

CSIR 27th Dec 2019 S1

Application No.	191620063849
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Test Date	27/12/2019
Test Time	9:30 AM - 12:30 PM
Subject	Life Sciences

Section : Part-A General Aptitude

Q.1 A commodity is sold n times, each time at a profit of $p\%$. If the value of the object finally becomes 10 times its original value, then p is

1. $(10^{\frac{1}{n}} - 1)100$
2. $(10^n - 1)100$
3. $(1 - 10^{-n})100$
4. $(1 - 10^{-\frac{1}{n}})100$

Options 1. 1

2. 2

3. 3

4. 4

Question Type : **MCQ**

Question ID : **3398931617**

Option 1 ID : **3398936237**

Option 2 ID : **3398936238**

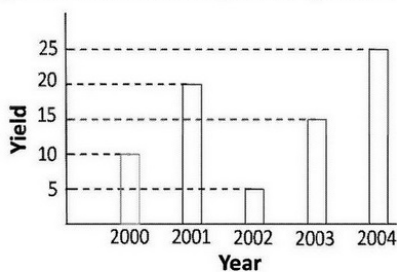
Option 3 ID : **3398936239**

Option 4 ID : **3398936240**

Status : **Not Answered**

Chosen Option : --

Q.2 Year-wise yield in tonnes of a product is given in the graph below. Which year had the largest percent variation in the yield compared to the previous year ?



1. 2004
2. 2003
3. 2002
4. 2001

Options 1. 1

2. 2

3. 3

4. 4

Question Type : **MCQ**

Question ID : **3398931610**

Option 1 ID : **3398936209**

Option 2 ID : 3398936210
Option 3 ID : 3398936211
Option 4 ID : 3398936212
Status : Answered
Chosen Option : 3

Q.3 The decay rate of a certain radioisotope is measured to be 6000 decays/second after 2 seconds and 750 decays/second after 5 seconds. What is the half life of the radioisotope?

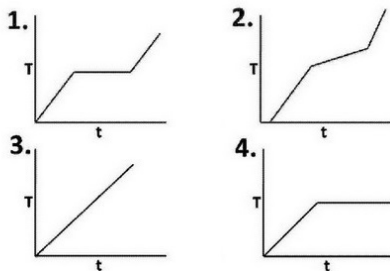
1. 1 second
2. 0.5 second
3. e seconds
4. 1.5 seconds

Options

1. 1
2. 2
3. 3
4. 4

Question Type : MCQ
Question ID : 3398931607
Option 1 ID : 3398936197
Option 2 ID : 3398936198
Option 3 ID : 3398936199
Option 4 ID : 3398936200
Status : Not Answered
Chosen Option : --

Q.4 A piece of iron is heated at a uniform rate. Heating is continued even after it melts. Which one of the following is the correct Temperature-time (T-t) diagram for this process?



Options

1. 1
2. 2
3. 3
4. 4

Question Type : MCQ
Question ID : 3398931612
Option 1 ID : 3398936217
Option 2 ID : 3398936218
Option 3 ID : 3398936219
Option 4 ID : 3398936220
Status : Answered
Chosen Option : 2

Q.5

Options 1. 1

2. 2

3. 3

4. 4

Question Type : **MCQ**

Question ID : **3398931616**

Option 1 ID : **3398936233**

Option 2 ID : **3398936234**

Option 3 ID : **3398936235**

Option 4 ID : **3398936236**

Status : **Answered**

Chosen Option : **4**

Q.6 A certain radioactive material produces H units of heat per unit volume per unit time. A uniform solid sphere is made of this material. The sphere radiates S units of heat per unit area per unit time. For the sphere to reach a steady temperature, its radius should necessarily be

1. less than or equal to $\frac{3S}{H}$

2. more than $\frac{3S}{H}$

3. less than $\frac{S}{H}$

4. more than $\frac{S}{H}$

Options 1. 1

2. 2

3. 3

4. 4

Question Type : **MCQ**

Question ID : **3398931601**

Option 1 ID : **3398936173**

Option 2 ID : **3398936174**

Option 3 ID : **3398936175**

Option 4 ID : **3398936176**

Status : **Not Answered**

Chosen Option : **--**

Q.7

- Options**
1. 1
 2. 2
 3. 3
 4. 4

Question Type : **MCQ**
Question ID : **3398931602**
Option 1 ID : **3398936177**
Option 2 ID : **3398936178**
Option 3 ID : **3398936179**
Option 4 ID : **3398936180**
Status : **Answered**
Chosen Option : **3**

Q.8 Which of the following is true for the internal angles A, B and C of a plane scalene triangle ?

1. $\tan A + \tan B + \tan C = 0$
2. $\tan A + \tan B + \tan C = 1$
3. $\tan (A + B) = \tan C$
4. $\tan A + \tan B + \tan C = \tan A \tan B \tan C.$

- Options**
1. 1
 2. 2
 3. 3
 4. 4

Question Type : **MCQ**
Question ID : **3398931611**
Option 1 ID : **3398936213**
Option 2 ID : **3398936214**
Option 3 ID : **3398936215**
Option 4 ID : **3398936216**
Status : **Answered**
Chosen Option : **3**

Q.9 If 'DELHI' is coded as 'BCJFG' and 'MADRAS' is coded as 'KYBPYQ', then 'MUMBAI' is coded as:

1. LTLAZH
2. KWNCBG
3. KSKZYG
4. KTKAYH

- Options**
1. 1
 2. 2
 3. 3
 4. 4

Question Type : **MCQ**
Question ID : **3398931604**
Option 1 ID : **3398936185**

Option 2 ID : 3398936186
Option 3 ID : 3398936187
Option 4 ID : 3398936188
Status : Answered
Chosen Option : 3

Q.10 In a cricket match, team A needed to score 20 runs to win in the last 12 balls, with players A_1 and A_2 batting. A_1 faced 8 out of 12 balls with a strike rate (*defined as number of runs scored per hundred balls faced*) of 75. What is the least strike rate A_2 needed to score at, for team A to win (assuming team A did not lose any more wickets or get any extra runs)?

1. 250
2. 300
3. 350
4. 375

Options 1. 1

2. 2
3. 3
4. 4

Question Type : MCQ
Question ID : 3398931609
Option 1 ID : 3398936205
Option 2 ID : 3398936206
Option 3 ID : 3398936207
Option 4 ID : 3398936208
Status : Answered
Chosen Option : 3

Q.11 What is the maximum number of cubes of side 2 cm each that can be fitted into a cylinder without rising above the brim of a cylinder whose diameter and height are 6 cm and 15 cm, respectively?

1. 14
2. 21
3. 28
4. 35

Options 1. 1

2. 2
3. 3
4. 4

Question Type : MCQ
Question ID : 3398931603
Option 1 ID : 3398936181
Option 2 ID : 3398936182
Option 3 ID : 3398936183
Option 4 ID : 3398936184
Status : Not Answered
Chosen Option : --

Q.12

- Options**
1. 1
 2. 2
 3. 3
 4. 4

Question Type : **MCQ**
Question ID : **3398931605**
Option 1 ID : **3398936189**
Option 2 ID : **3398936190**
Option 3 ID : **3398936191**
Option 4 ID : **3398936192**
Status : **Not Answered**
Chosen Option : --

Q.13 10 g of a compound is dissolved in 1 L of water. 50 mL of this solution is replaced by water and the solution is homogenised. The process is repeated once more. Then the concentration (in g/mL) of the final solution is

1. 0.010000
2. 0.009500
3. 0.009025
4. 0.005000

- Options**
1. 1
 2. 2
 3. 3
 4. 4

Question Type : **MCQ**
Question ID : **3398931600**
Option 1 ID : **3398936169**
Option 2 ID : **3398936170**
Option 3 ID : **3398936171**
Option 4 ID : **3398936172**
Status : **Not Answered**
Chosen Option : --

Q.14

Options 1. 1

2. 2

3. 3

4. 4

Question Type : **MCQ**

Question ID : **3398931614**

Option 1 ID : **3398936225**

Option 2 ID : **3398936226**

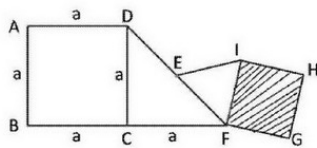
Option 3 ID : **3398936227**

Option 4 ID : **3398936228**

Status : **Answered**

Chosen Option : **4**

Q.15 In the following figure, E is the mid-point of DF, FGHI is a square and EIF is an equilateral triangle. What is the area of the square FGHI ?



1. $\frac{\sqrt{3}a^2}{2}$

2. $\sqrt{2}a^2$

3. $\frac{a^2}{2}$

4. $\frac{a^2}{\sqrt{2}}$

Options 1. 1

2. 2

3. 3

4. 4

Question Type : **MCQ**

Question ID : **3398931608**

Option 1 ID : **3398936201**

Option 2 ID : **3398936202**

Option 3 ID : **3398936203**

Option 4 ID : **3398936204**

Status : **Not Answered**

Chosen Option : **--**

Q.16

- Options**
- 1. 1
 - 2. 2
 - 3. 3
 - 4. 4

Question Type : **MCQ**
Question ID : **3398931598**
Option 1 ID : **3398936161**
Option 2 ID : **3398936162**
Option 3 ID : **3398936163**
Option 4 ID : **3398936164**
Status : **Answered**
Chosen Option : **4**

Q.17

- Options**
1. 1
 2. 2
 3. 3
 4. 4

Question Type : **MCQ**
Question ID : **3398931599**
Option 1 ID : **3398936165**
Option 2 ID : **3398936166**
Option 3 ID : **3398936167**
Option 4 ID : **3398936168**
Status : **Not Answered**
Chosen Option : --

Q.18 To enter a building a password is needed. When A enters, the sentry says "Five", A replies "4" and is let in. When B enters, the sentry says "Six" and B replies "3" and is let in. When C enters, the sentry says "One" and C replies "3" and is let in. When you try to enter, the sentry says "Three". What should your reply be to gain entry?

1. 1
2. 2
3. 4
4. 5

- Options**
1. 1
 2. 2
 3. 3
 4. 4

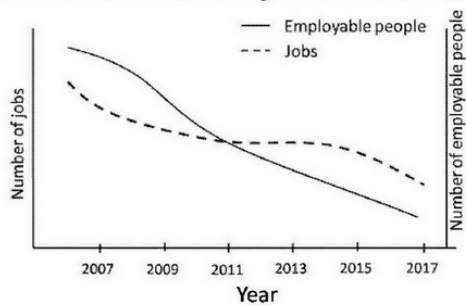
Question Type : **MCQ**
Question ID : **3398931606**
Option 1 ID : **3398936193**
Option 2 ID : **3398936194**
Option 3 ID : **3398936195**
Option 4 ID : **3398936196**
Status : **Answered**
Chosen Option : **4**

Q.19

- Options
1. 1
 2. 2
 3. 3
 4. 4

Question Type : **MCQ**
 Question ID : **3398931615**
 Option 1 ID : **3398936229**
 Option 2 ID : **3398936230**
 Option 3 ID : **3398936231**
 Option 4 ID : **3398936232**
 Status : **Not Answered**
 Chosen Option : --

Q.20 Which one of the following inferences can definitely be drawn based on the plot shown ?



1. Number of jobs and number of employable people decreased at the same rate from 2007 to 2017.
2. There were surplus jobs from 2012 onwards.
3. Unemployment increased from 2012 onwards.
4. Minimum unemployment was during 2007 and 2011.

- Options
1. 1
 2. 2
 3. 3
 4. 4

Question Type : **MCQ**
 Question ID : **3398931613**
 Option 1 ID : **3398936221**
 Option 2 ID : **3398936222**
 Option 3 ID : **3398936223**
 Option 4 ID : **3398936224**
 Status : **Answered**
 Chosen Option : **1**

Section : **Part-B Life Sciences**

Q.1

Options 1. 1

2. 2

3. 3

4. 4

Question Type : **MCQ**

Question ID : **3398931647**

Option 1 ID : **3398936357**

Option 2 ID : **3398936358**

Option 3 ID : **3398936359**

Option 4 ID : **3398936360**

Status : **Not Answered**

Chosen Option : --

Q.2 A 30-residue peptide containing Phe, Tyr and Trp is dissolved in D₂O and the high field proton NMR is recorded after 24 hours. The resonances that are unlikely to be present are

1. aromatic protons

2. C^α protons

3. aliphatic protons

4. amide protons

Options 1. 1

2. 2

3. 3

4. 4

Question Type : **MCQ**

Question ID : **3398931667**

Option 1 ID : **3398936437**

Option 2 ID : **3398936438**

Option 3 ID : **3398936439**

Option 4 ID : **3398936440**

Status : **Answered**

Chosen Option : 1

Q.3

- Options
1. 1
 2. 2
 3. 3
 4. 4

Question Type : **MCQ**
Question ID : **3398931653**
Option 1 ID : **3398936381**
Option 2 ID : **3398936382**
Option 3 ID : **3398936383**
Option 4 ID : **3398936384**
Status : **Answered**
Chosen Option : **4**

Q.4 Pulmonary surfactant is synthesized primarily by

1. type I alveolar epithelial cells
2. alveolar macrophages
3. type II alveolar epithelial cells
4. alveolar mast cells

- Options
1. 1
 2. 2
 3. 3
 4. 4

Question Type : **MCQ**
Question ID : **3398931641**
Option 1 ID : **3398936333**
Option 2 ID : **3398936334**
Option 3 ID : **3398936335**
Option 4 ID : **3398936336**
Status : **Not Answered**
Chosen Option : **--**

Q.5

Options 1. 1

2. 2

3. 3

4. 4

Question Type : **MCQ**

Question ID : **3398931633**

Option 1 ID : **3398936301**

Option 2 ID : **3398936302**

Option 3 ID : **3398936303**

Option 4 ID : **3398936304**

Status : **Answered**

Chosen Option : **4**

Q.6 Which one of the following combinations of *nodulation* (*nod*) genes are found in all rhizobial strains?

