NTA JOINT CSIR UGC NET December 2025 18th Dec 2025

Application No	
Candidate Name	
Roll No.	
Test Date	18/12/2025
Test Time	9:00 AM - 12:00 PM
Subject	Life Sciences

Section : PART-A

Q.1 Consider the following information regarding a 3-digit PIN.

6	8	9	→ One number is correct and correctly placed
7	3	8	→ Nothing is correct
9	0	6	→ Two numbers correct but wrongly placed
6	1	5	→ One number is correct but wrongly placed
7	8	0	→ One number is correct but wrongly placed

The correct PIN is

1. 059
2. 601
3. 590
4. 859

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

Question Type : MCQ
Question ID : 209355282
Option 1 ID : 209355125
Option 2 ID : 209355126
Option 3 ID : 209355127
Option 4 ID : 209355128
Status : Answered
Chosen Option : 2

Q.2

Numbers of seats for Mathematics, Physics and Biology in a college are in the ratio 2:3:4. What will be the respective ratio if the seats for each subject are increased by 50%?

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

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

Question Type : MCQ
Question ID : 209355271
Option 1 ID : 2093551081
Option 2 ID : 2093551082
Option 3 ID : 2093551083
Option 4 ID : 2093551084
Status : Answered
Chosen Option : 1

Q.3

With only one match, between teams B and C, remaining in a tournament where each win fetches two points and a loss none, team A observes that they will become champions with more points than any other team if B wins, but not necessarily if B loses. Then

1. A is leading B by one point
2. B is leading C by one point
3. B is leading C by at least two points
4. A is leading C by at most two points

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

Question Type : MCQ
Question ID : 209355281
Option 1 ID : 2093551121
Option 2 ID : 2093551122
Option 3 ID : 2093551123
Option 4 ID : 2093551124
Status : Answered
Chosen Option : 2

Q.4 Sachin sees one-fourth of his body (height) when he stands in front of a vertical mirror at a distance of 20 cm from it. How much of his body will he see if he steps back and stands 40 cm from the mirror?

1. half
2. one-fourth
3. one-eighth
4. full

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

Question Type : MCQ
Question ID : 209355274
Option 1 ID : 2093551093
Option 2 ID : 2093551094
Option 3 ID : 2093551095
Option 4 ID : 2093551096
Status : Answered
Chosen Option : 3

Q.5 A box contains 20 black, 22 white, and 24 red socks. If a person draws socks at random one by one without looking, what is the minimum number of socks she must pick to be certain of having at least one pair of black socks?

1. 3
2. 4
3. 44
4. 48

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

Question Type : MCQ
Question ID : 209355283
Option 1 ID : 2093551129
Option 2 ID : 2093551130
Option 3 ID : 2093551131
Option 4 ID : 2093551132
Status : Answered
Chosen Option : 2

Q.6

The unit's place digit is half the ten's place digit in a two-digit number N. If we swap the digits, the number gets reduced by 18. The number N is _____.

1. 24
2. 42
3. 48
4. 84

Options 1. 1

2. 2

3. 3

4. 4

Question Type : MCQ
Question ID : 209355276
Option 1 ID : 2093551101
Option 2 ID : 2093551102
Option 3 ID : 2093551103
Option 4 ID : 2093551104
Status : Answered
Chosen Option : 2

Q.7

Suppose a tap mixes hot water and cold water in a ratio that depends linearly on the proportion of opening. Water out of the tap has temperature 40°C when the tap is half-open, and 30°C when it is three-fourths open. To get water at 50°C, the tap should be_____.

1. one-eighth open
2. one-fourth open
3. three-eighths open
4. five-eighths open

Options 1. 1

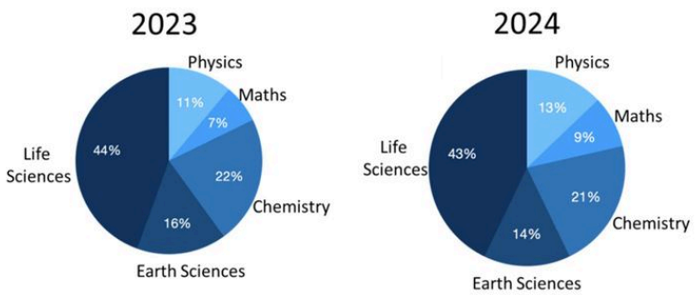
2. 2

3. 3

4. 4

Question Type : MCQ
Question ID : 209355285
Option 1 ID : 2093551137
Option 2 ID : 2093551138
Option 3 ID : 2093551139
Option 4 ID : 2093551140
Status : Answered
Chosen Option : 2

Q.8 The pie charts show placement percentages of graduates of five different subjects out of the total campus placements for two consecutive years.



In the year 2024, the number of Maths students who got placed was the double that of the previous year. Which of the following is the closest to the percentage change in the number of Life Sciences students placed in the year 2024?

1. decreased by 1%
2. increased by 50%
3. decreased by 50%
4. increased by 20%

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

Question Type : MCQ
Question ID : 2093552275
Option 1 ID : 2093551097
Option 2 ID : 2093551098
Option 3 ID : 2093551099
Option 4 ID : 2093551100
Status : Answered
Chosen Option : 1

Q.9 The following bus schedule is seen at a bus stop located somewhere in between town A and town B.

Town A- 00:10, then every 20 mins

Town B- 00:15, then every 20 mins

If a person arrives at this bus stop at some random time, the probability that the next bus is for town B is

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

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

Question Type : MCQ
Question ID : 2093552279
Option 1 ID : 2093551113
Option 2 ID : 2093551114
Option 3 ID : 2093551115
Option 4 ID : 2093551116
Status : Answered
Chosen Option : 1

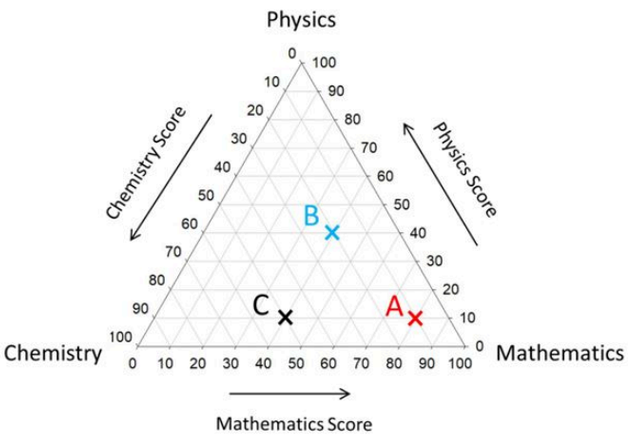
Q.10 There is an increase of 30% in the number of people coming to a theatre after reducing the entry fee by 25% per person. How much change is expected in the total earnings?

1. 2.5% increase
2. 2.5% decrease
3. Nil
4. 7.5% increase

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

Question Type : MCQ
Question ID : 2093552 67
Option 1 ID : 2093551065
Option 2 ID : 2093551066
Option 3 ID : 2093551067
Option 4 ID : 2093551068
Status : Answered
Chosen Option : 1

Q.11 The following ternary figure shows the marks obtained by students A, B and C in an exam of 100 marks. Here, C received 10 marks in Physics, 50 marks in Chemistry and 40 marks in Mathematics.



Which one of the following is CORRECT?

1. A's marks in Chemistry are more than C's marks in Physics
2. B has scored equal in Mathematics and Physics
3. A has scored 20 in Chemistry
4. A has scored 80 in Chemistry

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

Question Type : MCQ
Question ID : 2093552 72
Option 1 ID : 2093551085
Option 2 ID : 2093551086
Option 3 ID : 2093551087
Option 4 ID : 2093551088
Status : Not Answered
Chosen Option : --

Q.12 A cellphone tower with signals reaching up to 500 m is set up on a conical hill of height 1.5 km and base radius 2 km. Assuming the tower's height to be negligible compared to the hill, the area served by the tower in km^2 is (the area of the curved surface of a right circular cone is π × base radius × slant height)

1. 0.2π
2. 0.25π
3. 4π
4. 5π

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

Question Type : MCQ
Question ID : 209355284
Option 1 ID : 2093551133
Option 2 ID : 2093551134
Option 3 ID : 2093551135
Option 4 ID : 2093551136
Status : Not Answered
Chosen Option : --

Q.13 Restaurants A, B, C, and D give the following offers:

A: one mocktail free for every two purchased
B: one mocktail free for every three purchased
C: two mocktails free for every six purchased
D: 30% discount on each mocktail

If all of the restaurants have the same marked price for each mocktail, in which restaurant would you pay the least if you drank eight mocktails?

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

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

Question Type : MCQ
Question ID : 209355273
Option 1 ID : 2093551089
Option 2 ID : 2093551090
Option 3 ID : 2093551091
Option 4 ID : 2093551092
Status : Answered
Chosen Option : 4

Q.14 Suppose the words GATE, FAST, SAND and READ can be written in numbers as 2938, 6921, 0798 and 5917, but not necessarily in that order. The positions of the letters in a word and the corresponding digits in the respective number are the same. Then the word NEGATE will be written as

1. 716921
2. 380798
3. 375917
4. 891217

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

Question Type : MCQ
Question ID : 2093551268
Option 1 ID : 2093551069
Option 2 ID : 2093551070
Option 3 ID : 2093551071
Option 4 ID : 2093551072
Status : Answered
Chosen Option : 2

Q.15 A boatman on a bank of a river has to carry a dog, a cat and a container full of milk to the other bank in a boat, one at a time. The cat cannot be left alone with the milk or with the dog on either bank. What is the minimum number of times the boatman has to cross the river to carry all to the other bank?

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

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

Question Type : MCQ
Question ID : 2093552777
Option 1 ID : 2093551105
Option 2 ID : 2093551106
Option 3 ID : 2093551107
Option 4 ID : 2093551108
Status : Answered
Chosen Option : 1

Q.16 A person borrowed Rs. 2500/- for 2 years, and Rs. 2000/- for 3 years, with the same simple interest rate. If he paid a total of Rs. 550/- as interest, then the annual rate of interest was

1. 10%
2. 2%
3. 5%
4. 8%

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

Question Type : MCQ
Question ID : 209355269
Option 1 ID : 2093551073
Option 2 ID : 2093551074
Option 3 ID : 2093551075
Option 4 ID : 2093551076
Status : Not Answered
Chosen Option : --

Q.17 An auditorium has 8 seats in the first row, with every row to follow having 4 more seats than its preceding row. The total capacity is 416. What is the minimum number of rows needed to seat 150 people?

1. 8
2. 5
3. 3
4. 2

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

Question Type : MCQ
Question ID : 209355280
Option 1 ID : 2093551117
Option 2 ID : 2093551118
Option 3 ID : 2093551119
Option 4 ID : 2093551120
Status : Not Answered
Chosen Option : --

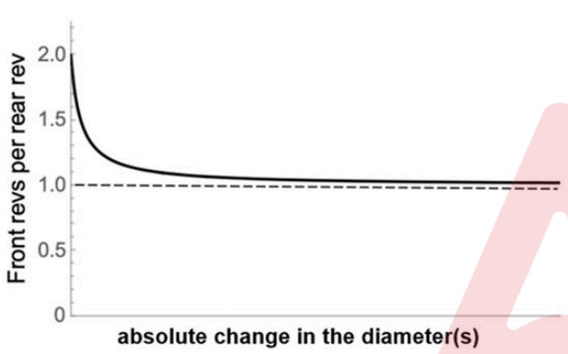
Q.18 A father said to his son, “I was as old as you are when I became your father.” If the current age of father is 52 years, the age of son after 10 years will be _____.

1. 26 years
2. 36 years
3. 20 years
4. 40 years

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

Question Type : MCQ
Question ID : 209355270
Option 1 ID : 209355l077
Option 2 ID : 209355l078
Option 3 ID : 209355l079
Option 4 ID : 209355l080
Status : Answered
Chosen Option : 2

Q.19 With a certain set of diameters, a tractor’s front wheels make 2 revolutions (revs) for every 1 revolution of the rear wheels. The effect of changing wheel diameter(s) is shown in the following plot.



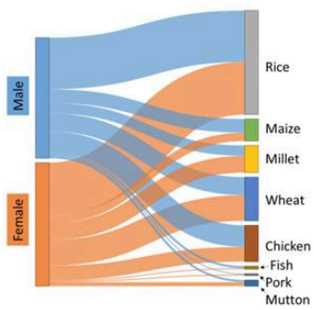
In this context, which of the following statements is CORRECT?

1. Only the rear wheel diameter is decreased
2. Both the rear and front wheel diameters are decreased equally
3. Both the rear and front wheel diameters are increased equally
4. The rear wheel diameter decreased, and the front wheel diameter increased equally

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

Question Type : MCQ
Question ID : 209355278
Option 1 ID : 209355l109
Option 2 ID : 209355l110
Option 3 ID : 209355l111
Option 4 ID : 209355l112
Status : Not Answered
Chosen Option : --

Q.20 The Sankey diagram shows food preferences of males and females. The widths of the bands are proportional to numbers of persons opting for a given food item.



Which one of the following is an INCORRECT statement about the food preferences?

1. Chicken is the second most preferred food in males.
2. As compared to males, more females prefer wheat.
3. As compared to males, more females prefer mutton and millet.
4. Fewer females prefer rice than the total number of males preferring maize and millet.

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

Question Type : MCQ
Question ID : 2093552666
Option 1 ID : 2093551061
Option 2 ID : 2093551062
Option 3 ID : 2093551063
Option 4 ID : 2093551064
Status : Answered
Chosen Option : 4

Section : PART-B

Q.21 Given below is one of the strands of a double-stranded DNA sequence:

5′ – ATGCGATGACGATGACGATGACGATGACGAACGATGAGATGG – 3′

In the absence of any other confounding factors (viz., length, T_m, etc.), which one of the following options represents the primer combination that would amplify the above double-stranded template in a PCR?

