Botany (XL-R)

Question Number : 36 **Correct : 1 Wrong : -0.33**

As per the Angiosperm Phylogeny Group (APG II, 2003) classification, which of the following plant families comprises of only single genus with single species?

(A) Lauraceae
(B) Aristolochiaceae
(C) Amborellaceae
(D) Typhaceae

Question Number : 37 **Correct : 1 Wrong : -0.33**

A cavity, lysigenous in origin and possessing volatile oil is found in the pericarp of one of the following plants. Identify the **CORRECT** answer.

(A) Litchi
(B) Citrus
(C) Mango
(D) Coconut

Question Number : 38 **Correct : 1 Wrong : -0.33**

Among the following, which genetic material is naturally inherited through maternal inheritance in higher plants?

(A) Nuclear DNA
(B) Plasmid DNA
(C) Chloroplast DNA
(D) T-DNA

Question Number : 39 **Correct : 1 Wrong : -0.33**

A typical floral meristem differs from shoot apical meristem on the basis of

(A) Determinate growth
(B) Presence of auxin
(C) Presence of stem cells
(D) Negative geotropism

Question Number : 40 **Correct : 1 Wrong : -0.33**

Which of the following plant hormones is a carotenoid-cleavage product?

(A) Phytosulfokine
(B) Brassinosteroid
(C) Methyl jasmonate
(D) Strigolactone

Question Number : 41 **Correct : 1 Wrong : -0.33**

Two of the *vir* operons of Ti plasmid in *Agrobacterium tumefaciens* are constitutively expressed. Identify the **CORRECT** pair.

(A) *virA* and *virG*
(B) *virF* and *virH*
(C) *virC* and *virD*
(D) *virB* and *virE*

Question Number : 42 **Correct : 1 Wrong : -0.33**

Which of the following fungi is an example of obligate biotrophic plant pathogen?

(A) *Alternaria brassicicola*
(B) *Botrytis cinerea*
(C) *Puccinia triticina*
(D) *Sclerotinia sclerotiorum*

Question Number : 43 **Correct : 1 Wrong : -0.33**

The phenomenon where an organism lives at the expense of another organism by harming it but not killing, is called

(A) Commensalism
(B) Predation
(C) Symbiosis
(D) Parasitism

Question Number : 44 **Correct : 1 Wrong : -0.33**

Which of the following is **TRUE** for *K*-strategist species?

(A) Produce relatively large number of offspring
(B) Population often grow exponentially
(C) Provide relatively little or no parental care to offspring
(D) Occur in stable and predictable habitats

Question Number : 45 **Correct : 1 Wrong : -0.33**

Identify the **INCORRECT** statement with relation to plant secondary metabolites.

(A) Atropine is a member of indole alkaloids
(B) Limonene is a cyclic terpene found in citrus plants
(C) Green tea is rich in polyphenols
(D) Cyanidin contributes to the red color in rose petals

Question Number : 46 **Correct : 2 Wrong : -0.66**

Choose the **CORRECT** set of matches between group I and group II in relation to nitrogen fixation and assimilation

GROUP I	**GROUP II**
P. *Nitrobacter*	1. $NO_3^- \rightarrow NO_2^-$
Q. Nitrite reductase	2. $N_2 \rightarrow 2NH_3$
R. Nitrogenase	3. $NO_2^- \rightarrow NH_4^+$
S. Nitrate reductase	4. $NO_2^- \rightarrow NO_3^-$

(A) P-4, Q-3, R-2, S-1
(B) P-4, Q-3, R-1, S-2
(C) P-1, Q-2, R-4, S-3
(D) P-3, Q-4, R-2, S-1

Question Number : 47 Correct : 2 Wrong : -0.66

Two plant cells M and N are lying side by side making direct contact. "M" has osmotic potential (Ψs) of -10 bar and pressure potential (Ψp) of 4 bar. On the other hand, "N" has osmotic potential (Ψs) of -12 bar and pressure potential (Ψp) of 5 bar.

