Biochemistry (XL-Q)

Question Number : 16 **Correct : 1 Wrong : -0.33**

The molecular weight of a protein as determined by native PAGE is 400 kDa. This protein when run on a non-reducing SDS-PAGE gave a band of 200 kDa, and on a reducing SDS-PAGE, gave a band of 100 kDa. The protein has

(A) four subunits of which two sets are linked by two disulfide bridges
(B) four subunits which are linked by four disulfide bridges
(C) two subunits only and none are linked by disulfide bridges
(D) two subunits which are linked by disulfide bridges

Question Number : 17 **Correct : 1 Wrong : -0.33**

Which one of the following techniques CANNOT be used to determine the sequence of a novel protein?

(A) De novo sequencing by ESI-MS/MS
(B) Edman degradation
(C) Sanger sequencing
(D) Peptide mass fingerprinting

Question Number : 18 **Correct : 1 Wrong : -0.33**

Which type of polyacrylamide gel can be used for analyzing the four different proteins listed below?
Protein P: 60 kDa, pI 4
Protein Q: 45 kDa, pI 8
Protein R: 60 kDa, pI 6
Protein S: 45 kDa, pI 7.5

(A) 20% gel, pH 4-7
(B) 20% gel, pH 3-10
(C) 12% gel, pH 3-10
(D) 12% gel, pH 4-7

Question Number : 19 **Correct : 1 Wrong : 0**

The number of fragments generated when the peptide '**ANDCQEGKFMLKPDTWRYVSFMRPA**' is subjected to complete digestion with trypsin are ……

Question Number : 20 **Correct : 1 Wrong :- 0.33**

Puromycin is a structural analog of

(A) alanyl-tRNA (B) tyrosyl-tRNA (C) methionyl-tRNA (D) glycyl-tRNA

Question Number : 21 **Correct : 1 Wrong :- 0.33**

Which one of the enzymes is responsible for arsenic toxicity?

(A) Pyruvate kinase
(B) Aldolase
(C) Phosphofructokinase
(D) Pyruvate dehydrogenase

Question Number : 22 **Correct : 1 Wrong :- 0.33**

Which one is TRUE for Calvin cycle?

(A) Glycerol 3-phosphate is generated in this cycle
(B) CO_2 is not consumed in this cycle
(C) This is a reductive pentose phosphate cycle
(D) Ribose 5-phosphate is a carboxylation substrate in this cycle

Question Number : 23 **Correct : 1 Wrong :- 0.33**

Administration of primaquine causes severe hemolytic anemia because it

(A) increases the demand for NADPH to a level that cells can't meet
(B) decreases the demand for NADPH
(C) inactivates glutathione peroxidase of erythrocytes
(D) increases reduced glutathione level of erythrocytes

Question Number : 24 **Correct : 1 Wrong :- 0.33**

Which one of the following will NOT form lipid bilayer?

(A) Cholesterol
(B) Phosphatidyl ethanolamine
(C) Triacylglycerol
(D) Phosphatidyl serine

Question Number : 25 **Correct : 1 Wrong :- 0.33**

Which one of the following features is NOT appropriate for Fab fragment of IgG ?

(A) Contains antigen binding site
(B) Contains an intact L chain
(C) Two fragments are formed from one IgG molecule
(D) Mediates complement fixation in the intact IgG molecule

Question Number : 26 **Correct : 2 Wrong : 0**

The duration of DNA synthesis (S phase) in plant cells is 11 h and the DNA is replicated at a rate of 100 bp/s/fork. A plant species has about 3.0×10^{10} bp DNA/genome. The number of bidirectional forks per genome required for replication will be ……..

Question Number : 27 **Correct : 2 Wrong : 0**

In a PCR reaction, with one double stranded DNA of 600 bp, nano gram of DNA produced after 40 cycles of amplification will be …….