1. 5′– TACGCTACT – 3′ and 5′ – ATGAGATGG – 3′
2. 5′ – ATGCGATGA – 3′ and 5′ – GGTAGAGTA – 3′
3. 5′ – TCATCGCAT – 3′ and 5′ – CCATCTCAT – 3′
4. 5′ – ATGCGATGA – 3′ and 5′ – CCATCTCAT – 3′

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

Question Type : MCQ
Question ID : 2093553341
Option 1 ID : 2093551333
Option 2 ID : 2093551334
Option 3 ID : 2093551335
Option 4 ID : 2093551336
Status : Answered
Chosen Option : 4

Q.22 Which one of the following histone marks is NOT an indicator of heterochromatin?

1. H3K9 trimethylation
2. MacroH2A
3. H2AX
4. H4K20 trimethylation

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

Question Type : MCQ
Question ID : 2093552911
Option 1 ID : 2093551161
Option 2 ID : 2093551162
Option 3 ID : 2093551163
Option 4 ID : 2093551164
Status : Not Answered
Chosen Option : --

Q.23 Gradualism and punctuated equilibrium represent contrasting models of evolutionary change. Which one of the following options best describes these two models?

1. Gradualism emphasizes that evolution occurs through long periods of stasis interrupted by sudden, large-scale mutations, while punctuated equilibrium proposes continuous, slow change within species.
2. Gradualism and punctuated equilibrium both deny the role of natural selection in shaping evolutionary change.
3. Gradualism proposes that evolution proceeds through the steady accumulation of small changes, whereas punctuated equilibrium suggests long periods of evolutionary stability marked by relatively rapid bursts of speciation.
4. Both models reject the importance of the fossil record in understanding macroevolutionary patterns.

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

Question Type : MCQ
Question ID : 209355327
Option 1 ID : 2093551305
Option 2 ID : 2093551306
Option 3 ID : 2093551307
Option 4 ID : 2093551308
Status : Not Answered
Chosen Option : --

Q.24 Which one of the following is NOT involved in the secretion of K^+ from blood into the tubular fluid by the principal cells of distal tubules?

1. Big K^+ channels (BK)
2. Renal outer medullary K^+ channels (ROMC)
3. $1Na^+$-$1K^+$-$2Cl^-$ symporter (NKCC2)
4. K^+/Cl^- cotransporter (KCC1)

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

Question Type : MCQ
Question ID : 2093553111
Option 1 ID : 2093551241
Option 2 ID : 2093551242
Option 3 ID : 2093551243
Option 4 ID : 2093551244
Status : Answered
Chosen Option : 1

Q.25 Which one of the following components of the immune system is NOT effective for the clearance of large parasites like worms?

1. Basophils
2. Eosinophils
3. NK cells
4. Mast cells

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

Question Type : MCQ
Question ID : 209355299
Option 1 ID : 209355 1193
Option 2 ID : 209355 1194
Option 3 ID : 209355 1195
Option 4 ID : 209355 1196
Status : Answered
Chosen Option : 4

Q.26 Which one of the following is NOT an evolutionary model for mate choice in animals?

1. Direct benefit model
2. Good gene model
3. Chase away model
4. Green beard effect

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

Question Type : MCQ
Question ID : 209355329
Option 1 ID : 209355 1313
Option 2 ID : 209355 1314
Option 3 ID : 209355 1315
Option 4 ID : 209355 1316
Status : Answered
Chosen Option : 1

Q.27 Which one of the following statements is NOT considered a core principle of conservation biology?

1. Conservation efforts should focus on maintaining entire ecosystems, as opposed to only individual species.
2. A disruption of species/trophic interactions can create a cascading effect throughout an entire ecosystem.
3. Ecosystems should be maintained in their climax state, preventing processes like disturbance and succession.
4. Management of an ecosystem should be long term and include many ecological processes and impacts of human activities.

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

Question Type : MCQ
Question ID : 2093551325
Option 1 ID : 2093551297
Option 2 ID : 2093551298
Option 3 ID : 2093551299
Option 4 ID : 2093551300
Status : Answered
Chosen Option : 3

Q.28 The genome editing tool, CRISPR-Cas9, was developed based on which one of the following natural phenomena?

1. An immune response of lower eukaryotes
2. A bacterial defence mechanism
3. A specialised homologous recombination machinery in eukaryotes
4. Transposon insertion machinery in prokaryotes

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

Question Type : MCQ
Question ID : 2093551332
Option 1 ID : 2093551325
Option 2 ID : 2093551326
Option 3 ID : 2093551327
Option 4 ID : 2093551328
Status : Answered
Chosen Option : 3

Q.29 The cytosolic proteins, Ras and Rab, are anchored to the cytosolic face of the plasma membrane by prenylation. Prenylation typically occurs at which amino acid of the protein?

1. Cysteine residue at or near the C-terminus
2. Cysteine residue at or near the N-terminus
3. Glycine residue at or near the C-terminus
4. Glycine residue at or near the N-terminus

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

Question Type : MCQ
Question ID : 2093552293
Option 1 ID : 2093551169
Option 2 ID : 2093551170
Option 3 ID : 2093551171
Option 4 ID : 2093551172
Status : Not Answered
Chosen Option : --

Q.30 Lac repressor binding occurs at the level of

1. mRNA, on the sequence corresponding to the operator region.
2. DNA, in the *lac* operon in the operator region.
3. both DNA and RNA, in the sequences corresponding to the operator region.
4. ribosomes, during mRNA translation.

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

Question Type : MCQ
Question ID : 2093553115
Option 1 ID : 2093551257
Option 2 ID : 2093551258
Option 3 ID : 2093551259
Option 4 ID : 2093551260
Status : Answered
Chosen Option : 1

Q.31 During long-term growth in static liquid culture, *Pseudomonas fluorescens* diversifies into distinct colony types with the following characteristics: wrinkly spreaders that form biofilms at the oxygen-rich surface, smooth morphs that grow freely in the oxygen-poor bottom layer, and fuzzy types that colonises the intermediate zone.

Which one of the following evolutionary processes best explains this ecological diversification?

1. Genetic drift resulting in differential microhabitat use
2. Adaptive radiation into different microhabitats
3. Coevolution between the distinct *P. fluorescens* strains in microhabitats
4. Convergent evolution among unrelated bacterial species

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

Question Type : MCQ
Question ID : 2093553l8
Option 1 ID : 2093551269
Option 2 ID : 2093551270
Option 3 ID : 2093551271
Option 4 ID : 2093551272
Status : Answered
Chosen Option : 3

Q.32 Which one of the following is NOT caused by atriopeptins, a family of peptides produced in cardiac atrial tissues?

1. Natriuresis
2. Vasoconstriction
3. Diuresis
4. Inhibition of aldosterone secretion

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

Question Type : MCQ
Question ID : 2093553l2
Option 1 ID : 2093551245
Option 2 ID : 2093551246
Option 3 ID : 2093551247
Option 4 ID : 2093551248
Status : Not Answered
Chosen Option : —

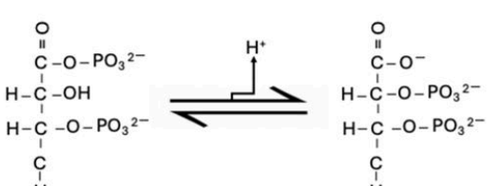
Q.33 The circadian rhythm of higher vertebrates is regulated by the

1. suprachiasmatic nucleus.
2. cerebral cortex.
3. pituitary gland.
4. thymus.

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

Question Type : MCQ
Question ID : 209355328
Option 1 ID : 209355l309
Option 2 ID : 209355l310
Option 3 ID : 209355l311
Option 4 ID : 209355l312
Status : Answered
Chosen Option : 1

Q.34 Which one of the following enzymes catalyzes the biochemical reaction given below?



1. Phosphoenolpyruvate mutase
2. Phosphoglycerate kinase
3. Pyruvate dehydrogenase phosphatase
4. Bis-phosphoglycerate mutase

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

Question Type : MCQ
Question ID : 209355287
Option 1 ID : 209355l145
Option 2 ID : 209355l146
Option 3 ID : 209355l147
Option 4 ID : 209355l148
Status : Not Answered
Chosen Option : --

Q.35

Which one of the following molecules does NOT directly transduce signals to neighbouring cells?

1. Beta catenin
2. Connexin
3. BMP7
4. Dopamine

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

Question Type : MCQ
Question ID : 209355300
Option 1 ID : 2093551197
Option 2 ID : 2093551198
Option 3 ID : 2093551199
Option 4 ID : 2093551200
Status : Answered
Chosen Option : 3

Q.36

Which one of the following pairs is analogous and NOT homologous?

1. Potato tuber and sweet potato tuber
2. Human arm and whale flipper
3. The thorn of citrus plant and the tendril of a cucurbit plant
4. Flippers of dolphin and fins of fish

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

Question Type : MCQ
Question ID : 209355320
Option 1 ID : 2093551277
Option 2 ID : 2093551278
Option 3 ID : 2093551279
Option 4 ID : 2093551280
Status : Answered
Chosen Option : 3

Q.37

Which one of the following corresponds to the angle of rotation per residue in a 3_{10} helix and 3.6_{13} helix, respectively?

1. 100° and 120°
2. 30° and 60°
3. 60° and 30°
4. 120° and 100°

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

Question Type : MCQ
Question ID : 209355288
Option 1 ID : 2093551149
Option 2 ID : 2093551150
Option 3 ID : 2093551151
Option 4 ID : 2093551152
Status : Not Answered
Chosen Option : --

Q.38 Which one of the following options is NOT included in the Wildlife (Protection) Amendment Act, 2022?

1. Inclusion of a new schedule designating some species as 'vermin'
2. Rationalization of schedules
3. Regulation of invasive alien species
4. Recommendation for implementation of provisions of CITES

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

Question Type : MCQ
Question ID : 2093553322
Option 1 ID : 2093551285
Option 2 ID : 2093551286
Option 3 ID : 2093551287
Option 4 ID : 2093551288
Status : Not Answered
Chosen Option : --

Q.39 An antibiotic, that mimics aminoacyl-tRNAs, gets incorporated into the polypeptide chain and prematurely terminates elongation.

The following statements are made based on this observation:

A. It enters the ribosome through the A-site.
B. It enters the ribosome through the P-site.
C. A part of its structure resembles the carboxy terminus of amino acids and is available for making a peptide bond.
D. A part of its structure resembles the amino terminus of amino acids and is available for making a peptide bond.

Which one of the following options represents all correct statements?

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

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

Question Type : MCQ
Question ID : 2093552916
Option 1 ID : 2093551181
Option 2 ID : 2093551182
Option 3 ID : 2093551183
Option 4 ID : 2093551184
Status : Not Answered
Chosen Option : --

Q.40 In developing mouse brain, when gene *yfg* is deleted from hippocampal cell-type 'A', the number of neighbouring cell-type 'B' increases by five-fold. From this information, which one of the following statements accurately describes *yfg* functioning in wildtype 'A' cells?

1. It promotes 'B' proliferation.
2. It has no role in 'B' proliferation.
3. It inhibits 'B' proliferation.
4. It induces *yfg* expression in 'B' cells.

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

Question Type : MCQ
Question ID : 209355303
Option 1 ID : 2093551209
Option 2 ID : 2093551210
Option 3 ID : 2093551211
Option 4 ID : 2093551212
Status : Answered
Chosen Option : 4

Q.41 Assimilation Efficiency is calculated as the percentage of the ingested energy that is assimilated by an organism. Which one of the following gut architectures has the lowest assimilation efficiency?

1. A monogastric gut with acid enzymes to break down food
2. A ruminant gut that facilitates regurgitation and chewing of cud
3. An avian gut with mechanical grinding in the gizzard
4. Cecal/Hindgut fermentation with enlarged cecum or large intestine

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

Question Type : MCQ
Question ID : 209355323
Option 1 ID : 2093551289
Option 2 ID : 2093551290
Option 3 ID : 2093551291
Option 4 ID : 2093551292
Status : Answered
Chosen Option : 3

Q.42 Which one of the following statements is FALSE regarding how retroviruses and DNA viruses can lead to cancer in host cells?

1. Rous sarcoma virus contains an oncogene derived from a host proto-oncogene, which allows it to rapidly induce tumours.
2. Slow-acting retroviruses cause cancer by integrating near host proto-oncogenes, activating their expression and leading to cell proliferation.
3. DNA viruses can cause cancer if their DNA becomes integrated into the host genome and expresses viral oncogenes, which stimulate cell growth and proliferation.
4. Retroviruses cause cancer only by directly mutating host DNA, without the need for integration or activation of proto-oncogenes.

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

Question Type : MCQ
Question ID : 209355298
Option 1 ID : 209355189
Option 2 ID : 209355190
Option 3 ID : 209355191
Option 4 ID : 209355192
Status : Answered
Chosen Option : 2

Q.43 In the complete blood profile analysis using an automated haematology analyser, the haemoglobin concentration is measured using

1. sedimentation analysis.
2. spectrophotometric methods.
3. mass spectrometry.
4. NMR spectroscopy.

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

Question Type : MCQ
Question ID : 209355331
Option 1 ID : 209355321
Option 2 ID : 209355322
Option 3 ID : 209355323
Option 4 ID : 209355324
Status : Answered
Chosen Option : 2

Q.44 Which one of the following is the most appropriate effects of hypoxic pretreatment and acclimation on survival of plants under anoxia?

1. Prevention of ethanol fermentation
2. Increase in capacity of roots for lactate efflux
3. Prevention of glucose to lactate conversion
4. Prevention of ethanol diffusion

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

Question Type : MCQ
Question ID : 209355309
Option 1 ID : 209355l233
Option 2 ID : 209355l234
Option 3 ID : 209355l235
Option 4 ID : 209355l236
Status : Not Answered
Chosen Option : --

Q.45 Which key feature best differentiates somatic embryogenesis from organogenesis in plant tissue culture?