1. *nodA*, *nodB* and *nodC*

2. *nodP*, *nodQ* and *nodH*

3. *nodF*, *nodE* and *nodL*

4. *nodA*, *nodE* and *nodP*

Options 1. 1

2. 2

3. 3

4. 4

Question Type : **MCQ**

Question ID : **3398931638**

Option 1 ID : **3398936321**

Option 2 ID : **3398936322**

Option 3 ID : **3398936323**

Option 4 ID : **3398936324**

Status : **Answered**

Chosen Option : **1**

Q.7 Three bird species with similar habitat and diet preferences co-exist in a habitat. For these species, which one of the following statements is most likely to be correct?

1. The fundamental and realised niches of these species are same.

2. Their fundamental niches are greater than their realised niches.

3. Their realised niches are greater than their fundamental niches.

4. The fundamental and realised niches both will expand.

Options 1. 1

2. 2

3. 3

4. 4

Question Type : **MCQ**

Question ID : **3398931655**

Option 1 ID : **3398936389**

Option 2 ID : **3398936390**

Option 3 ID : **3398936391**

Option 4 ID : 3398936392
Status : Answered
Chosen Option : 3

Q.8 Reproductive success of individuals in a population is likely to be skewed under all the following conditions, **EXCEPT** when

1. females are choosy.
2. male-male competition is intense.
3. pair-bonding occurs in the species.
4. females prefer males with larger territories

Options 1. 1
2. 2
3. 3
4. 4

Question Type : MCQ
Question ID : 3398931658
Option 1 ID : 3398936401
Option 2 ID : 3398936402
Option 3 ID : 3398936403
Option 4 ID : 3398936404
Status : Answered
Chosen Option : 4

Q.9 "In *Agrobacterium*-mediated transformation of a plant using a binary vector construct, _____." Complete the above statement with the correct option.

1. all transgenic plants generated would show similar levels of transgenic expression".
2. the *Agrobacterium* cells lose the binary vector after the transfer of T-DNA".
3. some transgenic plants generated may contain partial or truncated versions of the T-DNA".
4. proteins of the host plant do not play any role".

Options 1. 1
2. 2
3. 3
4. 4

Question Type : MCQ
Question ID : 3398931660
Option 1 ID : 3398936409
Option 2 ID : 3398936410
Option 3 ID : 3398936411
Option 4 ID : 3398936412
Status : Not Answered
Chosen Option : --

Q.10 Given below are a few factors that influence the sensitivity of immunoassays:

- A. Affinity of the antibody used
- B. Epitope density on the antigen
- C. Epitope distribution on the antigen

Which one of the following options represents the correct factor(s)?

1. A only
2. B only
3. B and C only
4. A, B and C

Options 1. 1

- 2. 2
- 3. 3
- 4. 4

Question Type : **MCQ**
 Question ID : **3398931659**
 Option 1 ID : **3398936405**
 Option 2 ID : **3398936406**
 Option 3 ID : **3398936407**
 Option 4 ID : **3398936408**
 Status : **Not Answered**
 Chosen Option : --

Q.11 Distyly is

- A. presence of two styles in a flower
- B. presence of two lengths of styles in a species
- C. a form of dichogamy.
- D. a form of herkogamy.

Which one of the following options represents all correct statements?

- 1. B only
- 2. A and C
- 3. B and C
- 4. B and D

Options 1. 1
 2. 2
 3. 3
 4. 4

Question Type : **MCQ**
 Question ID : **3398931650**
 Option 1 ID : **3398936369**
 Option 2 ID : **3398936370**
 Option 3 ID : **3398936371**
 Option 4 ID : **3398936372**
 Status : **Marked For Review**
 Chosen Option : **3**

Q.12 Bacterial ribosomes consist of 30S and 50S ribosomal subunits. The translating monosome has a sedimentation value of

- 1. 70S because a fixed set of the ribosomal proteins (totalling to a value of ~10S) are removed when 30S and 50S subunits interact with each other
- 2. 70S because the interaction between the two subunits (30S and 50S) excludes some surface area decreasing the overall resistance of movement through the medium
- 3. 80S because the monosome consists of one subunit of 30S and one subunit of 50S
- 4. 50S because the sedimentation of the combined monosome is determined by the sedimentation of the large subunit

Options 1. 1
 2. 2
 3. 3
 4. 4

Question Type : **MCQ**
 Question ID : **3398931628**
 Option 1 ID : **3398936281**

Option 2 ID : 3398936282

Option 3 ID : 3398936283

Option 4 ID : 3398936284

Status : Answered

Chosen Option : 4

Q.13 How many kinetochores are present in a human cell at mitosis?

1. 46
2. 23
3. 92
4. 84

Options

1. 1
2. 2
3. 3
4. 4

Question Type : MCQ

Question ID : 3398931624

Option 1 ID : 3398936265

Option 2 ID : 3398936266

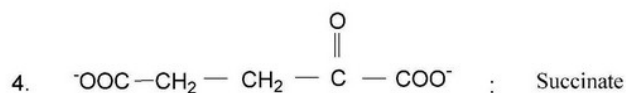
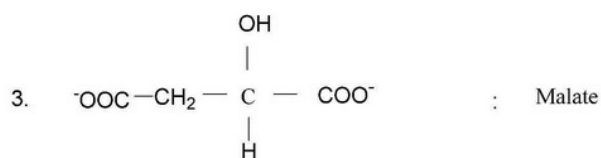
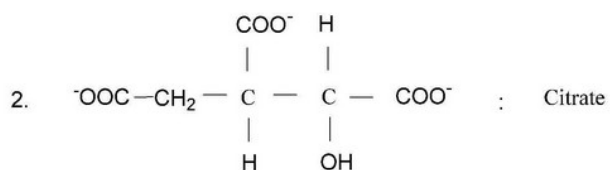
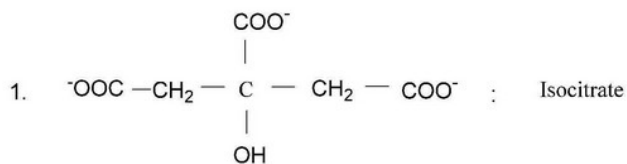
Option 3 ID : 3398936267

Option 4 ID : 3398936268

Status : Answered

Chosen Option : 3

Q.14 The molecules citrate, isocitrate, malate and succinate take part in the citric acid cycle. Identify the structure with the correct name.



Options

1. 1
2. 2
3. 3
4. 4

Question Type : MCQ

Question ID : 3398931620

Option 1 ID : 3398936249

Option 2 ID : 3398936250

Option 3 ID : 3398936251

Option 4 ID : 3398936252

Status : **Not Answered**

Chosen Option : --

Q.15 Which one of the following statements is correct?

1. Epigenetic memory depends on DNA acetylation by trithorax group of proteins
2. An epigenetic change could be inherited from a cell to a daughter cell
3. Parental origin does not influence the expression level of imprinted loci
4. Epigenetic changes do not alter the chromatin landscape

Options

1. 1
2. 2
3. 3
4. 4

Question Type : **MCQ**

Question ID : 3398931623

Option 1 ID : 3398936261

Option 2 ID : 3398936262

Option 3 ID : 3398936263

Option 4 ID : 3398936264

Status : **Answered**

Chosen Option : 4

Q.16 Which one of the following microorganisms is used for the fermentation of coffee beans?

1. *Candida krusei*
2. *Erwinia dissolvens*
3. *Lactobacillus delbrueckii*
4. *Lactobacillus plantarum*

Options

1. 1
2. 2
3. 3
4. 4

Question Type : **MCQ**

Question ID : 3398931663

Option 1 ID : 3398936421

Option 2 ID : 3398936422

Option 3 ID : 3398936423

Option 4 ID : 3398936424

Status : **Not Answered**

Chosen Option : --

Q.17 Which one of the following proteins catalyzes branch migration activity in Holliday junction?

1. Spo11
2. RuvB
3. Zip1
4. RuvC

Options

1. 1
2. 2
3. 3
4. 4

Question Type : **MCQ**

Question ID : **3398931626**

Option 1 ID : **3398936273**

Option 2 ID : **3398936274**

Option 3 ID : **3398936275**

Option 4 ID : **3398936276**

Status : **Not Answered**

Chosen Option : --

Q.18 The table given below provides categories and names of genes involved in *Drosophila* development.

Category		Gene Name	
I	Pair rule gene	(A)	<i>abdominal A</i>
II	Homeotic gene	(B)	<i>gooseberry</i>
III	Gap gene	(C)	<i>fushi tarazu</i>
IV	Segment polarity gene	(D)	<i>giant</i>

Which one of the following options is a correct match between the categories and gene names?

1. I – A, II – B, III – C, IV - D
2. I – D, II – C, III – B, IV - A
3. I – B, II – D, III – A, IV - C
4. I – C, II – A, III –D, IV - B

Options 1. 1

2. 2

3. 3

4. 4

Question Type : **MCQ**

Question ID : **3398931634**

Option 1 ID : **3398936305**

Option 2 ID : **3398936306**

Option 3 ID : **3398936307**

Option 4 ID : **3398936308**

Status : **Marked For Review**

Chosen Option : **2**

Q.19 Which one of the following pathogens cannot survive and replicate within phagocytic cells?

1. *Listeria monocytogenes*
2. *Mycobacterium tuberculosis*
3. *Leishmania donovani*
4. *Streptococcus pneumoniae*

Options 1. 1

2. 2

3. 3

4. 4

Question Type : **MCQ**

Question ID : **3398931630**

Option 1 ID : **3398936289**

Option 2 ID : **3398936290**

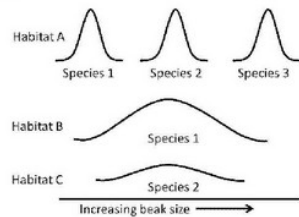
Option 3 ID : **3398936291**

Option 4 ID : 3398936292

Status : Answered

Chosen Option : 3

Q.20 The diagram below shows the frequency distribution of three closely related bird species based on their beak sizes, across three different habitat patches A, B and C. All the three species co-exist in habitat A, whereas only species 1 occurs in habitat B and species 2 occurs in habitat C.



Which one of the following phenomena most appropriately explains the change in frequency distributions of species 1 and 2 in the figure given above?

1. Migration
2. Character displacement
3. Colonization
4. Succession

Options

1. 1
2. 2
3. 3
4. 4

Question Type : MCQ

Question ID : 3398931654

Option 1 ID : 3398936385

Option 2 ID : 3398936386

Option 3 ID : 3398936387

Option 4 ID : 3398936388

Status : Answered

Chosen Option : 2

Q.21 A reciprocal translocation heterozygote at the end of meiosis I generates

1. an acentric and a dicentric chromosome
2. viable gametes with deletions and duplications
3. viable gametes with only parental type chromosomes
4. all non-viable gametes

Options

1. 1
2. 2
3. 3
4. 4

Question Type : MCQ

Question ID : 3398931646

Option 1 ID : 3398936353

Option 2 ID : 3398936354

Option 3 ID : 3398936355

Option 4 ID : 3398936356

Status : Not Answered

Chosen Option : --

Q.22

- Options
1. 1
 2. 2
 3. 3
 4. 4

Question Type : **MCQ**
Question ID : **3398931661**
Option 1 ID : **3398936413**
Option 2 ID : **3398936414**
Option 3 ID : **3398936415**
Option 4 ID : **3398936416**
Status : **Not Answered**
Chosen Option : --

Q.23 Which one of the following statements about M-phase cyclin is correct?

1. Cyclin synthesis and destruction is essential for cell cycle progression
2. Synthesis of new cyclin, but not destruction is essential for cell cycle progression
3. Cyclin and the corresponding kinase(s), both exhibit cyclic expression pattern during cell cycle
4. Cyclic pattern of cyclin protein is regulated by the controlled translation of stored cyclin transcripts, and not dependent on fresh transcription.

