option ID :- 2462,
- 14, Option ID :- 2463,
- 15, Option ID :- 2464,

Question ID:- 610

Add one more element to the given number series: 71, 76, 69, 74, 67, 72:

Options:-

- 77, Option ID :- 2437,
- 65, Option ID :- 2438,
- 80, Option ID :- 2439,
- 76, Option ID :- 2440,

Question ID:- 613

What will be the length of a DNA molecule containing 10 million bp?

Options:-

- 340 mm, Option ID :- 2449,
- 34 mm, Option ID :- 2450,
- 3.4 mm, Option ID :- 2451,
- 0.34 mm, Option ID :- 2452,

Question ID:- 596

A plasmid has three sites for *EcoRI*. When digested by this enzyme, incidentally partial digestion took place, though no uncut or nicked plasmid remained in the digestion mixture. The maximum number of bands that can be visualized in an agarose gel would be:

Options:-

- 1 , Option ID :- 2381,
- 3 , Option ID :- 2382,
- 7 , Option ID :- 2383,

- 10 , Option ID :- 2384,

Question ID:- 579

Eukaryotic RNA Polymerase II transcribes:

Options:-

- rRNA and tRNA genes, Option ID :- 2313,
- mRNA and tRNA genes, Option ID :- 2314,
- mRNA and 5S rRNA genes, Option ID :- 2315,
- mRNA, miRNA and snRNA genes, Option ID :- 2316,

Question ID:- 605

The cytosine residues in the DNA are methylated at specific di- or tri-nucleotide sequences. Which among these methylation motifs is predominantly found in case of protein-coding genes in animals? (H stands for A, T or C)

Options:-

- CpG , Option ID :- 2417,
- CpHpG , Option ID :- 2418,
- CpHpH , Option ID :- 2419,
- CpGpG , Option ID :- 2420,

Question ID:- 584

Which one of the following compound(s) is/are NOT the carbon source of acetyl Co-A?

Options:-

- Ethanol , Option ID :- 2333,
- Valine/ isoleucine , Option ID :- 2334,
- Pyruvate , Option ID :- 2335,
- Oxaloacetate/ acetoacetate , Option ID :- 2336,

Question ID:- 606

Which one of the following acts as a linker histone?

Options:-

- H1, Option ID :- 2421,
- H2A, Option ID :- 2422,
- H2B, Option ID :- 2423,
- H3, Option ID :- 2424,

Question ID:- 583

Which one of the following statements is true with respect to optical activity?

**Options:-**

- A relationship exists between the (R) and (S) configurations of enantiomers and the direction [(+) or (-)] in which they rotate plane-polarized light. , Option ID :- 2329,
- Equimolar mixture of D and L isomers of the same compound will be optically active. , Option ID :- 2330,
- Meso compounds that are optically inactive may contain stereogenic centers or chiral centers. , Option ID :- 2331,
- Optical activity is independent of temperature. , Option ID :- 2332,

**Question ID:- 585**

How many rectangles are there in the diagram?



**Options:-**

- 8, Option ID :- 2337,
- 9, Option ID :- 2338,
- 10, Option ID :- 2339,
- 12, Option ID :- 2340,

**Question ID:- 574**

The cytosine residues in the DNA are methylated at specific di- or trinucleotide sequences. Which among these methylation motifs are found predominantly in case of protein-coding genes in plants? H stands for A, T or C.

**Options:-**

- CpG and CpHpG , Option ID :- 2293,
- CpHpG and CpHpH , Option ID :- 2294,
- CpGpG and CpHpH , Option ID :- 2295,
- CpG and CpHpH , Option ID :- 2296,

**Question ID:- 573**

The motifs commonly found in the core promoter of eukaryotic protein coding genes are:

**Options:-**

- TATA and Pribnow box, Option ID :- 2289,

- Motif ten element and TATA, Option ID :- 2290,
- BRE and Kozak consensus sequence, Option ID :- 2291,
- TRE and TATA, Option ID :- 2292,

Question ID:- 576

You are given a 5 mM solution of sucrose. If you hydrolyse it by adding equal volume of 10 mM HCl, what would be the final concentration of glucose and fructose in the hydrolysate?

Options:-

- 5 mM glucose and 5 mM fructose, Option ID :- 2301,
- 2.5 mM glucose and 2.5 mM fructose, Option ID :- 2302,
- 1.25 mM glucose and 1.25 mM fructose, Option ID :- 2303,
- 1.25 mM glucose and 2.5 mM fructose, Option ID :- 2304,

Question ID:- 599

For transcribing protein coding genes, the RNA Polymerase forms the preinitiation complex (PIC) in association with:

Options:-

- TFIIA, TFIID, TFIIG, Option ID :- 2393,
- TFIIA, TFIIG, TFIIH, Option ID :- 2394,
- TFIIH, TFIIF, TFIID, Option ID :- 2395,
- TFIIC, TFIID, TFIIF, Option ID :- 2396,

Question ID:- 593

A growing bacterial culture doubles in 1 hr; the increase in cell mass in 30 minutes will be:

Options:-

- Zero, Option ID :- 2369,
- 50%, Option ID :- 2370,
- Less than 50%, Option ID :- 2371,
- More than 50%, Option ID :- 2372,

Question ID:- 598

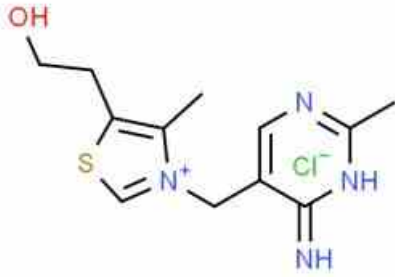
A culture contains two bacterial populations 'X' and 'Y' in equal proportion. On dilution plating only two colonies were obtained due to excessive dilution. The probability that one will be X and other will be Y is:

Options:-

- 100%, Option ID :- 2389,
- 75%, Option ID :- 2390,
- 50%, Option ID :- 2391,
- 25%, Option ID :- 2392,

Question ID:- 618

What is the molecular formula for the structure given below?



Options:-

- $C_{12}H_{17}ClN_4OS$ , Option ID :- 2469,
- $C_{10}H_{16}ClN_4OS$ , Option ID :- 2470,
- $C_{11}H_{16}ClN_4OS$ , Option ID :- 2471,
- $C_{13}H_{16}ClN_4OS$ , Option ID :- 2472,

Question ID:- 589

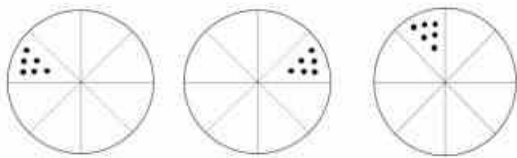
The line  $y = 2x$  from  $x = 0$  to  $1$  is rotated around the  $y$ -axis. The volume generated is:

Options:-

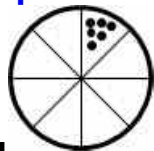
- $1/2 \pi$ , Option ID :- 2353,
- $2/3 \pi$ , Option ID :- 2354,
- $3/4 \pi$ , Option ID :- 2355,
- $\pi$ , Option ID :- 2356,

Question ID:- 586

Find the next image in the series.



Options:-



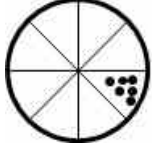
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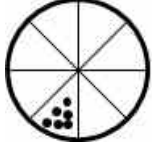
Option ID :- 2341,



Option ID :- 2342,



Option ID :- 2343,



Option ID :- 2344,

Question ID:- 592

An aircraft circumnavigates the earth 10 km above the earth's surface. If it completes one full circle, the distance covered will be \_\_\_\_\_ greater than the circumference of the earth. (Assume earth radius is 3280 km, and  $\pi = 3.14$ )

Options:-

- 62.8 km , Option ID :- 2365,
- 628 km , Option ID :- 2366,
- 6280 km , Option ID :- 2367,
- 12560 km , Option ID :- 2368,

Question ID:- 594

Two random numbers are generated between zero and one and added. The probability that the sum of these two numbers will be between 0.5 and 1.5 is:

Options:-

- 50%, Option ID :- 2373,
- 75%, Option ID :- 2374,
- 90%, Option ID :- 2375,
- 100%, Option ID :- 2376,

Question ID:- 604

The enzyme that links carbon and nitrogen metabolism is:

Options:-

- Glutamine synthetase., Option ID :- 2413,
- Transketolase., Option ID :- 2414,
- Glutamate dehydrogenase., Option ID :- 2415,

- Enolase., Option ID :- 2416,

**Subject : BET SECTION S1 B**

**Question ID:- 745**

Which one of the following is comparatively the best E-value to a pairwise sequence match?

**Options:-**

- $1e-4$ , Option ID :- 2977,
- $10e-3$ , Option ID :- 2978,
- $100e-2$ , Option ID :- 2979,
- $1000e-1$ , Option ID :- 2980,

**Question ID:- 623**

What will be the molecular weight of the tri-peptide Trp-Gly-His? Molecular weights of Trp, Gly, and His are 204.2, 75.07, and 155.2 respectively.