1. Somatic embryogenesis originates from zygotic embryos, while organogenesis originates from vegetative explants.
2. Somatic embryos develop bipolar structures (with both shoot and root poles), whereas organogenesis typically produces unipolar structures that require further differentiation.
3. Somatic embryogenesis does not require growth regulators, while organogenesis strictly requires an auxin–cytokinin balance.
4. In somatic embryogenesis, vascular connections are continuous with the parent tissue, whereas in organogenesis vascular strands remain independent.

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

Question Type : MCQ
Question ID : 209355333
Option 1 ID : 209355l329
Option 2 ID : 209355l330
Option 3 ID : 209355l331
Option 4 ID : 209355l332
Status : Not Answered
Chosen Option : --

Q.46

A cross is made between two strains of *E. coli*, Hfr *leu*$^+$ *arg*$^+$ *met*$^+$ × F$^-$ *leu*$^-$ *arg*$^-$ *met*$^-$ Str^R and the mixture is plated on minimal synthetic medium supplemented with streptomycin, arginine and methionine. If the linear organization of the genes are *leu-arg-met*, which one of the following genotypes is expected to occur with lowest frequency?

1. *leu*$^+$ *arg*$^+$ *met*$^+$
2. *leu*$^+$ *arg*$^+$ *met*$^-$
3. *leu*$^+$ *arg*$^-$ *met*$^-$
4. *leu*$^+$ *arg*$^-$ *met*$^+$

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

Question Type : MCQ
Question ID : 2093553l6
Option 1 ID : 2093551261
Option 2 ID : 2093551262
Option 3 ID : 2093551263
Option 4 ID : 2093551264
Status : Answered
Chosen Option : 2

Q.47

Choose the INCORRECT statement regarding the synthesis of reactive oxygen species (ROS) upon pathogen infection in plants.

1. Plasma membrane-spanning NADPH oxidase is involved in the synthesis of ROS.
2. NADPH oxidases are encoded by respiratory burst oxidase homolog genes in *Arabidopsis* (*Atrboh*).
3. Activation of NADPH oxidase does not require the action of calcium-dependent protein kinases (CDPKs).
4. Apoplastic peroxidase enzymes (PRX) are involved in ROS production.

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

Question Type : MCQ
Question ID : 20935530l
Option 1 ID : 2093551201
Option 2 ID : 2093551202
Option 3 ID : 2093551203
Option 4 ID : 2093551204
Status : Not Answered
Chosen Option : --

Q.48 Which one of the following options is the correct sequence of gene expression for successful axis specification in Drosophila?

1. *Fushi tarazu; giant; hairy; gooseberry*
2. *Hedgehog; hunchback; runt; paired*
3. *Odd-skipped; knirps; hairy; armadillo*
4. *Krüppel; hairy; fushi tarazu; wingless*

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

Question Type : MCQ
Question ID : 209355302
Option 1 ID : 2093551205
Option 2 ID : 2093551206
Option 3 ID : 2093551207
Option 4 ID : 2093551208
Status : Not Answered
Chosen Option : --

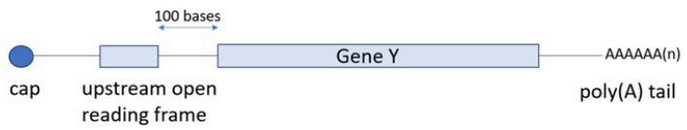
Q.49 Which one of the following metabotropic receptors increases intracellular cAMP level after stimulation by its specific neurotransmitter?

1. $mGluR_5$
2. $5HT_{2A}$
3. $5HT_4$
4. M_5

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

Question Type : MCQ
Question ID : 209355310
Option 1 ID : 2093551237
Option 2 ID : 2093551238
Option 3 ID : 2093551239
Option 4 ID : 2093551240
Status : Not Answered
Chosen Option : --

Q.50 Yeast gene Y has an mRNA with the structure shown below. Both the upstream open reading frame (uORF) and the coding region of gene Y have start and stop codons.



Which one of the following will you remove to maximize translation of gene Y?

1. Cap
2. Start codon of the uORF
3. Stop codon of the uORF
4. Poly(A) tail

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

Question Type : MCQ
Question ID : 209355297
Option 1 ID : 2093551185
Option 2 ID : 2093551186
Option 3 ID : 2093551187
Option 4 ID : 2093551188
Status : Answered
Chosen Option : 3

Q.51 Two different antibodies against the same protein were generated. They were named, AB1 and AB2. While AB1 was able to detect the target protein in a western blot, it was unable to detect the protein in ELISA. The opposite was true for AB2. Which one of the following is the most likely reason?

1. AB1 detects SDS-bound protein, whereas AB2 detects protein that is not bound to SDS.
2. AB1 is unable to cross the cell membrane, whereas AB2 is membrane permeable.
3. AB1 detects epitopes on the folded protein, whereas AB2 detects the unfolded epitopes.
4. AB1 detects linear epitopes on unfolded protein, but AB2 detects discontinuous epitopes present on the folded protein.

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

Question Type : MCQ
Question ID : 209355335
Option 1 ID : 2093551337
Option 2 ID : 2093551338
Option 3 ID : 2093551339
Option 4 ID : 2093551340
Status : Answered
Chosen Option : 1

Q.52 Which one of the following vitamins contains a transition metal ion as a part of its structure?

1. Vitamin C
2. Vitamin D_3
3. Vitamin B_{12}
4. Vitamin E

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

Question Type : MCQ
Question ID : 209355289
Option 1 ID : 2093551153
Option 2 ID : 2093551154
Option 3 ID : 2093551155
Option 4 ID : 2093551156
Status : Answered
Chosen Option : 2

Q.53 Which one of the enzymatic activities is NOT present in bacterial RecA?

1. ATP hydrolysis activity
2. Strand-exchange activity
3. Nucleolytic activity
4. Proteolytic activity

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

Question Type : MCQ
Question ID : 209355294
Option 1 ID : 2093551173
Option 2 ID : 2093551174
Option 3 ID : 2093551175
Option 4 ID : 2093551176
Status : Answered
Chosen Option : 2

Q.54 Which one of the following pairs is NOT a prokaryote : angiosperm symbiotic pair that can fix atmospheric nitrogen?

1. Nostoc and Gunnera
2. Frankia and Casuarina
3. Bradyrhizobium and Parasponia
4. Azolla and Rice

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

Question Type : MCQ
Question ID : 209355307
Option 1 ID : 2093551225
Option 2 ID : 2093551226
Option 3 ID : 2093551227
Option 4 ID : 2093551228
Status : Answered
Chosen Option : 4

Q.55 The resource-ratio hypothesis (R*) of competitive coexistence of species proposed by David Tilman postulates that

1. coexisting species are limited by different resources in the shared resource set.
2. shared resources are equally limiting for each competing species.
3. species abundances are determined by the ratios of limiting resources for each species.
4. the ratio between the resource availability and resource use is constant between competing species.

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

Question Type : MCQ
Question ID : 209355324
Option 1 ID : 2093551293
Option 2 ID : 2093551294
Option 3 ID : 2093551295
Option 4 ID : 2093551296
Status : Answered
Chosen Option : 4

Q.56 Given below are pairs of sugars.

A. D-glucose and D-fructose
B. D-galactose and D-glucose
C. α-D-glucose and β-D-glucose
D. D-ribose and D-ribulose

Which one of the following options represents the correct combination of anomer and epimer pairs, respectively?

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

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

Question Type : MCQ
Question ID : 209355286
Option 1 ID : 2093551141
Option 2 ID : 2093551142
Option 3 ID : 2093551143
Option 4 ID : 2093551144
Status : Answered
Chosen Option : 2

Q.57 Which one of the following options represents the correct order of events during newt limb regeneration following amputation?

1. Wound epidermis formation, remodelling of extracellular matrix, blastema formation, and differentiation
2. Blastema formation, remodelling of extracellular matrix, differentiation and wound epidermis formation
3. Blastema formation, wound epidermis formation, extracellular matrix remodelling and differentiation
4. Extracellular matrix remodelling, wound epidermis formation, blastema formation and differentiation

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

Question Type : MCQ
Question ID : 2093553O4
Option 1 ID : 2093551213
Option 2 ID : 2093551214
Option 3 ID : 2093551215
Option 4 ID : 2093551216
Status : Answered
Chosen Option : 3

Q.58 Which one of the following options is a correct match of plant selection marker genes used for genetic transformation and their properties?

1. *nptII* - Streptomycin resistance
2. Mutant *ALS* - Imidazolinone resistance
3. *aadA* - Rifampicin resistance
4. *pat* - Penicillin resistance

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

Question Type : MCQ
Question ID : 2093553O0
Option 1 ID : 2093551317
Option 2 ID : 2093551318
Option 3 ID : 2093551319
Option 4 ID : 2093551320
Status : Answered
Chosen Option : 4

Q.59 Which one of the following is NOT a disease caused by a virus?

1. Small pox
2. Tetanus
3. Rubella
4. Measles

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

Question Type : MCQ
Question ID : 2093552290
Option 1 ID : 2093551157
Option 2 ID : 2093551158
Option 3 ID : 2093551159
Option 4 ID : 2093551160
Status : Answered
Chosen Option : 2

Q.60 A polydactyly allele shows 60% penetrance and variable expressivity. What would you expect to observe in a family carrying this allele?

1. 60% of carriers show the trait, and among those who show it, severity varies.
2. 100% of carriers show the trait but with 60% maximum severity.
3. 40% of carriers express the trait to the same degree in an identical manner.
4. 100% of carriers show the trait but the severity varies only in 40% of carriers.

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

Question Type : MCQ
Question ID : 2093553117
Option 1 ID : 2093551265
Option 2 ID : 2093551266
Option 3 ID : 2093551267
Option 4 ID : 2093551268
Status : Not Answered
Chosen Option : --

Q.61 Which one of the following animals normally exhibit reflex ovulation?

1. Rats
2. Monkeys
3. Cats
4. Humans

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

Question Type : MCQ
Question ID : 2093553113
Option 1 ID : 2093551249
Option 2 ID : 2093551250
Option 3 ID : 2093551251
Option 4 ID : 2093551252
Status : Answered
Chosen Option : 1

Q.62 New protein-coding genes sometimes originate when exons from different ancestral genes are combined through recombination events, producing a novel domain architecture within a single polypeptide. This mechanism of generating new genes is called:

1. Exon shuffling, in which recombination or transposon-mediated rearrangements join coding regions from separate genes.
2. Alternative splicing, in which a single pre-mRNA is processed in multiple ways to yield different transcripts.
3. Retroposition, in which an mRNA is reverse-transcribed and inserted elsewhere in the genome.
4. Transposon insertion, in which mobile elements insert into genes, occasionally disrupting or modulating their expression.

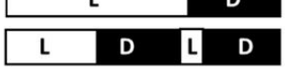
Options 1. 1
2. 2
3. 3
4. 4

Question Type : MCQ
Question ID : 209355326
Option 1 ID : 2093551301
Option 2 ID : 2093551302
Option 3 ID : 2093551303
Option 4 ID : 2093551304
Status : Not Answered
Chosen Option : --

Q.63 Which one of the following light treatments (L, light; D, dark) promotes flowering in short-day plants?

1. 

2. 

3. 

4. 

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

Question Type : MCQ
Question ID : 209355305
Option 1 ID : 2093551217
Option 2 ID : 2093551218
Option 3 ID : 2093551219
Option 4 ID : 2093551220
Status : Answered
Chosen Option : 1

Q.64 Which one of the following options represents a set of bird species, all of which are found ONLY in India?

1. Bluethroat, Amur Falcon, Bar-headed Goose
2. Yellow-throated Bulbul, Forest Owlet, Rufous Babbler
3. Pied Cuckoo, Green Imperial Pigeon, Black Drongo
4. Blue-tailed Bee-eater, Sarus Crane, Red-vented Bulbul

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

Question Type : MCQ
Question ID : 2093553211
Option 1 ID : 2093551281
Option 2 ID : 2093551282
Option 3 ID : 2093551283
Option 4 ID : 2093551284
Status : Answered
Chosen Option : 2

Q.65 Most transposable elements contain flanking terminal inverted repeats. Which one of following options is INCORRECT pertaining to these repeats?

1. They are not a part of the transposable element, but are generated during the insertion of the transposable element in the genome.
2. They are part of the transposable elements in the genome.
3. They move along with the transposable elements in the genome.
4. The repeats along with a functional transposase are sufficient for the process of transposition.

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

Question Type : MCQ
Question ID : 2093553141
Option 1 ID : 2093551253
Option 2 ID : 2093551254
Option 3 ID : 2093551255
Option 4 ID : 2093551256
Status : Answered
Chosen Option : 4

Q.66 Which one of the following statements is INCORRECT about the phylogenetic species concept?

1. It can be applied to both sexual and asexual organisms and is not dependent on reproductive isolation.
2. It relies on objective and statistically testable concepts based on genetic data.
3. It is robust to different data sources and produces consistent phylogenies.
4. It can suffer from taxonomic inflation.

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

Question Type : MCQ
Question ID : 2093553l9
Option 1 ID : 2093551273
Option 2 ID : 2093551274
Option 3 ID : 2093551275
Option 4 ID : 2093551276
Status : Answered
Chosen Option : 3

Q.67 Which one of the following events are likely to result in delayed or defective cytokinesis?

1. Stabilization of mitotic cyclins
2. Activation of formin and myosin II
3. Stimulation of RhoA by centralspindlin
4. Activation of RhoA by Rho-GEF

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

Question Type : MCQ
Question ID : 209355292
Option 1 ID : 2093551165
Option 2 ID : 2093551166
Option 3 ID : 2093551167
Option 4 ID : 2093551168
Status : Answered
Chosen Option : 1

Q.68 Sulfur taken by plant roots from the soil undergoes major changes in the oxidation state as it converts from inorganic to biochemically available form. Which one of the following options represents the correct order of the conversion states of sulfur?

