

Test Paper : III
Test Subject : LIFE SCIENCES
Test Subject Code : K-2817

Test Booklet Serial No. : _____
OMR Sheet No. : _____
Roll No. _____
(Figures as per admission card)

Name & Signature of Invigilator/s

Signature : _____
Name : _____

Paper : III
Subject : LIFE SCIENCES

Time : 2 Hours 30 Minutes

Maximum Marks : 150

Number of Pages in this Booklet : 16

Number of Questions in this Booklet : 75

ಅಭ್ಯರ್ಥಿಗಳಿಗೆ ಸೂಚನೆಗಳು

- ಈ ಪುಟದ ಮೇಲ್ಭಾಗದಲ್ಲಿ ಒದಗಿಸಿದ ಸ್ಥಳದಲ್ಲಿ ನಿಮ್ಮ ರೋಲ್ ನಂಬರನ್ನು ಬರೆಯಿರಿ.
- ಈ ಪತ್ರಿಕೆಯು ಬಹು ಆಯ್ಕೆ ವಿಧದ ಎಪ್ಪತ್ತೈದು ಪ್ರಶ್ನೆಗಳನ್ನು ಒಳಗೊಂಡಿದೆ.
- ಪರೀಕ್ಷೆಯ ಪ್ರಾರಂಭದಲ್ಲಿ ಪ್ರಶ್ನೆಪುಸ್ತಕವನ್ನು ನಿಮಗೆ ನೀಡಲಾಗುವುದು. ಮೊದಲ 5 ನಿಮಿಷಗಳಲ್ಲಿ ನೀವು ಪುಸ್ತಕವನ್ನು ತೆರೆಯಲು ಮತ್ತು ಕೆಳಗಿನಂತೆ ಕಡ್ಡಾಯವಾಗಿ ಪರಿಶೀಲಿಸಲು ಕೋರಲಾಗಿದೆ.
(i) ಪ್ರಶ್ನೆ ಪುಸ್ತಕದ ಪ್ರವೇಶಾಪಕ ಪದಗಳು, ಈ ಹೊದಿಕೆ ಪುಟದ ಅಂಚಿನ ಮೇಲಿರುವ ಪೇಪರ್ ಸೀಲನ್ನು ಹರಿಯಿರಿ. ಸ್ವಿಚ್ ಸೀಲ್ ಇಲ್ಲದ ಅಥವಾ ತೆರೆದ ಪುಸ್ತಕವನ್ನು ಸ್ವೀಕರಿಸಬೇಡಿ.
(ii) ಪುಸ್ತಕದಲ್ಲಿನ ಪ್ರಶ್ನೆಗಳ ಸಂಖ್ಯೆ ಮತ್ತು ಪುಟಗಳ ಸಂಖ್ಯೆಯನ್ನು ಮುಖಪುಟದ ಮೇಲೆ ಮುದ್ರಿಸಿದ ಮಾಹಿತಿಯೊಂದಿಗೆ ತಾಳೆ ನೋಡಿರಿ. ಪುಟಗಳು/ಪ್ರಶ್ನೆಗಳು ಕಾಣೆಯಾದ, ಅಥವಾ ದ್ವಿಪ್ರತಿ ಅಥವಾ ಅನುಕ್ರಮವಾಗಿಲ್ಲದ ಅಥವಾ ಇತರ ಯಾವುದೇ ವ್ಯತ್ಯಾಸದ ದೋಷಪೂರಿತ ಪುಸ್ತಕವನ್ನು ಕೊಡಲೆ 5 ನಿಮಿಷದ ಅವಧಿ ಒಳಗೆ ಸಂವಿಧಾನದಿಂದ ಸರಿ ಇರುವ ಪುಸ್ತಕಕ್ಕೆ ಬದಲಾಯಿಸಿಕೊಳ್ಳಬೇಕು. ಆ ಬಳಿಕ ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯನ್ನು ಬದಲಾಯಿಸಲಾಗುವುದಿಲ್ಲ, ಯಾವುದೇ ಹೆಚ್ಚು ಸಮಯವನ್ನೂ ಕೊಡಲಾಗುವುದಿಲ್ಲ.