**Options:-**

- 434.47 , Option ID :- 2489,
- 300.00 , Option ID :- 2490,
- 398.47 , Option ID :- 2491,
- 502.25 , Option ID :- 2492,

**Question ID:- 708**

The most likely sub-cellular localization of NAC transcription factors is:

**Options:-**

- Nucleus, Option ID :- 2829,
- Cytoplasm, Option ID :- 2830,
- Mitochondria , Option ID :- 2831,
- Plastid, Option ID :- 2832,

**Question ID:- 674**

AIDS is caused by a human retrovirus that kills:

**Options:-**

- B lymphocytes, Option ID :- 2693,
- Lymphocytes stem cells, Option ID :- 2694,
- CD4-positive T-lymphocytes, Option ID :- 2695,
- CD8-positive T-lymphocytes, Option ID :- 2696,

**Question ID:- 758**

The technique used in animal biotechnology for rapid multiplication and

production of animals with a desired genotype is:

**Options:-**

- Protoplast fusion and embryo transfer , Option ID :- 3029,
- Hybrid selection and embryo transfer , Option ID :- 3030,
- In vitro fertilization and embryo transfer , Option ID :- 3031,
- Nuclear injection of genetic material and embryo transfer , Option ID :- 3032,

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Question ID:- 675

Latency is a characteristic of which one of the following viruses?

**Options:-**

- Herpes virus , Option ID :- 2697,
- Polio virus , Option ID :- 2698,
- Rhino virus , Option ID :- 2699,
- Influenza virus , Option ID :- 2700,

---

Question ID:- 729

For determining  $V_m$  and  $K_m$  of an enzyme catalyzed reaction, we often use a double reciprocal plot of  $1/v$  versus  $1/s$ . This is NOT the best method because:

**Options:-**

- Errors in measurement are not normally distributed , Option ID :- 2913,
- A straight line fit does not minimize the error , Option ID :- 2914,
- Errors increase for larger values of  $v$  &  $s$  , Option ID :- 2915,
- Errors increase for smaller values of  $v$  &  $s$  , Option ID :- 2916,

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Question ID:- 670

Which one of the following organisms is NOT an obligate intracellular parasite and, therefore, can grow on bacteriological media?

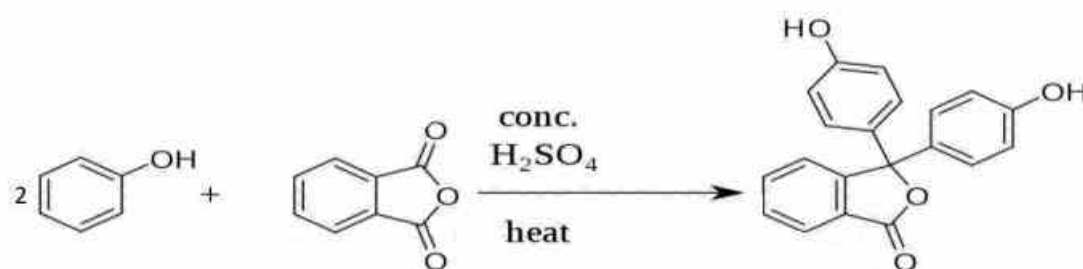
**Options:-**

- Mycoplasma , Option ID :- 2677,
- Chlamydia , Option ID :- 2678,
- Rickettsia , Option ID :- 2679,
- Adenovirus , Option ID :- 2680,

---

Question ID:- 626

What may be the simplest and most inexpensive way to know that the product is formed in the reaction given below?



**Options:-**

- Mass spectrometry, Option ID :- 2501,
- Reverse Phase HPLC, Option ID :- 2502,
- CD spectroscopy , Option ID :- 2503,
- Change of color upon addition of alkali , Option ID :- 2504,

**Question ID:- 641**

A following reaction is occurring in a test tube:



100 nM solution of A is incubated with an equal volume of 100 nM solution of B and left at 25°C till the equilibrium is reached. Finally, when the concentration of A is measured, it is found to be 10 nM. What is the approximate concentration of C when 2 nM solution of A is incubated with an equal volume of 100 nM solution of B under identical conditions?

Choose the correct answer:

**Options:-**

- , Option ID :- ,
- 0.95 nM , Option ID :- 2561,
- , Option ID :- 2561,
- 0.8 nM , Option ID :- 2562,
- , Option ID :- 2562,
- 0.1 nM , Option ID :- 2563,
- 10 nM , Option ID :- 2564,

**Question ID:- 718**

Yeast cells are immobilized in a column and glucose is fed through the inlet at a concentration of 90 g/l. If all the glucose is consumed and we can treat this as an anaerobic fermentation with negligible cell growth, then the ethanol concentration at the outlet will be:

**Options:-**

- 90 g/l  
, Option ID :- 2869,

- 60 g/l  
, Option ID :- 2870,
- 36 g/l  
, Option ID :- 2871,
- 46 g/l  
, Option ID :- 2872,

Question ID:- 630

The CO-NH moiety between two C-alpha atoms constitutes the Peptide bond. The measured bond lengths (Angstroms) are : C(alpha)-CO (1.51); C=O (1.24); C-N(1.33); N-C(alpha)1.46. In which of these, there is a decrease from the expected bond length due to partial double bond character of the peptide bond?

Options:-

- C(alpha)-CO, Option ID :- 2517,
- C=O, Option ID :- 2518,
- C-N, Option ID :- 2519,
- N-C(alpha), Option ID :- 2520,

Question ID:- 736

Given below are two statements one is labelled as Assertion A and the other is labelled as Reason R:

Assertion A: The dot matrix method of sequence alignment is a very basic method that should be used first, before other more complex methods.

Reason R: The diagonal Dot Matrix Display can readily reveal presence of insertions/deletions and direct and inverted repeats that are more difficult to find by the other, more automated methods.

In the light of the above statements, choose the most appropriate answer from the options given below:

Options:-

- Both A and R are correct and R is the correct explanation of A , Option ID :- 2941,
- Both A and R are correct but R is not the correct explanation of A , Option ID :- 2942,
- A is correct but R is not correct , Option ID :- 2943,
- A is not correct but R is correct , Option ID :- 2944,

Question ID:- 715

Given below are two statements one is labelled as Assertion A and the other is labelled as Reason R:

Assertion A : In size exclusion chromatography, larger proteins elute earlier and smaller proteins elute later.

Reason R : When matrices like sephadex are used, the partitioning of

protein molecules between liquid and solid phases is a function of protein size.

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

**Options:-**

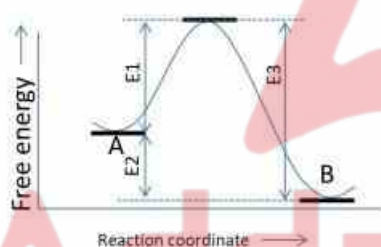
- Both A and R are true and R is the correct explanation of A , Option ID :- 2857,
- Both A and R are true and R is not the correct explanation of A , Option ID :- 2858,
- A is true but R is false , Option ID :- 2859,
- A is false but R is true , Option ID :- 2860,

**Question ID:- 643**

The energy landscape or the energy of a reaction:



Along its reaction coordinate follows the following pattern:



Which one of the following statements are true?

**Options:-**

- The rate at which A changes to B is independent of E1 , Option ID :- 2569,
- The rate at which B converts to A is determined by E3 , Option ID :- 2570,
- The rate at which A converts to B is determined by E2 , Option ID :- 2571,
- The rate at which B converts to A is independent of E3 , Option ID :- 2572,

**Question ID:- 768**

Ground shark cartilage ointment is popular for its role in fast wound recovery. The active ingredient primarily responsible for this function is:

**Options:-**

- N-acetylglucosamine, Option ID :- 3069,
- Hydroxyproline, Option ID :- 3070,
- Dihydroxyproline, Option ID :- 3071,
- 3,4-dihydroxyphenylalanine (DOPA), Option ID :- 3072,

Question ID:- 682

The animal embryonic stem cells that can differentiate into any embryonic cell type are known as:

Options:-

- Pluripotent stem cells, Option ID :- 2725,
- Multipotent stem cells, Option ID :- 2726,
- Oligopotent stem cells, Option ID :- 2727,
- Unipotent stem cells, Option ID :- 2728,

Question ID:- 740

Which one of the following DOES NOT represent known interactions of RNA secondary structural elements?

Options:-

- Pseudo knot , Option ID :- 2957,
- Kissing hairpins , Option ID :- 2958,
- Hairpin-bulge contact , Option ID :- 2959,
- Helix-turn-helix , Option ID :- 2960,

Question ID:- 638

A protein with 10 lysines and 2 arginine residues was digested with trypsin and the peptide mixture was resolved on an SDS-PAGE. After silver staining, 10 bands were detected instead of 13. Select the plausible reasons from the following:

- A. Some of the Arginines and Lysines were inside the protein core.
- B. Some of the Arginines and Lysines were followed by a Proline residue.
- C. Some of the Arginines and Lysines were followed by a negatively charged residue.
- D. Some of the Lysines were modified at the epsilon Nitrogen atom.
- E. One of the Lysine or Arginine was at the extreme C-terminus.

Choose the correct answer from the options given below:

Options:-

- A, B, C and D. , Option ID :- 2549,
- A, B, C and E. , Option ID :- 2550,
- B, C, D and E. , Option ID :- 2551,
- A, B, D and E. , Option ID :- 2552,

Question ID:- 753

Which command is suitable to list out all the directories in the working directory, in linux/unix environment?

**Options:-**

- `ls -l | grep ^d` , Option ID :- 3009,
- `grep ^d | ls -l` , Option ID :- 3010,
- `ls -l | grep ^d` , Option ID :- 3011,
- `ls | grep ^dir` , Option ID :- 3012,

**Question ID:- 668**

Which one of the following enzymes help the DNA to overcome the tension generated by the unwinding during replication?

**Options:-**

- Nickase , Option ID :- 2669,
- Helicase , Option ID :- 2670,
- Topoisomerase , Option ID :- 2671,
- DNA ligase , Option ID :- 2672,

**Question ID:- 709**

In a plant transformation vector, the selectable marker gene is ideally located next to the "left border" of T-DNA region, because:

- A. Left border of T-DNA enters last into the plant cell.
- B. Right border of T-DNA enters last into the plant cell.
- C. It ensures complete transfer of T-DNA into the plant cell.