1. $SO_4^{2-} \longrightarrow SO_3^{2-} \longrightarrow S^{2-} \longrightarrow$ Cys
2. $S^{2-} \longrightarrow SO_3^{2-} \longrightarrow SO_4^{2-} \longrightarrow$ Cys
3. $SO_4^{2-} \longrightarrow SO_3^{2-} \longrightarrow S^{2-} \longrightarrow$ Gln
4. $S^{2-} \longrightarrow SO_3^{2-} \longrightarrow SO_4^{2-} \longrightarrow$ Gln

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

Question Type : MCQ
Question ID : 209355308
Option 1 ID : 209355229
Option 2 ID : 209355230
Option 3 ID : 209355231
Option 4 ID : 209355232
Status : Answered
Chosen Option : 2

Q.69 Which one of the following statements correctly describes the role of Proliferating Cell Nuclear Antigen (PCNA) in eukaryotic DNA replication?

1. It catalyzes RNA primer synthesis.
2. It acts as a sliding clamp that increases DNA polymerase processivity.
3. It removes RNA primers from Okazaki fragments.
4. It unwinds parental DNA.

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

Question Type : MCQ
Question ID : 209355295
Option 1 ID : 209355177
Option 2 ID : 209355178
Option 3 ID : 209355179
Option 4 ID : 209355180
Status : Answered
Chosen Option : 1

Q.70

A C_3 plant is shifted from 25 °C to 40 °C under full sunlight. Which one of the following is most likely to happen?

1. Photorespiration rate decreases, leading to higher productivity.
2. Rubisco's oxygenase activity increases, reducing net CO_2 fixation.
3. Stomata remain fully open, increasing CO_2 uptake.
4. PEP carboxylase activity increases to compensate for CO_2 loss.

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

Question Type : MCQ
Question ID : 2093551306
Option 1 ID : 2093551221
Option 2 ID : 2093551222
Option 3 ID : 2093551223
Option 4 ID : 2093551224
Status : Answered
Chosen Option : 2

Section : PART-C

Q.71

Experiments addressing axes patterning in amphibian embryos are listed in column X and the observations are listed in column Y.

Column X		Column Y	
A.	Grafting of dorsal blastopore lip from donor early gastrula into presumptive ventral epidermis of host early gastrula	i.	Rescue of dorsal development
B.	Injection of noggin mRNA into UV-treated Xenopus embryos	ii.	Induction of secondary head structures
C.	Injection of morpholinos to inhibit BMPs 2, 4, and 7	iii.	Formation of a secondary embryo
D.	Grafting of anterior archenteron roof from late gastrula into the blastocoel of early gastrula	iv.	Enlarged neural tube

Which one of the following options represents all correct matches between column X and column Y?

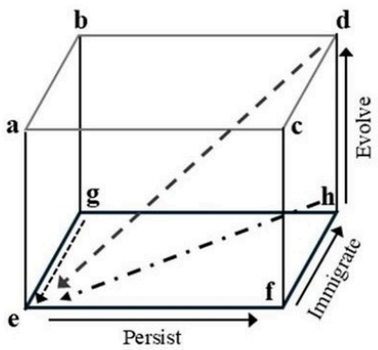
1. A - iii, B - i, C - iv, D - ii
2. A - ii, B - iii, C - iv, D - i
3. A - iv, B - i, C - ii, D - iii
4. A - iii, B - ii, C - iv, D - i

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

Question Type : MCQ
Question ID : 2093551363
Option 1 ID : 2093551449
Option 2 ID : 2093551450
Option 3 ID : 2093551451
Option 4 ID : 2093551452
Status : Not Answered
Chosen Option : --

Q.72

The taxon cycle is the predicted, progressive ecological and evolutionary changes in the descendants of founding populations. Taking the case of insular biotas, the figure below can be used to conceptualize and predict species types (a, b, c, d, e, f, g, h) in insular biotas based on fundamental capacities to evolve, immigrate and persist.



The table below has species types (Column X) and the possible traits (Column Y) associated with each type.

Column X		Column Y	
P.	c	i.	Ecologically naïve species, and endemics near the end of the taxon cycle (e.g., dwarfed elephants)
Q.	d	ii.	An unlikely type, because the ability to evolve on isolated islands requires relatively long persistence
R.	e	iii.	Limited dispersal abilities; unlikely to inhabit isolated oceanic islands
S.	b	iv.	Supertramps, powerful dispersers such as microsnails, ferns, and rafting rodents

Which one of the following options represents all correct matches between Column X and Column Y?

1. P (i) Q (ii) R (iii) S (iv)
2. P (iv) Q (i) R (ii) S (iii)
3. P (ii) Q (iii) R (iv) S (i)
4. P (iii) Q (iv) R (i) S (ii)

Options 1. 1

2. 2

3. 3

4. 4

Question Type : MCQ

Question ID : 2093553 90

Option 1 ID : 2093551557

Option 2 ID : 2093551558

Option 3 ID : 2093551559

Option 4 ID : 2093551560

Status : Not Answered

Chosen Option : --

Q.73 Given below are mechanisms that can facilitate major evolutionary transitions, such as the transition from genes to genomes, from unicellular to multicellular organisms, or from individuals to colonies.

A. Conflict mediation mechanisms maintain cooperation within emergent units.
B. Reduced genetic relatedness among cooperating units accelerates these transitions.
C. Division of labour evolves when specialisation increases group-level fitness more than individual fitness losses.
D. Transitions are irreversible once higher-level individuality is achieved.

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

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

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

Question Type : MCQ
Question ID : 2093553388
Option 1 ID : 2093551549
Option 2 ID : 2093551550
Option 3 ID : 2093551551
Option 4 ID : 2093551552
Status : Answered
Chosen Option : 3

Q.74 Antibiotic resistant strains of various pathogenic bacteria are a serious concern for human health. The following table has the names of important bacteria (Column X), specific strains of which can cause serious illnesses (Column Y).

Column X		Column Y	
A.	Specific strains of *Enterobacteriaceae*	i.	Re-emerged as a significant community- and hospital-acquired infection due to Methicillin resistance
B	Specific strains of *Rickettsia*	ii.	Multi-drug resistant (MDR) strains found in humans and food, suggesting a potential for broader spread
C.	*Salmonella* and *Klebsiella pneumoniae*	iii.	A type of bacteria that is difficult to treat due to resistance to multiple antibiotics, mainly Carbapenem
D.	*Staphylococcus aureus*	iv.	The causative agent of murine typhus, which has shown transmission via organ transplants.

Which one of the options below is the correct match between all terms of Column X and Column Y?

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

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

Question Type : MCQ
Question ID : 2093553841
Option 1 ID : 2093551533
Option 2 ID : 2093551534
Option 3 ID : 2093551535
Option 4 ID : 2093551536
Status : Answered
Chosen Option : 2

Q.75

Most vascular plants face two broad challenges that affect their growth, reproduction and evolutionary success. One major challenge (Stress) includes shortages of resources such as light, water, nutrients or other physicochemical limitations. A second major challenge (Disturbance) includes factors such as grazing, diseases, storms, frost, erosion, and fire. When cross tabulated, we get the following table:

Intensity of Disturbance	Intensity of Stress	
	Low	High
Low	I	III
High	II	IV

The outcomes of this cross tabulation can be seen as fundamental life history strategies. Based on the above information, which one of the following statements is correct?

1. Conditions of low stress and low disturbance, result in a strategy that aims to maximize competitiveness and results in plants with small biomass, rapid reproduction and are short-lived.
2. Conditions of high stress and low disturbance result in plants that are slow growing, attaining low- to medium-biomass, with low reproductive output and are long-lived.
3. Conditions of low stress and high disturbance results in plants that are robust in terms of biomass, with low growth rates and slow reproduction.
4. Conditions of high stress and high disturbance results in small plants that can rapidly grow, have high reproductive output and are long-lived.

Options 1. 1

2. 2

3. 3

4. 4

Question Type : MCQ
Question ID : 2093553395
Option 1 ID : 2093551577
Option 2 ID : 2093551578
Option 3 ID : 2093551579
Option 4 ID : 2093551580
Status : Answered
Chosen Option : 1

Q.76

Beyond its primary role in reducing atmospheric nitrogen to ammonia during symbiotic nitrogen fixation, the nitrogenase enzyme complex is also capable of catalyzing other reactions. Listed below are some reactions.

A. Acetylene reduction ($C_2H_2 \rightarrow C_2H_4$)
B. H_2 production ($2H^+ \rightarrow H_2$)
C. ATP hydrolysis ($ATP \rightarrow ADP + P_i$)
D. Oxidized ferredoxin to Reduced Ferredoxin
E. NAD reduction ($NAD^+ + H^+ \rightarrow NADH$)

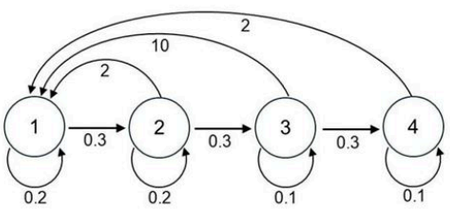
Which one of the following options represents the combination of reactions that are NOT catalysed by the nitrogenase enzyme complex?

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

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

Question Type : MCQ
Question ID : 209355367
Option 1 ID : 2093551465
Option 2 ID : 2093551466
Option 3 ID : 2093551467
Option 4 ID : 2093551468
Status : Answered
Chosen Option : 3

Q.77 The figure below shows a life cycle graph and the corresponding population projection matrix that is invariant over time for a population with four successive classes (1-4). All contributions to class 1 from other classes is via fecundity.



$$\begin{bmatrix} 0.2 & 2 & 10 & 2 \\ 0.3 & 0.2 & 0 & 0 \\ 0 & 0.3 & 0.1 & 0 \\ 0 & 0 & 0.3 & 0.1 \end{bmatrix}$$

Given this life cycle, no resource limitation, and initial numbers of individuals n_1 = 95, n_2 = 5, n_3 = 15, and n_4 = 4 in the four classes, consider the following statements regarding the future population states in a long-term simulation of population growth:

A. The population will grow and attain a stable class distribution.
B. The population will grow but the number of individuals in each class will be proportional to the initial numbers.
C. The population will grow but numbers of individuals in the classes will fluctuate disproportionately over time.
D. The population will grow at a fixed growth rate and all classes will grow at the same rates.

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

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

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

Question Type : MCQ
Question ID : 20935391
Option 1 ID : 20935156l
Option 2 ID : 20935156l562
Option 3 ID : 20935156l563
Option 4 ID : 20935156l564
Status : Not Answered
Chosen Option : —

Q.78

The following statements were made about host-pathogen interactions during influenza virus infection:

A. Entry of the virus is mediated by the interaction of the HA-protein of the virus with sialic acid receptors on the airway epithelium.
B. CTLs are primed in the thymus to kill respiratory epithelial cells that present viral antigens on MHC-I molecules.
C. CTLs are primed in the thymus to kill respiratory epithelial cells that present viral antigens on MHC-II molecules.
D. Viral neuraminidase is required for the release of mature viruses from infected cells.

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

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

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

Question Type : MCQ
Question ID : 209355354
Option 1 ID : 209355141 3
Option 2 ID : 209355141 4
Option 3 ID : 209355141 5
Option 4 ID : 209355141 6
Status : Answered
Chosen Option : 2

Q.79 The physiological regulation of plasma osmolality by osmotically active neurons (osmoreceptors) in the organum vasculosum of lamina terminalis (OVLT) of hypothalamus is described in the following statements:

A. In hyperosmolal state, the non-selective cationic channels in the osmoreceptor membrane becomes active causing hyperpolarization of receptor cells.
B. In hyperosmolal state, shrinkage of osmoreceptor cells occurs.
C. Activated osmoreceptors send action potentials to the supraoptic nucleus (SON) and paraventricular nucleus (PVN) to release arginine vasopressin (AVP).
D. In hypoosmolal state, the stretching of osmoreceptor membrane causes inactivation of transient receptor vanilloid protein 4 (TRVP4) resulting in the activation of osmoreceptors.

Which one of the following options represents a combination of all 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 : 2093553 73
Option 1 ID : 2093551489
Option 2 ID : 2093551490
Option 3 ID : 2093551491
Option 4 ID : 2093551492
Status : Not Answered
Chosen Option : --

Q.80 A lambda bacteriophage integrated into the genome of *E. coli* and became lysogenic. Upon UV irradiation, it is expected that the lytic cycle will be induced. Due to mutations that have occurred as a result of UV irradiation, you find that the lambda bacteriophage remains in the lysogenic state and lysis is impaired.

Mutations in the following genes have been proposed to explain this observation.

A. *cI* gene, protease cleavage site
B. *cII* gene, DNA binding site
C. *RecA* gene of *E. coli*
D. *RuvA* gene of *E. coli*

Which one of the following options represents all correct statements?

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

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

Question Type : MCQ
Question ID : 2093553 51
Option 1 ID : 2093551401
Option 2 ID : 2093551402
Option 3 ID : 2093551403
Option 4 ID : 2093551404
Status : Not Answered
Chosen Option : --

Q.81 The following statements were made about major histocompatibility complex (MHC) molecules:

A. Multiple MHC-I molecules can be expressed on a single cell.
B. MHC-I molecules exhibit greater diversity than antibodies.
C. MHC-I haplotypes inherited from the mother and father and expressed on a given cell are codominant.
D. All MHC-I molecules on a given cell express the same endogenous peptide.
E. MHC-I molecules are present on platelets.

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

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

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

Question Type : MCQ
Question ID : 209355356
Option 1 ID : 209355421
Option 2 ID : 209355422
Option 3 ID : 209355423
Option 4 ID : 209355424
Status : Answered
Chosen Option : 1

Q.82 In T4 phage, a mutation in the rII locus gives rise to large and round plaques. The wild type plaques are small and ragged. Ten independent mutants (M1 to M10) in the rII locus were isolated. In order to test whether the mutations affected the same protein coding regions, *E. coli* cells were infected with two mutant phages at a time. The plaques obtained from such infection were either small and ragged (+) or large and round (-). The results obtained from all combinations of infection involving the ten mutants is summarized below:

	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10
M1	-	+	-	-	+	+	+	+	+	-
M2		-	+	+	-	-	-	-	-	+
M3			-	-	+	+	+	+	+	-
M4				-	+	+	+	+	+	-
M5					-	-	-	-	-	+
M6						-	-	-	-	+
M7							-	-	-	+
M8								-	-	+
M9									-	+
M10										-

The following conclusions were drawn from the above observations:

A. The mutants map to two complementation groups.
B. M1 and M10 are mutations in two different genes.
C. Each complementation group is represented by 5 mutants.

