Pathfinder Academy

CSIR NET

Life Sciences

Question Paper

December 2024 Shift 2

Connect with Us

TELEGRAM DISCUSSION GROUP
https://t.me/CSIR_NET_Life_Sciences_GATE_BT

https://www.youtube.com/@Pathfinder-Academy

https://www.instagram.com/pathfinderacademy/

https://www.whatsapp.com/channel/0029Va4c95aAjPXMDfkBoH2N

Roll No	**LIFE SCIENCES -**	Registered Photo	Exam Day Photo
Registration No	**703 01-Mar-2025**		
Candidate Name	**15:00-18:00**		
Module Name			
Exam Date			
Exam Batch			

1) PART A

Question No. 1 / Question ID 703519 Marks: 2.00

$(2025)^{2025} - (2025)^{2024}$ is NOT divisible by

1. 8
2. 13
3. 23
4. 33

Question No. 2 / Question ID 703503 Marks: 2.00

Choose the arrangement in the increasing order of size for an average human being:-

A: arm, B: toe, C: head, D: heart.

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

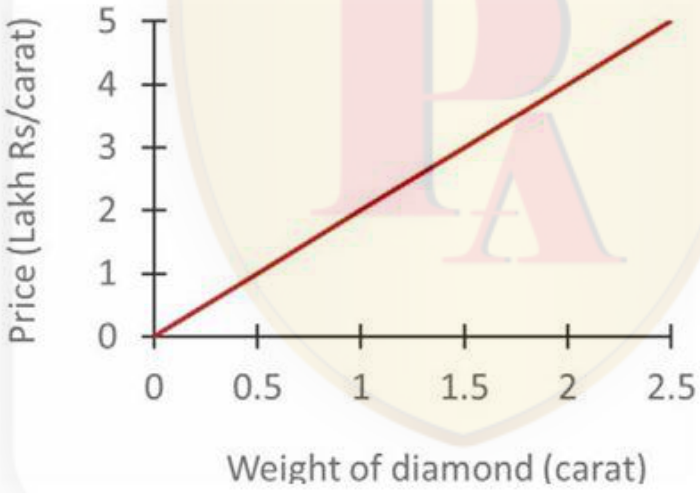
Question No. 3 / Question ID 703514 Marks: 2.00

Three positive integers a, b, c, have a sum of 15. Then the minimum value of $(a-2)^2 + (b-2)^2 + (c-2)^2$ would be

1. 25
2. 27
3. 29
4. 31

Question No. 4 / Question ID 703509 Marks: 2.00

The diagram shows the rate of diamonds of different sizes. Of what size is the largest diamond that can be purchased for Rs.4.5 lakh?



1. 1.5 carat
2. 2.25 carat
3. 2.5 carat
4. 4.5 carat

Question No. 5 / Question ID 703515 Marks: 2.00

How quickly must Rajesh drive the remaining distance to reach the city at an average speed of 100 km/h if he travels halfway there at 50 km/h?

1. 150 km/h
2. 100 km/h
3. 125 km/h
4. Average speed of 100 km/h is not possible in this case.

Question No. 6 / Question ID 703501 Marks: 2.00

Square of 5% is closest to

1. 0.25%
2. 25%
3. 2.5%
4. 1.25%

Question No. 7 / Question ID 703507 Marks: 2.00

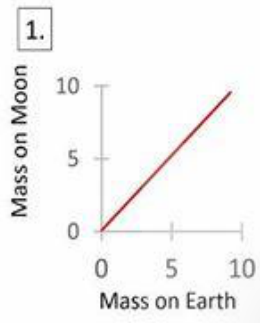
Any 9 papers printed on both sides are drawn from a book. The sum of their page numbers CAN NEVER be _____.

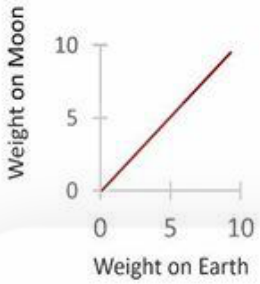
1. 199
2. 219
3. 235
4. 256

Question No. 8 / Question ID 703502 Marks: 2.00

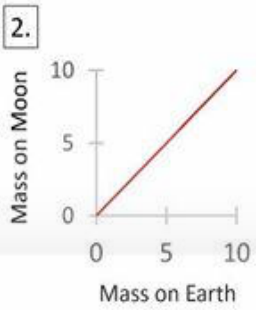
The masses and weights of some objects on the Moon were plotted against the same quantities on the Earth. The two graphs would appear as

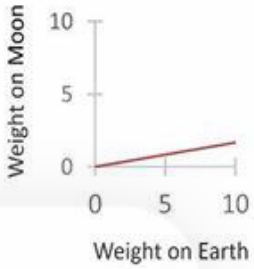
1.



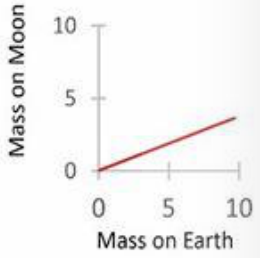


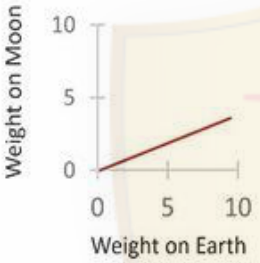
2.



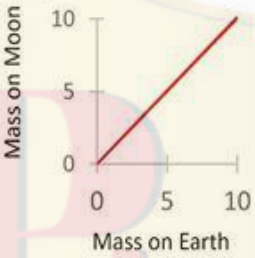


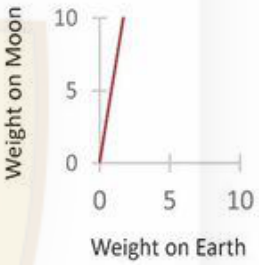
3.





4.





Question No. 9 / Question ID 703508 Marks: 2.00

A rectangular sheet 31.4 cm × 10 cm is rolled across its length to make a cylinder and both ends of the cylinder are covered with additional circular sheets. What will be the total surface area of the covered cylinder approximately?

1. 314 cm^2
2. 392.5 cm^2
3. 471 cm^2
4. 785 cm^2

Question No. 10 / Question ID 703511 Marks: 2.00

A person covers 1/10, 1/6, and 1/5 of the total distance at speeds of 3 km/h, 5 km/h and 6 km/h, respectively. The remaining 16 km she covers at a speed of 16 km/h. How long does she take to travel the total distance?

1. 1 hour
2. 3 hours
3. 4 hours
4. 5 hours

Question No. 11 / Question ID 703516 Marks: 2.00

To frame a portrait photo of 50 cm x 30 cm size, a 3 cm wide wooden strip is to be fixed all around the photo such that the inner periphery of the wooden strip touches the boundary of the photo. What is the total length of the wooden strip required?

1. 150 cm
2. 172 cm
3. 180 cm
4. 184 cm

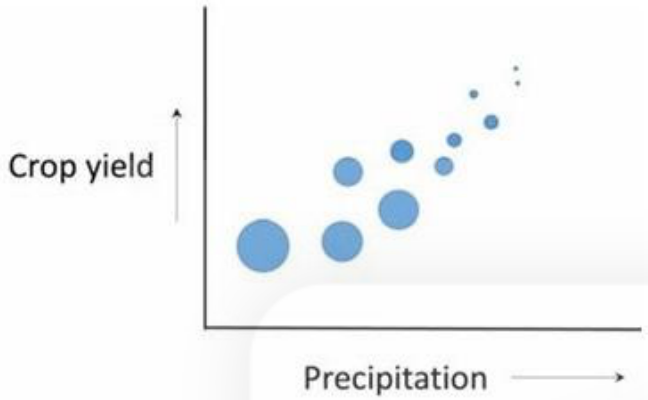
Question No. 12 / Question ID 703510 Marks: 2.00

In a square land of 200 m × 200 m size, saplings are to be planted such that the distance between the saplings as well as the distance of saplings from the boundary of the land are not less than 20 m. What is the maximum number of saplings that can be planted in the land?

1. 64
2. 81
3. 90
4. 100

Question No. 13 / Question ID 703506 Marks: 2.00

The bubble plot shows the relationship of Crop yield with precipitation and temperature. The size of the bubble is proportional to temperature. Which one of the following inferences CANNOT be drawn from the given plot?



1. Crop yield is inversely related to temperature
2. Precipitation and temperature are inversely related
3. Crop yield and precipitation are positively related
4. Precipitation and temperature are positively related

Question No. 14 / Question ID 703504 Marks: 2.00

In the fictional country of Vegereversia, which of the following provinces is the odd one out?

1. PANGOTATOP
2. SULTORRAC
3. HIABIGOHON
4. SINNEGABBAC

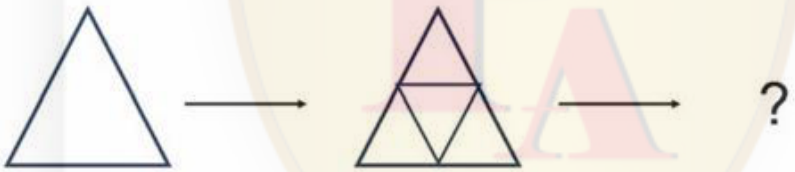
Question No. 15 / Question ID 703512 Marks: 2.00

A person orders a 12-inch circular pizza online. The restaurant calls her back and says that they ran out of 12-inch pizzas and instead offers the following choices in circular pizzas. Which of them gives the best value for her money?

1. Six 4-inch pizzas
2. Four 6-inch pizzas
3. Seven 3-inch pizzas
4. Five 5-inch pizzas

Question No. 16 / Question ID 703520 Marks: 2.00

Starting with a single triangle, every iteration adds smaller triangles at each of the vertices inside the previous triangle as shown in the figure. The number of vertices in the next iteration is:



1. 15
2. 42
3. 60
4. 18

Question No. 17 / Question ID 703518 Marks: 2.00

The average of 10 distinct nonnegative integers is 14.5. The average of the maximum and the minimum of these numbers is less than 15. Which of the following is the maximum possible value of the minimum?

1. 8
2. 9
3. 10
4. 11

Question No. 18 / Question ID 703513 Marks: 2.00

On a spherical balloon of radius 10 cm, two dots are put at a distance of 25 units. If the balloon is uniformly expanded to a sphere of radius 50 cm, the distance between the two dots in the same units would be

1. 100
2. 125
3. 150
4. 175

Question No. 19 / Question ID 703505 Marks: 2.00

How many 4-digit numbers can be generated from the digits 1, 2, 3, 4, 5, 6 and 7 such that no digit appears more than once, and '123' always appear as a string?

1. 8
2. 4
3. 6
4. 12

Question No. 20 / Question ID 703517 Marks: 2.00

Waters having three different colours (Red-R, Green-G, Blue-B) and temperatures: 4°C (R), 8°C (G) & 2°C (B), are put in a jar. How would these colours appear in the jar initially?

1.
R
G
B

2.
G
B
R

3.
B
G
R

4.
G
R
B

2) PART B

Question No. 1 / Question ID 703524 Marks: 2.00

Which one of the following properties is NOT responsible for the self-sealing nature of ruptured biological membranes?

1. The amphipathic character of the lipids
2. A hydrophobic interaction between lipid molecules
3. Hydrogen bonding between the head groups of the lipids and water
4. Covalent interactions among lipid molecules

Question No. 2 / Question ID 703535 Marks: 2.00

Haploinsufficiency in tumor suppressor genes can be caused by all of the following mechanisms EXCEPT

1. deletion of one allele of a gene.
2. a missense mutation leading to increased expression of one allele.
3. nonsense mutation in one allele leading to truncated protein.
4. epigenetic silencing of one allele.

Question No. 3 / Question ID 703563 Marks: 2.00

Which one of the following statements defines a monophyletic group?

1. A group of organisms that share a common ancestor and all of its descendants.
2. A group of organisms that includes species from unrelated lineages.
3. A group of organisms that lack a common ancestor.
4. A group of organisms that always lack apomorphic characters.

Question No. 4 / Question ID 703522 Marks: 2.00

Which one of the following bonds support the three intertwined polypeptide strands in the triple helical structure of collagen?

1. Disulfide bonds
2. Hydrogen bonds
3. Co-ordinate bonds
4. Ionic bonds

Question No. 5 / Question ID 703562 Marks: 2.00

Which one of the following phenomena describes the evolution of wings in bats, birds, and insects?

1. Homoplasy
2. Common ancestry
3. Pleiomorphy
4. Symplesiomorphy

Question No. 6 / Question ID 703529 Marks: 2.00

What is the correct order of enzyme actions during the long-patch base excision repair in humans?

1. Glycosylase, Lyase, AP endonuclease 1, DNA Polβ, DNA Ligase 3
2. Glycosylase, AP endonuclease 1, DNA Polδε, Flap endonuclease 1, DNA Ligase 1
3. Glycosylase, AP endonuclease 1, DNA Polβ, Flap endonuclease 1, DNA Ligase 1
4. Glycosylase, AP endonuclease 1, DNA Polδε, Flap endonuclease 1, DNA Ligase 3

Question No. 7 / Question ID 703556 Marks: 2.00

Which of the following is true for a monocot root?