Based on these data, what would be the direction of movement of water between M and N?

(A) M to N
(B) N to M
(C) There will be no movement
(D) In both directions

Question Number : 48 Correct : 2 Wrong : -0.66

Two independent non-segregating recessive mutants (*m1* and *m2*) display similar defects in petal formation. When they were crossed with each other (*m1* x *m2*), all the F1 plants developed normal petals. In view of this observation, which of the following conclusions is **CORRECT**?

(A) Mutations in both *m1* and *m2* are in the same gene
(B) Mutations in both *m1* and *m2* are in two separate genes
(C) Inheritance is non-Mendelian
(D) None of the above

Question Number : 49 Correct : 2 Wrong : 0

In a hypothetical trihybrid cross of three loci (*viz*. A, B, C), all were inherited in a complete dominant manner over their recessive alleles a, b, c, respectively. When a test cross between F1 and parent 'aabbcc' was performed, following genotypes of eight phenotypically distinct classes were observed with respective numbers

Class	Genotype	Number
1	ABC	412
2	abc	406
3	Abc	85
4	aBC	80
5	ABc	08
6	abC	07
7	AbC	01
8	aBc	01

The genetic distance (up to one decimal) between A and C loci will be _____ cM.

Question Number : 50 **Correct : 2 Wrong : 0**

In a typical sexually reproducing angiospermic plant, if an endosperm cell contains 4.8×10^8 nucleotide pairs of DNA, then a microsporocyte of this plant will have _____ $\times10^8$ nucleotide pairs of DNA.

Question Number : 51 **Correct : 2 Wrong : -0.66**

Identify the **CORRECT** matching between group I and group II in relation to ecology

GROUP I	GROUP II
P. The physical environment of an organism	1. Trophic level
Q. The totality of the needs of a population for survival and its resource utilization	2. Habitat
R. The position of a species in a food chain	3. Ecosystem
S. Basic functional unit comprising living community and its physical environment	4. Niche
	5. Ecological pyramid

(A) P-2, Q-5, R-4, S-1
(B) P-2, Q-4, R-1, S-3
(C) P-5, Q-2, R-3, S-1
(D) P-1, Q-3, R-4, S-2

Question Number : 52 **Correct : 2 Wrong : -0.66**

Choose the **CORRECT** set of matches between group I and group II in relation to plant genetic transformation methods.

GROUP I	GROUP II
P. Helium	1. *Agrobacterium tumefaciens*
Q. Acetosyringone	2. Microinjection
R. Polyethylene glycol	3. Particle bombardment
S. Agarose embedding	4. Protoplast

(A) P-4, Q-3, R-2, S-1
(B) P-2, Q-1, R-4, S-3
(C) P-3, Q-4, R-1, S-2
(D) P-3, Q-1, R-4, S-2

Question Number : 53 **Correct : 2 Wrong : -0.66**

Match the pathogen, disease caused and the affected plant in the **CORRECT** combination.

Pathogen	**Disease**	**Plant**
P. *Blumeria graminis*	i. Blast disease	1. Groundnut
Q. *Magnaporthe grisea*	ii. Powdery mildew	2. Apple
R. *Venturia inaequalis*	iii. Tikka disease	3. Barley
S. *Cercospora personata*	iv. Scab disease	4. Rice

(A) P-i-1, Q-ii-2, R-iii-3, S-iv-4
(B) P-i-2, Q-ii-1, R-iii-4, S-iv-3
(C) P-ii-3, Q-i-4, R-iv-2, S-iii-1
(D) P-ii-3, Q-i-4, R-iii-2, S-iv-1

Question Number : 54 Correct : 2 Wrong : -0.66

Choose the plant part, its use and the source species in **CORRECT** combination.