Which one of the following options represents a combination of correct statement(s)?

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

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

Question Type : MCQ
Question ID : 2093553811
Option 1 ID : 2093551521
Option 2 ID : 2093551522
Option 3 ID : 2093551523
Option 4 ID : 2093551524
Status : Answered
Chosen Option : 3

Q.83 A certain trait in a species is governed by variation at the AB locus that has two alleles (A, B) that give rise to three genotypes, AA, AB and BB. A sample of 1000 individuals of the species were genotyped and the data is given in the table below:

Genotype	Number of individuals
AA	400
AB	400
BB	200

Assume that each genotype is represented equally in males and females and mating is random. If the parents were randomly drawn from the sample of 1000 individuals given above, which one of the following options gives all correct values of the offspring genotype frequencies?

1. AA: 0.4; AB: 0.4; BB: 0.2
2. AA: 0.6; AB: 0.2; BB: 0.2
3. AA: 0.16; AB: 0.16; BB: 0.04
4. AA: 0.36; AB: 0.48; BB: 0.16

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

Question Type : MCQ
Question ID : 2093553 99
Option 1 ID : 2093551593
Option 2 ID : 2093551594
Option 3 ID : 2093551595
Option 4 ID : 2093551596
Status : Answered
Chosen Option : 1

Q.84 The following statements propose some of the similarities and differences between classic non-peptide neurotransmitters (CNN) and peptide neurotransmitters (PN):

A. CNN are synthesized at the presynaptic terminal while PN are synthesized in the cell body.
B. PN receptors are confined to the specific synapse at which PN is released like that of CNN.
C. When one neuron (containing both CNN and PN) is stimulated at low frequency, both PN and CNN are released from the presynaptic terminal, but at higher frequencies, only CNN is released.
D. The typical action of CNN has short latency and short duration (milliseconds) while PN action may have long latency and may persist for long duration (seconds).

Which one of the following options represents a combination of all 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 : 2093553 72
Option 1 ID : 2093551485
Option 2 ID : 2093551486
Option 3 ID : 2093551487
Option 4 ID : 2093551488
Status : Answered
Chosen Option : 3

Q.85 Given below are few hormones (Column X) and their specific inhibitors (Column Y).

Column X		Column Y	
A.	Growth hormone	i.	Mifepristone
B.	Progestogens	ii.	Inhibin B
C.	Parathormone	iii.	Somatostatin
D.	Follicle-stimulating hormone	iv.	High calcium levels

Which one of the following combinations correctly matches the hormones with their inhibitors?

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

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

Question Type : MCQ
Question ID : 2093553 76
Option 1 ID : 2093551501
Option 2 ID : 2093551502
Option 3 ID : 2093551503
Option 4 ID : 2093551504
Status : Answered
Chosen Option : 3

Q.86 In an *in vitro* translation reaction, the 43S pre-initiation complex (PIC) was incubated with the *in vitro* transcribed and capped mRNA for Gene X, followed by addition of the 60S subunit. As a control, mRNA for Gene Y isolated from cells was incubated in the same reaction. The mRNA for Gene Y was bound to the 80S ribosomes and polyribosomes, while mRNA of Gene X remained unbound. In a parallel experiment, mRNAs for both Gene X and Gene Y were found to be associated *in vivo* with 80S and polyribosomes.

The following statements were made to explain the above observation.

A. The *in vitro* system was globally defective for 80S assembly.
B. Gene X mRNA has a sequence or structural feature that specifically prevents 80S assembly *in vitro*.
C. Gene X mRNA lacks a start codon.
D. Gene X mRNA requires other cellular factors which are absent in the *in vitro* mix to permit initiation.
E. The *in vitro* assay preferentially degrades Gene X mRNA.

Which one of the following options represents all correct statements?

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

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

Question Type : MCQ
Question ID : 209355353
Option 1 ID : 209355l409
Option 2 ID : 209355l410
Option 3 ID : 209355l411
Option 4 ID : 209355l412
Status : Answered
Chosen Option : 2

Q.87 The following statements are made regarding phenolic biosynthesis in plants.

A. The lignans and flavonoids have abundant methylated carboxyl groups, compared to methylated hydroxyl groups.
B. Cells producing lignans and flavonoids have a very high demand for S-adenosylmethionine.
C. The majority of methylation reactions involved in the formation of phenolics are catalyzed by *O*-methyltransferases.
D. The catechol-*O*-methyltransferase (COMT) has strict substrate specificity.

Which one of the following options represents the combination of all 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 : 209355370
Option 1 ID : 209355147 7
Option 2 ID : 209355147 8
Option 3 ID : 209355147 9
Option 4 ID : 209355148 0
Status : Not Answered
Chosen Option : --

Q.88 The following statements are made with respect to the major classes of heat shock proteins (HSP) in plants.

A. Cytosolic HSP100 is essential while the chloroplast HSP100 / Clpβ family protein is not essential for heat stress response.
B. Proteins of HSP90 family are exclusively localized in the nucleus.
C. Members of HSP60 protein family, chaperonins, are abundant even at normal temperatures.
D. The C-terminal domain of small HSPs is homologous to α-crystallins, proteins found in vertebrate eye lens.

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

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

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

Question Type : MCQ
Question ID : 209355371
Option 1 ID : 209355148 1
Option 2 ID : 209355148 2
Option 3 ID : 209355148 3
Option 4 ID : 209355148 4
Status : Not Answered
Chosen Option : --

Q.89 The table below lists conditions (Column X) and their evolutionary/behavioural outcome (Column Y).

Column X		Column Y	
A	Cooperative breeding mediated by kin selection without physiological suppression of reproduction	i	Eusocial species such as naked mole rats
B	Hormonal reproductive suppression in nonbreeding females mediated by aggression	ii	High paternity certainty, low risk of cuckoldry
C	Biparental care	iii	Delayed dispersal and breeding of offspring such as in social birds

Which one of the options below is a correct match between all terms of Column X and Column Y?

1. A-ii B-i C-iii
2. A-i B-ii C-iii
3. A-ii B-iii C-i
4. A-iii B-i C-ii

Options 1. 1

2. 2

3. 3

4. 4

Question Type : MCQ
Question ID : 2093554100
Option 1 ID : 2093551597
Option 2 ID : 2093551598
Option 3 ID : 2093551599
Option 4 ID : 2093551600
Status : Answered
Chosen Option : 3

Q.90 Given below are the different stages of Arabidopsis embryogenesis (Column X) and their characteristic patterns of cell division (Column Y).

Column X		Column Y	
A.	Zygotic	(i)	Formation of an 8-cell embryo, exhibiting radial symmetry and undergoing additional cell division to create the protoderm
B.	Globular	(ii)	Polarized growth of cells followed by a symmetric transverse division giving rise to a small apical cell and an elongated basal cell
C.	Heart	(iii)	Cell elongation and cellular differentiation processes throughout the embryonic axis with visible distinction between the adaxial and abaxial tissue of the cotyledons
D.	Torpedo	(iv)	Focused cell division forming two cotyledons, giving bilateral symmetry to the embryo

Which one of the following options represents the correct match between Column X and Column Y?

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

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

Question Type : MCQ
Question ID : 209355364
Option 1 ID : 209355l453
Option 2 ID : 209355l454
Option 3 ID : 209355l455
Option 4 ID : 209355l456
Status : Answered
Chosen Option : 1

Q.91 The following statements were made regarding cell fate specification of trophoblast and inner cell mass (ICM) during mammalian embryogenesis:

A. Oct4 represses Cdx2 expression, enabling some cells to become ICM.
B. Cdx2 synthesized by the trophoblast cells activate Oct4 and Nanog.
C. Expression of Nanog allows cells of the ICM to retain their pluripotency.
D. YAP binds to TEAD4 and represses Cdx2 in the trophoblast cells.

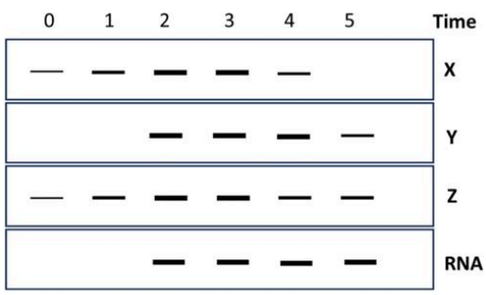
Which one of the following options correctly represent events that determine the fate of trophoblasts and ICM?

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

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

Question Type : MCQ
Question ID : 209355360
Option 1 ID : 209355143 7
Option 2 ID : 209355143 8
Option 3 ID : 209355143 9
Option 4 ID : 209355144 0
Status : Not Answered
Chosen Option : --

Q.92 Chromatin immunoprecipitation (ChIP) and RT-PCR were performed to investigate the activation of expression of a particular gene, results of which are shown below. X, Y and Z indicate ChIP with antibodies for specific proteins, and 'RNA' shows gene expression at the indicated time points.



Based on the results, choose the option that correctly identifies the X, Y and Z proteins.

1. X: H4K8Ac Y: TBP Z: H3K9Ac
2. X: TBP Y: H4K8Ac Z: H3K9Ac
3. X: H4K8Ac Y: H3K9Ac Z: TBP
4. X: H3K9Ac Y: TBP Z: H4K8Ac

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

Question Type : MCQ
Question ID : 2093553347
Option 1 ID : 2093551385
Option 2 ID : 2093551386
Option 3 ID : 2093551387
Option 4 ID : 2093551388
Status : Not Answered
Chosen Option : --

Q.93

Rhododendron arboreum of the family Ericaceae represents one of the ancient tree species of the genus showing extreme disjunction in the Indian subcontinent. It is represented by two sub-species *viz.*, ssp. *arboreum* Smith in the forests of north-eastern India (temperate) and spp. *nilagiricum* distributed in the southern Western Ghats (tropical) of India with no distribution in the intervening plains.

The following are some of the biogeographical theories that explain distribution of flora and fauna in the Indian subcontinent

A. Island biogeography theory - The mountains function as isolated islands, promoting speciation.
B. Satpura Hypothesis - Species migrated between the Himalayas and the Western Ghats along a cooler, wetter corridor formed by the Satpura mountain range during periods of glacial expansion
C. The Noah's Ark hypothesis/ 'Out of India' hypothesis – the Indian subcontinent is a remnant of the ancient supercontinent Gondwana, that acted as an isolated "ark" for millions of years, giving rise to some modern plant and mammalian groups

Which one of the combinations of biogeographical models explain the distribution of *R. arboreum*?

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

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

Question Type : MCQ
Question ID : 209355389
Option 1 ID : 209355l553
Option 2 ID : 209355l554
Option 3 ID : 209355l555
Option 4 ID : 209355l556
Status : Not Answered
Chosen Option : --

Q.94

Nitrogen cycling is a critical ecosystem process. The table below lists the names of the processes (Column X) and nature of the reactions (Column Y) in the nitrogen cycle.

Column X		Column Y	
A.	Ammonification	i.	Conversion of N_2 to NH_3
B.	Nitrogen fixation	ii.	Hydrolysis of protein and oxidation of amino acids
C.	Nitrification	iii.	Reduction of NO_3^- to N_2O and N_2
D.	Denitrification	iv.	Oxidation of NH_3 to NO_2^- and from NO_2^- to NO_3^-

Which one of the following options represents all correct matches between Column X and Column Y?

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

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

Question Type : MCQ
Question ID : 2093551565
Option 1 ID : 2093551565
Option 2 ID : 2093551566
Option 3 ID : 2093551567
Option 4 ID : 2093551568
Status : Answered
Chosen Option : 1

Q.95

The table below gives life history characteristics of an endangered grassland bird in two geographically distinct populations. Assume that the species follows a logistic growth model, calculate the population growth rate (dN/dt) for both populations.

Population	No. of individuals (N)	births/year (B)	deaths/year (D)	Carrying capacity (K)
Rajasthan (R)	120	42	6	240
Maharashtra (M)	300	96	6	375

Based on this data, which one of the following options gives the combination of correct inferences that can be drawn about the growth rate in both populations?

1. Both populations are growing AND $(dN/dt)_M > (dN/dt)_R$
2. Both populations are declining AND $(dN/dt)_M < (dN/dt)_R$
3. Both populations are growing AND $(dN/dt)_R = (dN/dt)_M$
4. Both populations are declining AND $(dN/dt)_M > (dN/dt)_R$

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

Question Type : MCQ
Question ID : 2093551569
Option 1 ID : 2093551569
Option 2 ID : 2093551570
Option 3 ID : 2093551571
Option 4 ID : 2093551572
Status : Answered
Chosen Option : 1

Q.96 Given below are different types of mapping populations in plants (Column X) and their characteristic features (Column Y).

Column X		Column Y	
A.	F_2 mapping population	i.	1:0 segregation ratio of dominant markers
B	Backcross population	ii.	1:1 segregation ratio for both dominant and co-dominant markers
C.	RILs	iii.	Recombination is represented only from the male source
D.	F_1DH	iv.	3:1 phenotypic segregation ratio of dominant markers

Which one of the following options is the correct match between all terms of Column X and Column Y?

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

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

Question Type : MCQ
Question ID : 209355382
Option 1 ID : 2093551525
Option 2 ID : 2093551526
Option 3 ID : 2093551527
Option 4 ID : 2093551528
Status : Answered
Chosen Option : 2

Q.97 A newly discovered small mammal from Madagascar lays eggs, has a cloaca, and shows electroreception through its snout. Molecular phylogenetics places it basal to all other living mammals. Based on these characters, which one of the following groups can it be assigned to?