- Options
1. 1
 2. 2
 3. 3
 4. 4

Question Type : **MCQ**
Question ID : **3398931622**
Option 1 ID : **3398936257**
Option 2 ID : **3398936258**
Option 3 ID : **3398936259**
Option 4 ID : **3398936260**
Status : **Not Answered**
Chosen Option : --

Q.24 Presence of sigma factor (σ^{70}) in *Escherichia coli* facilitates

1. sequence specific localization of RNA polymerase on the promoter regions of genes
2. phosphorylation of C-terminal tail of RNA polymerase
3. interaction of β -subunit of RNA polymerase with α -subunit
4. interaction of ω -subunit with $\beta\beta'\alpha_2$ complex of RNA polymerase

- Options
1. 1
 2. 2
 3. 3
 4. 4

Question Type : **MCQ**

Question ID : 3398931627

Option 1 ID : 3398936277

Option 2 ID : 3398936278

Option 3 ID : 3398936279

Option 4 ID : 3398936280

Status : Not Answered

Chosen Option : --

Q.25 In a metastudy, percentage of species affected by different ecological threats in different habitats was found to be as follows:

Habitat	Ecological threats		
	Over-exploitation	Invasive species	Pollution
A	20	22	7
B	19	20	44
C	86	5	38

Based on the above information, habitats A, B and C will be respectively:

1. Terrestrial, Fresh water, Marine
2. Marine, Fresh water, Terrestrial
3. Fresh water, Terrestrial, Marine
4. Marine, Terrestrial, Fresh water

Options 1. 1

2. 2

3. 3

4. 4

Question Type : MCQ

Question ID : 3398931652

Option 1 ID : 3398936377

Option 2 ID : 3398936378

Option 3 ID : 3398936379

Option 4 ID : 3398936380

Status : Answered

Chosen Option : 4

Q.26 Which one of the following sets contains at least one primate species **NOT** found in India?

1. Lion Tailed Macaque, Slender Loris, Common Langur
2. Golden Langur, Hoolock Gibbon, Howler Monkey
3. Bonnet Macaque, Stump Tailed Macaque, Slow Loris
4. Capped Langur, Rhesus Macaque, Phayre's Leaf Monkey

Options 1. 1

2. 2

3. 3

4. 4

Question Type : MCQ

Question ID : 3398931651

Option 1 ID : 3398936373

Option 2 ID : 3398936374

Option 3 ID : 3398936375

Option 4 ID : 3398936376

Status : Answered

Chosen Option : 2

Q.27

Options 1. 1

2. 2

3. 3

4. 4

Question Type : **MCQ**

Question ID : **3398931665**

Option 1 ID : **3398936429**

Option 2 ID : **3398936430**

Option 3 ID : **3398936431**

Option 4 ID : **3398936432**

Status : **Not Answered**

Chosen Option : --

Q.28 A test cross was made with phenotypically wild type *Drosophila* flies having genes for sepia eye and curled wing in heterozygous condition. The following results were obtained:

Wild type	400 individuals
Sepia eyed	150 individuals
Curled winged	100 individuals
Sepia eyed curled winged	350 individuals

The result indicates

1. independent assortment, as wild and the double mutant types are in almost equal proportion
2. unequal segregation, as it is showing departure from 1:1:1:1 ratio
3. complete linkage, as the two genes are very closely placed
4. linkage, the two genes are separated by 25 cM distance

Options 1. 1

2. 2

3. 3

4. 4

Question Type : **MCQ**

Question ID : **3398931645**

Option 1 ID : **3398936349**

Option 2 ID : **3398936350**

Option 3 ID : **3398936351**

Option 4 ID : **3398936352**

Status : **Answered**

Chosen Option : **1**

Q.29

Options 1. 1

2. 2

3. 3

4. 4

Question Type : **MCQ**

Question ID : **3398931621**

Option 1 ID : **3398936253**

Option 2 ID : **3398936254**

Option 3 ID : **3398936255**

Option 4 ID : **3398936256**

Status : **Not Answered**

Chosen Option : --

Q.30 A small-bodied hominid whose fossil was discovered very recently, ventured into the islands of South-East Asia from mainland Asia about 67,000 years ago. This species is believed to be closely related to another *Homo* species discovered previously from an island in Indonesia. The given scientific name of the newly discovered species is:

1. *Homo floresiensis*

2. *Homo luzonensis*

3. *Homo naledi*

4. *Homo habilis*

Options 1. 1

2. 2

3. 3

4. 4

Question Type : **MCQ**

Question ID : **3398931657**

Option 1 ID : **3398936397**

Option 2 ID : **3398936398**

Option 3 ID : **3398936399**

Option 4 ID : **3398936400**

Status : **Answered**

Chosen Option : **3**

Q.31 First committed precursor in the biosynthesis of chlorophyll is:

1. δ -aminolevulinic acid

2. Porphobilinogen

3. Protoporphyrin IX

4. Coproporphyrinogen III

Options 1. 1

2. 2

3. 3

4. 4

Question Type : **MCQ**

Question ID : 3398931639

Option 1 ID : 3398936325

Option 2 ID : 3398936326

Option 3 ID : 3398936327

Option 4 ID : 3398936328

Status : **Marked For Review**

Chosen Option : 3

Q.32 Which one of the statements given below is correct?

1. The Ramachandran plots of Acetyl-L-Ala-CONHMe and Acetyl-D-Ala-CONHMe will be identical.
2. Fe is a transition metal but Ca is not.
3. Side chain pKa of L-Glu and D-Glu will not be identical.
4. Hydrogen bonds are fundamentally van der Waals interaction.

Options

1. 1
2. 2
3. 3
4. 4

Question Type : **MCQ**

Question ID : 3398931618

Option 1 ID : 3398936241

Option 2 ID : 3398936242

Option 3 ID : 3398936243

Option 4 ID : 3398936244

Status : **Not Answered**

Chosen Option : --

Q.33 Which one of the following functions is correct for the microglia cells in the brain?

1. Myelin formation
2. Making blood-brain barrier
3. Scavenging injured cell debris
4. Enveloping synapses

Options

1. 1
2. 2
3. 3
4. 4

Question Type : **MCQ**

Question ID : 3398931644

Option 1 ID : 3398936345

Option 2 ID : 3398936346

Option 3 ID : 3398936347

Option 4 ID : 3398936348

Status : **Answered**

Chosen Option : 2

Q.34 Bacterial actin homologs contribute to the cell shape by serving as a scaffold to direct the synthesis of the peptidoglycan cell wall. Which of the following is/are actin homolog/s in bacteria?

1. MreB and Mbl
2. FtsZ
3. DnaK
4. DnaJ

Options

1. 1
2. 2

3. 3
4. 4

Question Type : **MCQ**
Question ID : **3398931625**
Option 1 ID : **3398936269**
Option 2 ID : **3398936270**
Option 3 ID : **3398936271**
Option 4 ID : **3398936272**
Status : **Not Answered**
Chosen Option : --

Q.35 Which one of the following is **NOT** a typical movement pattern observed during gastrulation?

1. Involution
2. Epiboly
3. Furrowing
4. Delamination

Options 1. 1
2. 2
3. 3
4. 4

Question Type : **MCQ**
Question ID : **3398931635**
Option 1 ID : **3398936309**
Option 2 ID : **3398936310**
Option 3 ID : **3398936311**
Option 4 ID : **3398936312**
Status : **Answered**
Chosen Option : 3

Q.36 The most common cause of blindness induced by microbial infection in humans is:

1. *Chlamydia psittaci*
2. *Chlamydia pneumoniae*
3. *Chlamydia muridarum*
4. *Chlamydia trachomatis*

Options 1. 1
2. 2
3. 3
4. 4

Question Type : **MCQ**
Question ID : **3398931649**
Option 1 ID : **3398936365**
Option 2 ID : **3398936366**
Option 3 ID : **3398936367**
Option 4 ID : **3398936368**
Status : **Answered**
Chosen Option : 1

Q.37

- Options**
1. 1
 2. 2
 3. 3
 4. 4

Question Type : **MCQ**
 Question ID : **3398931642**
 Option 1 ID : **3398936337**
 Option 2 ID : **3398936338**
 Option 3 ID : **3398936339**
 Option 4 ID : **3398936340**
 Status : **Answered**
 Chosen Option : **4**

Q.38 A new trait was found to be highly variable in a population. It showed a bell-shaped distribution and is shown to be influenced by environmental factors. The trait can be

1. a monogenic trait
2. a polygenic trait
3. a non-quantitative trait
4. due to a point mutation in the regulatory region of a gene

- Options**
1. 1
 2. 2
 3. 3
 4. 4

Question Type : **MCQ**
 Question ID : **3398931648**
 Option 1 ID : **3398936361**
 Option 2 ID : **3398936362**
 Option 3 ID : **3398936363**
 Option 4 ID : **3398936364**
 Status : **Answered**
 Chosen Option : **2**

Q.39 Column A lists a set of nutrients and Column B lists some sources for these nutrients that are used in industrial fermentation.

	Column A		Column B
A	Nitrogen	(i)	soya meal
B	Carbon	(ii)	yeast extract
C	Micronutrient	(iii)	corn liquor
		(iv)	molasses
		(v)	tryptone

Choose the option that matches the nutrient with its most common source.

1. A: (i), (ii); B: (iii), (iv); C: (v)
2. A: (i), (v); B: (iii), (iv); C: (ii)
3. A: (ii), (v); B: (iii), (iv); C: (i)
4. A: (v); B: (i), (iii); C: (ii), (iv)

- Options
1. 1
 2. 2
 3. 3
 4. 4

Question Type : **MCQ**
Question ID : **3398931662**
Option 1 ID : **3398936417**
Option 2 ID : **3398936418**
Option 3 ID : **3398936419**
Option 4 ID : **3398936420**
Status : **Answered**
Chosen Option : **4**

Q.40 Which one of the following techniques/approaches **CANNOT** be used to analyze expression pattern of a gene?

1. Western blotting
2. qRT-PCR
3. Northern blotting
4. Southern blotting

- Options
1. 1
 2. 2
 3. 3
 4. 4

Question Type : **MCQ**
Question ID : **3398931664**
Option 1 ID : **3398936425**
Option 2 ID : **3398936426**
Option 3 ID : **3398936427**
Option 4 ID : **3398936428**
Status : **Answered**
Chosen Option : **3**

Q.41 The mechanism by which ants find their way back to the nests after searching and finding food is:

1. migration
2. topographical mapping
3. piloting
4. path integration

- Options
1. 1
 2. 2
 3. 3
 4. 4

Question Type : **MCQ**
Question ID : **3398931656**
Option 1 ID : **3398936393**
Option 2 ID : **3398936394**
Option 3 ID : **3398936395**
Option 4 ID : **3398936396**
Status : **Marked For Review**
Chosen Option : **4**

Q.42

Options 1. 1

2. 2

3. 3

4. 4

Question Type : **MCQ**

Question ID : **3398931636**

Option 1 ID : **3398936313**

Option 2 ID : **3398936314**

Option 3 ID : **3398936315**

Option 4 ID : **3398936316**

Status : **Answered**

Chosen Option : **1**

Q.43 Some of the radioisotopes commonly used in biology are listed in column A and their properties are listed in Column B.

Column A		Column B	
I	^{35}S	i	High energy β
II	^{32}P	ii	α particle
III	^{238}U	iii	γ emission
IV	^{125}I	iv	Low energy β

Choose the option that correctly matches the isotope with the property listed.

1. I : iv; II : iii; III : ii; IV : i

2. I : iii; II : ii; III : iv; IV : i

3. I : ii; II : i; III : iv; IV : iii

4. I : iv; II : i; III : ii; IV : iii

Options 1. 1

2. 2

3. 3

4. 4

Question Type : **MCQ**

Question ID : **3398931666**

Option 1 ID : **3398936433**

Option 2 ID : **3398936434**

Option 3 ID : **3398936435**

Option 4 ID : **3398936436**

Status : **Not Answered**

Chosen Option : **--**

Q.44 Which one of the following statements about mRNA export from the nucleus is **INCORRECT**?

1. Cellular pre-mRNAs with introns are generally not exported out of nucleus

2. Dbp5 is an RNA helicase that releases mRNA from the transport complex

3. ATP hydrolysis is required for mRNA transport across the nuclear pore complex

4. Phe-Gly proteins of the nuclear pore complex are not involved in mRNA export

Options 1. 1

2. 2

3. 3

Question Type : **MCQ**Question ID : **3398931629**Option 1 ID : **3398936285**Option 2 ID : **3398936286**Option 3 ID : **3398936287**Option 4 ID : **3398936288**Status : **Not Answered**

Chosen Option : --

Q.45 Which one of the following amino acids is induced drastically in dark adapted plants?