1. Vascular bundles often polyarch; Pith large and well-developed
2. Vascular bundles always hexarch; Pith large and well-developed
3. Vascular bundles always diarch; Pith small or absent
4. Vascular bundles often polyarch; Pith absent

Question No. 8 / Question ID 703560 Marks: 2.00

A researcher captured 60 bivalves from a habitat on day 1 and tagged all of them. On day 2, she caught 40 bivalves out of which 20 were already tagged. She then estimated the population size of bivalves in the lake using this information. Which one of the options represents the percentage of the bivalve population that were marked on day 1?

1. 10
2. 50
3. 60
4. 20

Question No. 9 / Question ID 703550 Marks: 2.00

Which one of the following correctly describes how a mutagen induces a specific type of base change in DNA?

1. UV radiation typically creates thymine dimers causing G-C to A-T transition.
2. Nitrous acid deaminates adenine, leading to an A-T to G-C transition.
3. Ethidium bromide intercalates into DNA, causing specific base substitutions like A-T to C-G transversions.
4. EMS is a base analogue, causing G-C to A-T transitions.

Question No. 10 / Question ID 703569 Marks: 2.00

Select the correct set of 8-mer primer pair to PCR amplify a DNA fragment containing the region shown in upper case letters below:

5' – gagatcaggacttaGATTACAGATTACAGATTACAGATTACAggccaagtc - 3'

1. 5' - AGGACTTA - 3' and 5' - GGCCAAGT - 3'
2. 5' - TAAGTCCT - 3' and 5' - ACTTGGCC - 3'
3. 5' - AGGACTTA - 3' and 5' - ACTTGGCC - 3'
4. 5' - AGGACTTA - 3' and 5' - AGATTACA - 3'

Question No. 11 / Question ID 703561 Marks: 2.00

Which one of the following options suggests indirect selection in a population?

1. Survival rate
2. Reproductive rate
3. Selection via kin associations
4. Selection via deleterious mutations

Question No. 12 / Question ID 703534 Marks: 2.00

Which one of the following statements regarding the cadherin superfamily proteins is correct?

1. Non-classical cadherins *Fat* and *Flamingo*, regulate epithelial growth and cell polarity, respectively.
2. In an early mouse embryo, anti-N cadherin antibody prevents compaction.
3. P-cadherins lack transmembrane domain and are anchored to the membrane by GPI anchors.
4. Loss of the non-classical cadherin desmoglein causes skin blistering due to increased keratinocyte cell-to-cell adhesion.

Question No. 13 / Question ID 703546 Marks: 2.00

Which one of the following is NOT called secondary bile acid?

1. Deoxycholic acid
2. Lithocholic acid
3. Chenodeoxycholic acid
4. Ursodeoxycholic acid

Question No. 14 / Question ID 703530 Marks: 2.00

Match the following:

Column X		Column Y	
Eukaryotic DNA polymerase		Function	
A.	δ	i.	Base excision repair
B	ε	ii.	Thymine dimer bypass
C.	β	iii.	Lagging strand
D.	η	iv.	Leading strand

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

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

Question No. 15 / Question ID 703527 Marks: 2.00

Which one of the following statements best describes the functions of the SNARE protein complex in vesicular transport?

1. It catalyzes the hydrolysis of GTP to GDP during vesicle movement.
2. It provides structural support to the microtubule network.
3. It facilitates the fusion of vesicles with target membranes.
4. It transports cargo along actin filaments via motor proteins.

Question No. 16 / Question ID 703557 Marks: 2.00

The presence and abundance of a species in a local community is dependent on multiple processes. Which one of these processes is UNLIKELY to depend on intra- or inter-specific interactions?

1. Dispersal
2. Niche differentiation
3. Demographic stochasticity
4. Resource competition

Question No. 17 / Question ID 703523 Marks: 2.00

Skeletal muscle cells need to convert pyruvate to lactate while sustaining anaerobic respiration to

1. facilitate TCA cycle.
2. maintain the acidic extracellular environment.
3. recycle NADH.
4. generate more ATPs from the NADH.

Question No. 18 / Question ID 703554 Marks: 2.00

Which one of the following features distinguishes Echinoderms from Cnidarians?

1. The absence of sexual reproduction.
2. The presence of radial symmetry.
3. The total number of germ layers present.
4. The presence of a network of water-filled tubes for movement.

Question No. 19 / Question ID 703555 Marks: 2.00

Which one of the following statements is INCORRECT about lectotype designation, following ICBN rules?

1. A syntype is preferred over an isotype.
2. An isotype must be chosen over a syntype.
3. If syntype or isosyntype and isotype are not available, a paratype can be chosen.
4. In the absence of any type material, a lectotype can be chosen among the uncited specimens of any original material.

Question No. 20 / Question ID 703533 Marks: 2.00

Column X lists Pattern Recognition Receptors (PRRs) and Column Y lists the ligands that bind to the PRRs.

Column X		Column Y	
A.	TLR5	i.	Profilin
B	TLR3	ii.	Unmethylated CpG DNA
C.	TLR12	iii.	Flagellin
D.	TLR9	iv.	dsRNA
E.	TLR4	v.	ssRNA
F.	TLR7	vi.	LPS

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

1. A-iii, B-v, C-i
2. A-iii, D-ii, F-v
3. C-i D-ii, F-iv
4. B-iv E-vi, F-i

Question No. 21 / Question ID 703567 Marks: 2.00

Which experiment would be most effective in assessing the synergistic role of mycorrhizal fungi and plants in phytoremediation?

1. Comparing pollutant uptake in plants with and without fungal inoculation under identical soil conditions.
2. Analysing fungal growth rates in polluted versus unpolluted soil.
3. Measuring the root-to-shoot ratio of plants grown in polluted soil with fungal inoculation.
4. Assessing photosynthetic rates in inoculated versus uninoculated plants.

Question No. 22 / Question ID 703568 Marks: 2.00

Which of the following enzymes is used for conversion of blood glucose to gluconolactone in commercially available blood glucometer?

1. Glucose oxidase
2. Glucose reductase
3. Glucose dehydrogenase
4. Gluconolactonase

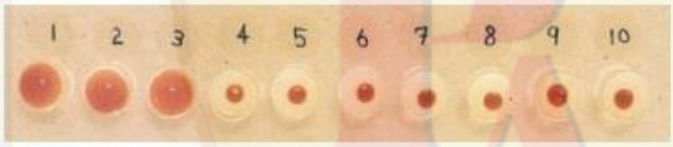
Question No. 23 / Question ID 703559 Marks: 2.00

In life history theory, the concept of 'cost of reproduction' refers to:

1. reduced future reproductive output or survival due to current reproduction.
2. reduced current reproductive output to conserve energy for future reproduction.
3. trade-offs between foraging rates and reproduction.
4. trade-offs between mating and territorial defense.

Question No. 24 / Question ID 703570 Marks: 2.00

Sheep RBCs (SRBCs) were added in wells 1-10 of a micro-titre plate as shown in the figure below. Next, serum from a mouse that had been immunized with SRBCs was diluted 1/50 in a tube and then added in serial two-fold dilutions from wells 1-9.



Which of the following statements is correct about titre of anti-SRBC antibodies in the serum sample?

1. The titre is 1/400.
2. The titre is 1/6.
3. The titre is 1/800.
4. The titre is 1/8.

Question No. 25 / Question ID 703538 Marks: 2.00

Which one of the following statements is INCORRECT regarding pattern formation during embryogenesis in Arabidopsis?

1. The zygote is unpolarized with respect to its intracellular composition.
2. The two daughter cells that arise from the first mitotic division of zygote has distinct developmental fates.
3. The cells derived from the basal quartet of the apical cell give rise to the apical regions of the root meristem.
4. The hypophysis derived from the uppermost cell of the suspensor gives rise to the quiescent center of the root apical meristem.

Question No. 26 / Question ID 703528 Marks: 2.00

During the most common form of protein glycosylation in the ER, a preformed precursor oligosaccharide which is transferred as a complete unit to the asparagine residue in a protein is:

1. 3 N-acetylglucosamines, 10 mannoses and 4 glucoses
2. 2 N-acetylglucosamines, 9 mannoses and 3 glucoses
3. 3 N-acetylglucosamines, 9 mannoses and 3 glucoses
4. 2 N-acetylglucosamines, 8 mannoses and 3 glucoses

Question No. 27 / Question ID 703539 Marks: 2.00

Which one of the following statements is true about cellular senescence?

1. Insulin signaling activates FoxO, and FoxO promotes senescence.
2. Insulin signaling inhibits FoxO, and FoxO protects cells from senescence.
3. Insulin signaling activates FoxO, and FoxO protects cells from senescence.
4. Insulin signaling inhibits FoxO, and FoxO promotes senescence.

Question No. 28 / Question ID 703564 Marks: 2.00

A grassland has five sympatric species of grasshoppers. Males sing species-specific songs to attract conspecific females. The song represents which mode(s) of reproductive isolation?

1. postmating and prezygotic
2. postzygotic
3. premating and postzygotic
4. premating

Question No. 29 / Question ID 703525 Marks: 2.00

Which one of the following statements about DNA packaging in chromosomes is INCORRECT?

1. Condensin I creates loops of nucleosomal chromatin for packaging in mitosis.
2. Histone H1 is required for higher order packaging of mammalian chromosomes.
3. Histones form hydrogen bonds with the sugar-phosphate backbone of DNA.
4. Histone modification is not required for mitotic chromosome condensation; it is mainly required for epigenetic control of gene repression in interphase.

Question No. 30 / Question ID 703548 Marks: 2.00

Which one of the following is NOT a true effect of aldosterone on the principal cells of distal tubule and the collecting duct to increase the reabsorption of Na^+?

1. Stimulation of CAP1 levels
2. Decrease in the serum and glucocorticoid-regulated kinase 1 (Sgk1) levels
3. Increase in the expression of ENaC in the apical membrane
4. Increase in the amount of Na^+, K^+-ATPase in the basolateral membrane

Question No. 31 / Question ID 703547 Marks: 2.00

Which one of the following does NOT increase airways resistance in lungs?

1. Norepinephrine
2. Thromboxane A_2
3. Histamine
4. Leukotriene B_4

Question No. 32 / Question ID 703565 Marks: 2.00

For expression of a gene of interest (Goi) and a green fluorescent protein (GFP) in mammalian cells, Goi and GFP must be expressed in a single mRNA, but translated independently. Which one of the following would be the structure of the expression construct?

(Pro - promoter; Enh - enhancer; IRES - internal ribosome entry site; pA - poly adenylation signal sequence)

1. Pro – Enh – Goi – IRES – GFP – pA
2. Enh – Pro – Goi – GFP– IRES – pA
3. Pro – Enh – Goi – GFP – IRES – pA
4. Enh – Pro – Goi – IRES – GFP– pA

Question No. 33 / Question ID 703536 Marks: 2.00

Which one of the following is NOT required for isotype switching from IgM to IgE?

1. VDJ recombination
2. Double stranded break repair
3. Cell division
4. T cell cytokines

Question No. 34 / Question ID 703542 Marks: 2.00

Acetohydroxy acid synthase (AHAS), an enzyme involved in branched-chain amino acid biosynthesis, is inhibited by all the following classes of herbicides, EXCEPT

1. Imidazolinones
2. L-phosphinothricin
3. Sulfonylureas
4. Triazolopyrimidines

Question No. 35 / Question ID 703558 Marks: 2.00

A desert annual plant with long-duration seed dormancy germinates only after heavy rainfall. What life history trait does this illustrate?

1. Bet-hedging strategy
2. *K* strategy
3. Frequency-dependent reproduction
4. Density-dependent reproduction

Question No. 36 / Question ID 703526 Marks: 2.00

Ten bacterial cells are inoculated into 10 ml of Luria broth and grown for 10 hours with shaking at 37°C. What will be the approximate number of bacteria in the flask at the end of 10-hour incubation? (Note: the doubling time of this bacterium in Luria broth is approximately 20 min).

1. 10^6
2. 10^8
3. 10^9
4. 10^{10}

Question No. 37 / Question ID 703537 Marks: 2.00

Which one of the following statements is INCORRECT regarding seasonality and sex in aphids?

1. An egg hatched in the spring gives rise to several generations of parthenogenetically reproducing females.
2. During autumn, a particular type of female is produced whose eggs can give rise to only asexual males.
3. After winter, when eggs hatch, each one gives rise to an asexual female.
4. The juvenile hormone controls the parthenogenetic/sexual switch and also inhibits the formation of wings.

Question No. 38 / Question ID 703549 Marks: 2.00

In a population, the frequency of allele 'a' is 0.2 and that of allele 'b' is 0.1. Consider that there are two alleles for each of the genes. What would be the expected percentage of population with genotype *AaBb*, considering that the population is under Hardy-Weinberg equilibrium?

1. 1.44 %
2. 2.88 %
3. 50 %
4. 57.6 %

Question No. 39 / Question ID 703553 Marks: 2.00

Which one of the following plants has a bisporic type of embryo sac development?

1. *Allium*
2. *Oenothera*
3. *Plumbago*
4. *Polygonum*

Question No. 40 / Question ID 703544 Marks: 2.00

Which one of the following plant pathogens has the most prolonged symptomless infection phase?