Choose the most appropriate answer from the options given below:

**Options:-**

- A and B Only , Option ID :- 2833,
- B and C Only , Option ID :- 2834,
- A and C Only , Option ID :- 2835,
- C Only , Option ID :- 2836,

**Question ID:- 730**

For monoclonal antibody production, mammalian expression systems are preferred over bacterial expression systems, primarily because:

**Options:-**

- mammalian cultures have better productivity, Option ID :- 2917,
- mammalian cultures produce extra-cellular product simplifying the purification steps, Option ID :- 2918,
- mammalian system provide necessary post-translational modifications, Option ID :- 2919,
- mammalian genes can only be expressed in mammalian systems , Option ID :- 2920,

Question ID:- 636

Which one of the molecular processes utilize 2', 3' Dideoxy-ribonucleoside triphosphates?

Options:-

- DNA synthesis for primers. , Option ID :- 2541,
- Okazaki fragment formation during lagging strand synthesis. , Option ID :- 2542,
- DNA sequencing by synthesis. , Option ID :- 2543,
- Transcript chain elongation. , Option ID :- 2544,

Question ID:- 639

15 to 30% of collagen residues are 4-hydroxyproline residues (Hyp). When rats are fed with  $^{14}\text{C}$  labeled Hyp, the collagen produced by them is not radioactive, but when they are fed with  $^{14}\text{C}$  labeled Proline, the collagen produced is radioactive. What is the most plausible reason?

Options:-

- Hyp is an essential amino acid in rats. , Option ID :- 2553,
- Free Hyp is dehydroxylated to form Proline in the rats. , Option ID :- 2554,
- Proline residues are hydroxylated once they are incorporated into collagen in rats. , Option ID :- 2555,
- Free  $^{14}\text{C}$  labelled Hyp is degraded in rats. , Option ID :- 2556,

Question ID:- 770

Choose the correct option to fill up the blanks:

\_\_\_\_\_ nourish the host coral as well as help it deposit its skeleton. They perform \_\_\_\_\_ and pass on some of the \_\_\_\_\_ they make to the coral.

Options:-

- hermatypic corals, scavenging, organic matter, Option ID :- 3077,
- scleractinian , respiration, calcium, Option ID :- 3078,
- ahermatypic corals, synthesis, calcium, Option ID :- 3079,
- Zooxanthellae, photosynthesis, organic matter, Option ID :- 3080,

Question ID:- 766

Identify the correct statement about Fucoidans:

Options:-

- Fucoidans are iron containing proteins, found in blue green algae. , Option ID :- 3061,

- Fucoidans are sulphur containing amino acids found in marine derived proteins. , Option ID :- 3062,
- Fucoidans are iron containing lipopolysaccharides found in algal biomass. , Option ID :- 3063,
- Fucoidans are sulfated polysaccharides, found in brown algae, that contain L-fucose among their constituent sugars. , Option ID :- 3064,

Question ID:- 661

Which one of the following CANNOT be used for progressive global multiple sequence alignment?

Options:-

- ClustalW , Option ID :- 2641,
- LALIGN , Option ID :- 2642,
- PILEUP , Option ID :- 2643,
- T-COFFEE , Option ID :- 2644,

Question ID:- 655

Which of the following are the sulfur containing amino acids?

- Methionine
- Histidine
- Leucine
- Cysteine

Options:-

- (ii) and (i), Option ID :- 2617,
- (i) and (iv), Option ID :- 2618,
- (iv) and (ii), Option ID :- 2619,
- (iii) and (ii), Option ID :- 2620,

Question ID:- 734

The red color of beetroot is due to the presence of:

Options:-

- Betalains, Option ID :- 2933,
- Anthocyanins, Option ID :- 2934,
- Flavonoids, Option ID :- 2935,
- Carotenoids, Option ID :- 2936,

Question ID:- 621

Green Fluorescent Protein (GFP) emits green light due to the presence of a:

Options:-

- prosthetic fluorophore that emits green light., Option ID :- 2481,
- group of amino acids that are not found in other proteins., Option ID :- 2482,

- metal cofactor that shifts the emission to green wavelength., Option ID :- 2483,
- post translational modification that generates a unique fluorophore., Option ID :- 2484,

Question ID:- 702

In plants, the overexpression of lectin genes confers resistance to:

Options:-

- Virus, Option ID :- 2805,
- Insects, Option ID :- 2806,
- Fungus, Option ID :- 2807,
- Bacteria, Option ID :- 2808,

Question ID:- 658

A conventional light microscope allows us to magnify cells up to 1000 times and to resolve details as small as \_\_\_\_\_.

Options:-

- 200  $\mu\text{m}$ , Option ID :- 2629,
- 200 nm, Option ID :- 2630,
- 0.2 nm, Option ID :- 2631,
- 20 nm, Option ID :- 2632,

Question ID:- 737

Given below are two statements:

Statement I: An alignment is generated by starting at the ends of the two sequences and attempting to match all possible pairs of characters between the sequences and by following a scoring scheme for matches, mismatches, and gaps.

Statement II: For proteins, an amino acid substitution matrix, such as the Dayhoff percent accepted mutation matrix 250 (PAM250) or Blosum substitution matrix 62 (BLOSUM62) is used to score matches and mismatches.

In the light of the above statements, choose the most appropriate answer from the options given below:

Options:-

- Both Statement I and Statement II are correct , Option ID :- 2945,
- Both Statement I and Statement II are incorrect , Option ID :- 2946,
- Statement I is correct but Statement II is incorrect , Option ID :- 2947,
- Statement I is incorrect but Statement II is correct , Option ID :- 2948,

Answer Given:- Not Attempted

Question ID:- 647

The term Dysbiosis is associated with:

**Options:-**

- Kinome, Option ID :- 2585,
- Immunome, Option ID :- 2586,
- Genome, Option ID :- 2587,
- Microbiome, Option ID :- 2588,

Question ID:- 751

During analysis of Next-Gen Sequencing data, what is the advantage of BAM files over SAM files?

**Options:-**

- BAM files are human readable while SAM files are not. , Option ID :- 3001,
- BAM files are larger than SAM files. , Option ID :- 3002,
- BAM files are smaller than SAM files and hence easier to transfer. , Option ID :- 3003,
- BAM files can hold more information than SAM files. , Option ID :- 3004,

Question ID:- 681

Match items in List I with items in List II.

List1	List2
A. Down Syndrome	I. Trisomy 18
B. Edward Syndrome	II. XXY
C. Klinefelter Syndrome	III. Female with one X
D. Turner Syndrome	IV. XX+21

Choose the correct answer from the options given below:

**Options:-**

- A-I, B-IV, C-II, D-III , Option ID :- 2721,
- A-IV, B-II, C-III, D-I , Option ID :- 2722,
- A-IV, B-I, C-II, D-III , Option ID :- 2723,
- A-III, B-I, C-IV, D-II , Option ID :- 2724,

Question ID:- 762

Which one of the following process is NOT used to convert the hydrocarbons present in the organic compounds to central metabolic intermediates?

**Options:-**

- Hydration , Option ID :- 3045,

- Extraction , Option ID :- 3046,
- Nitroreduction , Option ID :- 3047,
- Reductive dehydroxylation , Option ID :- 3048,

Question ID:- 686

In a neuronal culture experiment, the effect of a chemical (under study) was prevented by pretreating the cells with prazosin, an alpha1 adrenoceptor antagonist but not by propranolol, a beta adrenoceptor antagonist. The chemical under study is likely to be:

Options:-

- Acetylcholine or carbachol , Option ID :- 2741,
- Orexin or serotonin , Option ID :- 2742,
- GABA or glutamate , Option ID :- 2743,
- Noradrenaline or methoxamine , Option ID :- 2744,

Question ID:- 673

Which form of the plasmodia is transmitted from mosquito to human?

Options:-

- Sporozoite, Option ID :- 2689,
- Gametocyte, Option ID :- 2690,
- Merozoite, Option ID :- 2691,
- Hypnozoite, Option ID :- 2692,

Question ID:- 671

Differential expression of the genetic material depending on its parentage of inheritance is known as:

Options:-

- Penetrance , Option ID :- 2681,
- Expressivity , Option ID :- 2682,
- Epistasis , Option ID :- 2683,
- Genomic imprinting , Option ID :- 2684,

Question ID:- 654

A specialized histone associated with the centromeric region of the chromosome is:

Options:-

- CenH3, Option ID :- 2613,
- H2A.Z, Option ID :- 2614,
- H3.3, Option ID :- 2615,