1. Glutamine
2. Glycine
3. Asparagine
4. Serine

Options

1. 1
2. 2
3. 3
4. 4

Question Type : **MCQ**Question ID : **3398931640**Option 1 ID : **3398936329**Option 2 ID : **3398936330**Option 3 ID : **3398936331**Option 4 ID : **3398936332**Status : **Not Answered**

Chosen Option : --

Q.46 Heat shock protein binding region is located in which one of the following domains of glucocorticoid receptor protein?

1. DNA-binding
2. Ligand-binding
3. N-terminal
4. Hinge region

Options

1. 1
2. 2
3. 3
4. 4

Question Type : **MCQ**Question ID : **3398931643**Option 1 ID : **3398936341**Option 2 ID : **3398936342**Option 3 ID : **3398936343**Option 4 ID : **3398936344**Status : **Not Answered**

Chosen Option : --

Q.47 Which one of the following glycosaminoglycans is generally **NOT** covalently attached to protein as proteoglycans?

1. Chondroitin sulfate
2. Dermatan sulfate
3. Heparan sulfate
4. Hyaluronan

- Options
1. 1
 2. 2
 3. 3
 4. 4

Question Type : **MCQ**
Question ID : **3398931632**
Option 1 ID : **3398936297**
Option 2 ID : **3398936298**
Option 3 ID : **3398936299**
Option 4 ID : **3398936300**
Status : **Not Answered**
Chosen Option : --

Q.48 The initiator caspase responsible for promoting cell death after specific activation of TRADD is

1. Caspase 1
2. Caspase 8
3. Caspase 7
4. Caspase 5

- Options
1. 1
 2. 2
 3. 3
 4. 4

Question Type : **MCQ**
Question ID : **3398931631**
Option 1 ID : **3398936293**
Option 2 ID : **3398936294**
Option 3 ID : **3398936295**
Option 4 ID : **3398936296**
Status : **Answered**
Chosen Option : **2**

Q.49 Choose the correct statement from the following:

1. Iodoacetamide inactivates an enzyme by reaction with a critical serine residue at neutral pH.
2. Proline racemase causes isomerisation of L-proline to D-proline. Ribose will be an appropriate transition state analog.
3. Tosyl-1-phenylalanine chloromethyl ketone binds at the active site of chymotrypsin and modifies an essential arginine residue.
4. ${}^2\text{O}_3\text{PO}-\underset{\text{O}}{\underset{\parallel}{\text{C}}}\text{H}_2-\text{C}-\text{CH}_2-\text{Br}$ binds to triose phosphate isomerase at the active site and covalently modifies a glutamic acid residue required for enzyme activity.

- Options
1. 1
 2. 2
 3. 3
 4. 4

Question Type : **MCQ**
Question ID : **3398931619**
Option 1 ID : **3398936245**
Option 2 ID : **3398936246**
Option 3 ID : **3398936247**

Option 4 ID : **3398936248**
Status : **Not Answered**
Chosen Option : --

Q.50 Which one of the following proteins regulate photomorphogenesis in plants by adding ubiquitin tags to a subset of nuclear proteins?

1. PhyA
2. Hy5
3. LAF1
4. COP1

Options 1. 1
2. 2
3. 3
4. 4

Question Type : **MCQ**
Question ID : **3398931637**
Option 1 ID : **3398936317**
Option 2 ID : **3398936318**
Option 3 ID : **3398936319**
Option 4 ID : **3398936320**
Status : **Answered**
Chosen Option : **4**

Section : **Part-C Life Sciences**

Q.1 In a large, healthy, polygynous population of an ungulate species with distinct, short seasonal mating, the operational sex ratio (Male : Female) is likely to resemble which one of the following conditions:

1. Male > Female
2. Female $\geq$ Male
3. Male = Female
4. Female > Male

Options 1. 1
2. 2
3. 3
4. 4

Question Type : **MCQ**
Question ID : **3398931730**
Option 1 ID : **3398936689**
Option 2 ID : **3398936690**
Option 3 ID : **3398936691**
Option 4 ID : **3398936692**
Status : **Answered**
Chosen Option : **2**

Q.2

Options 1. 1

2. 2

3. 3

4. 4

Question Type : **MCQ**

Question ID : **3398931710**

Option 1 ID : **3398936609**

Option 2 ID : **3398936610**

Option 3 ID : **3398936611**

Option 4 ID : **3398936612**

Status : **Answered**

Chosen Option : **3**

Q.3 The following statements are made regarding a plant cell:

- A. Polysaccharides of various sugars with methyl esters of galacturonic acid are generically referred as chitin.
- B. Suberin and cutin are polymers and are mixtures of polyesters of hydroxy fatty acids and glycerol
- C. Cellulose is a polymer of glucose and fructose which can be stained by light green and haematoxylin
- D. Plasmodesmata maintain continuity between the cytoplasm of adjacent cells and allow large molecules to pass between them without crossing membrane.

Which one of the following options represents a combination of correct statements?

- 1. A and C
- 2. B and C
- 3. B and D
- 4. A and B

Options 1. 1

2. 2

3. 3

4. 4

Question Type : **MCQ**

Question ID : **3398931698**

Option 1 ID : **3398936561**

Option 2 ID : **3398936562**

Option 3 ID : **3398936563**

Option 4 ID : **3398936564**

Status : **Answered**

Q.4 Certain statements made on the mechanisms of action of a neurohormone, vasopressin (VP) are given below:

- A. VP acts on collecting ducts of kidney to concentrate urine by binding to V_1 receptors and activating cAMP cascade
- B. VP acts on collecting ducts of kidney to concentrate urine by binding to V_2 receptors and activating cAMP cascade
- C. VP acts on blood vessels to produce constriction by binding to V_1 receptors and activating cAMP cascade
- D. VP acts on blood vessels to produce constriction by binding to V_1 receptors and activating phosphatidylinositol cascade

Which one of the following options represents a combination of correct statements?

- 1. A and B
- 2. C and D
- 3. B and D
- 4. A and D

Options

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Type : **MCQ**

Question ID : **3398931706**

Option 1 ID : **3398936593**

Option 2 ID : **3398936594**

Option 3 ID : **3398936595**

Option 4 ID : **3398936596**

Status : **Not Answered**

Chosen Option : --

Q.5 In human cells, centrioles assemble centrosomes, and centrosomes are essential for microtubular nucleation. Centriole duplication is tightly coupled to the cell cycle progression. To discover which genes are crucial for centriole duplication, an investigator will conduct:

- A. RNAi-based functional genomics screen in human cells to uncover novel genes involved in centriole duplication.
- B. experiments to generate constitutive knockout human cell lines.
- C. chemical based screen in human cell lines.
- D. RNA sequencing followed by generating constitutive knockout human cell lines.

Choose the combination with correct statements:

- 1. A and B
- 2. A and C
- 3. B and C
- 4. B and D

Options

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Type : **MCQ**

Question ID : **3398931678**

Option 1 ID : **3398936481**

Option 2 ID : 3398936482

Option 3 ID : 3398936483

Option 4 ID : 3398936484

Status : Not Answered

Chosen Option : --

Q.6 Following are statements related to statistical methods:

- A. An outlier can be defined as a value in a data set that lies more than three standard deviations from the mean.
- B. Measures of central tendency and dispersion are independent of the presence of outliers in a data set.
- C. Standard deviation is a measure of dispersion.
- D. Mean, median and mode are not measure of central tendency.

Which one of the following options is a combination with both **INCORRECT** statements?

- 1. A and B
- 2. B and C
- 3. A and C
- 4. B and D

Options

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Type : MCQ

Question ID : 3398931741

Option 1 ID : 3398936733

Option 2 ID : 3398936734

Option 3 ID : 3398936735

Option 4 ID : 3398936736

Status : Not Answered

Chosen Option : --

Q.7 Given below are cytoskeleton filaments (**Column X**) and their component/associated proteins (**Column Y**)

Column X		Column Y	
A	Actin	i	Formin
B	Microtubule	ii	Arp 2/3 complex
C	Intermediate filaments	iii	EB 1
		iv	Lamin A
		v	Xmap 215

Choose the option that matches cytoskeleton filament (**Column X**) with the most appropriate protein (**Column Y**)

- 1. A – i , A – ii; B – iii, B – v; C – iv
- 2. A – iii, A – v; B – ii, B – i; C – iv
- 3. A – iv, A – v; B – i, B – ii; C – iii
- 4. A – ii, A – v; B – i, B – iv; C – v

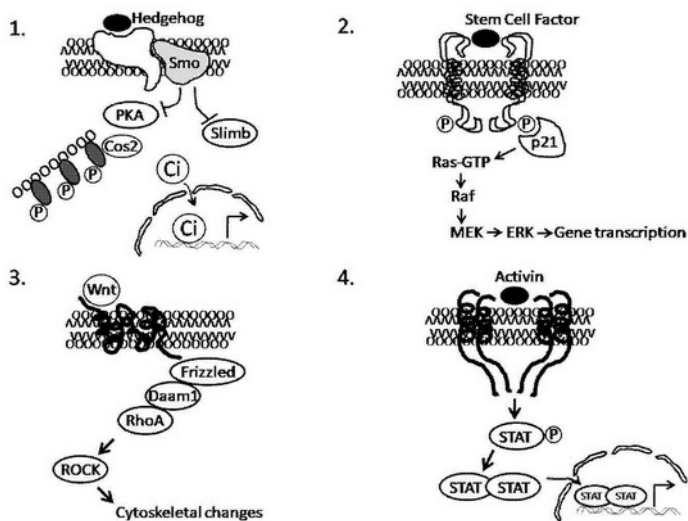
Options

- 1. 1
- 2. 2
- 3. 3

Question Type : **MCQ**Question ID : **3398931677**Option 1 ID : **3398936477**Option 2 ID : **3398936478**Option 3 ID : **3398936479**Option 4 ID : **3398936480**Status : **Not Answered**

Chosen Option : --

Q.8 Which one of the following signaling pathways will best support the formation of the zone of polarizing activity (ZPA) during limb development in mice?



Options 1. 1

2. 2

3. 3

4. 4

Question Type : **MCQ**Question ID : **3398931691**Option 1 ID : **3398936533**Option 2 ID : **3398936534**Option 3 ID : **3398936535**Option 4 ID : **3398936536**Status : **Not Answered**

Chosen Option : --

Q.9

- Options**
1. 1
 2. 2
 3. 3
 4. 4

Question Type : **MCQ**
Question ID : **3398931712**
Option 1 ID : **3398936617**
Option 2 ID : **3398936618**
Option 3 ID : **3398936619**
Option 4 ID : **3398936620**
Status : **Not Answered**
Chosen Option : --

- Q.10** An allosteric enzyme has two heterotropic effectors, X and Y. The allosteric constant, L for the enzyme in the absence of effector molecules is 180. For the X-saturated form, the value of L increases from 180 to 1200, while for Y-saturated form it decreases to 60. What kind of effector molecules are X and Y?
1. X and Y both are positive regulators.
 2. X is a negative regulator while Y is a positive regulator.
 3. X is a positive regulator while Y is a negative regulator.
 4. X and Y are not allosteric regulators.

- Options**
1. 1
 2. 2
 3. 3
 4. 4

Question Type : **MCQ**
Question ID : **3398931671**
Option 1 ID : **3398936453**
Option 2 ID : **3398936454**
Option 3 ID : **3398936455**

Option 4 ID : 3398936456

Status : Not Answered

Chosen Option : --

Q.11 In a gene stacking experiment, a transgenic plant generated using *bar* as a selection marker was crossed with another transgenic line containing *hpt* as the selection marker. Analysis of the F₁ progeny of this cross showed that 50% of the progeny was resistant to both selection agents (Basta and hygromycin) while the remaining 50% of the progeny was resistant to only hygromycin. Which one of the following statements is a possible explanation of the above results?

1. Both the transgenic lines used as parents for the cross are single-copy events that are homozygous for the transgenes.
2. The Basta-resistant transgenic plant is a single-copy, homozygous event and the hygromycin-resistant plant is a double-copy event that is homozygous for two unlinked copies of the transgene.
3. The *bar* containing transgenic plant is a hemizygous single-copy event and the *hpt* containing transgenic plant is a homozygous, single-copy event
4. Both the transgenic plants used as parents for the cross are hemizygous, single-copy events.

Options 1. 1

2. 2
3. 3
4. 4

Question Type : MCQ

Question ID : 3398931733

Option 1 ID : 3398936701

Option 2 ID : 3398936702

Option 3 ID : 3398936703

Option 4 ID : 3398936704

Status : Not Answered

Chosen Option : --

Q.12 Following are some statements given for vertebrate eye lens induction:

- A. Paired box6 (Pax6) is a transcription factor synthesized in specific region of head surface ectoderm.
- B. Pax6 is secreted by optic vesicle.
- C. Optic vesicle serves as an inducer for competent head surface ectoderm.
- D. Studies on amphibians suggest that the first inducers of lens may be the foregut endoderm and heart forming mesoderm.
- E. The genes for lens proteins get induced in the surface ectoderm of optic vesicle.