1. *Phytophthora infestans*
2. *Magnaporthe oryzae*
3. *Botrytis cinerea*
4. *Mycosphaerella fijiensis*

Question No. 41 / Question ID 703532 Marks: 2.00

Which one of the following translation systems is inhibited by cycloheximide?

1. 70S ribosome-associated bacterial translation system
2. 80S ribosome-associated eukaryotic cytosolic translation system
3. 74S ribosome-associated mitochondrial translation system
4. 70S ribosome-associated chloroplast translation system

Question No. 42 / Question ID 703566 Marks: 2.00

Which one of the following statements is correct?

1. The *ALS* selection marker gene used for development and selection of transgenic plants confers resistance to the antibiotic, ampicillin.
2. A T0 transgenic plant containing two tightly linked copies of a transgene expression cassette would show segregation of the transgenic phenotype in a 15:1 ratio in the T1 generation obtained by self-pollination.
3. Non-conditional, negative selection marker genes cannot be expressed under a constitutive promoter for selection of transgenic plants.
4. Transgenic plants containing multiple copies of the T-DNA are preferred for field studies as they would always show increased expression levels of the transgene across multiple generations.

Question No. 43 / Question ID 703552 Marks: 2.00

Which one of the following statements is correct?

1. A population of a diploid species can possess only two allelic forms of a gene.
2. In codominance, the phenotype of the heterozygote lies in the range between the phenotypes of individuals that are homozygous for either allele involved.
3. Penetrance is the frequency with which a genotype manifests itself in individuals in a given population.
4. Expressivity is the type or degree of phenotypic manifestation of a penetrant allele or genotype in a particular individual and is not influenced by the environment.

Question No. 44 / Question ID 703543 Marks: 2.00

Which of the following phytohormone signaling pathways are evolutionarily related to bacterial two-component regulatory systems?

1. Cytokinin and ethylene
2. Brassinosteroid and auxin
3. Auxin and cytokinin
4. Brassinosteroid and strigolactone

Question No. 45 / Question ID 703521 Marks: 2.00

The pKa of an amino acid side chain was measured in aqueous solution. Which one of the following is the correct arrangement of the amino acids in the decreasing order of their side chain pKa?

1. Serine > Lysine > Histidine > Aspartate
2. Lysine > Histidine > Aspartate > Serine
3. Aspartate > Histidine > Lysine > Serine
4. Serine > Histidine > Lysine > Aspartate

Question No. 46 / Question ID 703551 Marks: 2.00

Which one of the following statements best illustrates a dominant negative mutation?

1. A mutation in a growth factor receptor gene leads to an overactive receptor that signals constantly, even in the absence of a signal.
2. A mutation in an enzyme-coding gene decreases its activity, but enough enzyme activity remains in heterozygotes to maintain normal metabolic function.
3. A mutation in a transcription factor gene reduces its ability to bind DNA, but there is no effect on gene expression unless both alleles are mutated.
4. A mutation in a structural protein gene produces an altered protein that can interact with its wild type counterpart and disrupt its function.

Question No. 47 / Question ID 703540 Marks: 2.00

In a developing Drosophila embryo, which one of the following is the correct order of *Hox* gene expression from the anterior-to-posterior axis?

1. Antennapedia, Ultrabithorax, Abdominal A
2. Abdominal A, Ultrabithorax, Antennapedia
3. Antennapedia, Abdominal A, Ultrabithorax
4. Ultrabithorax, Antennapedia, Abdominal A

Question No. 48 / Question ID 703545 Marks: 2.00

Which one of the following is NOT a vitamin K-dependent blood clotting factor?

1. Factor II
2. Factor V
3. Factor IX
4. Factor X

Question No. 49 / Question ID 703541 Marks: 2.00

Which one of the following statements represents correct sequence of events during electron transport chain from P680 to P700 in a light reaction of photosynthesis in a typical plant?

1. Plastocyanin - Plastoquinone A - Plastoquinone B - Cytochrome b_6f complex - Pheophytin
2. Plastocyanin - Cytochrome b_6f complex - Plastoquinone A - Plastoquinone B - Pheophytin
3. Pheophytin - Plastoquinone A - Plastoquinone B - Cytochrome b_6f complex- Plastocyanin
4. Pheophytin - Cytochrome b_6f complex - Plastoquinone A - Plastoquinone B - Plastocyanin

Question No. 50 / Question ID 703531 Marks: 2.00

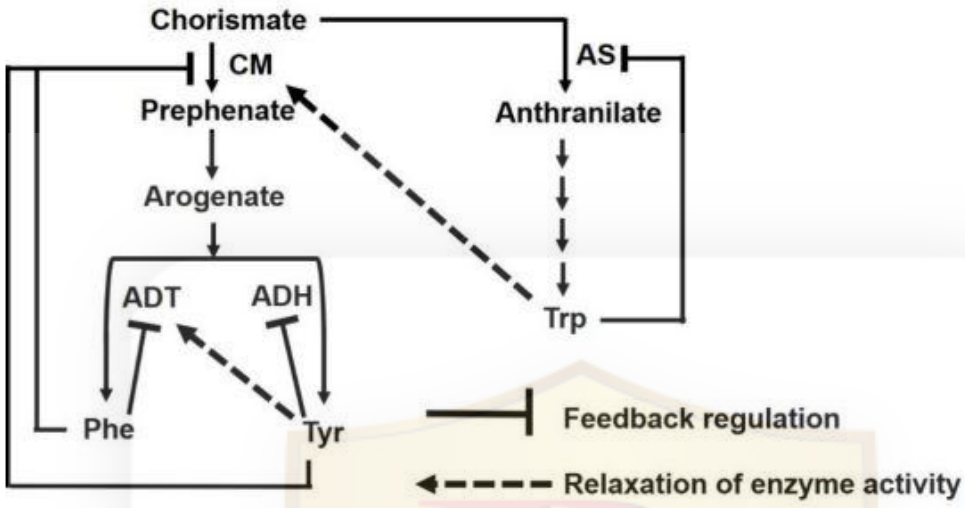
In the context of gene expression, what is the primary function of the mediator complex in eukaryotes?

1. To modify histones to promote transcription
2. To facilitate the interaction between transcription factors and RNA polymerase II
3. To promote helicase activity to unwind DNA during transcription initiation
4. To degrade mRNA after transcription

3) PART C

Question No. 1 / Question ID 703602 Marks: 4.00

The figure below depicts the allosteric regulation in the biosynthesis of three aromatic amino acids- Phe, Tyr and Trp, acting at four major steps catalyzed by enzymes, CM, AS, ADT and ADH. The feedback regulation and relaxation of enzyme activities by the end-product amino acids are marked.



Following assumptions are made regarding the pool of aromatic amino acids in the feedback-insensitive mutants of these allosteric enzymes.

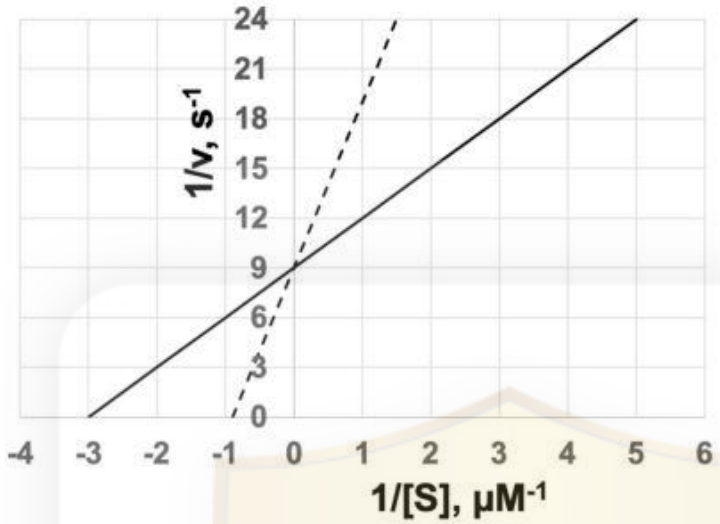
A. The feedback-insensitive mutant of CM will show higher pool of Phe and Tyr.
B. The feedback-insensitive mutant of AS will increase only Trp pool.
C. The feedback-insensitive mutant of AS will show higher pool of Trp, Phe and Tyr.
D. In feedback-insensitive mutant of ADH, only Tyr pool is decreased.
E. In feedback-insensitive mutant of ADH, both Tyr and Phe pools are increased transiently.

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

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

Question No. 2 / Question ID 703574 Marks: 4.00

The graph below shows the plot of 1/v vs 1/[S] for an enzymatic reaction, with the solid and dashed lines representing the reactions without and with an inhibitor, respectively. The concentration of the inhibitor is 1 μM.



Which one of the following will be the K_I of the inhibitor?

1. 0.33
2. 1.0
3. 0.50
4. 2.0

Question No. 3 / Question ID 703581 Marks: 4.00

A region of a mouse chromosome was subjected to micrococcal nuclease hypersensitivity analysis over stages of development. In early stages, the region had regularly spaced nucleosomes. In later stages, the nucleosomes were irregularly spaced with several nucleosome free regions detected.

Based on the above observations, which one of the following is the best possible inference?

1. The chromatin region is a facultative heterochromatin.
2. The region is highly expressed in early stages.
3. Nucleosomes are not made efficiently in the late developmental stages.
4. The nucleosomal arrangements cannot be used to infer potential expression states.

Question No. 4 / Question ID 703597 Marks: 4.00

Dorsal-ventral patterning in the oocyte of Drosophila depends on the expression of *Gurken*. The following events occur during generation of dorsal-ventral polarity.

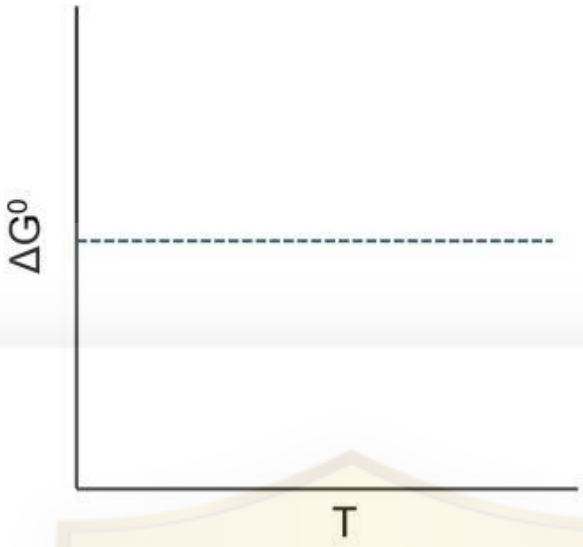
A. The oocyte nucleus travels to the anterior dorsal side of the oocyte where it localizes *gurken* mRNA.
B. *Gurken* protein reaches only those follicle cells closest to the oocyte nucleus.
C. The protein product forms an anterior-posterior gradient along dorsal surface of the oocyte.

What would happen if maternal deficiency of *gurken* occurs?

1. Dorsal-ventral polarity occurs in the follicle cell layer surrounding the growing oocytes.
2. Dorsalized follicle cells initiate the formation of dorsal-ventral axis of the embryo.
3. Absence of *gurken* leads to repression of the pipe protein in ventral cells.
4. Ventralization of the embryo would occur.

Question No. 5 / Question ID 703576 Marks: 4.00

ΔG^0 of a reaction shows the following temperature dependence.

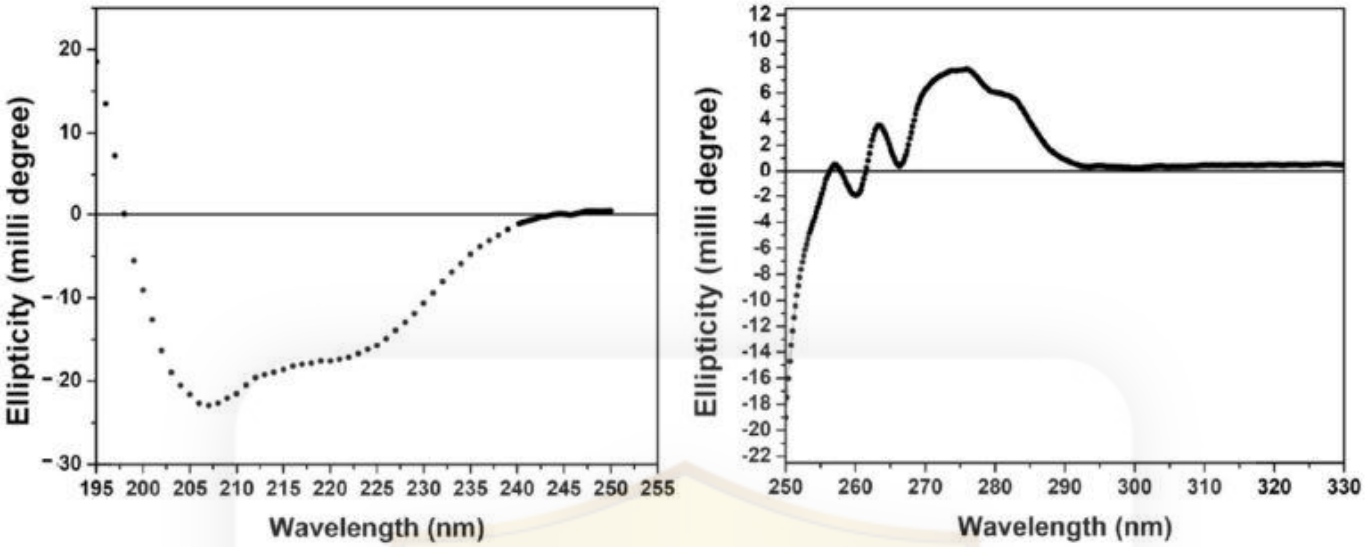


What is the expected dependence of K_{eq} of the reaction on the temperature, where C is a temperature-independent constant?