- H2A.X, Option ID :- 2616,

Question ID:- 735

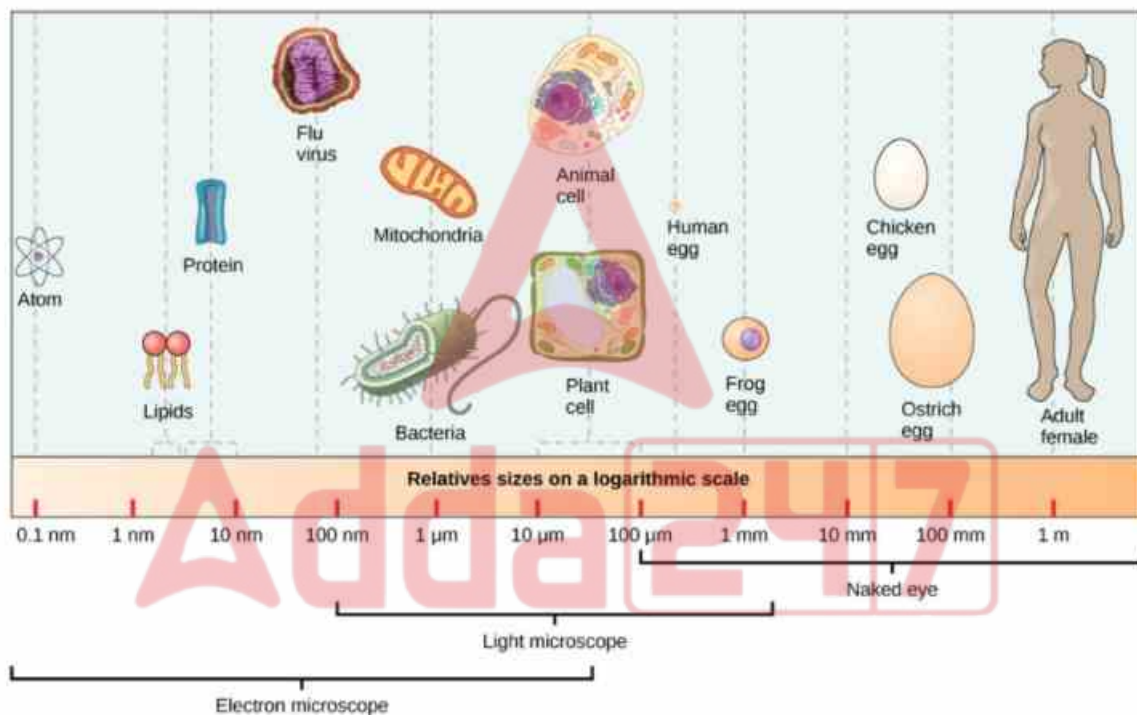
Commercial production of citric acid is done by fermentation using:

Options:-

- *Aspergillus niger* , Option ID :- 2937,
- *Clostridium butyricum* , Option ID :- 2938,
- *Saccharomyces cerevisiae* , Option ID :- 2939,
- *Lactobacillus acidophilus* , Option ID :- 2940,

Question ID:- 624

How many times is the Ostrich egg bigger than the mitochondrion?



Options:-

- 100, Option ID :- 2493,
- 1000, Option ID :- 2494,
- 10000, Option ID :- 2495,
- 100000, Option ID :- 2496,

Question ID:- 703

A spectrum that depicts the magnitude of response of a biological system to light as a function of wavelength is called:

Options:-

- Action spectrum, Option ID :- 2809,
- Absorption spectrum, Option ID :- 2810,
- Visible spectrum, Option ID :- 2811,

- Hypothetical spectrum, Option ID :- 2812,

Question ID:- 634

What will be the absorbance of a 1 mM solution of molecule X whose molar extinction coefficient is  $1000 \text{ M}^{-1}\text{cm}^{-1}$  & path length of the cuvette used is 1 cm?

Options:-

- 1.0, Option ID :- 2533,
- 0.1, Option ID :- 2534,
- 0.5, Option ID :- 2535,
- 2.0, Option ID :- 2536,

Question ID:- 755

Which one of the following is true for PAM250 Scoring Matrix?

Options:-

- It is used for structural database search. , Option ID :- 3017,
- It is based on an evolutionary model that predicts the types of amino acid changes over long periods of time. , Option ID :- 3018,
- It can be used to score alignments for nucleotide changes over long periods of time. , Option ID :- 3019,
- It can distinguish synonymous and non-synonymous mutations. , Option ID :- 3020,

Question ID:- 765

Which one of the following method can be used to treat crude sewage and nitrify secondary effluent?

Options:-

- Duck weed ponds , Option ID :- 3057,
- Reed beds , Option ID :- 3058,
- Algal fish ponds , Option ID :- 3059,
- Water hyacinth ponds , Option ID :- 3060,

Question ID:- 692

*Nod* gene products:

Options:-

- function as receptors of certain flavonoids, Option ID :- 2765,
- lack the ability to activate the expression of other Nod factors, Option ID :- 2766,
- cause activation of homeobox genes, Option ID :- 2767,
- are involved in photosynthesis, Option ID :- 2768,

Question ID:- 637

Proteins are glycosylated in the endoplasmic reticulum. In the final structures, the glycan moieties are typically present:

Options:-

- on the surface of these proteins. , Option ID :- 2545,
- in the core of these proteins. , Option ID :- 2546,
- on the surface as well as in the core of these proteins. , Option ID :- 2547,
- on the membrane inserted segments of these proteins. , Option ID :- 2548,

Question ID:- 763

In a water sample collected from an industrial cluster, the ratio of BOD:COD is found to be less than 0.3. Which one of the following may be presumed from this initial data?

Options:-

- There are numerous carbon-based compounds in the sample which are not utilizable by the microbial population. , Option ID :- 3049,
- The microbial population efficiently utilizes all the organic compounds present in the sample. , Option ID :- 3050,
- The water sample may contain carbohydrates that promote microbial growth. , Option ID :- 3051,
- The sample contains lipids and fatty acids which require less oxygen for breakdown. , Option ID :- 3052,

Question ID:- 642

A protein sample isolated from natural source was electrophoresed on a non-reducing SDS- PAGE. It migrated as a band corresponding to 60 kDa. When the same protein was electrophoresed on a native-PAGE its migration corresponded to a 120 kDa marker protein. What is a reasonable inference?

Options:-

- The protein is a dimer of 60 kDa subunits that are not linked with disulfides. , Option ID :- 2565,
- The protein has two 60 kDa subunits that are linked with disulfides. , Option ID :- 2566,
- No inference concerning protein size can be drawn since proteins don't run according to their masses in native PAGE. , Option ID :- 2567,
- The protein is unusually rich in aspartic and glutamic acid. , Option ID :- 2568,

Question ID:- 684

Short Chain variable fragments (ScFv) of antibody are composed of :

Options:-

- $V_H$  and  $V_L$  domains with  $C_H$  domain , Option ID :- 2733,
- $V_H$  and  $V_L$  domains along with Fc region , Option ID :- 2734,
- $V_H$  and  $V_L$  domains , Option ID :- 2735,
- Only Complementarity Determining Regions , Option ID :- 2736,

Question ID:- 728

The entropy of a growing cell does NOT keep increasing continuously because:

Options:-

- The cell is a highly structured system , Option ID :- 2909,
- The information content in the DNA is very high , Option ID :- 2910,
- Various regulatory loops provide feedback to the system , Option ID :-2911,
- The cell is an open system allowing both matter and energy to be exchanged with surroundings , Option ID :- 2912,

Question ID:- 627

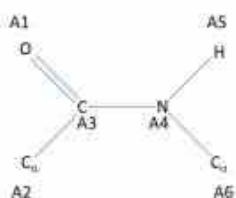
What will be the final concentration of the solute when 10 ml of its 10 M solution is mixed with 990 ml solvent?

Options:-

- 1 M, Option ID :- 2505,
- 0.1 M, Option ID :- 2506,
- 10 M, Option ID :- 2507,
- 0.001 M, Option ID :- 2508,

Question ID:- 635

Amide bonds between two amino acids (as shown below) are generally in trans-conformation. The atoms are labeled as A1 through A6. The angle measured for defining the trans-conformation of the amide bond is the angle between:

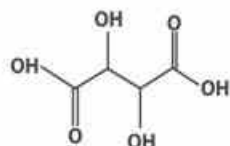
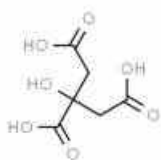


**Options:-**

- the atoms A2, A3 and A4. , Option ID :- 2537,
- the planes formed by A1,A3,A4 and A3,A4,A6. , Option ID :- 2538,
- the planes formed by A2,A3,A4 and A6,A4,A5. , Option ID :- 2539,
- the planes formed by A2,A3,A4 and A3,A4,A6. , Option ID :- 2540,

**Question ID:- 629**

How many chiral centers are there in each of these two molecules?

**Options:-**

- 1 and 1, Option ID :- 2513,
- 1 and 2, Option ID :- 2514,
- 2 and 2, Option ID :- 2515,
- 4 and 3, Option ID :- 2516,

**Question ID:- 752**

The measure of similarity between two structurally aligned macromolecules is:

**Options:-**

- Median Distance between the Centroids (MDC) , Option ID :- 3005,
- Root Mean Square Deviation (RMSD) , Option ID :- 3006,
- Squared Mean Distance between atoms (SMD) , Option ID :- 3007,
- Mean Distance between Centroids (DBC) , Option ID :- 3008,

**Question ID:- 680**

A probiotic is a live microorganism that is claimed to confer a health benefit by altering the indigenous microflora of the intestinal tract. Which one of the following bacteria has been used widely in probiotics?

**Options:-**

- *Klebsiella pneumoniae* , Option ID :- 2717,
- *Pseudomonas putida* , Option ID :- 2718,
- *Lactobacillus lactis* , Option ID :- 2719,
- *Escherichia coli* , Option ID :- 2720,

Question ID:- 672

Which one of the following statements is most relevant to leishmaniasis?

Options:-

- Large domestic animals such as cattle are the principal reservoir of *L. donovani* , Option ID :- 2685,
- Both visceral leishmaniasis and cutaneous leishmaniasis are transmitted by the bite of sandflies. , Option ID :- 2686,
- Artemisinin is effective in the treatment of leishmaniasis. , Option ID :- 2687,
- Leishmaniasis is transmitted by the bite of female *Anopheles* mosquitoes. , Option ID :- 2688,

Question ID:- 732

Which one of the following is NOT a food rich in Vitamin A?

Options:-

- Potato , Option ID :- 2925,
- Squash , Option ID :- 2926,
- Sweet potato , Option ID :- 2927,
- Spinach , Option ID :- 2928,

Question ID:- 663

Given below are two statements: one is labelled as Assertion A and the other is labelled as Reason R.