- ಪ್ರತಿಯೊಂದು ಪ್ರಶ್ನೆಗೂ (A), (B), (C) ಮತ್ತು (D) ಎಂದು ಗುರುತಿಸಿದ ನಾಲ್ಕು ಪರ್ಯಾಯ ಉತ್ತರಗಳಿವೆ. ನೀವು ಪ್ರಶ್ನೆಯ ಎದುರು ಸರಿಯಾದ ಉತ್ತರದ ಮೇಲೆ, ಕೆಳಗೆ ಕಾಣಿಸಿದಂತೆ ಅಂಡಾಕೃತಿಯನ್ನು ಕಪ್ಪಾಗಿಸಬೇಕು.
ಉದಾಹರಣೆ : (A) (B) (C) (D)
(C) ಸರಿಯಾದ ಉತ್ತರವಾಗಿದ್ದಾಗ.
- ಪ್ರಶ್ನೆಗಳಿಗೆ ಉತ್ತರಗಳನ್ನು ಪತ್ರಿಕೆ III ಪುಸ್ತಕಿಯೊಳಗೆ ಕೊಟ್ಟಿರುವ OMR ಉತ್ತರ ಹಾಳೆಯಲ್ಲಿ ಮಾತ್ರವೇ ಸೂಚಿಸತಕ್ಕದ್ದು. OMR ಹಾಳೆಯಲ್ಲಿನ ಅಂಡಾಕೃತಿ ಹೊರತುಪಡಿಸಿ ಬೇರೆ ಯಾವುದೇ ಸ್ಥಳದಲ್ಲಿ ಗುರುತಿಸಿದರೆ, ಅದರ ಮೌಲ್ಯಮಾಪನ ಮಾಡಲಾಗುವುದಿಲ್ಲ.
- OMR ಉತ್ತರ ಹಾಳೆಯಲ್ಲಿ ಕೊಟ್ಟ ಸೂಚನೆಗಳನ್ನು ಜಾಗರೂಕತೆಯಿಂದ ಓದಿರಿ.
- ಎಲ್ಲಾ ಕರಡು ಕೆಲಸವನ್ನು ಪುಸ್ತಕಿಯ ಕೊನೆಯಲ್ಲಿ ಮಾಡತಕ್ಕದ್ದು.
- ನಿಮ್ಮ ಗುರುತನ್ನು ಬಹಿರಂಗಪಡಿಸಬಹುದಾದ ನಿಮ್ಮ ಹೆಸರು ಅಥವಾ ಯಾವುದೇ ಚಿಹ್ನೆಯನ್ನು, ಸಂಗತವಾದ ಸ್ಥಳ ಹೊರತು ಪಡಿಸಿ, OMR ಉತ್ತರ ಹಾಳೆಯ ಯಾವುದೇ ಭಾಗದಲ್ಲಿ ಬರೆದರೆ, ನೀವು ಅನರ್ಹತೆಗೆ ಬಾಧ್ಯರಾಗಿರುತ್ತೀರಿ.
- ಪರೀಕ್ಷೆಯು ಮುಗಿದ ನಂತರ, ಕಡ್ಡಾಯವಾಗಿ OMR ಉತ್ತರ ಹಾಳೆಯನ್ನು ಸಂವಿಧಾನದಿಂದ ನೀವು ಹಿಂತಿರುಗಿಸಬೇಕು ಮತ್ತು ಪರೀಕ್ಷಾ ಕೊಠಡಿಯ ಹೊರಗೆ OMR ನ್ನು ನಿಮ್ಮೊಂದಿಗೆ ಕೊಂಡೊಯ್ಯಕೂಡದು.
- ಪರೀಕ್ಷೆಯ ನಂತರ, ಪರೀಕ್ಷಾ ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯನ್ನು ಮತ್ತು ನಕಲು OMR ಉತ್ತರ ಹಾಳೆಯನ್ನು ನಿಮ್ಮೊಂದಿಗೆ ತೆಗೆದುಕೊಂಡು ಹೋಗಬಹುದು.
- ನೀಲಿ/ಕಪ್ಪು ಬಾಲ್ ಪಾಯಿಂಟ್ ಪೆನ್ ಮಾತ್ರವೇ ಉಪಯೋಗಿಸಿರಿ.
- ಕ್ಯಾಲ್ಕುಲೇಟರ್, ವಿದ್ಯುನ್ಮಾನ ಉಪಕರಣ ಅಥವಾ ಲಾಗ್ ಟೇಬಲ್ ಇತ್ಯಾದಿಯು ಉಪಯೋಗವನ್ನು ನಿಷೇಧಿಸಲಾಗಿದೆ.
- ಸರಿ ಅಲ್ಲದ ಉತ್ತರಗಳಿಗೆ ಋಣ ಅಂಕ ಇರುವುದಿಲ್ಲ.
- ಕನ್ನಡ ಮತ್ತು ಇಂಗ್ಲಿಷ್ ಆವೃತ್ತಿಗಳ ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಗಳಲ್ಲಿ ಯಾವುದೇ ರೀತಿಯ ವ್ಯತ್ಯಾಸಗಳು ಕಂಡುಬಂದಲ್ಲಿ, ಇಂಗ್ಲಿಷ್ ಆವೃತ್ತಿಗಳಲ್ಲಿರುವುದೇ ಅಂತಿಮವೆಂದು ಪರಿಗಣಿಸಬೇಕು.