Which combination of the above statements is correct towards vertebrate eye lens induction?

1. A, C, D
2. A, C, E
3. B, E
4. B, C, D

Options 1. 1

2. 2
3. 3
4. 4

Question Type : MCQ

Question ID : 3398931694

Option 1 ID : 3398936545

Option 2 ID : 3398936546

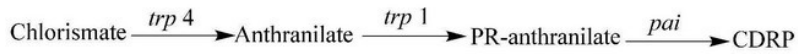
Option 3 ID : 3398936547

Option 4 ID : 3398936548

Status : Not Answered

Chosen Option : --

Q.13 The first few steps of the tryptophan biosynthetic pathway in plants along with the available mutants is provided below



Column X represents genotypes and Column Y summarizes the anthranilate fluorescence phenotype in UV light.

Column X	Column Y
Genotype	Phenotype in UV Light
A – wild type	i. Strong fluorescence
B – <i>trp1</i>	ii. No fluorescence
C – <i>trp1; trp4</i>	iii. Weak fluorescence
D – <i>pai</i>	

Which of the following combinations represent the correct match between column X and column Y?

1. A – i, B – ii, C – i, D – iii
2. A – ii, B – i, C – ii, D – iii
3. A – ii, B – ii, C – iii, D – i
4. A – iii, B – i, C – iii, D – ii

Options 1. 1

2. 2

3. 3

4. 4

Question Type : MCQ

Question ID : 3398931701

Option 1 ID : 3398936573

Option 2 ID : 3398936574

Option 3 ID : 3398936575

Option 4 ID : 3398936576

Status : Not Answered

Chosen Option : --

Q.14

Options 1. 1

2. 2

3. 3

4. 4

Question Type : **MCQ**

Question ID : **3398931739**

Option 1 ID : **3398936725**

Option 2 ID : **3398936726**

Option 3 ID : **3398936727**

Option 4 ID : **3398936728**

Status : **Not Answered**

Chosen Option : --

Q.15 Two cell surface receptors, A and B with a single binding site specifically bind with their respective ligands, X and Y. In the table below are the values for the association constant, K_a of the respective ligand-receptor interactions. K_a is also called the affinity constant.

Receptor	Ligand	K_a
A	X	1×10^8
B	Y	1×10^{11}

Based on these values, which one of the following statements is **INCORRECT**?

1. K_d for B-Y binding is smaller than that for A-X binding
2. K_1 for A-X binding is lesser than that for B-Y binding
3. K_{-1} for B-Y binding is smaller than that for A-X binding
4. K_{-1}/K_1 for B-Y binding is higher than that for A-X binding

(K_1 is the forward rate constant, K_{-1} is the reverse rate constant and K_d is the dissociation constant)

Options 1. 1

2. 2

3. 3

4. 4

Question Type : **MCQ**

Question ID : **3398931687**

Option 1 ID : **3398936517**

Option 2 ID : 3398936518

Option 3 ID : 3398936519

Option 4 ID : 3398936520

Status : Not Answered

Chosen Option : --

Q.16 For ELISPOT measurements of interferon γ [IFN- γ] secretion by mouse NKT cells, the following steps were performed in an ELISA plate:

- A. Addition of purified spleenocytes
- B. Stimulation of spleenocytes by peptide pulsed antigen presenting cells (APCs)
- C. Addition of biotin-conjugated anti IFN- γ antibody
- D. Addition of capture antibody specific to IFN- γ
- E. Addition of avidin-conjugated colour changing substrate.

Which one of the following options lists the correct sequence of steps performed?

- 1. A $\rightarrow$ D $\rightarrow$ B $\rightarrow$ C $\rightarrow$ E
- 2. D $\rightarrow$ B $\rightarrow$ A $\rightarrow$ C $\rightarrow$ E
- 3. D $\rightarrow$ A $\rightarrow$ B $\rightarrow$ C $\rightarrow$ E
- 4. B $\rightarrow$ A $\rightarrow$ D $\rightarrow$ C $\rightarrow$ E

Options

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Type : MCQ

Question ID : 3398931736

Option 1 ID : 3398936713

Option 2 ID : 3398936714

Option 3 ID : 3398936715

Option 4 ID : 3398936716

Status : Not Answered

Chosen Option : --

Q.17 In sea urchins, successful fertilization can be ensured only after specific interaction between sperm proteins and their receptors on the egg vitelline envelope. Which one of the following will ensure proper fertilization of sea urchin eggs?

- 1. Expression of EBR1, a putative bindin receptor, on the surface of the acrosomal membrane
- 2. Expression of bindin just below the egg jelly
- 3. Expression of EBR1 on the egg vitelline envelope
- 4. Expression of bindin molecules on the egg vitelline envelope

Options

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Type : MCQ

Question ID : 3398931692

Option 1 ID : 3398936537

Option 2 ID : 3398936538

Option 3 ID : 3398936539

Option 4 ID : 3398936540

Status : Answered

Chosen Option : 4

Q.18

Options 1. 1

2. 2

3. 3

4. 4

Question Type : **MCQ**

Question ID : **3398931725**

Option 1 ID : **3398936669**

Option 2 ID : **3398936670**

Option 3 ID : **3398936671**

Option 4 ID : **3398936672**

Status : **Answered**

Chosen Option : **3**

Q.19 Male fiddler crabs with larger claws are preferred by females over males with smaller claws. If the selection pressure exerted on claw size is strong, which one of the following options is true with respect to male claw size over generations?

1. Mean > Median > Mode

2. Mean < Median < Mode

3. Mean = Mode < Median

4. Mean = Median = Mode

Options 1. 1

2. 2

3. 3

4. 4

Question Type : **MCQ**

Question ID : **3398931727**

Option 1 ID : **3398936677**

Option 2 ID : **3398936678**

Option 3 ID : **3398936679**

Option 4 ID : **3398936680**

Status : **Not Answered**

Chosen Option : **--**

Q.20

- Options
- 1
 - 2
 - 3
 - 4

Question Type : **MCQ**
Question ID : **3398931707**
Option 1 ID : **3398936597**
Option 2 ID : **3398936598**
Option 3 ID : **3398936599**
Option 4 ID : **3398936600**
Status : **Answered**
Chosen Option : **1**

Q.21 Which among the following sets of conditions are best suited for a mimic species to coexist with its model?

Condition	Abundance	Predators learn	Resource overlap
A	Mimic > Model	Yes	Yes
B	Model > Mimic	Yes	No
C	Mimic = Model	No	Yes
D	Model $\geq$ Mimic	No	No

1. Condition A
2. Condition B
3. Condition C
4. Condition D

- Options
- 1
 - 2
 - 3
 - 4

Question Type : **MCQ**
Question ID : **3398931721**
Option 1 ID : **3398936653**
Option 2 ID : **3398936654**
Option 3 ID : **3398936655**
Option 4 ID : **3398936656**
Status : **Answered**
Chosen Option : **2**

Q.22

Options 1. 1

2. 2

3. 3

4. 4

Question Type : **MCQ**

Question ID : **3398931740**

Option 1 ID : **3398936729**

Option 2 ID : **3398936730**

Option 3 ID : **3398936731**

Option 4 ID : **3398936732**

Status : **Not Answered**

Chosen Option : --

Q.23 Humans exposed to cold climate are able to maintain their body temperature. The physiological mechanisms operating in the condition were suggested in the following statements:

- A. The increased thermogenesis in brown adipose tissue occurred in cold
- B. Uncoupling protein 1 in brown adipose tissue participated in the increased heat production
- C. The decreased secretion of catecholamine in cold elevated heat production
- D. The reflex responses activated by cold were controlled from the anterior hypothalamus
- E. The counter-current exchanges of temperature between warm arterial blood flowing towards limbs and the cold venous blood coming from extremities conserved body heat.

Which one of the following options represents a combination of **INCORRECT** statements?

- 1. A and B
- 2. B and C
- 3. C and D
- 4. D and E

Options 1. 1

2. 2

3. 3

4. 4

Question Type : **MCQ**

Question ID : **3398931703**

Option 1 ID : **3398936581**

Option 2 ID : **3398936582**

Option 3 ID : **3398936583**

Option 4 ID : 3398936584
Status : Not Answered
Chosen Option : --

Q.24 During mitosis in a eukaryotic cell incorrect kinetochore attachments are corrected by a system of trials and errors. The tension-based mechanism acting at the kinetochore is linked with ensuring that sister chromatid pairs are properly oriented at the spindle. Which one of the following kinases is tethered to the inner kinetochore and phosphorylates the microtubule attachment site, including the Ndc 80 complex to regulate sister chromatids attachments in a bi-orientation manner?

1. Aurora A kinase
2. Aurora B kinase
3. Aurora C kinase
4. c-Jun N-terminal kinase

Options 1. 1

2. 2
3. 3
4. 4

Question Type : MCQ
Question ID : 3398931675
Option 1 ID : 3398936469
Option 2 ID : 3398936470
Option 3 ID : 3398936471
Option 4 ID : 3398936472
Status : Not Answered
Chosen Option : --

Q.25 The names of some specialized organs/structures are given in Column A and their location in organisms are given in Column B.

Column A		Column B	
A.	Crystalline style	i.	Stomach of bivalves
B.	Hastate plate	ii.	Stomach of crustaceans
C.	Organs of Bojanus	iii.	Kidney of gastropods
D.	Mehlis's gland	iv.	Female reproductive system of <i>Fasciola</i>

Select the correct matches:

1. A – ii, B – i, C – iv, D – iii
2. A – iii, B – iv, C – ii, D – i
3. A – i, B – ii, C – iii, D – iv
4. A – iv, B – iii, C – i, D – ii

Options 1. 1

2. 2
3. 3
4. 4

Question Type : MCQ
Question ID : 3398931716
Option 1 ID : 3398936633
Option 2 ID : 3398936634
Option 3 ID : 3398936635
Option 4 ID : 3398936636

Status : **Answered**
Chosen Option : **3**

Q.26 Which of the following events/examples represent observation of evolutionary changes on a human time scale? Here human time scale is defined by an average human age of approximately 70-80 years.

1. Complete eye degeneration in cave fishes
2. Human bipedalism
3. Evolution of flowering plants
4. Drug resistance in HIV

Options 1. 1
2. 2
3. 3
4. 4

Question Type : **MCQ**
Question ID : **3398931718**
Option 1 ID : **3398936641**
Option 2 ID : **3398936642**
Option 3 ID : **3398936643**
Option 4 ID : **3398936644**
Status : **Answered**
Chosen Option : **4**

Q.27 A mutant Trp repressor (TrpR^m) that cannot bind tryptophan is isolated. In this mutant

- A. Trp operon is constitutively expressed.
- B. Trp operon is super-repressed.
- C. Trp repressor does not bind to the operator.
- D. only Trp leader sequence is transcribed.

Which one of the following options represents all correct statements?

1. A and C only
2. B and C only
3. A and D only
4. A only

Options 1. 1
2. 2
3. 3
4. 4

Question Type : **MCQ**
Question ID : **3398931684**
Option 1 ID : **3398936505**
Option 2 ID : **3398936506**
Option 3 ID : **3398936507**
Option 4 ID : **3398936508**
Status : **Not Answered**
Chosen Option : **--**

Q.28

- Options**
1. 1
 2. 2
 3. 3
 4. 4

Question Type : **MCQ**
Question ID : **3398931688**
Option 1 ID : **3398936521**
Option 2 ID : **3398936522**
Option 3 ID : **3398936523**
Option 4 ID : **3398936524**
Status : **Not Answered**
Chosen Option : --

Q.29 The table given below lists animals and primary regions of domestication.

Animal		Region of domestication	
A.	Alpaca	(i)	Central Andes
B.	Goat	(ii)	South Asia
C.	Llama	(iii)	Southwest Asia
D.	Zebu cattle	(iv)	China

Which one of the following options represents the best match for animals and the primary region of their domestication?

1. A – (ii); B – (iv); C – (iii); D – (i)
2. A – (i); B – (iii); C – (i); D – (iv)
3. A – (iii); B – (i); C – (iv); D – (iii)
4. A – (i); B – (iii); C – (i); D – (ii)

- Options**
1. 1
 2. 2
 3. 3
 4. 4

Question Type : **MCQ**
Question ID : **3398931735**
Option 1 ID : **3398936709**
Option 2 ID : **3398936710**
Option 3 ID : **3398936711**
Option 4 ID : **3398936712**
Status : **Answered**
Chosen Option : **3**

Q.30

- Options
1. 1
 2. 2
 3. 3
 4. 4

Question Type : **MCQ**
Question ID : **3398931700**
Option 1 ID : **3398936569**
Option 2 ID : **3398936570**
Option 3 ID : **3398936571**
Option 4 ID : **3398936572**
Status : **Answered**
Chosen Option : **2**

Q.31 An enzyme follows Michaelis-Menten kinetics. The activity of the enzyme was measured in the presence or absence of a molecule, 'X'. Given below are the double reciprocal equations for the enzyme activity with or without 'X'.