Assertion A: Histones bind to DNA with high affinity.

Reason R: Histones are small proteins rich in valine and isoleucine residues.

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

Options:-

- Both A and R are true and R is the correct explanation of A. , Option ID :- 2649,
- Both A and R are true but R is not the correct explanation of A. , Option ID :- 2650,
- A is true but R is false. , Option ID :- 2651,
- A is false but R is true. , Option ID :- 2652,

Question ID:- 693

The ligand binding domain of a ligand gated channel (LGC) has a serine residue, phosphorylation of which is essential for ligand binding. By site

directed mutagenesis it was replaced by aspartic acid. The likely consequences will be:

**Options:-**

- LGC becomes non-functional , Option ID :- 2769,
- LGC becomes constitutively active , Option ID :- 2770,
- No change in function , Option ID :- 2771,
- It will rapidly shift between active and inactive forms , Option ID :- 2772,

---

**Question ID:- 749**

Which family of proteins has the greatest likelihood of containing a Leucine-zipper motif?

**Options:-**

- Serine proteases , Option ID :- 2993,
- Map kinases , Option ID :- 2994,
- Transcription factors , Option ID :- 2995,
- Sugar binding proteins , Option ID :- 2996,

---

**Question ID:- 748**

Where is the greatest likelihood of the occurrence of a Cysteine residue in a protein structure?

**Options:-**

- In the active site pocket, Option ID :- 2989,
- In the beta sheets , Option ID :- 2990,
- In the turns and loops, Option ID :- 2991,
- In the alpha helices, Option ID :- 2992,

---

**Question ID:- 660**

Which one of the following is NOT a major checkpoint in the cell division cycle of eukaryotic cell?

**Options:-**

- Beginning of S-phase , Option ID :- 2637,
- Transition from S to G2 phase , Option ID :- 2638,
- Transition from G2 to M phase , Option ID :- 2639,
- Transition from Metaphase to Anaphase during Mitosis , Option ID :-2640,

---

**Question ID:- 701**

Which one of the following is commonly used as a selection marker for developing transgenic plants?

**Options:-**

- Green fluorescent protein, Option ID :- 2801,
- $\beta$ -lactamase, Option ID :- 2802,
- $\beta$ -galactosidase, Option ID :- 2803,
- Hygromycin phosphotransferase, Option ID :- 2804,

Question ID:- 764

Given below are two statements:

**Statement I:** Fungi are important degraders of polymers and are used in the composting and biodegradation of toxic organic substances.

**Statement II:** Fungi are able to selectively excrete toxins present in these polymers.

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

**Options:-**

- Both Statement I and Statement II are true , Option ID :- 3053,
- Both Statement I and Statement II are false , Option ID :- 3054,
- Statement I is true but Statement II is false , Option ID :- 3055,
- Statement I is false but Statement II is true , Option ID :- 3056,

Question ID:- 714

For Bingham Plastics and pseudo plastic liquids, the apparent viscosity:

**Options:-**

- Increases with increase in shear force , Option ID :- 2853,
- Decreases with increase in shear force , Option ID :- 2854,
- Remains constant with increase in shear force , Option ID :- 2855,
- Changes in an unpredictable fashion with change in shear force , Option ID :- 2856,

Question ID:- 747

Where is the greatest likelihood of the occurrence of a proline residue in a protein structure?

**Options:-**

- In the active site pocket, Option ID :- 2985,
- In the beta sheets , Option ID :- 2986,
- In the turns and loops, Option ID :- 2987,
- In the alpha helices, Option ID :- 2988,

Question ID:- 666

Which one of the following will NOT change upon adding an enzyme to a chemical reaction or changing the concentration of reactants or products?

- A.  $\Delta G^\circ$
- B.  $K_{eq}$
- C.  $\Delta G$

Options:-

- A, B , Option ID :- 2661,
- B, C , Option ID :- 2662,
- A, B, C , Option ID :- 2663,
- Only A , Option ID :- 2664,

Question ID:- 646

When ice absorbs latent heat at a constant pressure to melt from solid to liquid state at constant temperature, which of the following changes are happening?

- A. Entropy of the system is increasing.
- B.  $C_p$  (heat capacity at constant pressure) of the system is infinite or undefined.
- C. Enthalpy of the system is increasing.
- D.  $C_p$  of the system is zero.

Choose the correct answer:

Options:-

- A, B, C , Option ID :- 2581,
- A, C, D , Option ID :- 2582,
- A, B , Option ID :- 2583,
- C, D , Option ID :- 2584,

Question ID:- 704

In a metabolic engineering experiment the flux from primary carbon metabolism was diverted towards methylerythritol phosphate (MEP) pathway. Which one of the following class of secondary carbon compounds do you think will accumulate more?

Options:-

- Alkaloids, Option ID :- 2813,
- Glucosinolates, Option ID :- 2814,
- Phenolics, Option ID :- 2815,
- Terpenes, Option ID :- 2816,

Question ID:- 722

If in a bioreactor, the gas hold up ( $\epsilon$ ) is 0.1 and the average diameter of the air bubbles is 1 mm; then the interfacial area (of the air bubble – liquid

interface), per unit reactor volume is:

**Options:-**

- 6000 cm<sup>3</sup>/l , Option ID :- 2885,
- 600 cm<sup>3</sup>/l , Option ID :- 2886,
- 60 cm<sup>3</sup>/l , Option ID :- 2887,
- 6 cm<sup>3</sup>/l , Option ID :- 2888,

**Question ID:- 725**

A diafiltration process is used to remove salts from a protein solution of 1L. After 1L of make-up buffer (without salts) has been added to this system, the residual salt concentration would be \_\_\_\_\_ of the original.

**Options:-**

- 50%, Option ID :- 2897,
- 36%, Option ID :- 2898,
- 10%, Option ID :- 2899,
- 5%, Option ID :- 2900,

**Question ID:- 679**

A bacterial signaling system that regulates population density-dependent gene expression using secreted chemical signals is known as :

**Options:-**

- G protein-coupled receptor signalling , Option ID :- 2713,
- Quorum sensing , Option ID :- 2714,
- Receptor-mediated signalling , Option ID :- 2715,
- Two component system , Option ID :- 2716,

**Question ID:- 719**

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

**Options:-**

- All particles have the same residence time., Option ID :- 2873,
- Particles which enter the reactor earlier have a higher probability of leaving than those that enter later., Option ID :- 2874,
- Particles which enter the reactor later have a higher probability of leaving than those that enter earlier., Option ID :- 2875,
- All the particles have equal probability of leaving, independent of their time of entry into the reactor., Option ID :- 2876,

**Question ID:- 659**

Arrange the following chemical bonds/interactions in the order of their strengths in vacuum -

Hydrogen bond, Covalent bond, van der Waals attraction and Ionic bond:

Options:-

- Covalent bond > Ionic bond > hydrogen bond > van der Waals attraction , Option ID :- 2633,
- Ionic bond > Covalent bond > hydrogen bond > van der Waals attraction , Option ID :- 2634,
- Covalent bond > Ionic bond > van der Waals attraction > hydrogen bond , Option ID :- 2635,
- Ionic bond > Covalent bond > van der Waals attraction > hydrogen bond , Option ID :- 2636,

Question ID:- 733

The principle microorganism for yogurt is:

Options:-

- *Streptococcus thermophilus* , Option ID :- 2929,
- *Lactobacillus acidophilus* , Option ID :- 2930,
- *Streptococcus lactis* , Option ID :- 2931,
- *Leuconostoc citrovorum* , Option ID :- 2932,

Question ID:- 653

Which one of the following markers is NOT routinely used for DNA fingerprinting?

Options:-

- Amplification short tandem repeats , Option ID :- 2609,
- Analysis of copy number variations , Option ID :- 2610,
- Restriction fragment length polymorphism , Option ID :- 2611,
- Amplification variable number tandem repeats , Option ID :- 2612,

Question ID:- 705

A haploid sperm from one species and a haploid egg from another species may form a diploid interspecies hybrid. Meiosis in these plants generally fails but can also lead to rare duplicated gametes called:

Options:-

- Allopolyploid, Option ID :- 2817,
- Aneuploid, Option ID :- 2818,
- Autopolyploid, Option ID :- 2819,
- Heteropolyploid, Option ID :- 2820,

Question ID:- 721

If the respiratory quotient (R.Q.) for growing cells is 1.1 and the exit gas analyzer of a bioreactor shows 3% CO<sub>2</sub> in the outlet gases; then given normal air as input to the reactor, you expect the outlet O<sub>2</sub> concentration to read approximately:

Options:-

- 3.3%, Option ID :- 2881,
- 2.7%, Option ID :- 2882,
- 18.3%, Option ID :- 2883,
- 17.7%, Option ID :- 2884,

Question ID:- 696

miRNAs are major regulators of gene expression. In an experiment, it was observed that gene 'X' is a direct target of miRNA 'A'. Upon overexpression of miRNA 'A' in *Arabidopsis thaliana*:

Options:-

- only transcript abundance of X will be affected , Option ID :- 2781,
- the resultant protein X will be of smaller size , Option ID :- 2782,
- only specific activity of protein X will get reduced , Option ID :- 2783,
- both transcript and protein abundance of X may get reduced , Option ID :- 2784,

Question ID:- 685

Protein A used for the purification of IgG is isolated from:

Options:-

- *Staphylococcus aureus* , Option ID :- 2737,
- *Streptomyces lividans* , Option ID :- 2738,
- *Streptomyces pyogenes* , Option ID :- 2739,
- *Staphylococcus carnosus* , Option ID :- 2740,

Question ID:- 662

Match the items in left column with those in the right column :

Conjugated protein	Prosthetic group
A. Casein	I. Calcium
B. Hemoglobin	II. Iron
C. Calmodulin	III. Flavin nucleotides
D. Succinate dehydrogenase	IV. Heme
E. Ferritin	V. Phosphate group

Choose the correct answer from the options given below:

Options:-

- A-V, B-IV, C-I, D-III, E-II , Option ID :- 2645,
- A-III, B-IV, C-I, D-V, E-II , Option ID :- 2646,
- A-V, B-IV, C-II, D-III, E-I , Option ID :- 2647,
- A-III, B-IV, C-II, D-V, E-I , Option ID :- 2648,

Question ID:- 699

Which one of the following genes can be used to generate male sterile crop plants?