Question Number : 28 **Correct : 2 Wrong : 0**

A solution containing GTP has molar extinction coefficient of 1.55×10^{4} $mol^{-1}dm^{3}cm^{-1}$ at a given wavelength. The concentration of GTP solution is 1.290×10^{-5} mol dm^{-3}. The absorbance of GTP solution in 1 cm cuvette at the same wavelength will be ……

Question Number : 29 **Correct : 2 Wrong : -0.66**

Which one of the following is NOT TRUE for class I MHC protein?

(A) MHC class I protein are polymorphic
(B) T-cell receptors recognizes MHC class I protein
(C) MHC class I protein are displayed on the surfaces of nucleated vertebrate cells
(D) β_2-microglobulin is covalently associated with MHC class I protein

Question Number : 30 **Correct : 2 Wrong : 0**

In an enzyme catalyzed reaction, the initial reaction velocity is only one fourth of its maximum velocity. If the substrate concentration is 3.0×10^{-3} mM, the value of K_m in micro molar (μM) will be ....

Question Number : 31 **Correct : 2 Wrong : -0.66**

Match the following enzymes in column I with their cofactors in column II

Column I	Column II
(P) Pyruvate decarboxylase	i. Biocytin
(Q) Glyceraldehyde 3-phosphate dehydrogenase	ii. $NADP^+$
(R) Pyruvate carboxylase	iii. NAD^+
(S) Glucose-6-phosphate dehydrogenase	iv. Thiamine pyrophosphate

(A) P-ii; Q-i; R-iv; S-iii
(B) P-iv; Q-iii; R-i; S-ii
(C) P-i; Q-ii; R-iii; S-iv
(D) P-iii; Q-i; R-iv; S-ii

Question Number : 32 **Correct : 2 Wrong : -0.66**

Match the molecule in column I with its function in column II

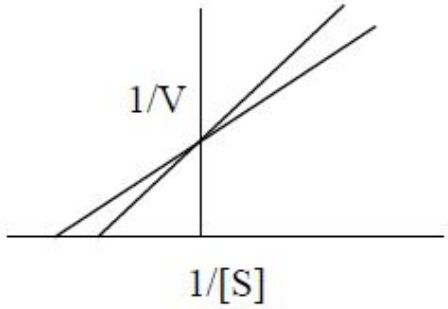
Column I	Column II
(P) Cholera toxin	(i) modifies $G_{\alpha i}$
(Q) Pertussis toxin	(ii) inhibits c-AMP phosphodiesterase
(R) IP3	(iii) modifies $G_{\alpha s}$
(S) Caffeine	(iv) increases intracellular Ca^{2+} level

(A) P-iii ; Q-i; R-iv, S-ii
(B) P-iv ; Q-i; R-iii, S-ii
(C) P-ii ; Q-iv; R-i, S-iii
(D) P-iii ; Q-i; R-ii, S-iv

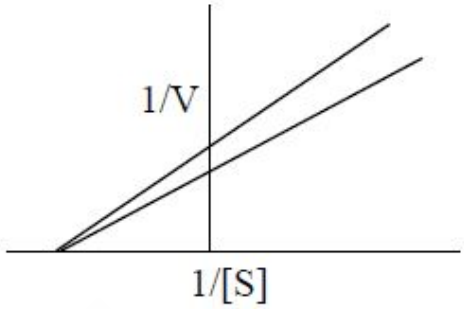
Question Number : 33 **Correct : 2 Wrong : -0.66**

In an *in vitro* dehydrogenation reaction of succinate catalyzed by succinate dehydrogenase, malonate is added. Which one of the following curves represents the effect of malonate on the catalysis of succinate dehydrogenase?