1. $K_{eq} = C$
2. $K_{eq} = C \times e^{1/T}$
3. $K_{eq} = C \times e^{-T}$
4. $K_{eq} = -RT \ln(C)$

Question No. 6 / Question ID 703575 Marks: 4.00

The circular dichroism spectra for near-UV and far-UV regions of a polypeptide chain are given below.

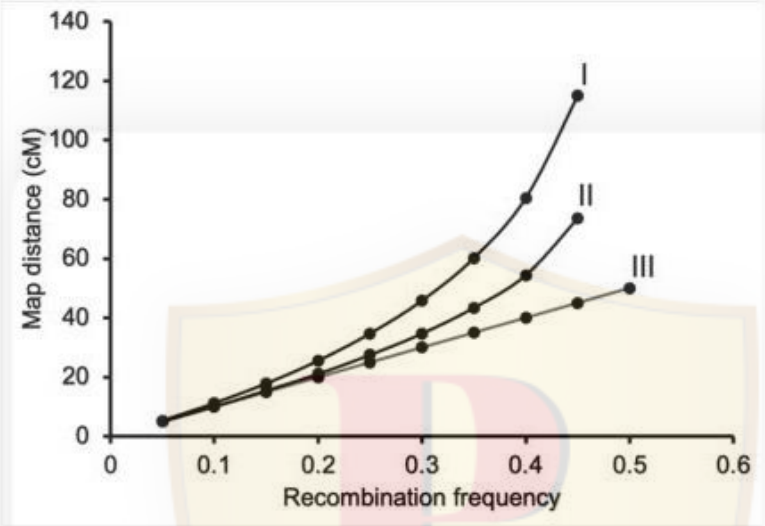


Which one of the following options represents a correct inference about the polypeptide fold based on the above data?

1. It contains only β sheets.
2. It has to be an alternate α/β fold.
3. It has to be a mixed α+β fold.
4. It belongs to either alternate α/β or mixed α+β fold.

Question No. 7 / Question ID 703613 Marks: 4.00

Sturtevant introduced the concept of recombination frequency-based genetic maps. Since genetic distances between genes may be underestimated due to the occurrence of double crossovers, other mapping functions were developed to provide more accurate estimates. Haldane's mapping function assumes no interference between crossovers, while Kosambi's mapping function accounts for interference. The following graph presents the relationship between recombination frequency and map distance (cM) as proposed by Sturtevant and after corrections using either Haldane's or Kosambi's mapping functions.



The following statements were made about genetic maps.

A. Line I in the above plot represents relationship between recombination frequency and map distance based on Kosambi function.

B. The chance of underestimation of map distance increases with increase in recombination frequency.

C. Genetic mapping proposed by Strutevant assumes complete interference.

Which one of the following options correctly identifies each statement as True (T) or False (F) from A to C, respectively?

1. T, T, T
2. T, T, F
3. T, F, T
4. F, T, T

Question No. 8 / Question ID 703577 Marks: 4.00

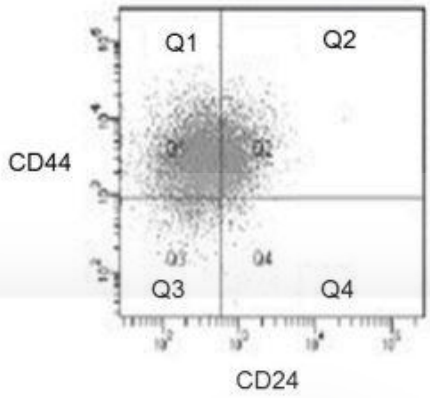
A putative mitochondrial signal peptide was attached to the N-terminus of the DHFR protein and expressed in mammalian cells. Mitochondria were isolated, and a fraction was osmotically shocked briefly. Both osmotically shocked and untreated pools of mitochondria were treated with protease. It was observed that the DHFR was intact in both cases.

Which of the following statements best describes the function of the signal peptide?

1. It targets DHFR to the mitochondrial outer membrane, facing the cytosol.
2. It targets DHFR to the mitochondrial inner membrane, facing the intermembrane space.
3. It targets DHFR to the mitochondrial outer membrane, facing the intermembrane space.
4. It targets DHFR to the mitochondrial matrix.

Question No. 9 / Question ID 703641 Marks: 4.00

Breast cancer stem cells may be identified by analyzing the CD24/CD44 phenotype of a breast tumor. CD24/CD44 stained cells were analyzed by flow cytometry and the analysis is shown below.



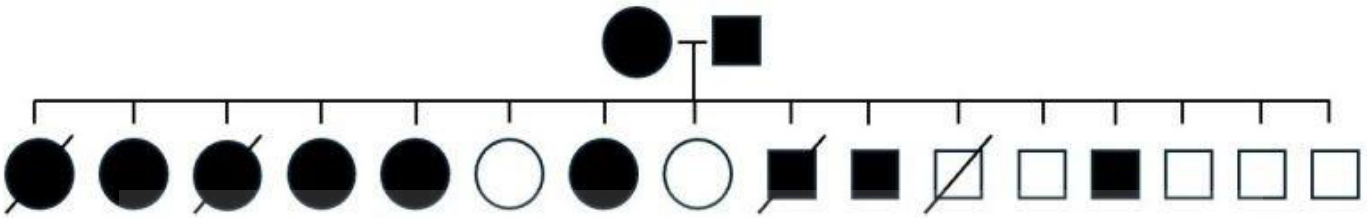
Further analyses of the sorted cells from different quadrants (Q1 to Q4) by immunoblotting revealed the following results. The dotted lines represent lanes with negligible signal.

Based on the above results, which phenotype is associated with the maximum number of breast cancer stem cells?

1. $CD24^{-}/CD44^{-}$
2. $CD24^{+}/CD44^{+}$
3. $CD24^{-}/CD44^{+}$
4. $CD24^{+}/CD44^{-}$

Question No. 10 / Question ID 703615 Marks: 4.00

Two closely related individuals, suffering from a congenital disease, have several children. A genetic counselor constructs the following pedigree of the family and concluded that this disease is caused by mutations in at least two genes.



Further, based on this information, the following statements were made:

A. At least one of the children will not carry any mutations linked to this condition.
B. The mutations causing this disease are recessive.
C. At least one of the mutant genes is on the Y chromosome.
D. Simultaneous heterozygous mutations in the involved genes can cause the disease.

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

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

Question No. 11 / Question ID 703640 Marks: 4.00

Given below are leaf lengths (in cm) measured from a sample of 15 Dipterocarp trees

5, 6, 7, 7, 8, 8, 8, 9, 9, 10, 10, 11, 11, 12, 13

What are the mean, median, and mode of the leaf lengths?

1. Mean - 7.93, Median - 7, Mode - 10
2. Mean - 8.93, Median - 9, Mode - 8
3. Mean - 7.93, Median - 9, Mode - 8
4. Mean - 8.93, Median - 9, Mode - 9

Question No. 12 / Question ID 703593 Marks: 4.00

In an experiment, while screening for loss-of-function mutants, a student found a mutation in the gene encoding caspase-9 in the intrinsic pathway of apoptosis. The following are the possible consequences for this mutant cell:

A. Loss of mitochondrial membrane potential and release of cytochrome C.
B. Reduced formation of the apoptosome and defective initiation of apoptosis.
C. Inability to activate the death receptors.
D. Become resistant to UV irradiation-induced cell death.

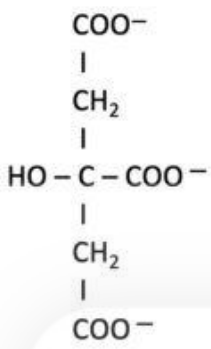
Which one of the following options represents all correct statements?

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

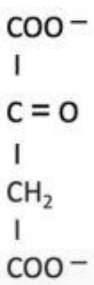
Question No. 13 / Question ID 703573 Marks: 4.00

Given below are four metabolic intermediates (i-iv) listed against amino acids (A-E):

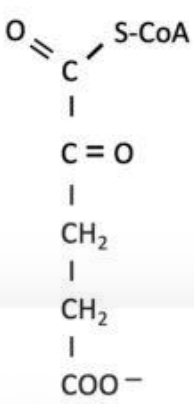
i



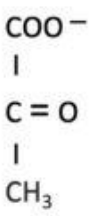
ii



iii



iv



A. i - serine, glycine, cysteine
B. iv - alanine, valine, leucine
C. iii - glutamate, glutamine, proline
D. ii - methionine, threonine, lysine
E. i - histidine

Which one of the following options correctly pairs the metabolic intermediates with their corresponding amino acid end product(s)?

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

Question No. 14 / Question ID 703627 Marks: 4.00

Populations of two species (A and B) follow logistic growth. The parameter values for the logistic growth equation are given in the table below.

Species	Intrinsic growth rate (r)	Carrying capacity (K)
A	2.5	500
B	0.8	1000

Select the option that correctly gives the population growth rate at N = 100 for both species.

1. Species A = 150; Species B = 82
2. Species A = 200; Species B = 72
3. Species A = 250, Species B = 46
4. Species A = 300, Species B = 68

Question No. 15 / Question ID 703606 Marks: 4.00

The following statements are made regarding root-knot nematode infection in plants.

A. Chemical signals released by the plant roots can induce hatching of the juvenile nematodes.
B. Mitosis coupled with cytokinesis and DNA endoreduplication is induced during root-knot nematode infection.
C. Nematodes form syncytial feeding structures by recruiting plant cells.
D. Nematode infections suppress cortical cell growth in plants.

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. B and D

Question No. 16 / Question ID 703579 Marks: 4.00

Cholera toxin activates the chloride channel in the epithelial cells of intestine leading to loss of Cl^-, and consequent loss of water leading to dehydration. Successful oral rehydration therapy involves supplementing water with glucose and salt and not just salt. This is

1. to replenish the energy lost by dehydration and replace chloride.
2. to create an osmotic gradient with Na^+ and glucose to allow water to move from intestinal lumen to blood via epithelial cells.
3. because the epithelial antiporter pumps water inside the epithelium in the presence of salt and glucose and eventually into blood.
4. because sodium chloride will release Cl^- for replacing lost chloride along with water in the intestinal lumen.

Question No. 17 / Question ID 703609 Marks: 4.00

The following statements suggest the physiological characteristics of the dead space in respiratory system, alveolar ventilation (the amount of air reaching alveoli per minute) and respiratory minute volume (RMV) in healthy individuals.

A. The alveolar ventilation is less than RMV.
B. The anatomic dead space can be estimated by the body weight of the individual.
C. At rest, the anatomic dead space and physiological dead space are identical.
D. The alveolar ventilation is higher in rapid shallow breathing than that of the slow deep breathing at the same RMV.

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

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

Question No. 18 / Question ID 703595 Marks: 4.00

A tetraploid plant (4X = 60 chromosomes) reproduces by obligate apomixis. However, fertilization of the central cell is required for its proper endosperm development (pseudogamy). The male meiosis in this plant is normal, giving rise to reduced gametes. What will be the chromosome numbers in the embryo and endosperm of the apomictic seeds resulting from pseudogamy?

1. Embryo = 30; endosperm = 90
2. Embryo = 60; endosperm = 150
3. Embryo = 60; endosperm = 90
4. Embryo = 60; endosperm = 120

Question No. 19 / Question ID 703643 Marks: 4.00

A molecule absorbs light at 'X' nm wavelength and emits light as fluorescence at 'Y' nm wavelength. Typically, there is a shift in the wavelength (Y>X). E is the energy transferred to the solvent during reorganization of the excited state, '*h*' is the Planck's constant, and 'c' is the speed of light.

E is equal to:

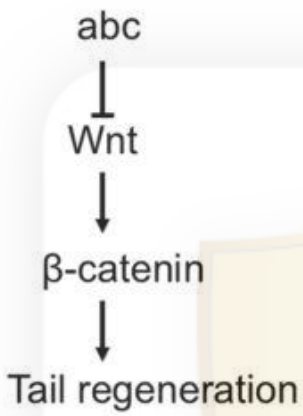
1. *h*(Y-X)
2. *hc*(Y-X) / XY
3. c(Y-X) / *h*
4. c / (Y-X)

Question No. 20 / Question ID 703600 Marks: 4.00

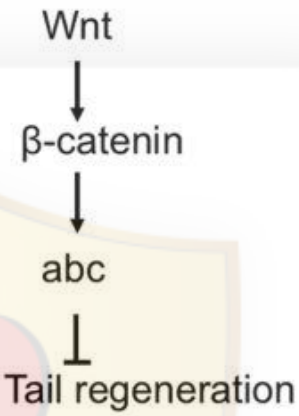
If planaria is cut in transverse, active Wnt signaling in the posterior side of the head piece is essential for the regeneration of a tail. Students were investigating the role of gene *abc* in this process. They find that overexpressing *abc* in the head piece blocks tail regeneration. However, overexpressing constitutively active β-catenin along with *abc* in the severed head piece allows tail formation.