Options:-

- Barnase, Option ID :- 2793,
- Bar, Option ID :- 2794,
- Lectinase, Option ID :- 2795,
- Chalcone Synthase, Option ID :- 2796,

Question ID:- 697

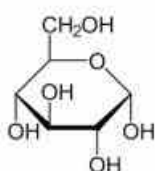
VirA and VirG form a two component signaling system during Agrobacterium infection in plants. In an experiment, *VirG* was mutated resulting in nonfunctional VirG protein. Which one of the following consequences is most likely?

Options:-

- Signaling leading to successful Agrobacterium infection will not be affected , Option ID :- 2785,
- Phenolic signal will be perceived but not transduced , Option ID :- 2786,
- Phenolic signal will not be perceived , Option ID :- 2787,
- VirD1 will take over the function of VirG , Option ID :- 2788,

Question ID:- 633

Given the molecular structure of glucose, the molecular formula and molecular weight of maltose will be:



Options:-

- $C_{12}H_{24}O_{12}$ , 360 Daltons , Option ID :- 2529,
- $C_{12}H_{24}O_{12}$ , 460 Daltons , Option ID :- 2530,
- $C_{12}H_{22}O_{11}$ , 342 Daltons , Option ID :- 2531,
- $C_{12}H_{22}O_{11}$ , 490 Daltons , Option ID :- 2532,

Question ID:- 720

A continuous reactor has a productivity of 0.5 g/l/h. The volume of reactor required to produce 1.2 ton/day of the product is:

Options:-

- 100 L , Option ID :- 2877,
- 1 m<sup>3</sup> , Option ID :- 2878,
- 10 m<sup>3</sup> , Option ID :- 2879,
- 100 m<sup>3</sup> , Option ID :- 2880,

Question ID:- 676

Which one of the following is the drug of choice for sexually transmitted diseases urethritis and cervicitis caused by *Chlamydia trachomatis*?

Options:-

- Ampicillin , Option ID :- 2701,
- Ciprofloxacin , Option ID :- 2702,
- Rifampin , Option ID :- 2703,
- Azithromycin , Option ID :- 2704,

Question ID:- 741

Which one of the following can be considered as a Data Matrix?

Options:-

- Your weight in kg, Option ID :- 2961,
- Marks and ages of students in a classroom, Option ID :- 2962,
- Name of a pet, Option ID :- 2963,
- A list of things to do, Option ID :- 2964,

Question ID:- 717

An exponentially increasing feed of concentrated substrate is fed into a fed batch reactor to maintain a constant specific growth rate 0.35 h<sup>-1</sup>. If the feed is 5 ml/hr at time, t = 0, then feed after 4 hrs will be approximately:

Options:-

- 5 ml/hr , Option ID :- 2865,
- 10 ml/hr , Option ID :- 2866,
- 20 ml/hr , Option ID :- 2867,
- 80 ml/hr , Option ID :- 2868,

Question ID:- 669

Which one of the following types of mutations can lead to a major change in the encoded protein?

- A. Insertion of a single nucleotide near the end of the coding sequence.
- B. Removal of a single nucleotide from the beginning of the coding sequence.
- C. Deletion of three consecutive nucleotides of a codon in the middle of the coding sequence.
- D. Deletion of four consecutive nucleotides in the middle of the coding sequence.

Options:-

- A, D, Option ID :- 2673,
- B, D, Option ID :- 2674,
- B, C, Option ID :- 2675,
- A, E, Option ID :- 2676,

Question ID:- 645

A 1 M Tris-HCl (pH 8.0) solution was diluted 10 fold. What will be the pH of the resulting solution?

Options:-

- 8.0, Option ID :- 2577,
- 7.0, Option ID :- 2578,
- 0.08, Option ID :- 2579,
- 0.8, Option ID :- 2580,

Question ID:- 707

Given below are two statements:

Statement I: Large subunit of rubisco is encoded by chloroplast genome while small subunit of Rubisco is encoded by nuclear genome

Statement II: Small subunit of rubisco has a transit peptide, which is cleaved off at the time of its translocation into plastids.

Choose the correct answer from the options given below:

Options:-

- Both Statement I and Statement II are true , Option ID :- 2825,
- Both Statement I and Statement II are false , Option ID :- 2826,
- Statement I is true but Statement II is false , Option ID :- 2827,
- Statement I is false but Statement II is true , Option ID :- 2828,

Question ID:- 706

Which one of the following is NOT a typical feature of the hypersensitive response observed in plants during the attack of invading microbes?

Options:-

- Onset of programmed cell death in the region surrounding the infection

site , Option ID :- 2821,

- Rapid accumulation of reactive oxygen species , Option ID :- 2822,
- Rapid spike in photosynthetic rate , Option ID :- 2823,
- Rapid spike in nitric oxide production accompanying the oxidative burst , Option ID :- 2824,

Question ID:- 767

Due to the difficulty of isolating and culturing, many marine microorganisms are regarded as "viable but non-culturable" (VBNC). Which one of the following is a suitable method to hunt for useful genes in these organisms?

Options:-

- *in situ* cultivation , Option ID :- 3065,
- growing them in a large bioreactor , Option ID :- 3066,
- barcode sequencing , Option ID :- 3067,
- metagenomic analysis , Option ID :- 3068,

Question ID:- 713

A concentrated feed of substrate is added at a constant rate in a fed-batch reactor. If all the substrate is utilized, the specific growth rate ( $\mu$ ) pattern will be:

Options:-

- Exponential growth with constant  $\mu$  , Option ID :- 2849,
- Exponential growth with increasing  $\mu$  , Option ID :- 2850,
- Growth with decreasing  $\mu$  , Option ID :- 2851,
- Growth with fluctuating  $\mu$  , Option ID :- 2852,

Question ID:- 746

Your friend runs a BLASTp on his unknown sequence and finds a match with E-value of 3 with a target. What does this mean?

Options:-

- There are  $e^3$  sequences in the database that match the unknown sequence. , Option ID :- 2981,
- There are 3 mismatches between the unknown and target sequences. , Option ID :- 2982,
- The random chance of unknown sequence matching the target is 1 in 3. , Option ID :- 2983,
- There are 3 hits of similar score that can be found by random chance. , Option ID :- 2984,

Question ID:- 727

In a batch culture of cells following Monod Kinetics, the declining log phase lasts longer when:

Options:-

- Initial substrate concentration is high, Option ID :- 2905,
- Initial substrate concentration is low, Option ID :- 2906,
- $K_s$  values are large, Option ID :- 2907,
- $K_s$  values are small, Option ID :- 2908,

Question ID:- 710

Given below are two statements one is labelled as Assertion A and the other is labelled as Reason R:

**Assertion A:** Phosphomannose isomerase (PMI) from *E. coli* was used as selection marker to develop 'golden rice 2'.

**Reason R:** When mannose is added in the selection media, endogenous hexokinase converts mannose into mannose-6-phosphate which blocks glycolysis, ATP production, and represses transcription of photosynthetic genes, resulting in slower growth of non-transformed plants. PMI, on the other hand, converts mannose-6-phosphate to fructose-6-phosphate.

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

Options:-

- Both A and R are true and R is the correct explanation of A , Option ID :- 2837,
- Both A and R are true but R is not the correct explanation of A , Option ID :- 2838,
- A is true but R is false , Option ID :- 2839,
- A is false but R is true , Option ID :- 2840,

Question ID:- 744

Which one of the following is NOT a Data Type?

Options:-

- Numeric , Option ID :- 2973,
- String , Option ID :- 2974,
- Logical , Option ID :- 2975,
- Thread , Option ID :- 2976,

Question ID:- 657

Given below are two statements:

**Statement I:** Polycistronic mRNAs are found in archaea and bacteria.

**Statement II:** Plastid genes in eukaryotes have only mono-cistronic mRNA.

In the light of the above statements, choose the most appropriate answer from the options given below:

Options:-

- Both Statement I and Statement II are correct. , Option ID :- 2625,
- Both Statement I and Statement II are incorrect. , Option ID :- 2626,
- Statement I is correct but Statement II is incorrect. , Option ID :- 2627,
- Statement I is incorrect but Statement II is correct. , Option ID :- 2628,

Question ID:- 724

In an enzyme catalyzed reaction following Michaelis-Menten kinetics, both the enzyme amount and substrate (S) are doubled and we observe that the reaction rate is also doubled. From this, we can conclude that:

Options:-

- Enzyme amount has no effect on enzyme kinetics , Option ID :- 2893,
- The substrate is toxic to enzyme , Option ID :- 2894,
- Initial substrate (S) concentration  $\ll K_m$  , Option ID :- 2895,
- Initial substrate (S) concentration  $\gg K_m$  , Option ID :- 2896,

Question ID:- 712

In an external recycle reactor (CSTR with external recycle), the outlet stream is concentrated 20 fold with respect to biomass and half of this concentrated cells is fed back into the reactor.