Plant Part	**Use**	**Species**
P. Bark	i. Insecticide	1. *Crocus sativus*
Q. Leaf	ii. Food colorant	2. *Papaver somniferum*
R. Capsule	iii. Flavoring agent	3. *Azadirachta indica*
S. Stigma	iv. Analgesic	4. *Cinnamomum zeylanicum*

(A) P-i-1, Q-ii-2, R-iii-3, S-iv-4
(B) P-iii-4, Q-ii-1, R-iv-2, S-i-3
(C) P-ii-1, Q-i-3, R-iv-2, S-iii-4
(D) P-iii-4, Q-i-3, R-iv-2, S-ii-1

Question Number : 55 Correct : 2 Wrong : -0.66

Which **TWO** of the following reactions are **INCORRECT** in relation to C_2 oxidative photosynthetic carbon cycle in land plants?

P. 2 (Ribulose-1,5-biphosphate) + 2(CO_2) → 2 (phosphoglycolate) + 2 (3-phosphoglycerate) + $4H^+$

Q. Serine + α-ketoglutarate → hydroxypyruvate + glutamine

R. 2 (Phosphoglycolate) + 2(H_2O) → 2 (glycolate) + 2Pi

S. Hydroxypyruvate + NADH + H^+ → glycerate + NAD^+

(A) P and Q
(B) Q and R
(C) R and S
(D) S and P

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

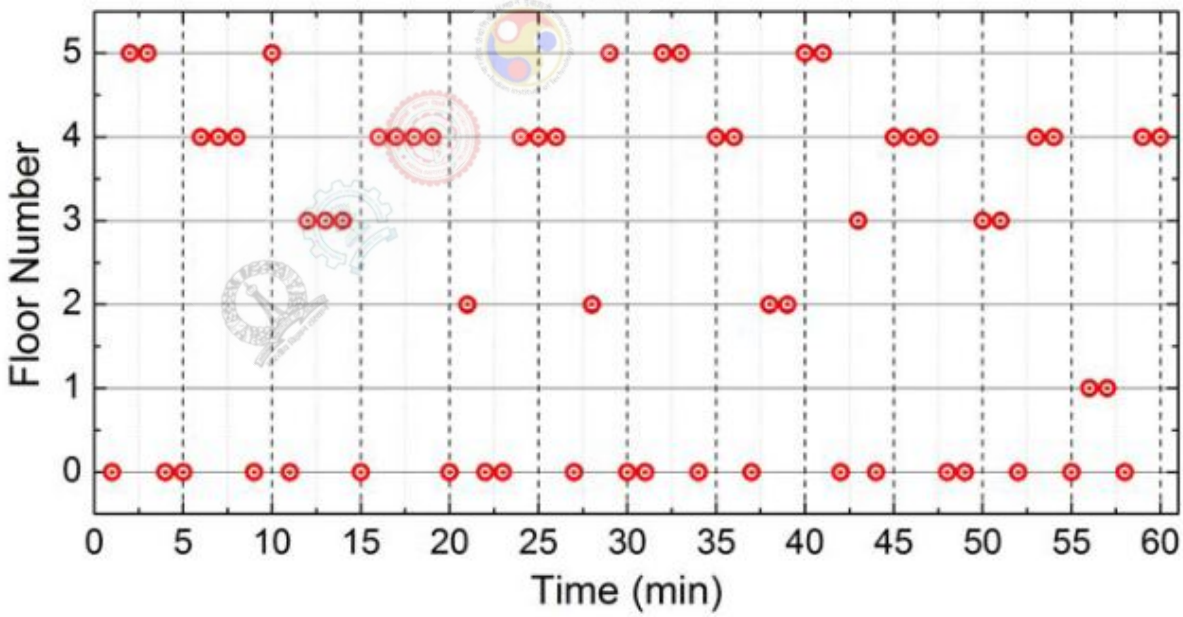
Question Number : 124 Correct : 2 Wrong : -0.66

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