(i) Without molecule 'X' $\frac{1}{V_0} = \frac{K_m}{V_{max}} \left(\frac{1}{[S]} \right) + \frac{1}{V_{max}}$

(ii) With molecule 'X' $\frac{1}{V_0} = \frac{K_m}{V_{max}} \left(\frac{1}{[S]} \right) + \frac{1}{V_{max}} \left(1 + \frac{[X]}{K_X} \right)$

What kind of molecule is 'X'? Select from the options given below.

1. Temperature independent competitive inhibitor
2. Temperature dependent competitive inhibitor
3. Non-competitive inhibitor
4. Uncompetitive inhibitor

- Options
1. 1
 2. 2
 3. 3
 4. 4

Question Type : **MCQ**
Question ID : **3398931673**
Option 1 ID : **3398936461**
Option 2 ID : **3398936462**
Option 3 ID : **3398936463**
Option 4 ID : **3398936464**
Status : **Not Answered**
Chosen Option : **--**

Q.32 Following are statements related to peptide/protein conformation.

- A. The circular dichroism spectra of collagen and a protein in α -helical conformation will be identical.
- B. The allowed region for the dihedral angles ϕ , ψ in Gly, spans a large area in the Ramachandran map. This can be drastically reduced by substituting the two hydrogens with methyl groups.
- C. Proline has high frequency of occurrence in β -turns.
- D. In a β -hairpin structure, the dihedral angles ϕ , ψ , of amino acids flanking the β -turn region will be $\sim -60^\circ$, -30° , respectively.

Choose the combination with both **INCORRECT** statements.

- 1. B and C
- 2. A and B
- 3. A and D
- 4. C and D

Options 1. 1

- 2. 2
- 3. 3
- 4. 4

Question Type : **MCQ**

Question ID : **3398931669**

Option 1 ID : **3398936445**

Option 2 ID : **3398936446**

Option 3 ID : **3398936447**

Option 4 ID : **3398936448**

Status : **Not Answered**

Chosen Option : --

Q.33 Following observations were made about mRNA degradation pathway in the eukaryotic organism:

- A. A sequence independent endonuclease attack initiates degradation pathway for all mRNAs
- B. Degradation of the majority of mRNAs is deadenylation dependent
- C. Initially, the poly(A) tail is shortened by the PAN2/3 complex, followed by a rapid digestion by CCR4-NOT complex
- D. mRNA decay occurs only by 3' to 5' exonuclease activity
- E. The 3' to 5' mRNA degradation step is catalyzed by the exosome complex

Which one of the following options represents the combination of correct statements?

- 1. B, C, E
- 2. B, D, E
- 3. A, B, D
- 4. A, C, E

Options 1. 1

- 2. 2
- 3. 3
- 4. 4

Question Type : **MCQ**

Question ID : **3398931680**

Option 1 ID : **3398936489**

Option 2 ID : **3398936490**

Option 3 ID : **3398936491**

Option 4 ID : **3398936492**

Status : **Not Answered**

Q.34 A football player injured in the heat of play did not feel pain until the game was over. This stress- induced analgesia was explained by the following proposed statements:

- A. The release of norepinephrine from brain stem catecholaminergic neurons in the amygdala reduced during stress
- B. The reduced release of 2-arachidonoglycerol (2AG) in brain contributed to stress-induced analgesia
- C. The inhibition of CB₁ receptors in many brain regions accounted for reduced analgesia in stress
- D. The activation of CB₂ receptors on microglia in stress caused analgesic effect

Which one of the following options represents both correct statements?

- 1. A and B
- 2. B and C
- 3. C and D
- 4. A and D

Options 1. 1

2. 2

3. 3

4. 4

Question Type : **MCQ**

Question ID : **3398931702**

Option 1 ID : **3398936577**

Option 2 ID : **3398936578**

Option 3 ID : **3398936579**

Option 4 ID : **3398936580**

Status : **Not Answered**

Chosen Option : --

Q.35 Column A lists names of microorganisms and column B lists the pollutants that are degraded by the microbes.

Column A		Column B	
I	<i>Pseudomonas putida</i>	(i)	Methyl tert-butyl ether
II	<i>Methylobium petroleiphilum</i>	(ii)	Heavy metal detoxification
III	<i>Alconivorax borkumensis</i>	(iii)	Toluene, naphthalene
IV	<i>Deinococcus radiodurans</i>	(iv)	Fuel hydrocarbon

Which one of the following options correctly matches the organism to the pollutant it most commonly degrades?

- 1. I – (ii); II – (iv); III – (i); IV – (iii)
- 2. I – (iii); II – (iv); III – (ii); IV – (i)
- 3. I – (iii); II – (i); III – (iv); IV – (ii)
- 4. I – (iv); II – (iii); III – (i); IV – (ii)

Options 1. 1

2. 2

3. 3

4. 4

Question Type : **MCQ**

Question ID : **3398931734**

Option 1 ID : **3398936705**

Option 2 ID : **3398936706**

Option 3 ID : **3398936707**

Option 4 ID : **3398936708**

Status : **Not Answered**

Chosen Option : --

Q.36 In a plant, male sterility is caused by the presence of a dominant allele for a nuclear gene (*Ms*). There are also lines which carry a gene whose dominant allele (*F*) restores male fertility. These are called restorer lines. A cross is made between a male sterile line and a homozygous restorer line which does not contain the *Ms* allele. Of the F_1 progeny, only those that carry the *Ms* allele are allowed to self-pollinate. What is the probability of obtaining a male sterile line in the resulting F_2 progeny? (The *Ms* and *F* genes assort independently).

1. $1/4$
2. $3/16$
3. $3/4$
4. $1/16$

Options

1. 1
2. 2
3. 3
4. 4

Question Type : **MCQ**

Question ID : **3398931711**

Option 1 ID : **3398936613**

Option 2 ID : **3398936614**

Option 3 ID : **3398936615**

Option 4 ID : **3398936616**

Status : **Not Answered**

Chosen Option : --

Q.37 Given below are four statements regarding the use of marker assisted selection (MAS) in plant breeding:

- A. Markers that are not linked to target traits cannot be used to test accumulation of the desired recurrent parent's genetic background in a backcross breeding program.
- B. Co-dominant markers are more effective for marker assisted backcrossing since they facilitate selection of heterozygous progeny.
- C. MAS can be used to facilitate backcrossing of recessive genes that influence traits of interest.
- D. Use of tightly linked flanking markers for a trait of interest increases linkage drag in a breeding program.

Which one of the following options represents a combination of all **INCORRECT** statements?

1. A and B
2. B and C
3. A and D
4. C and D

Options

1. 1
2. 2
3. 3
4. 4

Question Type : **MCQ**

Question ID : 3398931731

Option 1 ID : 3398936693

Option 2 ID : 3398936694

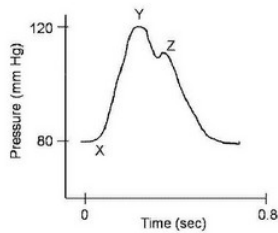
Option 3 ID : 3398936695

Option 4 ID : 3398936696

Status : Not Answered

Chosen Option : --

Q.38 The blood forced into aorta during systole sets up a pressure wave that travels along arteries (arterial pulse wave). The following figure depicts the pressure wave recorded from an artery during a cardiac cycle and the table below represents points in the graph (column A) and associated features (column B).



Column A		Column B	
a.	X	i.	Dichrotic notch
b.	Y	ii.	Systolic blood pressure
c.	(Y - X)	iii.	Diastolic blood pressure
d.	Z	iv.	Pulse pressure
e.	$\left[X + \frac{Y - X}{3}\right]$	v.	Mean arterial pressure

Which one of the following options represents a correct match between all terms of columns A and B?

1. a - i, b - iii, c - ii, d - v, e - iv
2. a - ii, b - iv, c - iii, d - v, e - i
3. a - iii, b - ii, c - iv, d - i, e - v
4. a - iv, b - v, c - i, d - iii, e - ii

Options 1. 1

2. 2

3. 3

4. 4

Question Type : MCQ

Question ID : 3398931704

Option 1 ID : 3398936585

Option 2 ID : 3398936586

Option 3 ID : 3398936587

Option 4 ID : 3398936588

Status : Not Answered

Chosen Option : --

Q.39

- Options**
1. 1
 2. 2
 3. 3
 4. 4

Question Type : **MCQ**
Question ID : **3398931723**
Option 1 ID : **3398936661**
Option 2 ID : **3398936662**
Option 3 ID : **3398936663**
Option 4 ID : **3398936664**
Status : **Answered**
Chosen Option : **1**

Q.40 Compaction during early embryonic development involves activation of actin filaments. Which one of the following inhibitors would prevent formation of the blastula from the morula?

1. An inhibitor that would block the action of Gli1.
2. A specific inhibitor for stabilizing the function of Axin.
3. A specific inhibitor for GSK3 β
4. An inhibitor which would block Smad4.

- Options**
1. 1
 2. 2
 3. 3
 4. 4

Question Type : **MCQ**
Question ID : **3398931686**
Option 1 ID : **3398936513**
Option 2 ID : **3398936514**
Option 3 ID : **3398936515**
Option 4 ID : **3398936516**
Status : **Answered**
Chosen Option : **3**

Q.41

- Options
1. 1
 2. 2
 3. 3
 4. 4

Question Type : **MCQ**
Question ID : **3398931676**
Option 1 ID : **3398936473**
Option 2 ID : **3398936474**
Option 3 ID : **3398936475**
Option 4 ID : **3398936476**
Status : **Not Answered**
Chosen Option : --

Q.42 The table below shows the number of unrooted and rooted trees generated when the number of taxa are three and four, respectively.

Number of taxa	Number of unrooted trees	Number of rooted trees
3	1	3
4	3	15
5	15	?

The number of rooted trees generated when there are five taxa is:

1. 75
2. 78
3. 105
4. 126

- Options
1. 1
 2. 2
 3. 3
 4. 4

Question Type : **MCQ**
Question ID : **3398931729**
Option 1 ID : **3398936685**
Option 2 ID : **3398936686**
Option 3 ID : **3398936687**
Option 4 ID : **3398936688**
Status : **Answered**
Chosen Option : **3**

Q.43

- Options
1. 1
 2. 2
 3. 3
 4. 4

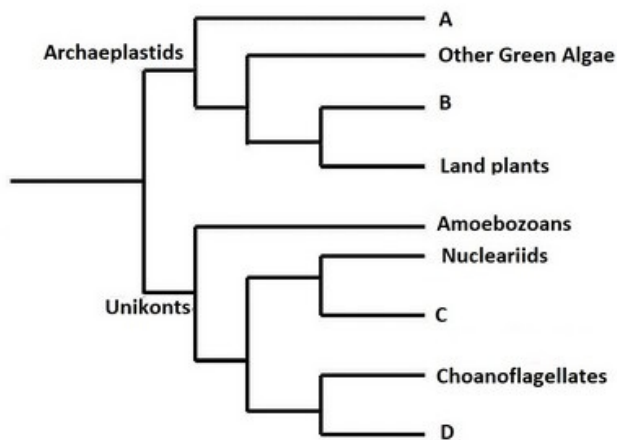
Question Type : **MCQ**
Question ID : **3398931668**
Option 1 ID : **3398936441**
Option 2 ID : **3398936442**
Option 3 ID : **3398936443**
Option 4 ID : **3398936444**
Status : **Not Answered**
Chosen Option : --

- Q.44** Following statements were made while describing the characteristics of transposable elements:
- A. Most transposons use a common mechanism in which DNA is nicked to generate blunt ends for its subsequent incorporation.
 - B. Homologous recombination between the repeats of a transposon may result in precise or imprecise excision.
 - C. P elements are transposons which show differential splicing pattern in germline and somatic cells.
 - D. In a transposon, *cis*-acting mutants that may prevent its transposition are generally located near the ends.
 - E. An insertion sequence (IS) is a transposon, which is always flanked by long (more than 30 bases) direct repeats known as Long Terminal Repeats (LTR).
- Which one of the following combinations of statements is correct?
1. A, C, E
 2. B, C, D
 3. C, D, E
 4. A, B, D

- Options
1. 1
 2. 2
 3. 3
 4. 4

Question Type : **MCQ**
Question ID : **3398931674**
Option 1 ID : **3398936465**
Option 2 ID : **3398936466**
Option 3 ID : **3398936467**
Option 4 ID : **3398936468**

Q.45 Following diagram shows phylogeny of plants, fungi, and animals:



In the above diagram A, B, C and D represent; respectively;

1. Fungi, Red algae, Charophytes, Animals
2. Red algae, Charophytes, Animals, Fungi
3. Green algae, Red algae, Animals, Fungi
4. Red algae, Charophytes, Fungi, Animals

Options

1. 1
2. 2
3. 3
4. 4

Question Type : **MCQ**
Question ID : **3398931717**
Option 1 ID : **3398936637**
Option 2 ID : **3398936638**
Option 3 ID : **3398936639**
Option 4 ID : **3398936640**
Status : **Not Answered**
Chosen Option : --

Q.46 Duschenne muscular dystrophy (DMD) is caused by a defective dystrophin gene and can be cured by removing a specific faulty exon. If a CRISPR/Cas9 based genome editing approach is to be designed to remove the faulty exon, some of the following conditions have to be met.