In such a situation, washout will take place when dilution rate (D) -

Options:-

- is equal to  $\mu_{max}$ , Option ID :- 2845,
- is around  $2 \mu_{max}$ , Option ID :- 2846,
- is around  $0.5 \mu_{max}$ , Option ID :- 2847,
- Washout will never take place, Option ID :- 2848,

Question ID:- 677

Which one of the following is the most accurate statement regarding giardiasis?

Options:-

- The drug of choice for giardiasis is chloroquine., Option ID :- 2705,
- *Giardia lamblia* produces an enterotoxin that increases cAMP within the enterocyte, resulting in diarrhea., Option ID :- 2706,
- *Giardia lamblia* infection is acquired by ingestion of food or water contaminated with human feces only (i.e. there is no animal reservoir for this organism)., Option ID :- 2707,
- Infection by *Giardia lamblia* occurs principally in the small intestine

frequently resulting in the malabsorption of protein and fat., Option ID :- 2708,

Question ID:- 742

Which one of the following can be considered as an Atomic Vector?

Options:-

- Your name, Option ID :- 2965,
- Your thoughts, Option ID :- 2966,
- Your marks in all subjects, Option ID :- 2967,
- Your list of friends and their birthdays, Option ID :- 2968,

Question ID:- 716

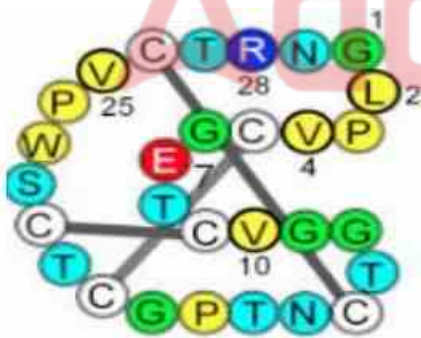
You wish to reduce the maximum shear rate in your reactor (given by impeller tip speed), without changing the power consumption (agitator power). For this, you will:

Options:-

- Increase the diameter of impeller and reduce the RPM, Option ID :- 2861,
- Reduce the diameter of impeller and increase the RPM, Option ID :- 2862,
- Reduce RPM only, Option ID :- 2863,
- Reduce diameter of impeller only , Option ID :- 2864,

Question ID:- 632

How many different kinds of post translational modifications are present in this peptide?



Options:-

- One, Option ID :- 2525,
- Two, Option ID :- 2526,
- Four, Option ID :- 2527,
- Nine, Option ID :- 2528,

Question ID:- 651

Given below are two statements:

**Statement I: MacConkey agar is a media used for recovery of Gram positive bacteria from mixed bacterial culture.**

**Statement II: The bile salts and crystal violet in MacConkey agar inhibit growth of some bacteria.**

**In the light of the above statements, choose the correct answer from the options given below :**

**Options:-**

- **Both Statement I and II are true and Statement II is the correct explanation of Statement I , Option ID :- 2601,**
- **Both Statement I and II are true but Statement II is not the correct explanation of Statement I , Option ID :- 2602,**
- **Statement I is true but Statement II is false , Option ID :- 2603,**
- **Statement I is false but Statement II is true , Option ID :- 2604,**

**Question ID:- 664**

**The color of emitted light of Quantum dots used in fluorescence microscopy depend on:**

**Options:-**

- **The antibody they are coupled with, Option ID :- 2653,**
- **The size of the nanocrystal, Option ID :- 2654,**
- **Time at which they are visualized, Option ID :- 2655,**
- **The material that coats them, Option ID :- 2656,**

**Question ID:- 761**

**Arrange these soluble cations (Na, Ca, K, Mg) in ascending order of abundance of soluble cations found in saline water bodies:**

**Options:-**

- **Na > Mg > Ca > K , Option ID :- 3041,**
- **Mg > Na > Ca > K , Option ID :- 3042,**
  - **K > Mg > Ca > Na , Option ID :- 3043,**
- **Na > Mg > K > Ca , Option ID :- 3044,**

**Question ID:- 667**

**Which of the following statements are correct?**

- A. Lipid bilayer lacking proteins is highly impermeable to all the charged molecules.**
- B. Channels have specific binding pockets for the solute molecules they allow to pass.**
- C. Transporters allow solutes to cross a membrane at much slower rates than do channels.**
- D. The plasma membrane of many animal cells contains open K<sup>+</sup> channels, yet the K<sup>+</sup> concentration in the cytosol is much higher than outside the cell.**

E. The membrane potential of an axon temporarily becomes more negative when an action potential excites it.

**Options:-**

- A, C, D , Option ID :- 2665,
- A, C, E , Option ID :- 2666,
- A, B, E , Option ID :- 2667,
- B, D, E , Option ID :- 2668,

**Question ID:- 698**

One centimorgan is defined as the genetic distance between two loci with a statistically corrected recombination frequency of:

**Options:-**

- 0.1%, Option ID :- 2789,
- 0.5%, Option ID :- 2790,
- 1.0%, Option ID :- 2791,
- 5.0%, Option ID :- 2792,

**Question ID:- 691**

Skotomorphogenesis is characterized by:

**Options:-**

- Small and closed cotyledons and elongated hypocotyl, Option ID :- 2761,
- Fully open cotyledons, Option ID :- 2762,
- Robust foliage and root growth, Option ID :- 2763,
- Early flowering resulting from short-day conditions, Option ID :- 2764,

**Question ID:- 652**

Given below are two statements: one is labelled as Assertion A and the other is labelled as Reason R

**Assertion A:** Mycoplasma is a bacteria without cell wall, and it stains negative in Gram staining.

**Reason R:** Only bacteria that have a cell wall would stain positive in Gram staining.

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

**Options:-**

- Both A and R are true and R is the correct explanation of A , Option ID :-2605,
- Both A and R are true but R is not the correct explanation of A , Option ID :- 2606,
- A is true but R is false , Option ID :- 2607,
- A is false but R is true , Option ID :- 2608,

Question ID:- 731

Yeast cells obtained from batch fermentation can be reutilized for the production of:

Options:-

- Beer , Option ID :- 2921,
- Trypsin , Option ID :- 2922,
- Chloramphenicol , Option ID :- 2923,
- Acetic acid , Option ID :- 2924,

Question ID:- 760

In animal cloning, donor somatic cells should be in which stage of cell cycle?

Options:-

- G1, Option ID :- 3037,
- S, Option ID :- 3038,
- G2, Option ID :- 3039,
- G0, Option ID :- 3040,

Question ID:- 739

A protein sequence has twenty consecutive hydrophobic amino acids followed by a few hydrophilic residues and this pattern repeats itself five to seven times. Which kind of a protein is described here?

Options:-

- A secretory protein , Option ID :- 2953,
- A transmembrane protein, Option ID :- 2954,
- A cytoplasmic soluble enzyme , Option ID :- 2955,
- A ribosomal protein , Option ID :- 2956,

Question ID:- 628

Which enzyme will digest RNA in a DNA-RNA Hybrid?

Options:-

- RNase A, Option ID :- 2509,
- BamHI, Option ID :- 2510,
- Reverse transcriptase, Option ID :- 2511,
- RNase H, Option ID :- 2512,

Question ID:- 631

Which one of these is a metal containing Vitamin?

Options:-

- Vitamin C, Option ID :- 2521,

- Vitamin B1, Option ID :- 2522,
- Vitamin B12, Option ID :- 2523,
- Vitamin A, Option ID :- 2524,

Question ID:- 695

Which one among the following is an important constituent of RNA induced silencing complex in plants?

Options:-

- Argonaute , Option ID :- 2777,
- LHP1 , Option ID :- 2778,
- RNaseP , Option ID :- 2779,
- RNA dependent RNA polymerase , Option ID :- 2780,

Question ID:- 656

DNA isolated from four unidentified species of bacteria – A, B, C and D has been estimated to have 38%, 26%, 24% and 12% thymine, respectively. One of these four species was isolated from a hot spring (64°C). Identify the candidate which is most likely to be a thermophilic bacterium.

Options:-

- A, Option ID :- 2621,
- B, Option ID :- 2622,
- C, Option ID :- 2623,
- D, Option ID :- 2624,

Question ID:- 723

A Continuous Stirred Tank Reactor (CSTR) is running at a dilution (D) of  $0.3 \text{ h}^{-1}$  and the product formed is growth associated with  $Y_{p/x} = 0.2 \text{ g/g}$ . In order to obtain productivity =  $1.2 \text{ g l}^{-1} \text{ h}^{-1}$  we need to have at steady state a biomass concentration of:

Options:-

- 0.8 g/l, Option ID :- 2889,
- 1.8 g/l, Option ID :- 2890,
- 0.072 g/l, Option ID :- 2891,
- 20 g/l, Option ID :- 2892,

Question ID:- 622

What is the molarity of 100 g Glycine (75 Daltons) dissolved in 1 liter water?

Options:-

- 75.0 M, Option ID :- 2485,
- 0.0133 M, Option ID :- 2486,

- 1.33 M, Option ID :- 2487,
- 10.0 M, Option ID :- 2488,

Question ID:- 769

Which one of the following is NOT extracted from seaweeds:

Options:-

- Agar , Option ID :- 3073,
- Alginate , Option ID :- 3074,
- Calcium , Option ID :- 3075,
- Aginomoto , Option ID :- 3076,

Question ID:- 678

T- cell clones in an individual recognize peptides only when bound and displayed by that individual's MHC molecules on the surface of antigen presenting cells. This process is known as:

Options:-

- MHC selection, Option ID :- 2709,
- MHC restriction, Option ID :- 2710,
- MHC interaction, Option ID :- 2711,
- MHC display, Option ID :- 2712,

Question ID:- 754

Which regions of the genome are best suited for generating DNA Barcodes for species identification?