Which one of the following pathways correctly depicts the role of abc and β-catenin in planarian tail regeneration?

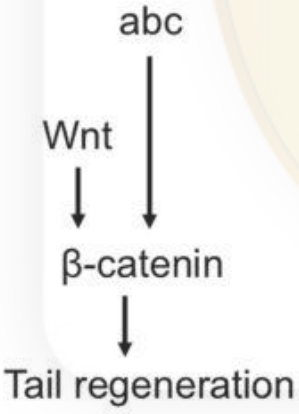
1.



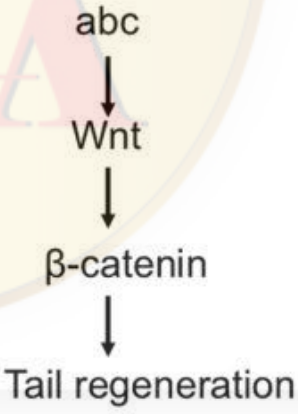
2.



3.



4.



Question No. 21 / Question ID 703624 Marks: 4.00

Consider the following statements on patterns in global biogeography.

A. The endemicity of terrestrial mammal families in biogeographic realms is greater than plant families.
B. There are fewer mammalian fruit eaters, omnivores, and carnivore species in Australia compared to other biogeographic realms.
C. Major diversification of modern mammals started only 65-55 million years ago.
D. On an average, plant species have dispersed much better than mammalian species across biogeographic realms.

Which one of the options given below contains the correct set of True/False statements, based on well-established patterns in global biogeography?

1. A: True, B: False, C: True, D: False
2. A: True, B: True, C: True, D: True
3. A: False, B: True, C: True, D: False
4. A: False, B: False, C: True, D: True

Question No. 22 / Question ID 703580 Marks: 4.00

After synchronizing mammalian cells in culture with a double thymidine block (cell cycle duration of 24h), cells are released into fresh medium. After 6h, cells are split into 4 sets and each is treated with a) nothing, b) proteasome inhibitor, c) myosin II inhibitor, d) nocodazole.

From the options given below, choose the one that has the most likely outcome of the experiment.

1. a: synchronously dividing cells; b: binucleate cells; c: metaphase arrested; d: prometaphase arrested
2. a: synchronously dividing cells; b: prometaphase arrested; c: binucleate cells; d: metaphase arrested
3. a: binucleate cells; b: prometaphase arrested; c: synchronously dividing cells; d: anaphase arrested
4. a: synchronously dividing cells; b: metaphase arrested; c: binucleate cells; d: pro-metaphase arrested

Question No. 23 / Question ID 703622 Marks: 4.00

The table below lists unique structural modifications (Column X) found in various plant genera (Column Y).

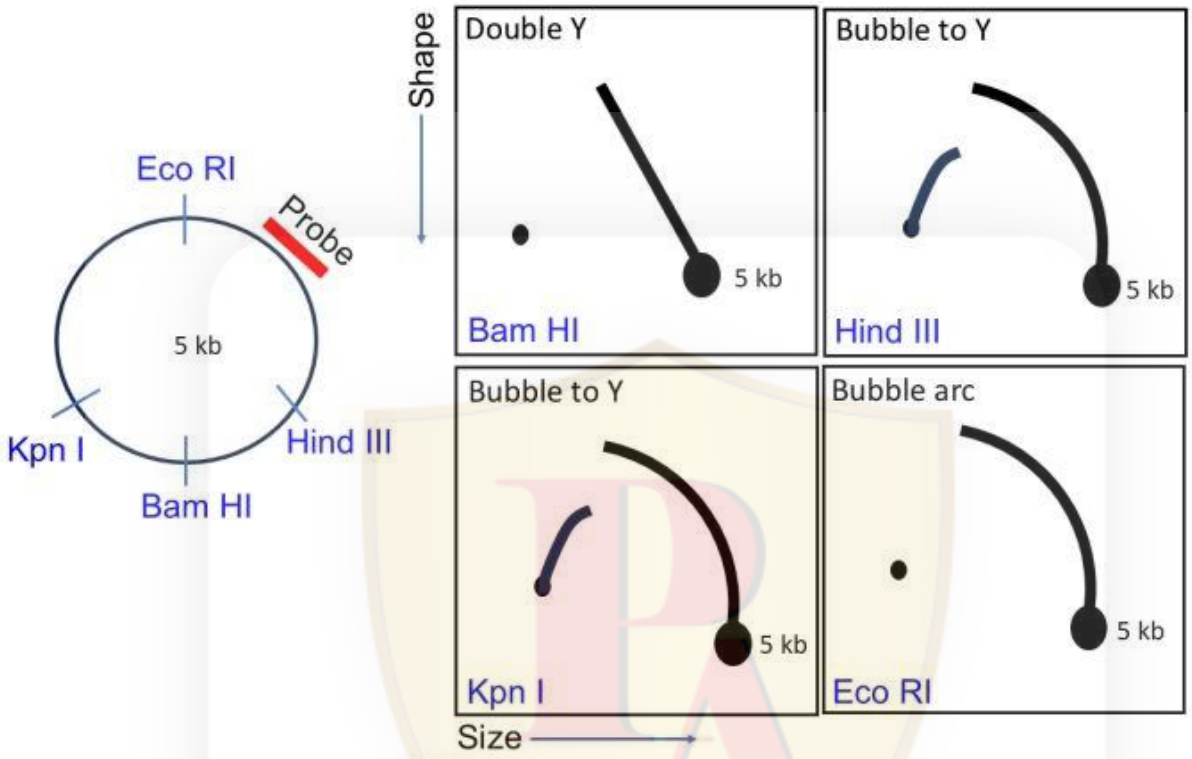
Column X	Column Y
A. Phylloclade	I. *Acacia*
B. Cladode	II. *Euphorbia*
C. Phyllode	III. *Pistia*
D. Inflated petiole	IV. *Opuntia*

Select the option that correctly matches column X with column Y.

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

Question No. 24 / Question ID 703584 Marks: 4.00

In order to determine the origin of replication of a circular DNA, isolated DNA from the actively replicating cells were digested with different restriction enzymes (as indicated), followed by electrophoresis in a two-dimensional gel. Southern hybridization was performed with a DNA probe as indicated.



Based on the results of the Southern blots, indicate which of the following options best describes the location of the origin of replication?

1. Near the EcoRI site
2. Near the BamHI site
3. Near the HindIII site
4. Near the KpnI site

Question No. 25 / Question ID 703628 Marks: 4.00

Which one of the following scenarios is likely to produce the highest beta diversity for tree species in a forested landscape?

1. High gamma diversity, strong dispersal limitation, high habitat heterogeneity
2. High gamma diversity, weak dispersal limitation, uniform habitat
3. High alpha diversity, low gamma diversity, strong dispersal limitation
4. High alpha diversity, low gamma diversity, weak dispersal limitation

Question No. 26 / Question ID 703592 Marks: 4.00

The following statements are made regarding the role of tumour microenvironment directly contributing to the metastatic process:

A. Hypoxia in primary tumours can induce the expression of VEGF and matrix metalloproteinases (MMPs) to promote metastasis.
B. Tumour-associated macrophages (TAMs) always inhibit metastasis through immune surveillance.
C. Cancer-associated fibroblasts (CAFs) provide structural support and secrete factors that promote metastasis.
D. The acidic pH of the tumour microenvironment impedes cancer cell migration.

Which one of the following options represents all correct statements?

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

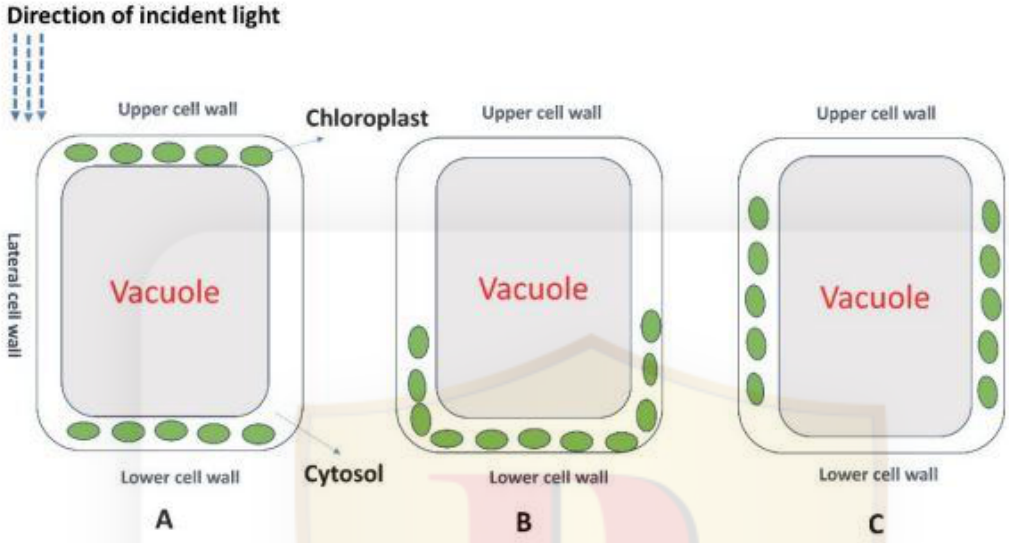
Question No. 27 / Question ID 703616 Marks: 4.00

A mutation in a plant gene is female gametophyte lethal. This mutant allele can be normally transmitted through pollen. However, when transmitted through egg, the embryos abort, resulting in inviable seeds irrespective of the male allele. A student harvested the seeds from a heterozygous mutant plant and grew a total of 100 plants. What is the expected number of homozygous plants in this population?

1. 25
2. 50
3. 66
4. 75

Question No. 28 / Question ID 703604 Marks: 4.00

Leaves can alter the intracellular distribution of their chloroplasts in response to changing light conditions. Shown below are schematic diagram of chloroplast distribution patterns in palisade cells of *Arabidopsis,* in response to different light intensities, grown in a growth chamber having light source from the top.



Which one of the following combinations correctly matches the chloroplast distribution with its corresponding light intensity?

1. A= High light; B=Darkness; C = Low light
2. A= Darkness; B= High light; C = Low light
3. A= Low light; B= Darkness; C = High light
4. A= High light; B= Low light; C = Darkness

Question No. 29 / Question ID 703619 Marks: 4.00

The table below lists the food reserves (Column X) found in different algal groups (Column Y).

Column X		Column Y	
A.	Paramylon	I.	Bacillariophyceae
B.	Starch	II.	Phaeophyceae
C.	Laminarin	III.	Charophyceae
D.	Chrysolaminarin	IV.	Euglenophyceae

Select the option that correctly matches column X with column Y.

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

Question No. 30 / Question ID 703631 Marks: 4.00

In a paper wasp, a worker helps to raise 4 full-sisters instead of producing 4 offspring of her own. According to Hamilton's rule, will selection favour this altruistic behaviour in terms of genetic units?

1. Yes, because 3.0 genetic units are gained and 2.0 genetic units are lost.
2. Yes, because 2.0 genetic units are gained and 1.0 genetic unit is lost.
3. No, because 2.0 genetic units are gained and 3.0 genetic units are lost.
4. No, because 2.0 genetic units are gained and 4.0 genetic units are lost.

Question No. 31 / Question ID 703590 Marks: 4.00

Wnt/β-catenin signaling plays essential roles during development. The following statements are made about the Wnt/β-catenin signaling pathway:

A. In the absence of Wnt ligands, β-catenin is phosphorylated by the APC/Axin/GSK-3β complex, leading to its degradation.
B. The β-catenin/TCF complex acts as a repressor of gene expression upon activation of Wnt signaling.
C. The Wnt/β-catenin pathway is initiated by binding of Wnt ligands to receptor tyrosine kinases (RTKs).
D. β-catenin is involved in both cell-to-cell adhesion and transcriptional regulation.

Which one of the following options represents all correct statements?

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

Question No. 32 / Question ID 703629 Marks: 4.00

In the classical metapopulation model articulated by Richard Levins (1969, 1970), the metapopulation is considered to be a collection of subpopulations occupying different patches. In this model, we consider the following conditions:

A. Individual subpopulations have realistic chances of both extinction and recolonization.
B. The dynamics of the various subpopulations should be largely independent.
C. Recolonization of a patch after extinction is mainly through dispersal from the mainland patch.
D. Population dynamics in the patches of a metapopulation should be highly synchronous.

Which one of the options given below includes conditions that should be met for a population to be considered a metapopulation?

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

Question No. 33 / Question ID 703608 Marks: 4.00

Given below are some statements about thyroid hormone biosynthesis in thyroid gland.

A. An antiporter transports two Na^+ ions and one I^- ion across the thyroid follicular cells.

B. Pendrin, a Cl^-/I^- symporter helps I^- entry into the colloid.

C. Pendrin, a Cl^-/I^- exchanger helps I^- entry into the colloid.

D. Iodination of tyrosine residue takes place first on the 3rd position in the thyroglobulin protein.

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

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

Question No. 34 / Question ID 703571 Marks: 4.00

In a typical experiment, 15 mL of an aqueous solution containing an unknown quantity of acetylcholine had a pH of 7.65. When the solution is incubated with acetylcholinesterase, the pH of the solution decreased to 6.87. Assuming that there was no buffer in the reaction mixture, determine the number of moles of acetylcholine in the 15 mL solution.