Instructions for the Candidates

- Write your roll number in the space provided on the top of this page.
- This paper consists of seventy five multiple-choice type of questions.
- At the commencement of examination, the question booklet will be given to you. In the first 5 minutes, you are requested to open the booklet and compulsorily examine it as below :
(i) To have access to the Question Booklet, tear off the paper seal on the edge of the cover page. Do not accept a booklet without sticker seal or open booklet.
(ii) Tally the number of pages and number of questions in the booklet with the information printed on the cover page. Faulty booklets due to pages/questions missing or duplicate or not in serial order or any other discrepancy should be got replaced immediately by a correct booklet from the invigilator within the period of 5 minutes. Afterwards, neither the Question Booklet will be replaced nor any extra time will be given.
- Each item has four alternative responses marked (A), (B), (C) and (D). You have to darken the circle as indicated below on the correct response against each item.
Example : (A) (B) (C) (D)
where (C) is the correct response.
- Your responses to the question of Paper III are to be indicated in the OMR Sheet kept inside the Booklet. If you mark at any place other than in the circles in OMR Sheet, it will not be evaluated.
- Read the instructions given in OMR carefully.
- Rough Work is to be done in the end of this booklet.
- If you write your name or put any mark on any part of the OMR Answer Sheet, except for the space allotted for the relevant entries, which may disclose your identity, you will render yourself liable to disqualification.
- You have to return the test OMR Answer Sheet to the invigilators at the end of the examination compulsorily and must NOT carry it with you outside the Examination Hall.
- You can take away question booklet and carbon copy of OMR Answer Sheet after the examination.
- Use only Blue/Black Ball point pen.
- Use of any calculator, Electronic gadgets or log table etc., is prohibited.
- There is no negative marks for incorrect answers.
- In case of any discrepancy found in the Kannada translation of a question booklet the question in English version shall be taken as final.



LIFE SCIENCES

PAPER – III

Note : This paper contains **seventy-five (75)** objective type questions. **Each** question carries **two (2)** marks. **All** questions are **compulsory**.