Options:-

- Organellar genes , Option ID :- 3013,
- Ribosomal genes , Option ID :- 3014,
- Histone genes , Option ID :- 3015,
- Non coding regions of the genome , Option ID :- 3016,

Question ID:- 650

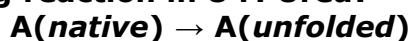
TATA box involved in the initiation of transcription is located in the:

Options:-

- Promoter region, Option ID :- 2597,
- Enhancer region, Option ID :- 2598,
- Exon region, Option ID :- 2599,
- Intron region, Option ID :- 2600,

Question ID:- 640

A protein completely unfolds in 8 M Urea. The stability of the folded state in water is calculated to be 8 kcal/mole at 25°C. What is the likely  $\Delta G$  of the following reaction in 8 M Urea?



Choose the correct answer:

Options:-

- Zero , Option ID :- 2557,
- Less than zero , Option ID :- 2558,
- $8^2$  kcal/mole , Option ID :- 2559,
- 8 kcal/mole , Option ID :- 2560,

Question ID:- 711

If an enzyme is NOT damaged during the process of entrapment in a bead, then internal pore diffusion will:

Options:-

- Change the observed  $V_{\max}$  only , Option ID :- 2841,
- Change the observed  $K_m$  only , Option ID :- 2842,
- Change both the  $V_{\max}$  and  $K_m$  , Option ID :- 2843,
- Both the observed  $V_m$  and  $K_m$  will remain unchanged , Option ID :- 2844,

Question ID:- 687

Which one of the following is NOT applicable for a chemical synapse?

Options:-

- Usually synaptic cleft is approx. 20 – 40 nm. , Option ID :- 2745,
- May release excitatory or inhibitory neurotransmitter. , Option ID :- 2746,
- Cannot modulate signal intensity. , Option ID :- 2747,
- There is a delay of signal propagation. , Option ID :- 2748,

Question ID:- 649

Which one of the following Immunoglobulins cause type 1 allergic reaction?

Options:-

- IgG, Option ID :- 2593,
- IgM, Option ID :- 2594,
- IgE, Option ID :- 2595,
- IgA, Option ID :- 2596,

Question ID:- 689

Sleep loss may induce:

Options:-

- increased learning ability and increased body weight., Option ID :- 2753,
- increased memory loss and reduced infection., Option ID :- 2754,
- increased memory retention, increased infection and reduced cognitive ability., Option ID :- 2755,
- increased memory loss, compromised immune system, and decreased cognitive ability., Option ID :- 2756,

Question ID:- 743

Which one of the following lines of unix commands can tell you the number of lines in a file?

Options:-

- pc - f , Option ID :- 2969,
- ls - a , Option ID :- 2970,
- df - h , Option ID :- 2971,
- wc - l , Option ID :- 2972,

Question ID:- 726

Penicillin titers have been increased more than 1000 fold by classical mutagenesis from the original Fleming strain. The reason behind this increase in the titer is:

Options:-

- Increase in the promoter strength of the penicillin encoding genes , Option ID :- 2901,
- Increase in the stability of the mRNA of these genes , Option ID :- 2902,
- Increase in the stability of the proteins encoded by these genes , Option ID :- 2903,
- Removal of the regulatory controls in the penicillin pathway , Option ID :- 2904,

Question ID:- 750

Proteins usually have hydrophobic interiors or cores and hydrophilic exteriors. If a protein comprises hydrophobic patches on its outer surface, what can it mean?

Options:-

- The protein is unstable, Option ID :- 2997,
- Structure prediction was done wrongly, Option ID :- 2998,
- It could be part of a multimeric protein complex, Option ID :- 2999,
- It is a DNA-binding protein, Option ID :- 3000,

Question ID:- 738

Given below are two statements:

**Statement I:** RNA secondary structure is composed primarily of double-stranded RNA regions formed by folding of the single-stranded molecule back on itself.

**Statement II:** Like protein secondary structure, RNA secondary structure can be conveniently viewed as an intermediate step in the formation of a three-dimensional structure.

In the light of the above statements, choose the most appropriate answer from the options given below

**Options:-**

- Both Statement I and Statement II are correct , Option ID :- 2949,
- Both Statement I and Statement II are incorrect , Option ID :- 2950,
- Statement I is correct but Statement II is incorrect , Option ID :- 2951,
- Statement I is incorrect but Statement II is correct , Option ID :- 2952,

Question ID:- 700

Which one among the following is the correct function of leghaemoglobin?

**Options:-**

- It sequesters oxygen to facilitate nitrogen fixation , Option ID :- 2797, ▪ It protects nitrogenase from  $\text{CO}_2$  , Option ID :- 2798,
- It facilitates the supply of  $\text{CO}_2$  to nitrogen fixing bacteria , Option ID :-2799,
- It binds to nitrogen and moves it out of the nodule , Option ID :- 2800,

Question ID:- 648

Which one of the immunodeficiency is caused by a mutation in *BTK* gene:

**Options:-**

- X-linked SCID , Option ID :- 2589,
- X-linked agammaglobulinemia , Option ID :- 2590,
- DiGeorge syndrome , Option ID :- 2591,
- Chronic granulomatous disease , Option ID :- 2592,

Question ID:- 690

Which one of the following is NOT a function of the glial cells in the brain?

**Options:-**

- Transporting neurotransmitter vesicles from soma to terminal. , Option ID :- 2757,

- Directing axons to their targets. , Option ID :- 2758,
- Promoting the survival of nascent neurons. , Option ID :- 2759,
- Forming the synapse. , Option ID :- 2760,

Question ID:- 759

In animal cloning protocol, while performing enucleation, which chemical is used for relaxing the cellular cytoskeleton?

Options:-

- Phytohaemagglutinin, Option ID :- 3033,
- Cytochalasin B, Option ID :- 3034,
- Pronase, Option ID :- 3035,
- Heparin, Option ID :- 3036,

Question ID:- 694

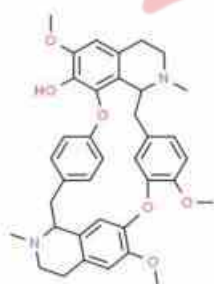
Cryptochromes control photomorphogenesis in response to:

Options:-

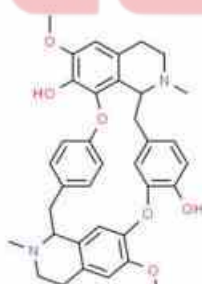
- Red light, Option ID :- 2773,
- Far-red light, Option ID :- 2774,
- Infra-red light, Option ID :- 2775,
- Blue and UV-A light, Option ID :- 2776,

Question ID:- 625

What, if any, is the difference between the molecular weights of molecule A (left) vs molecule B (right) ?



A



B

Options:-

- Molecular weight of the two are identical , Option ID :- 2497,
- Molecular weight of A is less by 20 Daltons , Option ID :- 2498,
- Molecular weight of A is more by 14 Daltons , Option ID :- 2499,
- Molecular weight of B is more by 2 Daltons , Option ID :- 2500,

**Question ID:- 688**

Given below are two statements: one is labelled as Assertion A and the other is labelled as Reason R

**Assertion A:** Heating of preoptic anterior hypothalamic area of the brain caused profuse sweating and dilation of blood vessels of the skin.

**Reason R:** The above (in A) is to absorb more heat into the body and throw out waste from the body.

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

**Options:-**

- Both A and R are correct and R is the correct explanation of A , Option ID :- 2749,
- Both A and R are correct but R is not the correct explanation of A , Option ID :- 2750,
- A is correct but R is incorrect , Option ID :- 2751,
- A is incorrect but R is correct , Option ID :- 2752,

**Question ID:- 756**

Which one of the following cell separation techniques allows cells from different stages of the cell cycle to be separated simultaneously with minimal perturbation to their physiology?

**Options:-**

- counterflow centrifugal elutriation, Option ID :- 3021,
- fluorescent activated cell sorter, Option ID :- 3022,
- size exclusion chromatography, Option ID :- 3023,
- ultracentrifugation, Option ID :- 3024,

**Question ID:- 644**

A laboratory is trying to purify a Histone-binding protein from its native source. Which one of the following purification techniques should be used for one-step purification of the protein?

**Options:-**

- Cation exchange chromatography , Option ID :- 2573,
- Immuno affinity chromatography , Option ID :- 2574,
- Gel exclusion chromatography , Option ID :- 2575,
- Metal affinity chromatography , Option ID :- 2576,

**Question ID:- 757**

Choose the correct statement in respect to metazoan development:

**Options:-**

- Delta is a cell surface protein while Notch is an intracellular protein. , Option ID :- 3025,
- Notch is a cell surface protein while Delta is an intracellular protein. , Option ID :- 3026,
- Delta and Notch are not present on the same cell. , Option ID :- 3027,
- Notch and Delta both are cell surface proteins present on the same precursor cell. , Option ID :- 3028,

Question ID:- 665

Which one of the following properties of naturally occurring D-amino acids is INCORRECT:

Options:-

- Peptides arising from them are more susceptible to attack by peptidases. , Option ID :- 2657,
- They are components of bacterial cell wall. , Option ID :- 2658,
- Peptides arising from them are not synthesized by ribosomal machinery. , Option ID :- 2659,
- They are components of many bacterially produced peptide antibiotics. , Option ID :- 2660,

Question ID:- 683

RTS,S vaccine for malaria consists of the central repeat (R) region derived from *Plasmodium falciparum* circumsporozoite protein (CSP) that is genetically fused to the T-cell epitope (T) and surface antigen (S) regions derived from:

Options:-

- Vaccinia virus , Option ID :- 2729,
- Hepatitis B virus , Option ID :- 2730,
- Adenovirus , Option ID :- 2731,
- Influenza virus , Option ID :- 2732,