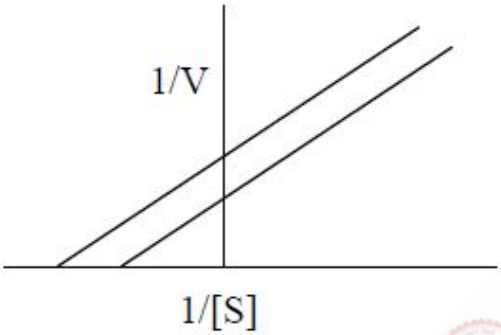
(A)



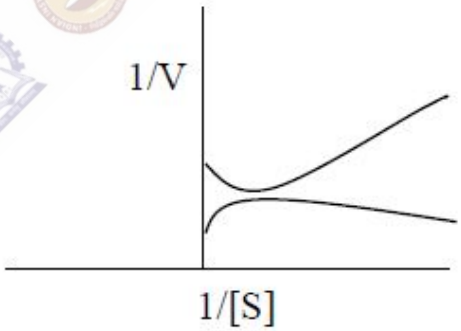
(B)



(C)



(D)



Question Number : 34 **Correct : 2 Wrong : -0.66**

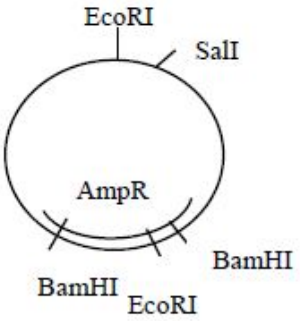
Cardiotonic steroids have ability to strengthen heart muscle contraction due to the fact that these steroids

(A) inhibit K^+-dependent dephosphorylation of Na^+-K^+ ATPase
(B) activate Na^+-K^+ ATPase
(C) increase uptake of Na^+ by activation of Na^+-Ca^{2+} exchanger
(D) increase uptake of Ca^{2+} by activation of Na^+-Ca^{2+} exchanger

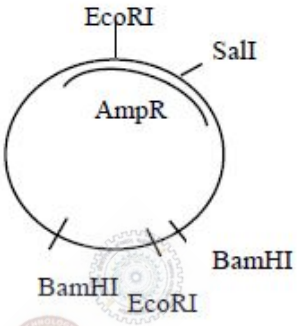
Question Number : 35 **Correct : 2 Wrong : -0.66**

A newly isolated circular plasmid gave two bands of 3.2 and 3 kb on digestion with EcoRI and two bands of 5.0 kb and 1.2 kb on digestion with BamHI. Double digestion with EcoRI and BamHI, yielded four bands of 2.6 kb, 2.4 kb, 0.8 kb and 0.4 kb. Digestion with SalI led to disruption of ampicillin resistance gene cassette. The correct restriction map is

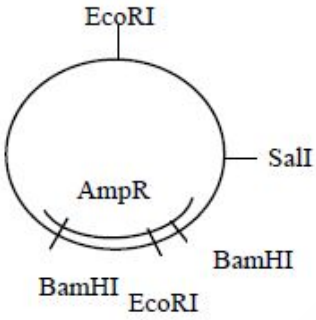
(A)



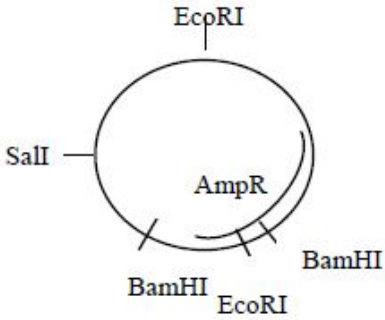
(B)



(C)



(D)



General Aptitude

Question Number : 116 **Correct : 1 Wrong : -0.33**

The event would have been successful if you _____ able to come.

(A) are (B) had been (C) have been (D) would have been

Question Number : 117 **Correct : 1 Wrong : -0.33**

There was no doubt that their work was thorough.

Which of the words below is closest in meaning to the underlined word above?

(A) pretty (B) complete (C) sloppy (D) haphazard

Question Number : 118 **Correct : 1 Wrong : -0.33**

Four cards lie on a table. Each card has a number printed on one side and a colour on the other. The faces visible on the cards are 2, 3, red, and blue.