- A. Two guide RNA molecules to match the flanking regions of the faulty exon
- B. An efficient non-homologous end joining system in the host
- C. Two separate, specific Cas9 endonucleases to target both ends of the exon
- D. A single guide RNA that targets the intron preceding the exon

Choose the option that includes all the correct conditions.

1. A, B and C only
2. A and B only
3. C and D only
4. A and C only

Options

1. 1
2. 2

- 3. 3
- 4. 4

Question Type : **MCQ**
Question ID : **3398931732**
Option 1 ID : **3398936697**
Option 2 ID : **3398936698**
Option 3 ID : **3398936699**
Option 4 ID : **3398936700**
Status : **Not Answered**
Chosen Option : --

Q.47 Given below are some of the major characteristics of inflammatory responses against bacterial infections in general:

- A. TGF β levels are elevated
- B. Phagocytic capacity of macrophages is increased
- C. Complement system may get activated
- D. Self-reactive CD8⁺ T cells may get activated

Which one of the following combinations of above characteristics is most appropriate for inflammatory response against extracellular bacterial infections?

- 1. A and B
- 2. B and C
- 3. C and D
- 4. A and D

Options

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Type : **MCQ**
Question ID : **3398931685**
Option 1 ID : **3398936509**
Option 2 ID : **3398936510**
Option 3 ID : **3398936511**
Option 4 ID : **3398936512**
Status : **Answered**
Chosen Option : **2**

Q.48 Following observations were made about tRNA.

- A. tRNA encoding genes cluster at specific regions of the human genome
- B. 5' end of the mature tRNA is generated by RNase P mediated cleavage
- C. Modified bases may confer increased stability to tRNA
- D. Modified bases of tRNA do not affect the pattern of wobble pairing
- E. Suppressor tRNAs compete with the release factors to read the termination codons

Which one of the following combinations of statements represents correct observations?

- 1. A, C, E
- 2. B, E, D
- 3. B, C, E
- 4. A, B, D

Options

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Type : **MCQ**

Question ID : **3398931679**

Option 1 ID : **3398936485**

Option 2 ID : **3398936486**

Option 3 ID : **3398936487**

Option 4 ID : **3398936488**

Status : **Not Answered**

Chosen Option : --

Q.49 In most angiosperms, flowers have a perianth that consists of whorls of organs. Select the statement that is **INCORRECT** about the floral organs in angiosperms.

1. All petals are not homologous
2. If there is only one whorl of organs, these structures are referred to as tepals
3. Sepals tend to be initiated almost simultaneously and never in a spiral sequence.
4. Both sepals and petals can act as protective organs for inner floral organs and also as organs to attract pollinators

Options 1. 1

2. 2

3. 3

4. 4

Question Type : **MCQ**

Question ID : **3398931714**

Option 1 ID : **3398936625**

Option 2 ID : **3398936626**

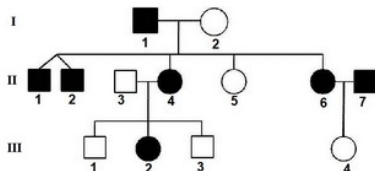
Option 3 ID : **3398936627**

Option 4 ID : **3398936628**

Status : **Not Answered**

Chosen Option : --

Q.50 The given pedigree shows the inheritance of a trait



The following derivations are made from the pedigree chart:

- A. The trait can be Y-linked because I-1 parent produced II-4 child
- B. The trait cannot be X-linked recessive because II-4 parent produced III-1 and III-3 children
- C. The trait can be X-linked dominant because I-1 parent produced II-5 child
- D. The trait is unlikely to be autosomal recessive because II-6 and II-7 parents produced III-4 child.
- E. The trait may be autosomal dominant

Which one of the following options represents a combination of all correct statements?

1. B, D, E
2. A, B, D
3. B, C, D
4. A, C.

Options 1. 1

2. 2

3. 3

4. 4

Question Type : **MCQ**

Question ID : **3398931709**

Option 1 ID : **3398936605**

Option 2 ID : **3398936606**

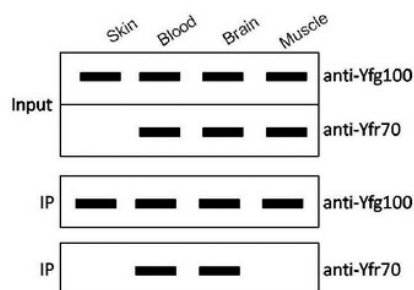
Option 3 ID : **3398936607**

Option 4 ID : **3398936608**

Status : **Not Answered**

Chosen Option : --

Q.51 A student hypothesized that protein Yfg100 interacted with protein Yfr70 in a tissue-specific manner. To test this, an immunoprecipitation experiment was performed using antibodies to Yfg 100 and the samples were subjected to western blot using antibodies to both Yfg100 and Yfr70. The results obtained are shown below



Based on the results shown, identify the **INCORRECT** statement

1. Protein Yfg100 is expressed in all tested tissues
2. Yfg100 does not interact with Yfr70 in muscle
3. Yfg100 interacts with Yfr70 in muscle but not in other tissues.
4. Yfr70 is not expressed in skin

Options

1. 1
2. 2
3. 3
4. 4

Question Type : **MCQ**

Question ID : **3398931738**

Option 1 ID : **3398936721**

Option 2 ID : **3398936722**

Option 3 ID : **3398936723**

Option 4 ID : **3398936724**

Status : **Not Answered**

Chosen Option : --

Q.52 Which one of the following statements about DNA replication is **INCORRECT**?

1. During DNA replication, when adjacent bidirectional forks converge, the lagging strand will meet the leading strand of the same template strand
2. Mismatched nucleotide at the 3'-OH end of the primer strand triggers the 3'-5' exonucleolytic proof reading activity
3. In a replication bubble moving bidirectionally, the same parental DNA strand cannot serve as a template for both the lagging and leading strand synthesis
4. DNA replication involves a RNA-DNA chimeric molecule

Options

1. 1
2. 2
3. 3
4. 4

Question Type : **MCQ**

Question ID : **3398931683**

Option 1 ID : **3398936501**

Option 2 ID : **3398936502**

Option 3 ID : **3398936503**

Option 4 ID : **3398936504**

Status : **Not Answered**

Chosen Option : --

Q.53 A patient with primary hyperaldosteronism develops diabetic glucose tolerance. Following statements are proposed on the pathophysiological condition of the patient:

- A. the increase of serum potassium inhibits insulin secretion
- B. the depletion of serum potassium decreases insulin secretion
- C. the depletion of sodium decreases insulin secretion
- D. thiazide diuretics worsen the condition of this patient

Which one of the following options represents a combination of correct statements?

- 1. A and B
- 2. B and C
- 3. C and D
- 4. B and D

Options

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Type : **MCQ**

Question ID : **3398931705**

Option 1 ID : **3398936589**

Option 2 ID : **3398936590**

Option 3 ID : **3398936591**

Option 4 ID : **3398936592**

Status : **Not Answered**

Chosen Option : --

Q.54 Given below are four statements on various methods used in molecular biology and recombinant DNA studies:

- A. Orientation of a cloned DNA fragment in a plasmid vector can be determined by using primers specific to the cloned fragment.
- B. Transcriptome sequencing cannot be used to identify differential expression profiles of mRNA in an organism.
- C. A DNA fragment with 5' overhangs can be converted into a blunt-ended fragment by using a nuclease but not by a DNA polymerase
- D. Oligonucleotide probes can be labelled at their 5' and 3' ends by using T4 polynucleotide kinase and terminal transferase, respectively

Which one of the following options consists of only correct statement/s?

- 1. A and C only
- 2. B only
- 3. C and D only
- 4. D only

Options

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Type : **MCQ**

Question ID : **3398931737**

Option 1 ID : **3398936717**

Option 2 ID : **3398936718**

Option 3 ID : **3398936719**

Option 4 ID : **3398936720**

Status : **Not Answered**

Chosen Option : --

Q.55 A guanine (G) base in DNA is susceptible to modification to 8-oxo-G because of oxidative damage. If the modified G residues are not removed by a DNA glycosylase (MutM or Fpg) prior to replication, an adenine (A) may be incorporated against 8-oxo-G. To avoid mutations, the cells have another DNA glycosylase called MutY. However, when the gene coding for MutY is deleted in *Escherichia coli*, the strain survives. This observation suggests that in *E. coli*

1. MutY is not responsible for the excision of 'A' incorporated against 8-oxo-G
2. alternate DNA repair pathways may substitute for the repair of A incorporated against 8-oxo-G
3. incorporation of 'A' against 8-oxo-G does not cause mutation in *E. coli*
4. the 8-oxo-G:A base pair in DNA distorts its structure in such a way that, during the next round of replication a 'G' is incorporated against A in the 8-oxo-G:A mismatch.

Options 1. 1

2. 2

3. 3

4. 4

Question Type : **MCQ**

Question ID : **3398931682**

Option 1 ID : **3398936497**

Option 2 ID : **3398936498**

Option 3 ID : **3398936499**

Option 4 ID : **3398936500**

Status : **Not Answered**

Chosen Option : --

Q.56 Given below are some properties that are applicable for T cell receptors:

- A. It is associated with a multi-component signal transducing complex, CD3, on the membrane
- B. It is divalent in nature
- C. It contains domains which are similar to the immunoglobulin fold structure
- D. It exhibits diversity generated by somatic mutation

Which one of the following combinations represents correct statements?

1. A and B
2. A and C
3. C and D
4. B and D

Options 1. 1

2. 2

3. 3

4. 4

Question Type : **MCQ**

Question ID : **3398931689**

Option 1 ID : **3398936525**

Option 2 ID : 3398936526

Option 3 ID : 3398936527

Option 4 ID : 3398936528

Status : Not Answered

Chosen Option : --

Q.57 Match the geological time period with the diversification events associated with them:

Geological era	Event
A. Cenozoic	i. Angiosperm diversification
B. Mesozoic	ii. Modern fauna diversification (bivalves, gastropods, bryozoans, malacostracan crustaceans)
C. Paleozoic	iii. Oceanic radiation of early eukaryotes
D. Proterozoic	iv. Mammal diversification

1. A – ii, B - i, C – iii, D - iv

2. A – iv, B - i, C – ii, D - iii

3. A – ii, B - iv, C – i, D - iii

4. A – iv, B - iii, C – i, D - ii

Options 1. 1

2. 2

3. 3

4. 4

Question Type : MCQ

Question ID : 3398931728

Option 1 ID : 3398936681

Option 2 ID : 3398936682

Option 3 ID : 3398936683

Option 4 ID : 3398936684

Status : Answered

Chosen Option : 3

Q.58 Given below are factors/terms associated with various aspects of plant growth and development:

Column A		Column B	
A.	Vacuolar-type programmed cell death	i.	Self-incompatibility
B.	S-locus	ii.	Adaxial-Abaxial patterning of leaf
C.	<i>CONSTANS</i>	iii.	Megasporogenesis
D.	<i>Knox</i>	iv.	Flowering in long photoperiods

Which one of the following options represents the most appropriate match between all terms of Column A and Column B?

1. A – ii, B – iii, C – iv, D – i

2. A – iii, B – i, C – iv, D – ii

3. A – ii, B – iv, C – i, D – iii

4. A – iv, B – i, C – ii, D – iii

Options 1. 1

2. 2

3. 3

4. 4

Question Type : **MCQ**

Question ID : **3398931690**

Option 1 ID : **3398936529**

Option 2 ID : **3398936530**

Option 3 ID : **3398936531**

Option 4 ID : **3398936532**

Status : **Not Answered**

Chosen Option : --

Q.59 Hippo pathway is responsible for the trophoblast and inner cell mass (ICM) differentiation during mammalian development. Which one of the following is true for ICM formation?

1. The Tead4 transcription factor, when active, promotes transcription of *Cdx2* gene leading to ICM formation.
2. If LATS kinase phosphorylates the YAP transcriptional coactivator, the phosphorylated form of YAP does not enter the nucleus and gets degraded which leads to ICM formation.
3. In the absence of functional LATS protein, the YAP transcriptional cofactor can bind to Tead4 to activate *Cdx2* gene promoting ICM
4. Synthesis of *Cdx2* upregulates Oct4 and Nanog leading to ICM formation.