1. Eutheria (placental mammals)
2. Metatheria (marsupials)
3. Prototheria (monotremes)
4. Theria (marsupials + placentals)

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

Question Type : MCQ
Question ID : 209355387
Option 1 ID : 2093551545
Option 2 ID : 2093551546
Option 3 ID : 2093551547
Option 4 ID : 2093551548
Status : Answered
Chosen Option : 4

Q.98 Which one of the following statements about evolution of the vertebrate brain is most accurate?

1. The relative size of the neocortex in primates is primarily determined by the absolute size of the brain and not by social or ecological pressures.
2. Increased brain size in birds and mammals is always accompanied by longer lifespans and slower reproductive rates, without exceptions.
3. Brain regions can evolve independently in response to specific ecological or behavioural demands, rather than all regions scaling uniformly with overall brain size.
4. The cerebellum, involved in motor coordination, has remained largely unchanged throughout vertebrate evolution because motor function is highly conserved.

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

Question Type : MCQ
Question ID : 209355401
Option 1 ID : 209355160l
Option 2 ID : 209355160 2
Option 3 ID : 209355160 3
Option 4 ID : 209355160 4
Status : Not Answered
Chosen Option : --

Q.99 The table below gives different eras (Column X) and periods of the geological time scale (Column Y).

Column X		Column Y	
A.	Ordovician	i.	Mesozoic
B.	Permian	ii.	Cenozoic
C.	Paleogene	iii.	Paleozoic
D.	Cretaceous		

Which one of the following options represents all correct matches of Column X and Column Y?

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

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

Question Type : MCQ
Question ID : 209355396
Option 1 ID : 209355158l
Option 2 ID : 209355158 2
Option 3 ID : 209355158 3
Option 4 ID : 209355158 4
Status : Answered
Chosen Option : 1

Q.100 Given below are statements about ion transport proteins in pancreatic duct cells which influence the composition of pancreatic juice.

A. Primary Cl^-/HCO_3^- exchanger is located on the luminal side.
B. CFTR is located primarily on the basolateral side.
C. Na^+- bicarbonate cotransporter is located on the basolateral side.
D. Na^+/hydrogen exchanger-1 is located on the luminal side.

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

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

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

Question Type : MCQ
Question ID : 2093553375
Option 1 ID : 2093551497
Option 2 ID : 2093551498
Option 3 ID : 2093551499
Option 4 ID : 2093551500
Status : Not Answered
Chosen Option : --

Q.101 The following statements are made regarding colchicine treatment in plants for inducing polyploidy.

A. In colchicine-treated cells, sister chromatids cannot separate during anaphase, leading to chromosome doubling when the nucleus reforms.
B. Colchicine stimulates endoreduplication in the treated cells, bypassing cytokinesis to yield polyploid cells in a process called “C-mitosis”.
C. In sterile interspecific hybrids, colchicine treatment may restore fertility by converting them into amphipolyploids.
D. Colchicine treatment during meiosis has no effect, as it only acts on mitotic cells.
E. Colchicine binds to tubulin and prevents spindle fibre formation during mitosis.

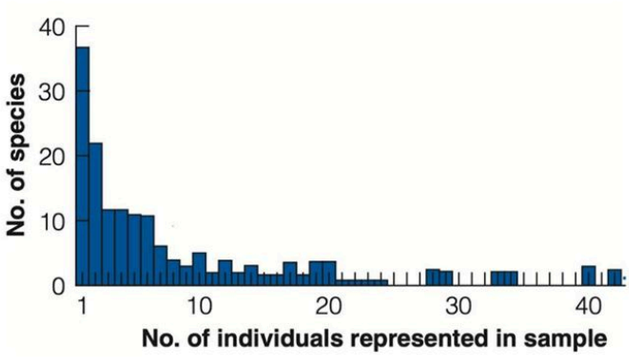
Which one of the following options represents a combination of all correct statements?

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

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

Question Type : MCQ
Question ID : 2093554102
Option 1 ID : 2093551605
Option 2 ID : 2093551606
Option 3 ID : 2093551607
Option 4 ID : 2093551608
Status : Not Answered
Chosen Option : --

Q.102 In a systematic ecological survey of lepidopterans in a moist deciduous forest, a total of 197 species were recorded with 6814 individuals. The relative abundance data are presented below.



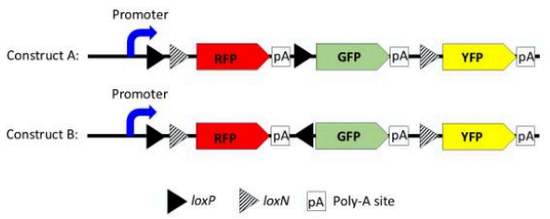
Keeping the above pattern in mind, which one of the statements below is correct?

1. Most species are common and are represented by a large number of individuals.
2. Most species are rare and few species are common, represented by a large number of individuals.
3. Most species are common and few species are rare, represented by few individuals.
4. Common and rare species are evenly present, with an equal representation of individuals.

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

Question Type : MCQ
Question ID : 209355394
Option 1 ID : 209355157 3
Option 2 ID : 209355157 4
Option 3 ID : 209355157 5
Option 4 ID : 209355157 6
Status : Not Answered
Chosen Option : --

Q.103 The following constructs, A or B, have been introduced into two different cultures of eukaryotic cells.



Cre recombinase can act upon *loxP-loxP* and *loxN-loxN* sites. The following outcomes have been predicted on the types of fluorescence emitted by the cells upon induction of Cre-recombinase:

A. The cells transfected with construct A will yield three types of cells: each type expressing either red or green or yellow fluorescence.
B. The cells transfected with construct B will yield three types of cells: each type expressing either red or green or yellow fluorescence.
C. The cells transfected with construct A will yield two types of cells: each type expressing either red or green fluorescence.
D. The cells transfected with construct B will yield two types of fluorescent cells: each type expressing either red or yellow fluorescence.

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

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

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

Question Type : MCQ
Question ID : 2093553349
Option 1 ID : 2093551393
Option 2 ID : 2093551394
Option 3 ID : 2093551395
Option 4 ID : 2093551396
Status : Answered
Chosen Option : 2

Q.104 Given below are statements on the citric acid cycle and urea cycle, which have shared metabolic intermediates.

A. Oxaloacetate is converted to aspartate.
B. Fumarate is a citric acid cycle intermediate.
C. Arginosuccinate is cleaved to fumarate and arginine.
D. Aspartate combines with citrulline to produce argininosuccinate in the mitochondrial matrix.

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

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

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

Question Type : MCQ
Question ID : 209355336
Option 1 ID : 2093551341
Option 2 ID : 2093551342
Option 3 ID : 2093551343
Option 4 ID : 2093551344
Status : Answered
Chosen Option : 4

Q.105 The following statements are made about body temperature regulation in humans:

A. Lactic acid and potassium ions are less concentrated in sweat while sweating little than while sweating a lot.
B. When the temperature of the surroundings becomes greater than that of the skin, body loses heat by conduction.
C. When heat is applied directly to the pre-optic area of hypothalamus by inserting a thermode in the brain, the animal begins to sweat profusely.
D. Chemical thermogenesis through thyroid gland stimulation requires weeks of exposure to cold temperature.

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

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

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

Question Type : MCQ
Question ID : 209355377
Option 1 ID : 2093551505
Option 2 ID : 2093551506
Option 3 ID : 2093551507
Option 4 ID : 2093551508
Status : Not Answered
Chosen Option : --

Q.106

Following statements were made regarding the theory of symbiogenesis in the origin of eukaryotic cells.

A. Mitochondria and chloroplasts have typically their own circular DNA, similar to bacterial DNA.
B. Mitochondria and chloroplasts are surrounded by a single membrane like other organelles.
C. Division of mitochondria and chloroplasts occurs synchronously with the division of nuclear genome.
D. Ribosomes in mitochondria and chloroplasts are similar to those found in prokaryotes.
E. Genetic analysis shows that mitochondrial DNA is closely related to certain proteobacteria.

Which one of the following options has all the correct statements?

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

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

Question Type : MCQ
Question ID : 2093553342
Option 1 ID : 2093551365
Option 2 ID : 2093551366
Option 3 ID : 2093551367
Option 4 ID : 2093551368
Status : Answered
Chosen Option : 3

Q.107

The following statements are made regarding bioremediation and phytoremediation.

A. Phytovolatilization can reduce soil contamination but may create secondary pollution in the atmosphere.
B. In rhizofiltration, plants are effective only if their roots are exposed to contaminated soil.
C. Phytostabilization reduces contaminant mobility, but the total pollutant load in the soil remains unchanged.
D. Bioventing involves the injection of air or oxygen into soil to stimulate aerobic microbial degradation.
E. During *in situ* bioaugmentation, the remediation is achieved by physically removing contaminated soil for off-site treatment and replacing it with decontaminated soil.

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

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

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

Question Type : MCQ
Question ID : 2093554403
Option 1 ID : 2093551609
Option 2 ID : 2093551610
Option 3 ID : 2093551611
Option 4 ID : 2093551612
Status : Not Answered
Chosen Option : --

Q.108

Given below are a few statements about meiosis in animal cells.

A. Failure of the chiasma formation leads to non-disjunction in meiosis I.
B. Meiotic cohesin Rec8 ensures mono-orientation of sister chromatids in meiosis II.
C. Crossover interference reduces clustering of recombination sites.
D. Residual double-strand breaks arrest meiosis at metaphase.

Which one of the following options has all the correct statements?

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

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

Question Type : MCQ
Question ID : 2093553344
Option 1 ID : 2093551373
Option 2 ID : 2093551374
Option 3 ID : 2093551375
Option 4 ID : 2093551376
Status : Not Answered
Chosen Option : --

Q.109

ENZ function prevents premature differentiation of mouse neural stem cells. Kinase inhibitor treatment differentiates these cells prematurely. This is prevented if a specific serine-to-aspartate (S to D) mutation is introduced in ENZ.

Based on this information, which one of the following statements is INCORRECT?

1. The specific serine to aspartate substitution has the same effect as phosphorylation of ENZ on neural stem cell differentiation.
2. The specific serine may be the site of ENZ phosphorylation.
3. The serine-to-aspartate mutation is expected to yield the same results as an asparagine substitution.
4. The serine-to-aspartate mutation is expected to yield the same results as a glutamic acid substitution.

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

Question Type : MCQ
Question ID : 2093553350
Option 1 ID : 2093551397
Option 2 ID : 2093551398
Option 3 ID : 2093551399
Option 4 ID : 2093551400
Status : Not Answered
Chosen Option : --

Q.110

The following statements describe some of the features of Quartz Crystal Microbalance (QCM) biosensors:

A. A QCM biosensor is built with thin disc-shaped piezoelectric material which is connected to metal electrodes on the opposite faces.
B. If an AC voltage is applied on the quartz crystal, it produces an oscillation at a stable resonant frequency which is not determined by the applied AC voltage.
C. The surface of the quartz crystal is functionalized with a specific receptor that can bind to the target analyte.
D. As the mass on the surface of the crystal is increased, the resonant frequency of crystal increases in a predictable, quantitative way following Sauerbrey equation.

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

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

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

Question Type : MCQ
Question ID : 2093554406
Option 1 ID : 2093551621
Option 2 ID : 2093551622
Option 3 ID : 2093551623
Option 4 ID : 2093551624
Status : Not Answered
Chosen Option : --

Q.111

Column X lists different types of ion channels and column Y defines the nature/ property of these channels.

	Column X		Column Y
A	Channelrhodopsin	i	Voltage-gated
B	Shaker-related potassium channels	ii	Mechano-sensitive
C	Piezo ion channel	iii	Ligand-gated
D	Acetylcholine receptor	iv	Light driven

Which one of the following options represents all correct matches between Column X and Column Y?

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

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

Question Type : MCQ
Question ID : 2093553345
Option 1 ID : 2093551377
Option 2 ID : 2093551378
Option 3 ID : 2093551379
Option 4 ID : 2093551380
Status : Answered
Chosen Option : 3

Q.112 Given below are a few statements regarding Aquaporin-mediated water transport in plants.

A. The activity of aquaporins is regulated by altered pH and Ca^{2+} concentration as well as phosphorylation.
B. Aquaporin activity is also regulated by reactive oxygen species.
C. Aquaporins are restricted only to epidermis and endodermal cells and not present in xylem parenchyma.
D. Aquaporins do not mediate influx of boric acid and salicylic acid into cytosol.

Which one of the following options represents the combination of all 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 : 209355369
Option 1 ID : 2093551473
Option 2 ID : 2093551474
Option 3 ID : 2093551475
Option 4 ID : 2093551476
Status : Not Answered
Chosen Option : --

Q.113 The table below lists taxonomic groups (Column X) and their morphological features (Column Y).

Column X	Column Y
A. Crustacea	i. Two pairs of antennae
B. Chelicerata	ii. Antennae absent
C. Phoronida	iii. Presence of lophophore

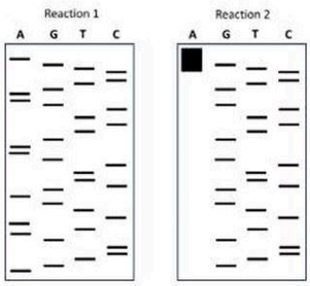
Which one of the following options represents all correct matches between Column X and Column Y?

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

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

Question Type : MCQ
Question ID : 209355386
Option 1 ID : 2093551541
Option 2 ID : 2093551542
Option 3 ID : 2093551543
Option 4 ID : 2093551544
Status : Not Answered
Chosen Option : --

Q.114 Two Sanger sequencing reactions were carried out using the same DNA template and primer. The sequencing gels are shown below:



Lane A of the reaction 2 gel shows the absence of lower bands and accumulation of higher bands (represented by a black thick band). The following reasons are predicted:

A. The template DNA does not contain the base A near its 5′-region.
B. The processivity of the Sequenase enzyme is very high.
C. In the second reaction, the concentration of ddATP is very low.
D. In the second reaction, the concentration of ddTTP is very high.