1. Transgenic animals are those wherein
 - (A) Foreign genes in some cells
 - (B) Foreign genes in all cells
 - (C) Foreign genes in single cell expressing proteins
 - (D) Foreign gene in a group of cells expressing a single protein
2. Vinblastin and Vincristine are used as anticancer drugs. They act as inhibitors of
 - (A) RNA biosynthesis
 - (B) DNA replication
 - (C) Telomerase
 - (D) Microtubules
3. Arrest of replication fork at Ter site requires action of
 - (A) RNA polymerase
 - (B) DNA polymerase
 - (C) Tus protein
 - (D) Ori "c" protein
4. Which of the following denaturing reagent is used in Sanger's method of DNA sequencing ?
 - (A) 8 M Urea
 - (B) 2 N NaOH
 - (C) 5% SDS
 - (D) 2 M Guonadine hydrochloride
5. Apo B100 is a 4536 amino acid protein and Apo B48 is a 2152 amino acid protein made from the same gene. This is made possible by
 - (A) Nonsense mutation of the gene of Apo B100 resulting in Apo B48
 - (B) Modifying the gene of Apo B100 in the intestine to give Apo B48
 - (C) RNA editing of the transcript from c→u resulting in a stop codon at codon 2153
 - (D) Two separate copies of the genes for Apo B100 and Apo B48 by gene duplication



6. Nothing in biology makes sense except in the light of evolution framed by
- (A) Charles Darwin
 - (B) Thomas H. Morgan
 - (C) Theodonus Dobzhasky
 - (D) Sewall Wright
7. Protostele occurs in
- (A) Bryophytes (B) Pteridophytes
 - (C) Gymnosperms (D) Angiosperms
8. The phenomenon in which genes on the same chromosome are separated from each other during Meiosis and new combination of genes are formed is known as
- (A) Non disjunction
 - (B) Phenocopy
 - (C) Linkage
 - (D) Recombination
9. Selection that favors an extreme phenotype, thus shifting the population mean in one or the other direction is called _____ selection.
- (A) Stabilizing selection
 - (B) Balancing selection
 - (C) Disruptive selection
 - (D) Directional selection
10. In gene expression, the least accurate step is protein synthesis. How does the cell minimize errors in this process ?
- i) Ribosomes carry out proof reading
 - ii) Amino acyl tRNA synthetase ensures correct addition of tRNA and amino acid
 - iii) If a wrong amino acid is inserted, the protein synthesis is aborted
 - iv) Speed of synthesis is reduced to minimize errors
- (A) ii) and iii)
 - (B) ii) and iv)
 - (C) i) and iii)
 - (D) i), ii) and iii)
11. Inheritance of acquired characters and struggle for existence are proposed by _____ and _____ respectively.
- (A) Darwin and Lamarck
 - (B) Lamarck and Darwin
 - (C) Lamarck and Morgan
 - (D) Darwin and Morgan



12. Identify the correct statement with regard to the Embryonic Stem cells (ES).

- (A) They are not derived from inner cell mass of Blastocyst
- (B) Cannot proliferate into different cell types
- (C) They can generate primitive ectoderm
- (D) They are not pluripotent cells

13. If a mother with blood group B has a child with blood group O. What would be the genotype of the father ?

- 1) $I^A I^B$ [Father] and $I^A I^O$ (Mother)
 - 2) $I^A I^B$ [Father] and $I^B I^O$ (Mother)
 - 3) $I^A I^O$ [Father] and $I^B I^O$ (Mother)
 - 4) $I^B I^O$ [Father] and $I^B I^O$ (Mother)
- (A) 1 and 2
 - (B) 3 and 4
 - (C) 2 and 4
 - (D) 1 and 3

14. In a biolistic application, DNA was coated on a gold nanoparticle and shot into a cell. If the particle ends up in the matrix of the mitochondria. How many membranes did it pass through ?