Proposition: If a card has an even value on one side, then its opposite face is red.

The cards which MUST be turned over to verify the above proposition are

(A) 2, red (B) 2, 3, red (C) 2, blue (D) 2, red, blue

Question Number : 119 **Correct : 1 Wrong : -0.33**

What is the value of x when $81 \times \left(\frac{16}{25}\right)^{x+2} \div \left(\frac{3}{5}\right)^{2x+4} = 144$?

(A) 1 (B) -1 (C) -2 (D) Cannot be determined

Question Number : 120 **Correct : 1 Wrong : -0.33**

Two dice are thrown simultaneously. The probability that the product of the numbers appearing on the top faces of the dice is a perfect square is

(A) 1/9 (B) 2/9 (C) 1/3 (D) 4/9

Question Number : 121 **Correct : 2 Wrong : -0.66**

Bhaichung was observing the pattern of people entering and leaving a car service centre. There was a single window where customers were being served. He saw that people inevitably came out of the centre in the order that they went in. However, the time they spent inside seemed to vary a lot: some people came out in a matter of minutes while for others it took much longer.

From this, what can one conclude?

(A) The centre operates on a first-come-first-served basis, but with variable service times, depending on specific customer needs.
(B) Customers were served in an arbitrary order, since they took varying amounts of time for service completion in the centre.
(C) Since some people came out within a few minutes of entering the centre, the system is likely to operate on a last-come-first-served basis.
(D) Entering the centre early ensured that one would have shorter service times and most people attempted to do this.

Question Number : 122 **Correct : 2 Wrong : -0.66**

A map shows the elevations of Darjeeling, Gangtok, Kalimpong, Pelling, and Siliguri. Kalimpong is at a lower elevation than Gangtok. Pelling is at a lower elevation than Gangtok. Pelling is at a higher elevation than Siliguri. Darjeeling is at a higher elevation than Gangtok.

Which of the following statements can be inferred from the paragraph above?

i. Pelling is at a higher elevation than Kalimpong
ii. Kalimpong is at a lower elevation than Darjeeling
iii. Kalimpong is at a higher elevation than Siliguri
iv. Siliguri is at a lower elevation than Gangtok

(A) Only ii (B) Only ii and iii (C) Only ii and iv (D) Only iii and iv

Question Number : 123 **Correct : 2 Wrong : -0.66**

P, Q, R, S, T and U are seated around a circular table. R is seated two places to the right of Q. P is seated three places to the left of R. S is seated opposite U. If P and U now switch seats, which of the following must necessarily be true?

(A) P is immediately to the right of R
(B) T is immediately to the left of P
(C) T is immediately to the left of P or P is immediately to the right of Q
(D) U is immediately to the right of R or P is immediately to the left of T