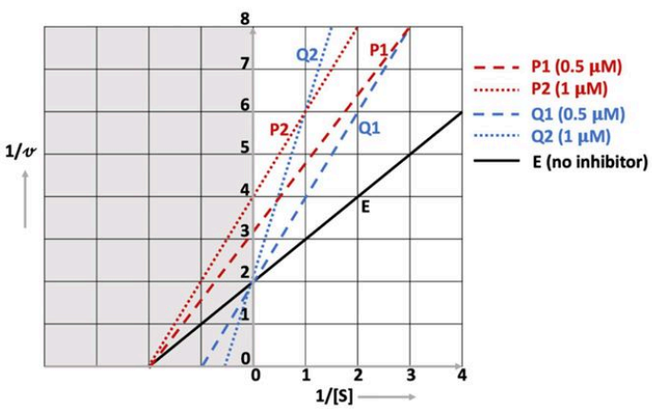
Which one of the following options represents the correct reason(s)?

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

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

Question Type : MCQ
Question ID : 2093551409
Option 1 ID : 2093551633
Option 2 ID : 2093551634
Option 3 ID : 2093551635
Option 4 ID : 2093551636
Status : Not Answered
Chosen Option : --

Q.115 The following graph represents the enzyme kinetics observed for an enzyme (E) in the presence of 2 different inhibitors, P and Q, each at two different concentrations (x-axis – 1/v; 1/(moles/min); y-axis – 1/[S]; 1/μM).



Based on the graph, what is the substrate concentration (in μM) at which both inhibitors achieve 50% inhibition?

1. 0.333
2. 0.5
3. 1.0
4. 2.0

Options 1. 1

2. 2

3. 3

4. 4

Question Type : MCQ
Question ID : 20935341
Option 1 ID : 20935136l
Option 2 ID : 20935136 2
Option 3 ID : 20935136 3
Option 4 ID : 20935136 4
Status : Not Answered
Chosen Option : --

Q.116 The following are four biological processes that occur inside a living cell.

A. Spontaneous *cis-trans* isomerization of proline in proteins
B. Co-translational protein folding
C. α-helix formation
D. Hydrogen bond formation in free water

Which one of the following options represents the slowest to fastest order of the timescale for these processes?

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

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

Question Type : MCQ
Question ID : 2093553338
Option 1 ID : 2093551349
Option 2 ID : 2093551350
Option 3 ID : 2093551351
Option 4 ID : 2093551352
Status : Not Answered
Chosen Option : --

Q.117 In eukaryotes, many cells can assemble a spindle in the absence of centrosomes as in the case of plant cells during mitosis, and animal cells during meiosis in females. In this context, centrosome-free mitotic extracts from frog oocytes, when supplied with beads covered with DNA, are sufficient to assemble the mitotic spindle. Listed below are a few proteins that could be involved in spindle assembly in such a setting:

A. Ran GTPase
B. Ran-GEF
C. TPX2
D. Myosin V

Which one of the following options has all proteins that are directly involved in controlling spindle assembly without centrosomes?

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

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

Question Type : MCQ
Question ID : 2093553343
Option 1 ID : 2093551369
Option 2 ID : 2093551370
Option 3 ID : 2093551371
Option 4 ID : 2093551372
Status : Not Answered
Chosen Option : --

Q.118

The following statements are made regarding photosynthesis in a mutant maize (C_4 plant) that lacks functional bundle sheath chloroplasts:

A. Photorespiration would remain low due to PEP carboxylase activity.
B. Calvin cycle would be severely compromised, reducing sugar production.
C. Carbon fixation would shift entirely to mesophyll cells without yield penalty.
D. CO_2 concentration around Rubisco would increase dramatically.

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

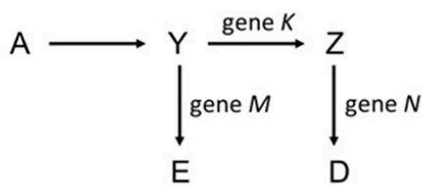
1. A and B only
2. A, B and C
3. C and D only
4. A, C and D

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

Question Type : MCQ
Question ID : 209355366
Option 1 ID : 2093551461
Option 2 ID : 2093551462
Option 3 ID : 2093551463
Option 4 ID : 2093551464
Status : Not Answered
Chosen Option : --

Q.119

Researchers attempted genetic manipulation of the metabolic pathway shown below for enhanced production of "D". However, increased expression of gene "*N*" did not result in increased production of "D" in any transgenic line. Levels of "E" were similar in transgenic as well as untransformed plants.



The following hypotheses were proposed for explaining the observed results.

A. Feedback inhibition of "N" by "D"
B. Epistasis of gene *N* over gene *M*
C. Substrate limitation for "N"
D. Feedback inhibition of "M" by "E"

Which one of the following options lists all factors that, either independently or in combination, could explain the above results?

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 : 2093554O4
Option 1 ID : 2093551613
Option 2 ID : 2093551614
Option 3 ID : 2093551615
Option 4 ID : 2093551616
Status : Not Answered
Chosen Option : --

Q.120

A eukaryotic protein, 'X' activates a target gene by increasing its transcription when an inducer is added. The results of the experiments are shown in the table below.

Experiment	Results without inducer	Results with inducer
Immunofluorescence of protein 'X'	No colocalization with DAPI	Colocalization with DAPI
Electrophoretic Mobility Shift Assay (EMSA)	No binding to probe derived from the promoter of the target gene	No binding to probe derived from the promoter of the target gene
Chromatin immunoprecipitation of the promoter of the target gene	Low acetylation	High acetylation

Which one of the following options is the correct mechanism of protein X-mediated transcriptional activation of the target gene upon addition of the inducer?

1. It acts in the cytoplasm as part of a signal transduction cascade.
2. It moves to the nucleus and acts as a coactivator.
3. It remains in the nucleus and acts as a chromatin modifier.
4. It moves to the cytoplasm and acts as a repressor.

Options 1. 1

2. 2

3. 3

4. 4

Question Type : MCQ
Question ID : 2093553352
Option 1 ID : 2093551405
Option 2 ID : 2093551406
Option 3 ID : 2093551407
Option 4 ID : 2093551408
Status : Not Answered
Chosen Option : --

Q.121 Given below are names of plants (Column X) and the habitats (Column Y) in which they naturally occur.

Column X		Column Y	
A	*Myristica fatua*	i	Eastern Himalayas
B	*Strobilanthes kunthiana*	ii	Nilgiris
C	*Madhuca indica*	iii	Fresh water swamp forests
D	*Rhododendron pendulum*	iv	Central India

Which one of the following options is a correct match of all terms between Column X and Column Y?

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

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

Question Type : MCQ
Question ID : 2093551385
Option 1 ID : 2093551537
Option 2 ID : 2093551538
Option 3 ID : 2093551539
Option 4 ID : 2093551540
Status : Not Answered
Chosen Option : --

Q.122

Immunoprecipitation (IP) of protein X from cell lysate using anti-X antibody, followed by RT-PCR for mRNA-Y, indicates the presence of protein X-mRNA-Y complex *in vivo*. To confirm this interaction, recombinant protein X and *in vitro* transcribed mRNA-Y are incubated, followed by affinity purification of protein X. However, mRNA-Y was not present in the eluates containing X but rather in the unbound fraction.

Given below are a few statements to explain the observations.

A. Protein X and mRNA-Y are expressed at the same level in the cell, so the interaction is robust.
B. Protein X and mRNA-Y physically interact via a bridge protein/co-factor absent in the purified protein X.
C. mRNA-Y binds to the antibody used in the immunoprecipitation.
D. The mRNA binding domain of the recombinant protein X may have an altered conformation.

Which one of the following is a combination of all correct statements?

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

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

Question Type : MCQ
Question ID : 209355362
Option 1 ID : 209355l445
Option 2 ID : 209355l446
Option 3 ID : 209355l447
Option 4 ID : 209355l448
Status : Not Answered
Chosen Option : --

Q.123

Some features of Transcranial Direct Current Stimulation (tDCS) are stated below:

A. The membrane potential of neurons is modulated by applying a weak electrical current between two electrodes placed on the scalp.
B. Neurons under the anode become depolarized, and neurons under the cathode become hyperpolarized during tDCS.
C. tDCS can disrupt neuronal activity and create a “virtual lesion” via anodal stimulation.
D. Neuronal activity is decreased in regions below the anode and increased in regions below the cathode.

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

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

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

Question Type : MCQ
Question ID : 209355408
Option 1 ID : 209355l629
Option 2 ID : 209355l630
Option 3 ID : 209355l631
Option 4 ID : 209355l632
Status : Not Answered
Chosen Option : --

Q.124

Signalling pathways that are important for tumorigenesis and cancer include those involved in cell proliferation and cell growth. The following statements were made regarding pathways and molecules involved in cancer:

A. Abnormal activation of the PI3-kinase/Akt pathway is involved in dysregulated growth.
B. Bcl2 overexpression and enhanced apoptosis lead to efficient clearance of damaged cancer cells.
C. Loss of p53 can allow cells with damaged DNA to escape apoptosis and continue to proliferate.
D. Inhibition of the Rho family GTPase *RhoC* leads to enhanced actin-based cell motility and facilitates metastasis.

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

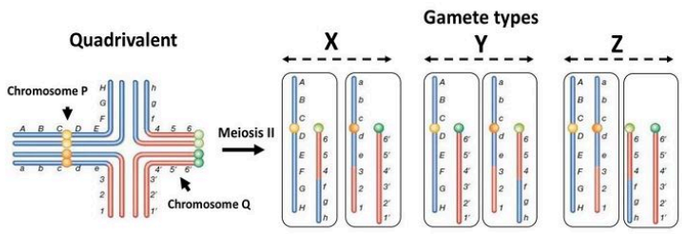
1. A and B
2. A and C
3. B and C
4. C and D

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

Question Type : MCQ
Question ID : 209355355
Option 1 ID : 209355l4l7
Option 2 ID : 209355l4l8
Option 3 ID : 209355l4l9
Option 4 ID : 209355l420
Status : Not Answered
Chosen Option : --

Q.125

In a plant heterozygous for a reciprocal translocation involving chromosome P (ABCDEFGH) and chromosome Q (123456), meiosis I produces a quadrivalent as shown in the figure, which after meiosis II results in gametes of types labelled X, Y and Z.



Which one of the following combinations correctly represents the segregation pattern of gametes that arise from the quadrivalent configuration as shown in the diagram?

1. X = Alternate Y = Adjacent II Z = Adjacent I
2. X = Adjacent II Y = Alternate Z = Adjacent I
3. X = Adjacent I Y = Adjacent II Z = Alternate
4. X = Adjacent I Y = Alternate Z = Adjacent II

Options 1. 1

2. 2

3. 3

4. 4

Question Type : MCQ
Question ID : 2093553 79
Option 1 ID : 2093551513
Option 2 ID : 2093551514
Option 3 ID : 2093551515
Option 4 ID : 2093551516
Status : Not Answered
Chosen Option : --

Q.126

Conjugation experiments were performed by mixing four different auxotrophic strains (P, Q, R and S) of *E. coli* in different combinations. The generation of prototrophs in each of these combinations on appropriate minimal selection media is given below:

Combination of strains	No. of prototrophs obtained
P and Q	20
S and R	1000
P and R	0
P and S	1000

Based on the above data, the following statements were made:

A. Strains P and R are F^- strains.
B. Strain Q is a F^+ strain.
C. Strain S is a Hfr strain.
D. Strains P and R are F^+ and F^- strains, respectively.
E. Strains P and R are both Hfr strains.

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

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

Options 1. 1

2. 2

3. 3

4. 4

Question Type : MCQ
Question ID : 2093553383
Option 1 ID : 2093551529
Option 2 ID : 2093551530
Option 3 ID : 2093551531
Option 4 ID : 2093551532
Status : Not Answered
Chosen Option : --

Q.127

To test if viral proteins are transported between Golgi stacks in vesicles or are released into the cytosol by one Golgi stack and taken up by another, viral protein transport was examined between Golgi stacks of infected and uninfected cells.

Which one of the following experimental designs would best distinguish these two hypotheses?

1. Test whether viral protein transport happens in the presence of antibodies depleting clathrin in acceptor Golgi stacks
2. Test whether viral protein transport happens in the presence of antibodies depleting COPII in acceptor Golgi stacks
3. Test whether viral protein transport happens in the presence of protease in the assay mix.
4. Test whether viral protein transport happens when either donor or acceptor Golgi stacks are treated with detergents sequentially

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

Question Type : MCQ
Question ID : 2093553346
Option 1 ID : 2093551381
Option 2 ID : 2093551382
Option 3 ID : 2093551383
Option 4 ID : 2093551384
Status : Not Answered
Chosen Option : --

Q.128

Recombination between two genes in *Neurospora crassa* yielded equal numbers of parental ditype (PD) and tetratype (TT), and 12 times as many TT as non-parental ditype (NPD).

What is the distance between the genes in map units (mu)?

1. 6 mu
2. 7 mu
3. 14 mu
4. 28 mu

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

Question Type : MCQ
Question ID : 2093553378
Option 1 ID : 2093551509
Option 2 ID : 2093551510
Option 3 ID : 2093551511
Option 4 ID : 2093551512
Status : Not Answered
Chosen Option : --

Q.129

During development, *yfg* expression is regulated by proteins E, F and G, which are abundant and have long half-lives. After a "specific stage of development", the protein E is activated by a single short wave of phosphorylation. This leads to the following events:

- Phosphorylated E activates F.
- Active F activates G.
- Active G promotes *yfg* expression.
- Active F completely inhibits E, and active G completely inhibits F function.

Which one of the following describes the expression of *yfg* soon after the "specific stage of development" is reached?