- (A) 2
- (B) 3
- (C) 4
- (D) 6

15. The sequence alignment tool provided by NCBI is

- (A) Chime
- (B) BLAST
- (C) Rasmol
- (D) Clustal W

16. The microbial process in which the soil contaminates are removed is termed as

- (A) Decomposition
- (B) Biodegradation
- (C) Bioremediation
- (D) Biomagnification

17. Which of the following is a State bird of Karnataka ?

- (A) House Sparrow
- (B) Peacock
- (C) Indian Roller
- (D) Parakeet



18. The hormone responsible for moulting in insects is

- (A) Brain hormone
- (B) Diapause hormone
- (C) Ecdysone
- (D) Juvenile hormone

19. Which of the following reactions takes place in the 3' → 5' direction ?

- (A) mRNA synthesis
- (B) DNA replication
- (C) RNA editing
- (D) All the above processes

20. Which of the following is accompanied by redness, swelling, heat and pain ?

- (A) B cell mediated immune response
- (B) Humoral immune response
- (C) Complement cascade
- (D) Inflammation

21. Which of the following statements are True with reference to Hemoglobin ?

- i) One hemoglobin molecule can bind to four molecules of oxygen
- ii) Carbon monoxide has a higher affinity to hemoglobin than oxygen
- iii) Binding of oxygen to hemoglobin shows hyperbolic kinetics
- iv) Myoglobin is a better oxygen carrier than hemoglobin

(A) i) and ii)

(B) iii) and iv)

(C) i) and iii)

(D) ii) and iv)

22. Most abundant immunoglobulin of the serum is

- (A) IgM
- (B) IgG
- (C) IgD
- (D) IgE



23. Atrial Natriuretic Factor (ANF) is a hormone produced by
- (A) Heart
 - (B) Kidney
 - (C) Spleen
 - (D) Liver
24. ECORI cuts the sequence GAATTC. Assuming random sequence of DNA, what will be the size of the fragments generated ?
- (A) 1096
 - (B) 2048
 - (C) 4096
 - (D) 6048
25. E.coli cells were grown for several generation on ^{14}N enriched media. The cells were then transformed to ^{15}N enriched media and allowed to grow exactly for two generations. What will be the ratio of heavy and light DNA strands ?
- (A) L : H = 1 : 1
 - (B) L : H = 1 : 2
 - (C) L : H = 1 : 3
 - (D) L : H = 1 : 4
26. The pKa of acetic acid is 4.76. If a buffer is prepared using acetic acid sodium acetate, and the pH of the solution is 5.76, what will be the ratio of acetic acid concentration to sodium acetate concentration ?
- (A) 1 : 1
 - (B) 1 : 10
 - (C) 10 : 1
 - (D) 1 : 100
27. Acrosome present on sperm head is derived from
- (A) Golgi
 - (B) Nucleus
 - (C) Endoplasmic reticulum
 - (D) Mitochondria
28. Domesticated plants that have escaped and maintained themselves in wild without human intervention are known as
- (A) Rare plants
 - (B) Rage plants
 - (C) Wild plants
 - (D) Feral plants



29. Which of the following statements are True about GPI anchored proteins ?

- i) Amino terminal end of the GPI anchored protein binds to Mannose
- ii) The core tetrasaccharide of the GPI anchor is attached to inositol of phosphatidyl inositol
- iii) GPI anchored proteins have phosphatidyl ethanolamine attached to the protein
- iv) GPI anchored proteins will always appear on the inner bilayer of the plasma membrane

- (A) i), ii) and iii)
- (B) ii) and iii)
- (C) i), iii) and iv)
- (D) ii), iii) and iv)

30. Species where males being homogametic is observed in

- (A) Moths
- (B) Bees
- (C) Bugs
- (D) Flies

31. In the Marker Assisted Selection (MAS), the most critical aspect for consideration is

- (A) Their inherent repeatability
- (B) Direct selection
- (C) Linkage with economically important traits
- (D) Linkage with nucleosomes