1. 1.65×10^{-9} mol to 1.75×10^{-9} mol
2. 2.65×10^{-9} mol to 2.75×10^{-9} mol
3. 0.65×10^{-9} mol to 0.75×10^{-9} mol
4. 3.30×10^{-9} mol to 3.40×10^{-9} mol

Question No. 35 / Question ID 703625 Marks: 4.00

The following table presents soil formation processes (Column X) and climatic conditions in which they occur (Column Y).

Column X	Column Y
A. Gleization	I. Low rainfall arid climates
B. Laterization	II. High rainfall or low-lying areas associated with poor drainage
C. Podzolization	III. Humid environments in the tropical and subtropical regions
	IV. Cool, moist climates of the mid-latitude regions

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

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

Question No. 36 / Question ID 703603 Marks: 4.00

Following statements are made with respect to polar auxin transport in plants.

A. It proceeds via symplast.
B. Its velocity is faster than the phloem translocation rates.
C. It is specific for active auxins, both natural and synthetic.
D. It is mediated by protein carriers on the plasma membrane.

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

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

Question No. 37 / Question ID 703617 Marks: 4.00

In sesame, the seed coat color is of two types: white or brown. True breeding white- and brown-seeded plants were reciprocally crossed and the results are given below.

Which one of the following types of inheritance explains the depicted transmission of seed color in sesame?

1. Plastid/mitochondrial gene-mediated maternal/cytoplasmic inheritance
2. Nuclear gene-mediated maternal effect
3. Polar overdominance
4. Incomplete maternal inheritance

Question No. 38 / Question ID 703611 Marks: 4.00

The descending phase of the nerve action potential is caused by:

A. delayed opening of voltage-gated K^+ ion channels.
B. rapid opening of voltage-gated Na^+ ion channels.
C. closing of voltage-gated Na^+ ion channels.
D. leaky K^+ ion channels.

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

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

Question No. 39 / Question ID 703587 Marks: 4.00

Adding mRNA that encodes a eukaryotic secretory protein to a cell-free translation system initiates protein translation. Signal recognition particle in low concentration and endoplasmic reticulum (ER) treated with 1% Triton X-100 were sequentially added to the cell free translation system.

Which of the following outcomes is the most likely?

1. Protein synthesis will begin but terminate prematurely, leading to shorter products.
2. The protein will be fully synthesized and incorporated into ER.
3. The protein will be fully synthesized, and its signal sequence will be removed without being incorporated into the ER
4. The protein will be fully synthesized but not incorporated into ER.

Question No. 40 / Question ID 703582 Marks: 4.00

Given below are a few statements about vesicular transport.

A. Clathrin-mediated endocytosis requires the recruitment of adaptors to the cytosolic face of the plasma membrane.
B. The low-pH environment of early endosomes leads to the dissociation of cargo from its receptor, allowing for the recycling of receptors to the plasma membrane.
C. The late endosomes, which mature into the lysosomes, are directly involved in the recycling of synaptic vesicle proteins in neurons.
D. The multivesicular body pathway involves the formation of intraluminal vesicles, which sort cargo for degradation in the lysosomes.

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

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

Question No. 41 / Question ID 703614 Marks: 4.00

Normal yeast cells grow at 42°C. Five yeast haploid strains, with independent alleles of *YFG1* having impaired cell growth at 42°C, were isolated and labeled as *yfg1ts1* to *yfg1ts5*. A haploid (*yfg1ts1*) carrying a spontaneously generated mutation (*sup1*) at an independent locus was isolated, which can grow at 42°C. Using pairwise crossing, *sup1* was introduced into strains carrying *yfg1ts2* to *yfg1ts5* alleles. All these haploids grew at 42°C.

Based on this data, the following statements were made to describe the *Sup1-Yfg1* molecular/genetic interaction.

A. *Sup1* codes for a protein which, when over-expressed, stabilized mutant *yfg1ts* proteins.
B. *Sup1* codes for a protein that physically interacts with *Yfg1* protein.
C. *Sup1* protein upregulates an alternate pathway.
D. *Sup1* is a nonsense suppressor that restores protein translation in cells carrying *yfg1ts* allele.

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

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

Question No. 42 / Question ID 703638 Marks: 4.00

A student performed an ELISA to detect anti-ovalbumin IgG in a serum sample. The experiment involved the following sequential steps: coating plates with ovalbumin, blocking with BSA, adding serum sample, adding anti-mouse-IgG-HRP, adding H_2O_2 + *o*-Phenylenediamine dihydrochloride (OPD), and adding H_2SO_4. The student made the following statements:

A. If the plates are not blocked with BSA, the specificity of the assay decreases.
B. If the plates are not washed between addition of serum sample and addition of anti-mouse IgG-HRP, the sensitivity of the assay decreases.
C. If the plates are not washed between addition of anti-mouse IgG-HRP and addition of H_2O_2 + OPD, the specificity of the assay decreases.
D. OPD is the substrate for the enzyme.
E. Without H_2SO_4, no colour is developed.

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

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

Question No. 43 / Question ID 703598 Marks: 4.00

The table below shows the outcomes of surgical experiments in chick embryos.

	Surgical experiments	Outcomes
A.	Early wing bud progress zone is transplanted to a late wing bud after the formation of zeugopod	An extra set of ulna and radius is formed
B.	An extra ZPA is transplanted to anterior limb bud mesoderm after the formation of stylopod	Pattern duplication of ulna, radius and digits occurs
C.	Late wing bud progress zone, after the formation of zeugopod, is transplanted to an early wing bud that has just formed stylopod	Formation of autopod will be affected
D.	Early leg mesenchyma is transplanted just beneath the wing AER after the formation of stylopod	Distal leg structures develop at the end of the wing

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

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

Question No. 44 / Question ID 703618 Marks: 4.00

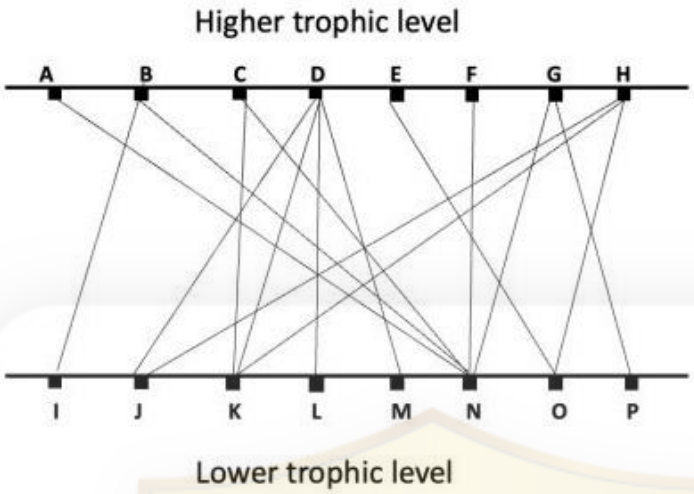
Based on homology, a protein, CG2024, functions as a homotetramer. The function of each unit within the tetramer is essential for its catalytic activity. CG2024 protein has three domains. Domain 'a' is essential for tetramerization, domain 'b' is essential for catalytic activity and domain 'c' does not contribute to CG2024 function at all. Three mutations, a*, b* and c* in the 'a', 'b' and 'c' domains of CG2024, respectively, have been identified. The a* and b* disrupt the function of their respective domains.

Based on this information, which one of the following options correctly describes the nature of mutations a*, b* and c* (in the same order)?

1. Dominant, recessive, amorphic
2. Dominant, dominant, amorphic
3. Recessive, dominant, recessive
4. Recessive, recessive, dominant.

Question No. 45 / Question ID 703630 Marks: 4.00

The figure below represents a bipartite network of species interactions between two trophic levels. Each link represents an interaction between a species in the higher trophic level (A to H) and a species in the lower trophic level (I to P).



Given below are a few statements describing potential conclusions that can be drawn from the network:

A. If the network represents predator species (A-H) and prey species (I-P), then D is an apex predator.
B. If the network represents plant species (I-P) and pollinator species (A-H), then species I is more likely to experience local extinction than K.
C. The network is more stable if D is removed and the population size of O increases.
D. If the network represents frugivore species (A-H) and plant species (I-P), then M is a keystone species.

Which one of the options given below represents all correct statement/s that can be inferred from the network above?

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

Question No. 46 / Question ID 703601 Marks: 4.00

Phosphoenolpyruvate carboxylase (PEPCase) is an important enzyme involved in both C4 and CAM photosynthesis. Given below are a few statements regarding PEPCase in C4 and CAM plants.

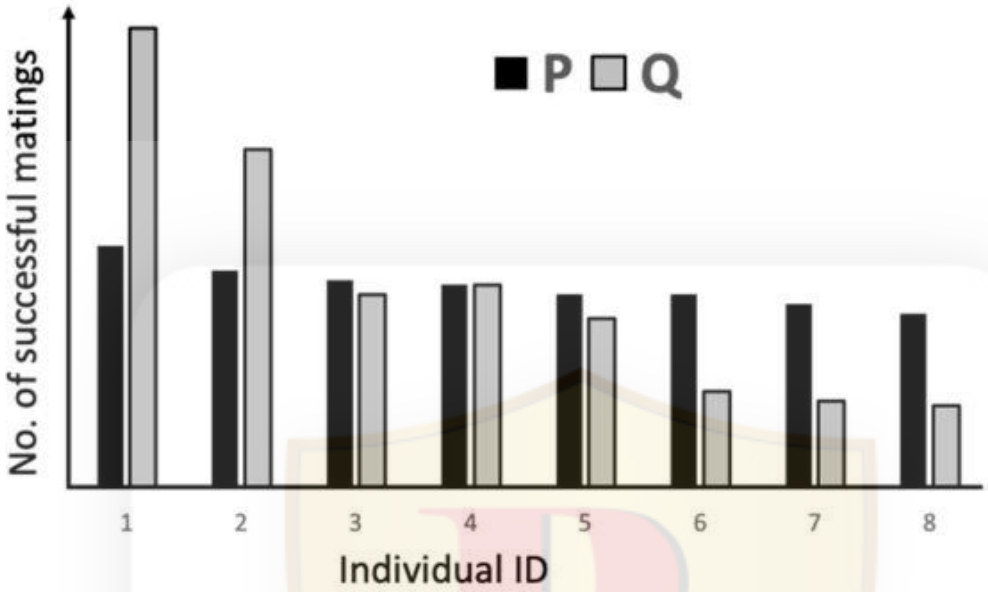
A. Light activates PEPCase kinase in C4 plants.
B. Phosphorylation inactivates PEPCase in C4 plants while it activates the enzyme in CAM plants.
C. PEPCase kinase gets activated by light in CAM plants.
D. Phosphorylated PEPCase is less sensitive to malate.

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

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

Question No. 47 / Question ID 703633 Marks: 4.00

A researcher studying the mating systems in birds (operational sex ratio 1:1) uses the number of successful matings as a measure of male reproductive fitness and female reproductive fitness, as depicted in the figure below.



Which one of the following options correctly matches P and Q with the correct sex for different mating systems?

1. Polygyny: P, male, Q, female; Polyandry: Q, male, P, female
2. Polygyny: Q, male, P, female; Polyandry: P, male, Q, female
3. Polygyny: P, male, Q, female; Polyandry: P, male, P, female
4. Polygyny: Q, male, P, female; Polyandry: Q, male, Q, female

Question No. 48 / Question ID 703637 Marks: 4.00

Given below are a few statements.

A. Codominant molecular markers _____(i)_____ be used for identification of heterozygotes.
B. Genome wide association studies (GWAS) _____(ii)_____ be performed on germplasm with high genetic diversity.
C. An F2 mapping population _____(iii)_____ be used as an immortal population for genetic mapping studies in plants.
D. Bulk segregant analysis (BSA) _____(iv)_____ be used for mapping of monogenic qualitative traits.

Which one of the following options represents the correct sequence of terms to fill in the blanks in the above statements so that all the statements are true?

1.	(i) cannot	(ii) can	(iii) can	(iv) can
2.	(i) can	(ii) cannot	(iii) cannot	(iv) cannot
3.	(i) can	(ii) can	(iii) can	(iv) cannot
4.	(i) can	(ii) can	(iii) cannot	(iv) can

Question No. 49 / Question ID 703589 Marks: 4.00

The following statements are made about the involvement of the type III protein secretion system (T3SS) during bacterial pathogenesis in plants and animals.

A. It involves a protein complex that spans both the inner and outer bacterial membranes.
B. T3SS mostly secretes Avr effector proteins directly into plant apoplast.
C. The genes encoding conserved components of the T3SS of plant and animal pathogenic bacteria are referred to as *Hrp* (hypersensitive response and pathogenicity cluster).
D. Once Avr effectors are delivered inside the plant cell, Hrp proteins are not needed for the activation of the defence response.

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

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

Question No. 50 / Question ID 703605 Marks: 4.00

The interconversion of fructose 6-phosphate to fructose 1,6-bisphosphate is a critical step in central metabolism in plants. Followings are certain statements regarding this interconversion.