1. Continuously transcribing
2. One pulse of transcription
3. Transcription not initiated
4. Multiple pulses of transcription

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

Question Type : MCQ
Question ID : 2093553357
Option 1 ID : 2093551425
Option 2 ID : 2093551426
Option 3 ID : 2093551427
Option 4 ID : 2093551428
Status : Not Answered
Chosen Option : --

Q.130

In amphibians and fish, the cells of the organizer ultimately contribute to – (i) pharyngeal endoderm, (ii) head mesoderm, (iii) dorsal mesoderm, and (iv) dorsal blastopore lip. The following statements are made about the function of the organizer and its derivatives:

A. The pharyngeal endoderm and pre-chordal plate prevent formation of forebrain and midbrain.
B. The organizer has the ability to dorsalize the ectoderm and induce formation of the neural tube.
C. The dorsal mesoderm inhibits induction of the hindbrain and trunk.
D. The organizer tissue possesses the ability to dorsalize the surrounding mesoderm into somite-forming mesoderm.

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

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

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

Question Type : MCQ
Question ID : 2093553361
Option 1 ID : 2093551441
Option 2 ID : 2093551442
Option 3 ID : 2093551443
Option 4 ID : 2093551444
Status : Not Answered
Chosen Option : --

Q.131 Dynamic Light Scattering measurements of a protein encapsulated inside AOT/isooctane reverse micelles suspended in n-heptane at 10 °C and 1 atm show an average hydrodynamic diameter of 17 nm, while the empty micelles have an average diameter of 11 nm. Calculate the approximate hydrodynamic radius of the encapsulated protein, assuming spherical geometry of the protein and the reverse micelle and that the protein only occupies the aqueous core of the micelle.

1. 8.60 nm
2. 7.60 nm
3. 3.00 nm
4. 6.60 nm

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

Question Type : MCQ
Question ID : 2093554l0
Option 1 ID : 2093551637
Option 2 ID : 2093551638
Option 3 ID : 2093551639
Option 4 ID : 2093551640
Status : Not Answered
Chosen Option : --

Q.132 A 20-bp GC-rich promoter undergoes a conformational transition between the B-form to Z-form of DNA, involving bases 6 to 13. The rest of the bases always remain in the B-form. The B- to Z-DNA transition occurs with a half-life of 2 s, and Z- to B-DNA transition has a half-life of 6 s.

If the cognate transcription factor requires 10 continuous B-DNA base pairs for binding, for how many seconds in a 20 s window can the transcription factor remain bound to the promoter, assuming steady-state conditions?

1. 4 s
2. 5 s
3. 10 s
4. 15 s

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

Question Type : MCQ
Question ID : 2093553l0
Option 1 ID : 2093551357
Option 2 ID : 2093551358
Option 3 ID : 2093551359
Option 4 ID : 2093551360
Status : Not Answered
Chosen Option : --

Q.133 Given below are a few statements related to inheritance biology:

A. A crossover is the breakage of two DNA molecules at the same position and their rejoining in two reciprocal recombinant combinations.
B. Crossing over takes place at the four-chromatid stage.
C. As the distance between two genes increases, the recombination frequencies move closer to 50%.
D. Percentage of recombinants between two genes can be used as a quantitative index of the accurate physical distance between them.

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

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

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

Question Type : MCQ
Question ID : 2093551380
Option 1 ID : 2093551517
Option 2 ID : 2093551518
Option 3 ID : 2093551519
Option 4 ID : 2093551520
Status : Not Answered
Chosen Option : --

Q.134 A B6 mouse (H-2b haplotype) was crossed with a CBA mouse (H-2k haplotype) to generate F1 progeny. The following skin transplant experiments were then performed:

A. Graft from B6 mouse to CBA mouse
B. Graft from F1 mouse to B6 parent
C. Graft from F1 mouse to CBA parent
D. Graft from F1 mouse to F1 mouse
E. Graft from B6 mouse to F1 mouse

Which one of the following options represents all recipients in which the graft is tolerated?

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

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

Question Type : MCQ
Question ID : 2093554405
Option 1 ID : 2093561617
Option 2 ID : 2093561618
Option 3 ID : 2093561619
Option 4 ID : 2093561620
Status : Not Answered
Chosen Option : --

Q.135 The following statements are made regarding the functioning of phytochromes A and B during light signaling in plants.

A. Phytochrome B (PhyB) lacks nuclear localization signal (NLS) and after perceiving light, it takes hours for nuclear import.
B. Phytochrome A (PhyA) contains NLS and its nuclear import occurs rapidly.
C. P_{FR} form of PhyA depends on FAR-RED ELONGATED HYPOCOTYL 1 (FHY1) and its homolog FHL for nuclear import.
D. P_{FR} form of PhyB depends on FHY1 and its homolog FHL for nuclear import.

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

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

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

Question Type : MCQ
Question ID : 209355359
Option 1 ID : 2093551433
Option 2 ID : 2093551434
Option 3 ID : 2093551435
Option 4 ID : 2093551436
Status : Not Answered
Chosen Option : --

Q.136 The following experimental observations are made when a small ligand binds with nanomolar affinity in a deep hydrophobic pocket of the partner protein.

A. The ligand forms a hydrogen bond with a backbone carbonyl oxygen upon binding.
B. Several nonpolar groups in proteins form a hydrophobic network due to the conformational change, leading to the displacement of buried water molecules to the surface.
C. A negatively charged side chain of an amino acid located near the binding site is desolvated.
D. The desolvated sidechain of an amino acid located near the binding site does not form a salt bridge with the ligand.

Which one of the following options represents the combination of all correct statement(s) that explain(s) net stabilisation of the ligand:protein complex?

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

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

Question Type : MCQ
Question ID : 209355337
Option 1 ID : 2093551345
Option 2 ID : 2093551346
Option 3 ID : 2093551347
Option 4 ID : 2093551348
Status : Not Answered
Chosen Option : --

Q.137 A protein with a binding pocket containing amino acid residues, Asp (pKa = 4.0), and His (pKa = 6.5) interacts with a ligand at pH 7.0 at 25 °C. The binding affinity of the ligand increases 10-fold upon 'His' protonation. Assuming 'His' protonation is the sole contributor to the enhanced binding, calculate the fraction of 'His' residue protonation and the change in the binding free energy corresponding to the enhanced affinity (R = 1.987 cal/mol/K).

1. 0.48 and –3.61 kcal/mol
2. 0.76 and –2.46 kcal/mol
3. 0.96 and –1.63 kcal/mol
4. 0.24 and –1.36 kcal/mol

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

Question Type : MCQ
Question ID : 2093551339
Option 1 ID : 2093551353
Option 2 ID : 2093551354
Option 3 ID : 2093551355
Option 4 ID : 2093551356
Status : Not Answered
Chosen Option : --

Q.138 In standard or batch cultures, cells are grown in a fixed volume of medium. As they grow, nutrients are consumed and metabolites accumulate. Eventually, cultures may stop growing because of nutrient depletion and accumulation of toxic products. The following procedures may prolong the life of batch cultures:

A. Gradual addition of fresh medium and increasing volume of the culture
B. Replacing a constant fraction with an equal volume of fresh medium
C. Occasional removal of used medium and reducing growth factors in the medium
D. Intermittently adding serum and growth factors to the medium

Which one of the following combinations will ensure healthy growth of cells in culture?

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 : 2093551407
Option 1 ID : 2093551625
Option 2 ID : 2093551626
Option 3 ID : 2093551627
Option 4 ID : 2093551628
Status : Not Answered
Chosen Option : --

Q.139

Following statements are made regarding abscisic acid (ABA) signalling during water stress in plants.

A. ABA causes membrane depolarization by decreasing cytosolic calcium levels.
B. ABA causes alkalinisation of the cytosol which stimulates opening of K^+ efflux channels.
C. ABA inhibits the activity of the plasma membrane H^+-ATPase which results in membrane depolarization.
D. During stomatal closure, ABA induces reorganization of tubulin cytoskeleton mediated by Rho GTPases.
E. ABA induced membrane depolarization occur by release of calcium from endoplasmic reticulum and vacuoles.

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

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

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

Question Type : MCQ
Question ID : 209355368
Option 1 ID : 209355469
Option 2 ID : 209355470
Option 3 ID : 209355471
Option 4 ID : 209355472
Status : Not Answered
Chosen Option : --

Q.140

The following statements are put forth about hormonal changes during normal pregnancy in humans.

A. Pituitary secretion of FSH and LH increases.
B. Aldosterone secretion increases.
C. Glucocorticoid secretion decreases.
D. Thyroxine secretion increases.

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

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

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

Question Type : MCQ
Question ID : 209355374
Option 1 ID : 209355493
Option 2 ID : 209355494
Option 3 ID : 209355495
Option 4 ID : 209355496
Status : Answered
Chosen Option : 1

Q.141 The following statements are made with respect to signal transduction events in phytohormone signalling in plants:

A. Autophosphorylation of a histidine residue in the receiver domain of the response regulator is important for signal transduction through the two-component system.
B. Phosphorylation of a conserved aspartate residue in the transmitter domain of the histidine kinase is important for the two-component system.
C. CYTOKININ RESPONSE 1 (CRE1), a cytokinin receptor, functions as an Arabidopsis histidine-containing phosphotransfer (AHP) factor.
D. In Arabidopsis, pseudo-AHP, called AHP6, acts as an inhibitor of cytokinin signalling.
E. ETR1, an ethylene receptor in Arabidopsis, has histidine kinase activity and a receiver domain.

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

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

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

Question Type : MCQ
Question ID : 209355358
Option 1 ID : 209355l429
Option 2 ID : 209355l430
Option 3 ID : 209355l431
Option 4 ID : 209355l432
Status : Not Answered
Chosen Option : --

Q.142 In a monogamous haplodiploid social insect colony, sterile workers assist the queen in producing additional sisters instead of reproducing themselves. According to Hamilton's rule, altruistic behaviour is favoured when the genetic benefit to relatives (weighted by coefficient of relatedness, r) exceeds the cost, 'c' to the actor. If a worker helps the queen raise three daughters instead of producing two of her own, then based on Hamilton's rule, will helping behaviour evolve?

[assume, genetic unit, which is the number of offsprings weighted by r as a measure of inclusive fitness]

1. Yes, because rb = 2.25 genetic units and c = 1 genetic unit
2. No, because rb = 0.375 genetic units and c = 1 genetic unit
3. Yes, but only if r < 0.1, indicating weaker kin selection.
4. No, because kin selection cannot operate in haplodiploid species.

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

Question Type : MCQ
Question ID : 209355398
Option 1 ID : 209355l589
Option 2 ID : 209355l590
Option 3 ID : 209355l591
Option 4 ID : 209355l592
Status : Not Answered
Chosen Option : --

Q.143 In a polluted aquatic environment, bacteria are chronically exposed to low concentrations of multiple antibiotics released from pharmaceutical effluents. Over time, resistant colonies appear even when the antibiotic concentration remains constant. To determine whether resistance arises through induced mutation (a physiological response to antibiotics) or random mutation followed by selection, an ecologist performs a fluctuation test similar to that of Luria and Delbrück (1943) using replicate bacterial cultures.

Which one of the following outcomes would best support the conclusion that antibiotic resistance arises by random mutation followed by selection, rather than by induction?

1. Each replicate culture yields nearly the same number of resistant colonies after exposure to the antibiotic.
2. Different replicate cultures show large fluctuations in the number of resistant colonies, even though each was treated identically.
3. Resistant colonies appear only after antibiotic addition.
4. The number of resistant colonies increases predictably and proportionally with exposure time in every replicate culture.

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

Question Type : MCQ
Question ID : 209355397
Option 1 ID : 2093551585
Option 2 ID : 2093551586
Option 3 ID : 2093551587
Option 4 ID : 2093551588
Status : Answered
Chosen Option : 3

Q.144 Following statements are made regarding sex determination in plants.

A. In *Silene latifolia*, females are homogametic (XX) and males are heterogametic (XY).
B. Papaya (*Carica papaya*) shows trioecy, but its sex determination is not associated with sex chromosomes.
C. All dioecious plants with separate sexes possess heteromorphic sex chromosomes.
D. Plant sex chromosomes are ancient, and their Y chromosomes are highly degenerated, much like those in mammals.
E. Unlike animals, dosage compensation is generally weak or absent in plant sex chromosome systems.

Which one of the following combinations contains all INCORRECT statements?

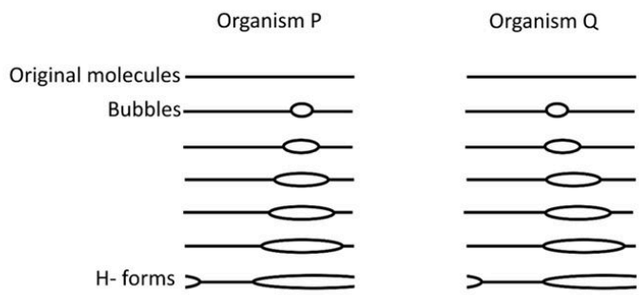
1. A, C and E
2. B, C and D
3. A and D
4. B and E

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

Question Type : MCQ
Question ID : 209355365
Option 1 ID : 2093551457
Option 2 ID : 2093551458
Option 3 ID : 2093551459
Option 4 ID : 2093551460
Status : Not Answered
Chosen Option : --

Q.145

Circular genomic DNA isolated from actively replicating stages of organisms, P and Q were digested with a restriction enzyme that cuts both genomes only once. The electron-micrographs of the digested DNAs are shown below:



The following comments are made on the number of replication origins and directionality of the replication fork(s):

A. In organism P there are two replication origins, and replication is bidirectional.
B. In organism P there is one replication origin, and replication is bidirectional.
C. In organism Q there is one replication origin, and replication is bidirectional.
D. In organism Q there is one replication origin, and replication is unidirectional.

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

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

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

Question Type : MCQ
Question ID : 2093553 48
Option 1 ID : 2093551389
Option 2 ID : 2093551390
Option 3 ID : 2093551391
Option 4 ID : 2093551392
Status : Answered
Chosen Option : 3