

Zoology (XL-T)

Question Number : 76

Correct : 1 Wrong : -0.33

The characteristic feature of deuterostomes is depicted by

- (A) coelom formed by the hollowing out of a previously solid cord of mesodermal cells
- (B) spiral and determinate cleavage
- (C) formation of mouth from blastopore
- (D) formation of anus from blastopore

Question Number : 77

Correct : 1 Wrong : -0.33

One of the most remarkable features of evolution is the formation of amnion and allantois. This appeared for the "first time" in evolutionary time scale in

- (A) reptiles
- (B) birds
- (C) fishes
- (D) humans

Question Number : 78

Correct : 1 Wrong : -0.33

A woman with blood group A gave birth to a baby with blood group AB. The blood group of the father would be

- (A) only AB
- (B) only B
- (C) either AB or B
- (D) blood group O

Question Number : 79

Correct : 1 Wrong : -0.33

The enzyme amylase can break alpha glycosidic linkages between glucose monomers. Hence, amylase can digest which one of the following carbohydrates?

- (A) Cellulose
- (B) Starch
- (C) Chitin
- (D) Xylans

Question Number : 80

Correct : 1 Wrong : -0.33

The metabolic pathway which is common to both fermentation and cellular respiration is

- (A) the TCA cycle
- (B) the electron transport chain
- (C) glycolysis
- (D) synthesis of acetyl CoA from pyruvate

Question Number : 81

Correct : 1 Wrong : -0.33

A female "Spotted sand piper" courts males repeatedly. This behavior can be explained by the term

- (A) polyandry
- (B) polygyny
- (C) monogamy
- (D) sexual cannibalism

Question Number : 82

Correct : 1 Wrong : -0.33

Malaria is caused by *Plasmodium* species, which is a parasite having a complex life cycle. The fusion between male and female gametocytes of *Plasmodium* happens inside

- (A) human liver
- (B) human RBCs
- (C) mosquito midgut
- (D) mosquito salivary glands

Question Number : 83

Correct : 1 Wrong : -0.33

Aromatase inhibitors are often prescribed for post-menopausal women to treat estrogen receptor positive breast cancer patients, because these class of drugs

- (A) reduce prostaglandin biosynthesis
- (B) reduce the level of estradiol biosynthesis
- (C) inhibit conversion of testosterone to dihydrotestosterone
- (D) are non-toxic in post-menopausal women

Question Number : 84

Correct : 1 Wrong : -0.33

The covalent modification performed by kinases which regulate proteins in signaling pathways is

- (A) glycosylation
- (B) methylation
- (C) ubiquitination
- (D) phosphorylation

Question Number : 85

Correct : 1 Wrong : -0.33

Which one of the following statements is NOT correct?

- (A) During metaphase, the 2 copies of chromosomal DNA are held together at the centromere
- (B) The short arm of chromosomes is referred to as p and the long arm is referred to as q
- (C) The terminal structures at the end of the chromatids are referred to as telomeres
- (D) The terms heterochromatin and euchromatin refer to the active and repressed regions of the chromosome respectively

Question Number : 86

Correct : 2 Wrong : 0

A particular species is found to have $2n=16$ chromosomes. The number of linkage groups in this species will be _____

Question Number : 87

Correct : 2 Wrong : 0

In the Meselson and Stahl experiment, *E. coli* was grown in a medium containing $^{15}\text{NH}_4\text{Cl}$. After 24 hours, *E. coli* were transferred to medium containing $^{14}\text{NH}_4\text{Cl}$. After the fourth generation in medium containing $^{14}\text{NH}_4\text{Cl}$, the ratio between hybrids ($^{15}\text{N}/^{14}\text{N}$) and light ($^{14}\text{N}/^{14}\text{N}$) labeled DNA will be 1: n , where the value of n is _____

Question Number : 88

Correct : 2 Wrong : 0

The population data present in an island is as follows

Genotype	Number
<i>AA</i>	300
<i>Aa</i>	500
<i>aa</i>	200
Total	1000

The allele frequency of *A* (upto two decimals) will be _____

Question Number : 89

Correct : 2 Wrong : 0

A cell in G1 phase has 16 chromosomes. The total number of chromatids that would be found per cell during Metaphase II of meiosis are _____

Question Number : 90

Correct : 2 Wrong : -0.66

Upon activation of phospholipase C by ligand binding to G-protein coupled receptor, the Ca^{+2} concentration in cytosol will