A. Phosphofructokinase catalyzes the C6 phosphorylation of fructose 6-phosphate.
B. Plastid phosphofructokinase is activated by P_i while cytosolic phosphofructokinase is activated by phosphenolpyruvate.
C. Cytosolic fructose1,6-bisphosphatase is strongly inhibited by fructose 2,6-bisphosphate.
D. Pyrophosphate-dependent phosphofructokinase catalyzes a reversible reaction of interconversion of fructose 6-phosphate to fructose 1,6-bisphosphate.

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

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

Question No. 51 / Question ID 703594 Marks: 4.00

The following statements were made about the alternative pathway of Complement activation in the immune system:

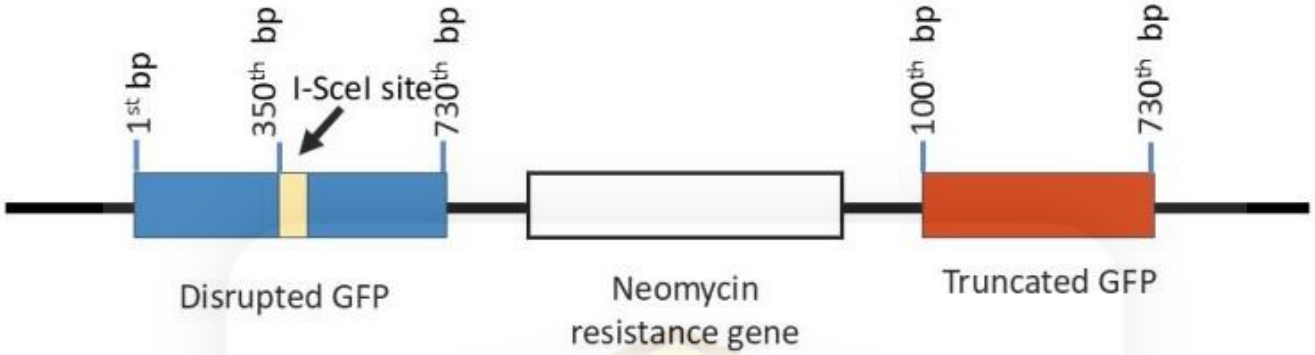
A. The pathway is initiated when antibodies bind to pathogen.
B. The pathway is initiated by spontaneous hydrolysis of serum Complement.
C. The pathway uses the same C3- and C5-convertases as the lectin pathway.
D. The pathway can be initiated by properdin and thrombin.

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

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

Question No. 52 / Question ID 703583 Marks: 4.00

To study different DNA double-strand break (DSB) repair pathways, a construct is developed that contains a neomycin selectable marker gene flanked by two inactive GFP genes: the first one is inactivated by the insertion of an I-SceI recognition sequence, and the other one has a 99 bp deletion at the 5′ end of the gene. The induction of the I-SceI endonuclease will create a DSB in the first GFP sequence.



The following expected outcomes have been proposed:

A. If the DSB is repaired by the gene conversion (GC) pathway, cells will be GFP-positive and neomycin-resistant.
B. If the DSB is repaired by the GC pathway, cells will be GFP-positive but neomycin-sensitive.
C. If the DSB is repaired by the single-strand annealing (SSA) pathway, cells will be GFP-positive and neomycin resistant.
D. If the DSB is repaired by the non-homologous end joining (NHEJ) pathway, cells will be GFP-negative and neomycin resistant.

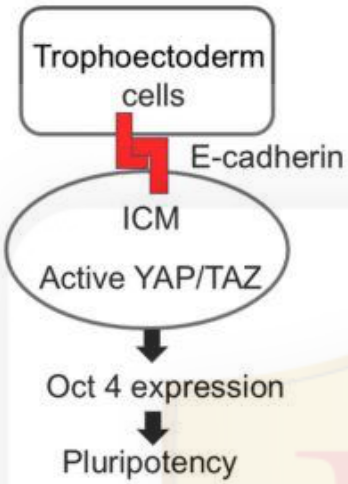
Which one of the following options represents the combination of all correct statements?

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

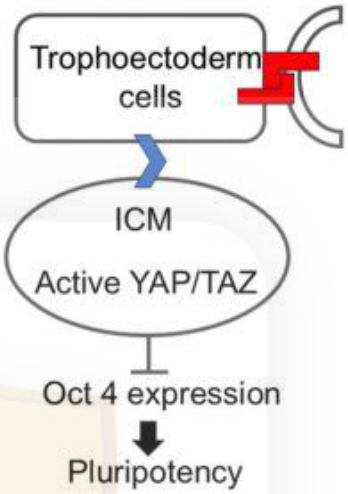
Question No. 53 / Question ID 703599 Marks: 4.00

Presence of E-cadherin activates the Hippo pathway in the inner cell mass (ICM). Experimentally eliminating E-cadherin disrupts both apicobasal polarity and specification of the ICM and trophoectoderm lineages. Which one of the following schemes leads to pluripotency?

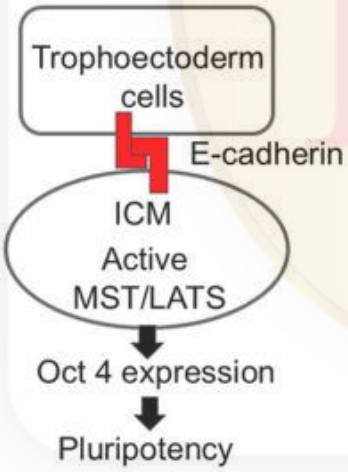
1.



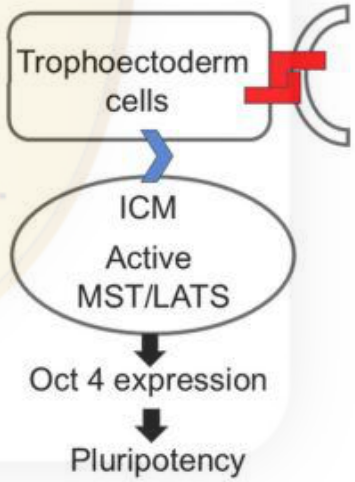
2.



3.



4.



Question No. 54 / Question ID 703620 Marks: 4.00

Some of the following statements describe nomenclature rules in the International Code of Zoological Nomenclature (ICZN).

A. If the generic name is of masculine gender, the species name should be of feminine gender.
B. A name is to be rejected if it is a tautonym or inappropriately describes a taxon's character.
C. The name of an animal taxon cannot be rejected because it is identical with the name of another taxon which is not an animal.
D. Even if the taxon concerned is no longer classified as an animal, its name remains available.

Select the option that includes all statements representing currently accepted nomenclature rules of the ICZN.

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

Question No. 55 / Question ID 703621 Marks: 4.00

The following table shows a list of migratory birds coming to India (Column X) and the region from where they migrate (Column Y).

Column X		Column Y	
A.	Black-tailed Godwit	I.	Arctic Tundra
B.	Comb Duck	II.	Iceland or Russia
C.	Ruff	III.	Madagascar and South Asia
D.	Spotted Redshank	IV.	Scandinavia

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

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

Question No. 56 / Question ID 703610 Marks: 4.00

Angiotensin converting enzyme (ACE) converts angiotensin I into angiotensin II. ACE inhibitors should not be given to a person with severe loss of blood because:

A. these will increase renal tubular K^+ excretion.
B. these will relax smooth muscles in the arteries.
C. these will reduce aldosterone secretion and thereby prevent water retention.
D. these will decrease renal tubular NaCl and water excretion.

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

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

Question No. 57 / Question ID 703612 Marks: 4.00

The mechanisms of action of calcitropic hormones are important for understanding the molecular basis of disease states related to calcium homeostasis.

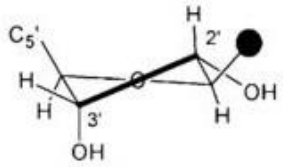
A. Calcium binding (transport) protein (CaBP) enhances the movement of calcium from the brush border into the cytoplasm.
B. Receptors for calcitonin are present in the osteoclasts where they increase cAMP production.
C. Parathormone essentially works independently to mobilize bone mineral, and never in concert with vitamin D.
D. The major calcitropic hormone, calcitriol, regulates intestinal calcium absorption.

Which one of the following options is INCORRECT in maintaining calcium homeostasis?

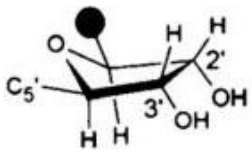
1. A and B
2. Only B
3. Only C
4. C and D

Question No. 58 / Question ID 703572 Marks: 4.00

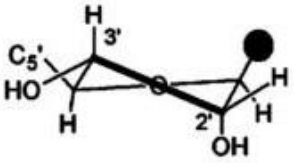
Match the following ribose sugar pucker in nucleic acids (labeled A, B, C, D) with their corresponding conformational states. The black circle denotes the base of the nucleotide.



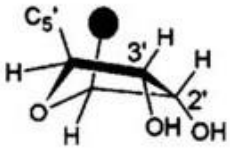
A



B



C



D

1. A – C2′-exo; B – O4′-exo; C – C3′-endo; D – O4′-endo
2. A – C2′-endo; B – O4′-endo; C – C3′-endo; D – O4′-exo
3. A – C2′-endo; B – O4′-exo; C – C3′-exo; D – O4′-exo
4. A – C2′-exo; B – O4′-endo; C – C3′-exo; D – O4′-endo

Question No. 59 / Question ID 703578 Marks: 4.00

The lipid composition of the two monolayers of the plasma membrane is quite different. This lipid asymmetry is functionally relevant, especially in converting extracellular signals into intracellular ones. Given below are a few membrane lipids:

A. Phosphatidylserine
B. Phosphatidylinositol 4-phosphate
C. Phosphatidylcholine
D. Sphingomyelin

Choose the option that correctly defines all the lipids involved in signaling and are restricted to the cytosolic face of the plasma membrane.

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

Question No. 60 / Question ID 703639 Marks: 4.00

Given below is a list of microbes or their components (Column X) and specific stains (Column Y) used for their identification.

Column X		Column Y	
A.	*Bacillus subtilis*	i.	Albert stain
B.	*Mycobacterium leprae*	ii.	Malachite green
C.	Pseudomonas flagella	iii.	Lactophenol cotton blue
D.	Volutin granules of *C. diphtheriae*	iv.	Gram stain
E.	Cultured fungi	v.	Silver stain
F.	Klebsiella capsule	vi.	Ziehl Neelsen stain
G.	Clostridium endospore	vii.	India ink

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

1. A-iv, C-iii, E-v
2. B-vi, F-ii, A-i
3. A-i, B-vi, F-vii
4. E-iii, C-v, D-i

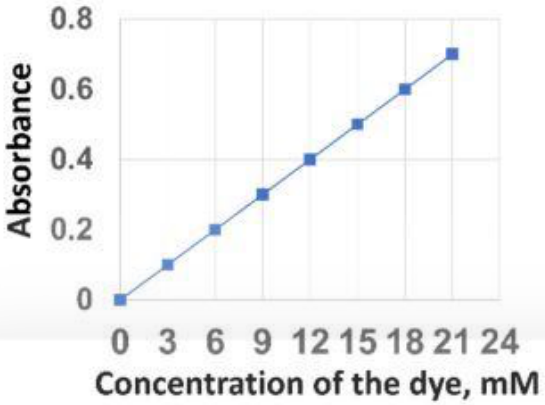
Question No. 61 / Question ID 703635 Marks: 4.00

With reference to the origin of multicellularity in different life forms, which one of the following statements is INCORRECT?

1. The 'snowflake yeast' experiment demonstrated the evolution of multicellularity through cell adhesion and programmed cell death.
2. The syncytial theory states that multicellular organisms arose through the aggregation of free-living unicellular forms.
3. Cadherin-based adhesion pathways played an important role in the evolution of multicellularity in plants.
4. Co-option of existing functions is hypothesized to have driven the evolutionary transition from undifferentiated multicellular clusters to differentiated tissues.

Question No. 62 / Question ID 703642 Marks: 4.00

The absorbance values of a dye measured at 600 nm were plotted against its corresponding concentrations, as given below.

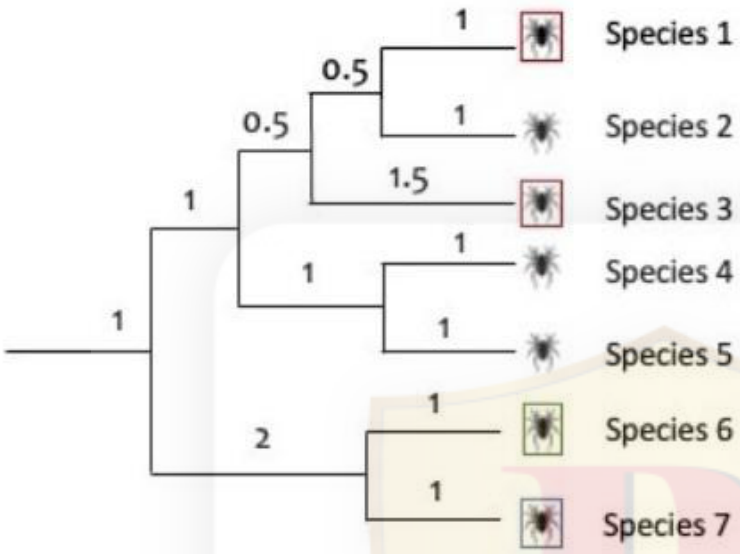


Which of the following will be the best estimate of the extinction coefficient of the compound in $M^{-1}cm^{-1}$ units? The path length of the cuvette used for the measurement is 1 cm.