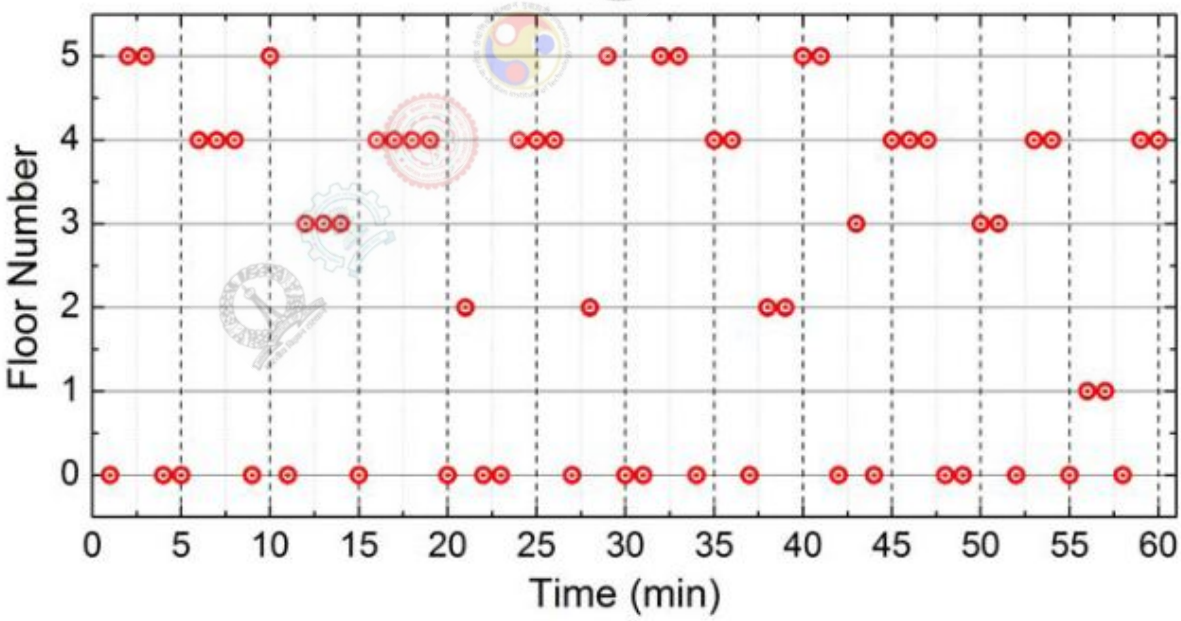
Question Number : 124 **Correct : 2 Wrong : -0.66**

Budhan covers a distance of 19 km in 2 hours by cycling one fourth of the time and walking the rest. The next day he cycles (at the same speed as before) for half the time and walks the rest (at the same speed as before) and covers 26 km in 2 hours. The speed in km/h at which Budhan walks is

(A) 1 (B) 4 (C) 5 (D) 6

Question Number : 125 **Correct : 2 Wrong : -0.66**

The points in the graph below represent the halts of a lift for durations of 1 minute, over a period of 1 hour.



Which of the following statements are correct?

i. The elevator never moves directly from any non-ground floor to another non-ground floor over the one hour period
ii. The elevator stays on the fourth floor for the longest duration over the one hour period

(A)) Only i (B) Only ii (C) Both i and ii (D) Neither i nor ii

Q. No.	Type	Section	Key	Marks
1	MCQ	XL-P	A	1
2	MCQ	XL-P	D	1
3	MCQ	XL-P	D	1
4	MCQ	XL-P	B	1
5	MCQ	XL-P	A	1
6	MCQ	XL-P	C	2
7	MCQ	XL-P	B	2
8	MCQ	XL-P	C	2
9	MCQ	XL-P	C	2
10	MCQ	XL-P	B	2
11	MCQ	XL-P	A	2
12	NAT	XL-P	13260 to 13285	2
13	MCQ	XL-P	A	2
14	MCQ	XL-P	C	2
15	MCQ	XL-P	A	2
16	MCQ	XL-Q	A	1
17	MCQ	XL-Q	D	1
18	MCQ	XL-Q	C	1
19	NAT	XL-Q	3.0 to 3.0	1
20	MCQ	XL-Q	B	1
21	MCQ	XL-Q	D	1
22	MCQ	XL-Q	C	1
23	MCQ	XL-Q	A	1
24	MCQ	XL-Q	C	1
25	MCQ	XL-Q	D	1
26	NAT	XL-Q	7575 to 7576	2
27	NAT	XL-Q	722 to 725	2
28	NAT	XL-Q	0.19 to 0.20	2
29	MCQ	XL-Q	D	2
30	NAT	XL-Q	9.0 to 9.0	2
31	MCQ	XL-Q	B	2
32	MCQ	XL-Q	A	2
33	MCQ	XL-Q	A	2
34	MCQ	XL-Q	A	2
35	MCQ	XL-Q	B	2
36	MCQ	XL-R	C	1