Options

1. 1
2. 2
3. 3
4. 4

Question Type : **MCQ**

Question ID : **3398931695**

Option 1 ID : **3398936549**

Option 2 ID : **3398936550**

Option 3 ID : **3398936551**

Option 4 ID : **3398936552**

Status : **Answered**

Chosen Option : **4**

Q.60

Options 1. 1

2. 2

3. 3

4. 4

Question Type : **MCQ**

Question ID : **3398931724**

Option 1 ID : **3398936665**

Option 2 ID : **3398936666**

Option 3 ID : **3398936667**

Option 4 ID : **3398936668**

Status : **Answered**

Chosen Option : **4**

Q.61 Plants expressing bacterial *NahG* (Salicylate hydroxylase) are known to be defective in inducing systemic acquired resistance (SAR). A researcher applied the following synthetic chemicals on the *NahG* expressing plants.

A. 2,6-dichloroisonicotinic acid (INA)

B. Benzo (1,2,3) thiodiazole-7-carbothionic acid S-methyl ester (BTH)

Which one of the following statements is correct?

1. INA induces SAR but BTH does not induce SAR

2. INA does not induce SAR but BTH induces SAR

3. Both INA and BTH induce SAR

4. Neither INA nor BTH induce SAR

Options 1. 1

2. 2

3. 3

4. 4

Question Type : **MCQ**

Question ID : **3398931699**

Option 1 ID : **3398936565**

Option 2 ID : **3398936566**

Option 3 ID : **3398936567**

Option 4 ID : **3398936568**

Status : **Not Answered**

Chosen Option : --

Q.62 Two *petite* yeasts, *Mat-a* and *Mat-α* are crossed. The diploid is *grande*. After a few mitotic divisions, the *grande* diploid is sporulated. The analysis of a large number of tetrads yielded a 2:2 ratio of *petite: grande*. A few potential scenarios describing the reason for this segregation pattern are stated below:

- A. The parental strains had two different mitochondrial *rho*⁻ mutations
- B. One of the parents had a recessive nuclear *petite* mutation
- C. Only one of the mitochondrial *petite* mutation is inherited in the tetrads
- D. The mitochondria inherited are wild type.

Which one of the following options represents a combination of all correct statements?

- 1. A, B and C
- 2. B and D only
- 3. A and D only
- 4. B and C only

Options

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Type : **MCQ**

Question ID : **3398931708**

Option 1 ID : **3398936601**

Option 2 ID : **3398936602**

Option 3 ID : **3398936603**

Option 4 ID : **3398936604**

Status : **Not Answered**

Chosen Option : --

Q.63 In the following transformations,

Succinate + X $\rightleftharpoons$ fumarate

Malate + Y $\rightleftharpoons$ oxaloacetate

Pyruvate + Z $\rightleftharpoons$ oxaloacetate

The correct combination of X, Y, Z is

- 1. X=FAD, Y=NAD⁺, Z=ATP
- 2. X= ATP, Y= FAD, Z= NAD⁺
- 3. X= NAD⁺, Y= FAD, Z=ATP
- 4. X= NAD⁺, Y= ATP, Z= FAD

Options

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Type : **MCQ**

Question ID : **3398931672**

Option 1 ID : **3398936457**

Option 2 ID : **3398936458**

Option 3 ID : **3398936459**

Option 4 ID : **3398936460**

Status : **Answered**

Chosen Option : **2**

Q.64 Chromatin remodelling leading to histone modifications is invariably required for regulation of transcriptional activity of eukaryotic genes. The residues in histone tails may be methylated or acetylated. The nature of these modifications

1. is identical on all the nucleosomes of a gene
2. varies between the nucleosomes present in the transcription initiation and elongation regions
3. is always fixed for the nucleosomes in the promoter regions of the genes that are transcriptionally active
4. in the transcription initiation regions is identical for the genes that are sensitive to nuclease activity

Options 1. 1

2. 2

3. 3

4. 4

Question Type : **MCQ**

Question ID : **3398931681**

Option 1 ID : **3398936493**

Option 2 ID : **3398936494**

Option 3 ID : **3398936495**

Option 4 ID : **3398936496**

Status : **Not Answered**

Chosen Option : **--**

Q.65 In a flower species, light pink locus is hypostatic to pigment development locus. *R* is for pigment development and *W* for light pink. The recessive allele (*w*) in light pink locus gives red colour and recessive allele in pigment locus (*r*) gives white colour. What will be the phenotype of *W/-, r/r* and *w/w, r/r*?

1. Red, Pink
2. Pink, White
3. Red, Red
4. White, White

Options 1. 1

2. 2

3. 3

4. 4

Question Type : **MCQ**

Question ID : **3398931713**

Option 1 ID : **3398936621**

Option 2 ID : **3398936622**

Option 3 ID : **3398936623**

Option 4 ID : **3398936624**

Status : **Answered**

Chosen Option : **3**

Q.66

Options 1. 1

2. 2

3. 3

4. 4

Question Type : **MCQ**

Question ID : **3398931726**

Option 1 ID : **3398936673**

Option 2 ID : **3398936674**

Option 3 ID : **3398936675**

Option 4 ID : **3398936676**

Status : **Answered**

Chosen Option : **1**

Q.67 The two cell types, Anchor cell and vulval precursor cells are involved in vulva formation in *C. elegans*. The following statements are given towards understanding the roles of these two cell types and their signalling activities:

- A. Anchor cell is a germ cell from the gonad which sends induction signal to vulva for maintaining differentiation states.
- B. The six vulval precursor cells, influenced by anchor cell, form an equivalence group
- C. The cell directly beneath the anchor cell divides to form the central vulval cells, while the two flanking cells divide to become the lateral vulval cells
- D. The three cells further away from anchor cell generate hypodermal cells
- E. Lin3 signal from anchor cell forms a gradient and activates vulva forming genes in central and lateral cells
- F. The Notch-Delta mediated mechanism of restricting adjacent cell fates is called Lateral inhibition.

Which combination of the above statements is correct towards vulva formation in *C. elegans*?

- 1. A, B and E only
- 2. A, B, E and F
- 3. A, B, C and D
- 4. B, C, D, E and F

Options 1. 1

2. 2

3. 3

4. 4

Question Type : **MCQ**

Question ID : **3398931693**

Option 1 ID : **3398936541**

Option 2 ID : **3398936542**

Option 3 ID : 3398936543
Option 4 ID : 3398936544
Status : Answered
Chosen Option : 3

Q.68 The following statements were made regarding photosynthesis:

- A. Conversion of 3-phosphoglycerate into glyceraldehyde 3- phosphate is a reduction process which utilizes ATP as well as NADH in Calvin cycle
- B. Conversion of ribulose 5-phosphate to ribulose 1,5-bisphosphate utilizes one third of the total ATP requirements of carbon fixation in Calvin cycle.
- C. Sucrose is synthesized outside the chloroplast and uses uridine triphosphate to activate glucose.
- D. Starch is a glucose polymer which is synthesized in chloroplast stroma and uses ATP

Which one of the following options represents a combination of correct statements?

- 1. C and D
- 2. B and D
- 3. A and C
- 4. A and D

Options 1. 1

- 2. 2
- 3. 3
- 4. 4

Question Type : MCQ
Question ID : 3398931697
Option 1 ID : 3398936557
Option 2 ID : 3398936558
Option 3 ID : 3398936559
Option 4 ID : 3398936560
Status : Answered
Chosen Option : 3

Q.69 Below is a table showing the number of species and actual food web links observed in three different ecosystems.

Ecosystem	No. of species	Observed food web links
A	11	25
B	21	70
C	51	200

By calculating connectance as a measure of relative complexity of food webs, infer which of the following statements is correct?

- 1. Connectance increases as species richness increases.
- 2. Connectance decreases as species richness increases.
- 3. Connectance is constant regardless of species richness.
- 4. Relationship between species richness and connectance is stochastic.

Options 1. 1

- 2. 2
- 3. 3
- 4. 4

Question Type : MCQ
Question ID : 3398931719
Option 1 ID : 3398936645
Option 2 ID : 3398936646
Option 3 ID : 3398936647

Option 4 ID : 3398936648
Status : Answered
Chosen Option : 1

Q.70 Given below are some statements related to bacterial toxins.

- A. Exotoxins are usually heat stable proteins secreted by bacteria.
- B. Exotoxins are usually heat labile proteins secreted by bacteria.
- C. Endotoxins are heat stable lipopolysaccharide-protein complexes of the outer membrane of gram-negative bacteria.
- D. Endotoxins are heat labile lipoproteins of the outer membrane of gram-negative bacteria.

Which one of the following options represents a combination of correct statements?

- 1. A and B
- 2. B and C
- 3. B and D
- 4. A and D

Options

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Type : MCQ
Question ID : 3398931715
Option 1 ID : 3398936629
Option 2 ID : 3398936630
Option 3 ID : 3398936631
Option 4 ID : 3398936632
Status : Not Answered
Chosen Option : --

Q.71 A small number (approx. 10) of mice are introduced into an uninhabited island. Their population grows exponentially initially and after 4 years, reaches a population size of 520 after which the population stays stable. At what point would you expect the population to attain its highest growth rate?

- 1. When the population size is 260
- 2. When the mice population was first introduced
- 3. Their population growth rate remains constant throughout
- 4. When the population size reaches 520

Options

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Type : MCQ
Question ID : 3398931722
Option 1 ID : 3398936657
Option 2 ID : 3398936658
Option 3 ID : 3398936659
Option 4 ID : 3398936660
Status : Answered
Chosen Option : 3

Q.72

- Options 1. 1
2. 2
3. 3
4. 4

Question Type : **MCQ**
Question ID : **3398931670**
Option 1 ID : **3398936449**
Option 2 ID : **3398936450**
Option 3 ID : **3398936451**
Option 4 ID : **3398936452**
Status : **Not Answered**
Chosen Option : --

Q.73 Given below are sampling techniques and their features.

Sampling technique		Features	
A.	Stratified sampling	(i)	Population is divided into groups/clusters and a sample of groups/clusters is chosen using a probability method
B.	Systematic sampling	(ii)	Population is divided into groups/clusters and within each group/cluster, a probability sample is selected from it.
C.	Opportunity sampling	(iii)	Only participants available and willing to participate are used.
D.	Clustered sampling	(iv)	Samples are selected at regular intervals from the population

Which one of the following options correctly matches sampling techniques with their features?

1. A – (ii); B – (i); C – (iv); D – (iii)
2. A – (ii); B – (iv); C – (iii); D – (i)
3. A – (i); B – (iv); C – (iii); D – (ii)
4. A – (i); B – (iv); C – (ii); D – (iii)

- Options 1. 1
2. 2
3. 3
4. 4

Question Type : **MCQ**
Question ID : **3398931742**

Option 1 ID : 3398936737

Option 2 ID : 3398936738

Option 3 ID : 3398936739

Option 4 ID : 3398936740

Status : Not Answered

Chosen Option : --

Q.74 Suppose a population has three age classes. Females in the second and third age classes produce four and three offsprings, respectively. While 50% female in the first age class survive into the second age class, only 30% females survive into the third age class. The

Leslie matrix for this population is given by $L = \begin{pmatrix} 0 & 4 & 3 \\ 0.5 & 0 & 0 \\ 0 & 0.3 & 0 \end{pmatrix}$

If there are 10 individuals in each of the three age classes, the number of individuals in the next iteration would be:

1. 50
2. 78
3. 100
4. 65

Options 1. 1

2. 2
3. 3
4. 4

Question Type : MCQ

Question ID : 3398931720

Option 1 ID : 3398936649

Option 2 ID : 3398936650

Option 3 ID : 3398936651

Option 4 ID : 3398936652

Status : Not Answered

Chosen Option : --

Q.75 A plant cell with turgor pressure of 0.1 MPa and osmotic pressure of 0.7 MPa is placed in a salt solution of 0.6 MPa osmotic pressure. Considering that all other pressures and coefficients have no effect on water potential, the following statements were recorded:

- A. Water potential of the salt solution will be higher as compared to that of plant cell.
- B. Higher osmotic pressure will lower water potential, but higher turgor pressure will raise water potential. Therefore, both of these components are important to calculate water potential.
- C. There will be no net movement of water in the cell.
- D. Higher turgor pressure will force the water to move out of the cell.

Which one of the following options represents a combination of correct statements?

1. A and D
2. A and B
3. C and D
4. B and C

Options 1. 1

2. 2
3. 3
4. 4

Question Type : MCQ

Question ID : 3398931696

Option 1 ID : 3398936553

Option 2 ID : 3398936554

Option 3 ID : **3398936555**
Option 4 ID : **3398936556**
Status : **Not Answered**
Chosen Option : --