- (A) decrease due to blockage of InsP_3 gated channel on endoplasmic reticulum
- (B) decrease due to blockage of InsP_3 gated channel on plasma membrane
- (C) increase due to efflux of Ca^{+2} from InsP_3 gated channel on mitochondria
- (D) increase due to efflux of Ca^{+2} from InsP_3 gated channel on endoplasmic reticulum as well as influx of Ca^{+2} from InsP_3 gated channel on plasma membrane

Question Number : 91**Correct : 2 Wrong : -0.66**

Match the following molecules in Group I with their function in Group II

Group I

- P. Transferrin
- Q. Insulin
- R. α -macroglobulin
- S. Fibronectin

Group II

- (i) Uptake of glucose
- (ii) Binds iron
- (iii) Substratum for cell attachment
- (iv) Proteinase inhibitor
- (v) Binds to oxygen in RBC

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

Question Number : 92**Correct : 2 Wrong : -0.66**

If a heavy chain of an antibody molecule weighs 65,000 Daltons (Da) and a light chain weighs 25,000 Da, the approximate calculated weight of an IgM antibody in Da will be

- (A) 90,000
- (B) 180,000
- (C) 360,000
- (D) 900,000

Question Number : 93**Correct : 2 Wrong : -0.66**

MATCH the signaling pathways in Group I with their functions in Group II, during the process of development

Group I

- P. Hedgehog signaling
- Q. Hox proteins
- R. Wnt signaling
- S. Notch signaling

Group II

- (i) Involved in signaling at 4-cell embryo stage in *C. elegans* through *glp 1* expression
- (ii) Involves frizzled receptor on target cell membrane and establish polarity in insects
- (iii) Plays critical role in facial morphogenesis in vertebrates and its mutation causes cyclopia
- (iv) Required for *T-bx* transcription factor expression for vertebrate limb development

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

Question Number : 94

Correct : 2 Wrong : 0

In a population which is in Hardy-Weinberg equilibrium, the frequency of the recessive genotype of a certain trait is 0.09. The percentage of individuals with heterozygous genotype is ___ %

Question Number : 95

Correct : 2 Wrong : 0

An enzyme preparation has activity of 2 Units per 20 μ l, and protein concentration 0.4 mg/ml. The specific activity (Units/mg) of this enzyme will be ____

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

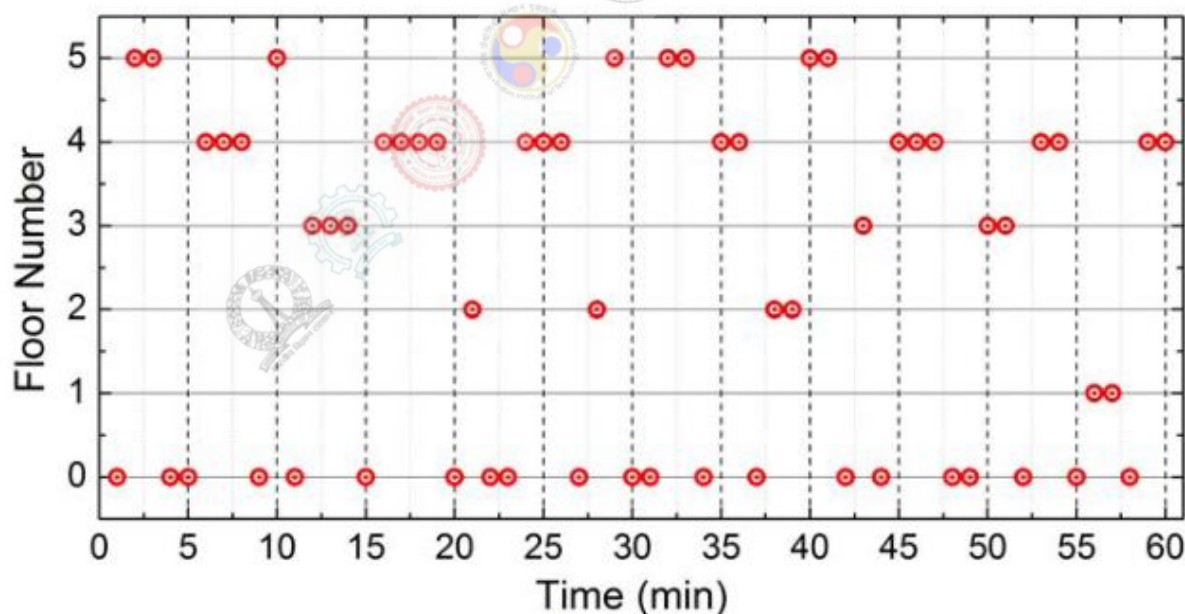
Question Number : 124**Correct : 2 Wrong : -0.66**

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