37	MCQ	XL-R	B	1
38	MCQ	XL-R	C	1
39	MCQ	XL-R	A	1
40	MCQ	XL-R	D	1
41	MCQ	XL-R	A	1
42	MCQ	XL-R	C	1
43	MCQ	XL-R	D	1
44	MCQ	XL-R	D	1
45	MCQ	XL-R	A	1
46	MCQ	XL-R	A	2
47	MCQ	XL-R	A	2
48	MCQ	XL-R	B	2
49	NAT	XL-R	18.3 to 18.5	2
50	NAT	XL-R	3.2 to 3.2	2
51	MCQ	XL-R	B	2
52	MCQ	XL-R	D	2
53	MCQ	XL-R	C	2
54	MCQ	XL-R	D	2
55	MCQ	XL-R	A	2
56	MCQ	XL-S	A	1
57	MCQ	XL-S	B	1
58	MCQ	XL-S	D	1
59	MCQ	XL-S	C	1
60	MCQ	XL-S	C	1
61	MCQ	XL-S	A	1
62	MCQ	XL-S	A	1
63	MCQ	XL-S	D	1
64	MCQ	XL-S	B	1
65	MCQ	XL-S	C	1
66	MCQ	XL-S	A	2
67	MCQ	XL-S	B	2
68	MCQ	XL-S	A	2
69	MCQ	XL-S	B	2
70	MCQ	XL-S	B	2
71	NAT	XL-S	4550000 to 4650000	2
72	NAT	XL-S	99 to 101	2
73	NAT	XL-S	78000 to 82000	2

74	NAT	XL-S	9990 to 10020	2
75	MCQ	XL-S	A	2
76	MCQ	XL-T	D	1
77	MCQ	XL-T	A	1
78	MCQ	XL-T	C	1
79	MCQ	XL-T	B	1
80	MCQ	XL-T	C	1
81	MCQ	XL-T	A	1
82	MCQ	XL-T	C	1
83	MCQ	XL-T	B	1
84	MCQ	XL-T	D	1
85	MCQ	XL-T	D	1
86	NAT	XL-T	8.0 to 8.0	2
87	NAT	XL-T	7.0 to 7.0	2
88	NAT	XL-T	0.55 to 0.55	2
89	NAT	XL-T	16 to 16	2
90	MCQ	XL-T	D	2
91	MCQ	XL-T	A	2
92	MCQ	XL-T	B or D	2
93	MCQ	XL-T	B	2
94	NAT	XL-T	42.0 to 42.0	2
95	NAT	XL-T	250 to 250	2
96	MCQ	XL-U	B	1
97	MCQ	XL-U	B	1
98	MCQ	XL-U	D	1
99	MCQ	XL-U	B	1
100	NAT	XL-U	1000 to 1000	1
101	MCQ	XL-U	A	1
102	NAT	XL-U	2078 to 2086	1
103	NAT	XL-U	0.80 to 0.90	1
104	MCQ	XL-U	A	1
105	MCQ	XL-U	D	1
106	MCQ	XL-U	C	2
107	MCQ	XL-U	B	2
108	MCQ	XL-U	D	2
109	NAT	XL-U	25550 to 25650	2
110	MCQ	XL-U	D	2

111	NAT	XL-U	53.30 to 55.25	2
112	NAT	XL-U	64.0 to 64.0	2
113	NAT	XL-U	10.80 to 11.20	2
114	NAT	XL-U	9000 to 9000	2
115	NAT	XL-U	0.30 to 0.40	2
116	MCQ	GA	B	1
117	MCQ	GA	B	1
118	MCQ	GA	C	1
119	MCQ	GA	B	1
120	MCQ	GA	B	1
121	MCQ	GA	A	2
122	MCQ	GA	C	2
123	MCQ	GA	C	2
124	MCQ	GA	D	2
125	MCQ	GA	D	2