1. 0.1
2. 0.033
3. 33.3
4. 100

Question No. 63 / Question ID 703632 Marks: 4.00

The phylogeny given below depicts the evolutionary relationships and branch lengths of species found in three spider communities, X, Y, and Z, along with a table showing their absence (0) and presence (1) in these communities.



Species	X	Y	Z
1	1	1	1
2	0	1	1
3	0	1	0
4	0	0	0
5	0	0	0
6	1	0	0
7	1	0	1

Which one of the following options gives the correct values of phylogenetic diversity for these communities?

1. X=7.0 Y=4.5 Z=8.0
2. X=8.0 Y=6.0 Z=7.0
3. X=7.0 Y=4.0 Z=7.0
4. X=7.0 Y=3.5 Z=6.0

Question No. 64 / Question ID 703636 Marks: 4.00

Evolution by natural selection may produce organisms that are adapted to their environment. Given below are four statements regarding adaptation by natural selection.

A. Adaptation implies that organisms are perfectly matched to their current environment.

B. Adaptive traits have been shaped by natural selection to past environments.

C. Natural selection is the only process by which adaptive traits evolve.

D. Adaptation to current environments may be constrained by adaptation to past environments.

Which one of the following options gives the correct combination of True/False statements?

1. A: True, B: False, C: True, D: False
2. A: True, B: True, C: True, D: False
3. A: False, B: True, C: False, D: True
4. A: False, B: False, C: False, D: True

Question No. 65 / Question ID 703645 Marks: 4.00

Given below are recognition sites of some restriction enzymes with the sites of restriction marked with a '^' symbol.

EcoRV	: GAT^ATC	AvaI	: C^YCGRG
HindIII	: A^AGCTT	SalI	: G^TCGAC
SmaI	: CCC^GGG	XbaI	: T^CTAGA

Which one of the following options represents all enzyme-treated vector (V) and insert (I) fragment combinations that would generate compatible ends for ligation without any other intermediate enzymatic treatment?

1. HindIII (V) – SalI (I); SmaI (V) – EcoRV (I)
2. SmaI (V) – XbaI (I); EcoRV (V) – HindIII (I)
3. HindIII (V) – SalI (I); XbaI (V) – AvaI (I)
4. EcoRV (V) – SmaI (I); AvaI (V) – SalI (I)

Question No. 66 / Question ID 703591 Marks: 4.00

T cell precursors that exit the bone marrow undergo positive and negative selection in the thymus before emerging as mature T cells. These processes are controlled by cellular interactions of the thymocyte with stromal cells in the thymus. The following statements are made regarding the selection process:

A. The selection process involves negative selection of auto-reactive cells in the cortex followed by their migration to the medulla.
B. The selection process relies on the transcription factor 'Aire'.
C. The selection process can lead to the generation of CD4 cells that can interact with dendritic cells (DCs) as well as B cells.
D. The selection process can lead to the generation of regulatory CD4 T cells.

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

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

Question No. 67 / Question ID 703586 Marks: 4.00

Match the following bacterial gene expression mechanisms:

Column X		Column Y	
A.	Translated protein acts as a repressor (translational feedback)	i.	Stringent response
B.	Production of ppGpp in response to amino acid starvation, which in turn regulates transcription by binding to β subunit of RNA polymerase	ii.	Ribosomal protein operon regulation
C.	Regulation of bacterial mRNA translation in *cis*	iii.	sRNA (small RNA) and chaperone require pairing with mRNA
D.	Regulation of bacterial mRNA translation in *trans*	iv.	Riboswitches that bind a ligand

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

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

Question No. 68 / Question ID 703623 Marks: 4.00

Match the insects (Column X) to the insect orders (Column Y)

	Column X		Column Y
A	Thrips	i	Blattodea
B	Lacewings	ii	Dermaptera
C	Termites	iii	Phasmatodea
D	Earwigs	iv	Thysanoptera
E	Stick insects	v	Neuroptera

Select the option that correctly matches column X with column Y.

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

Question No. 69 / Question ID 703634 Marks: 4.00

Consider a predator that can forage on two prey types, where $Prey_1$ is the more profitable prey and $Prey_2$ is the less profitable prey. While searching for $Prey_1$, if it encounters $Prey_2$, the decision to capture $Prey_2$ or ignore it and continue to search for $Prey_1$ is given by the predictions of the Optimal Foraging Theory (OFT). The table below gives various parameters that may be used as per OFT by the predator in making this foraging decision.

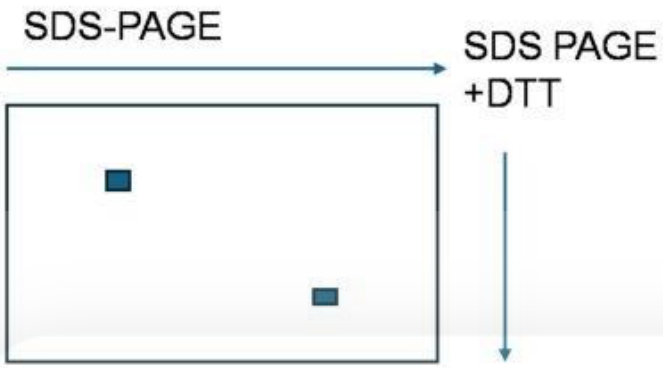
Prey type	Energy gained	Handling time	Search time
$Prey_1$	E_1	h_1	S_1
$Prey_2$	E_2	h_2	S_2

Which one of the following statements predicts correctly when the predator should eat $Prey_2$, given the conditions above?

1. Only when $S_1 < [(E_1h_2) / E_2] - h_1$
2. Only when $S_1 > [(E_1h_2) / E_2] - h_1$
3. Whenever $S_2 < [(E_1h_2) / E_2] - h_1$
4. Whenever $S_2 > [(E_1h_2) / E_2] - h_1$

Question No. 70 / Question ID 703644 Marks: 4.00

A purified 150 kDa species obtained from a gel filtration column was run on a 2-dimensional SDS-PAGE as shown below:



What is the likely form of the 150 kDa species from this observation?

1. There are at least two proteins that are linked through non-covalent interactions.
2. There are at least two proteins in the complex that are linked through covalent bonds.
3. There are two proteins in the mixture without forming a complex.
4. There is only one protein and it has a disulfide bond.

- (●) 1 (Chosen Option)
- ( ) 2
- ( ) 3
- ( ) 4

Question No. 71 / Question ID 703607 Marks: 4.00

Given below are a few ion transport proteins present on the membrane of pancreatic duct cells.

A. Cystic fibrosis transmembrane conductance regulator (CFTR)
B. Sodium-bicarbonate cotransporter (NBC)
C. K^+ channel
D. Cl^-/HCO_3^- exchanger

Which one of the following options represents the correct combinations of proteins located on the basolateral membrane of pancreatic duct cells?

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

Question No. 72 / Question ID 703588 Marks: 4.00

Below is a table with the list of post-translational modifications on proteins and amino acid residues that are correspondingly modified.

	Post-translational modification	Amino acid residue(s)
A.	Phosphorylation	Histidine
B.	Ubiquitination	Lysine, N-terminal Methionine
C.	O-linked glycosylation	Asparagine
D.	Hydroxylation	Proline, Cysteine

Which post-translational modifications are correctly matched with the amino acid residues they typically modify?

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

Question No. 73 / Question ID 703585 Marks: 4.00

In a study, researchers replaced the natural promoter of a gene with a synthetic promoter that contains a point mutation in the TATA box that prevents binding of the TATA-binding protein (TBP). The following outcomes would most likely result from this modification.

A. An mRNA will be generated with an alternate reading frame.

B. The mRNA will be transcribed by RNA polymerase I instead of RNA polymerase II.

C. Transcription may occur with a reduced efficiency.

D. Transcription may occur but will always result in the formation of a non-functional mRNA.

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

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

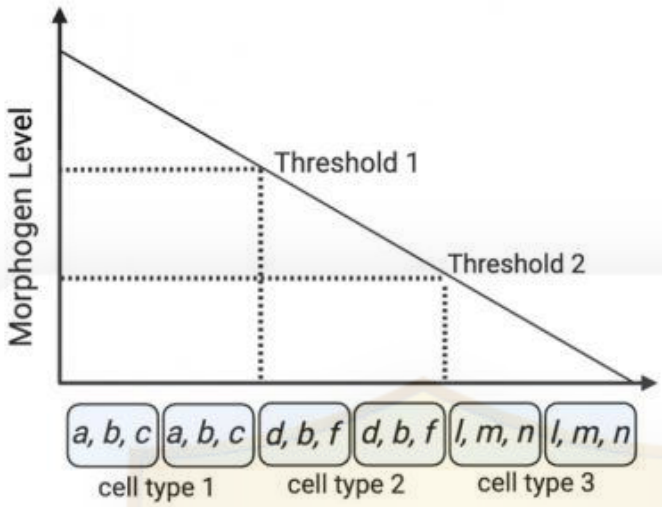
Question No. 74 / Question ID 703626 Marks: 4.00

An ecologist calculates the Shannon-Wiener diversity index for an ecosystem with high species diversity. Which one of the following statements about this diversity index is INCORRECT?

1. It increases as species richness increases.
2. It is maximized when all species have equal abundances.
3. It is unaffected by the evenness of species abundances.
4. A low index value indicates dominance of one or a few species.

Question No. 75 / Question ID 703596 Marks: 4.00

The figure below shows the genes (***a***, ***b***, ***c***, ***d***, ***f***, ***l***, ***m***, ***n***) that are expressed in cell types 1, 2, and 3 because of the concentration of morphogen signaling received by these cells.



Which one of the following statements is correct about the pattern of gene expression induced by the morphogen?

The transcription factor activated by the morphogen has:

1. higher affinity for regulatory region of ***a*** than that of ***d***.
2. higher affinity for regulatory region of ***f*** than that of ***c***.
3. same affinity for regulatory regions of ***a*** and ***b***.
4. lower affinity for regulatory region of ***m*** than that of ***c***.

Save & Print

Pathfinder Publication

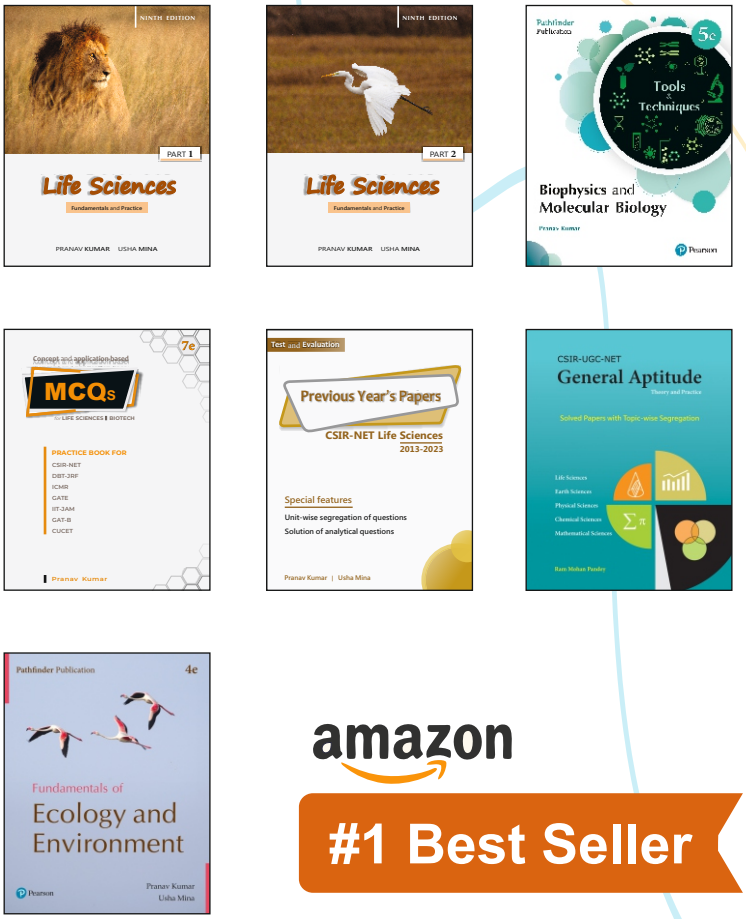
Pathfinder's

CSIR NET
Life Sciences

Complete Study Material

by **Pranav Kumar**

9818063394



amazon

#1 Best Seller

Click here to buy now

https://pathfinderacademy.in/book/csir-net-life-sciences-combo-with-ecology-11.html

Connect with Us

TELEGRAM DISCUSSION GROUP
https://t.me/CSIR_NET_Life_Sciences_GATE_BT

https://www.youtube.com/@Pathfinder-Academy

https://www.instagram.com/pathfinderacademy/

https://www.whatsapp.com/channel/0029Va4c95aAjPXMDfkBoH2N