32. A person with phenylketonuria cannot convert

- (A) Phenyl alanine to tyrosine
- (B) Phenyl alanine to isoleucine
- (C) Phenol into ketones
- (D) Phenyl alanine to lysine

33. Which of the following is not a Indian mammal ?

- (A) Rhinoceros
- (B) Panda
- (C) Squirrel
- (D) Panther

34. Alpha diversity refers to

- (A) Species diversity
- (B) Genetic diversity
- (C) Community and ecosystem diversity
- (D) Plant diversity



35. The Indian roller bird Coracias benghalensis has been chosen as the State bird by
- (A) West Bengal and Jammu and Kashmir
(B) Karnataka and Odisha
(C) Himachal Pradesh and Kerala
(D) Sikkim and Nagaland
36. Which of the following are the essential requirements for Mitchell's chemiosmotic hypothesis to work ?
- i) The inner mitochondrial membrane should be intact
ii) There should be a proton gradient between inside and outside the mitochondrial membrane
iii) The inner mitochondrial membrane can be permeable to OH^- , Cl^- , K^+ and Na^+ ions
iv) The pH outside the inner mitochondrial membrane will be the same as that on the inside.
- (A) i), ii) and iii)
(B) i), iii) and iv)
(C) i) and ii)
(D) iii) and iv)
37. Inversions in a chromosome leads to
- (A) Aneuploidy
(B) Endoduplication
(C) Formation of Isochromosomes
(D) Cross over suppressor
38. The coding strand of DNA has the following sequence
 $5' - \text{ATGCAATTGCCT} \dots 3'$.
- What will be the sequence of the mRNA
- (A) $5' - \text{UAC GUU AAC GGU} \dots 3'$
(B) $5' - \text{AGG CAA UUG CAU} \dots 3'$
(C) $5' - \text{TAC GTT AAC GGA} \dots 3'$
(D) $5' - \text{AUG CAA UUG CCU} \dots 3'$
39. A population of 1000 individuals are in Hardy-Weinberg genetic equilibrium. If the frequency of one allele is 0.2. What will be the number of Heterozygous individuals ?
- (A) 200
(B) 320
(C) 400
(D) 640



40. Which of the following are endemic species of India ?
- Asiatic lion
 - Sangai deer
 - Lion Tailed Macaque
 - Polar bear
- (A) a, b and c
(B) a, b and d
(C) b, c and d
(D) a, c and d
41. The characteristic pigment of phaeophycean algae is
- Phycocyanin
 - Fucoxanthin
 - Phycoerythrin
 - Haematochrome
42. Photosystem I (PS I) is a fast photosystem whereas photosystem II (PS II) is a slow photosystem. How does the cell ensure continuous flow of electrons through the photosystems ?
- Electron transfer does not take place continuously
 - Grana containing PS II are stacked ensuring more number of PS II to provide electrons to PS I
 - Electrons are given to PS I from splitting water
 - PS I is made to function at a slower rate
43. Wings of Drosophila are attached to _____ segment.
- Prothorax
 - Mesothorax
 - Metathorax
 - Abdomen
44. Sequencing of genomic DNA is studied under
- Structural genomics
 - Proteomics
 - Gene library
 - Functional genomics
45. Transducin regulates
- cGMP phosphodiesterase
 - Adenyl cyclase
 - Phospholipase C
 - Phosphatidyl inositol 3-kinase
46. Biomass pyramid is inverted in which ecosystem ?
- Grassland
 - Desert
 - Forest
 - Pond



47. The correct sequence of photo-induced electron transfer between PS I and PS II in photosynthesis is
- (A) Plastoquinone – Plastocyanin – Cytochrome b6 – Cytochrome f
 - (B) Plastocyanin – Plastoquinone – Cytochrome b6 – Cytochrome f
 - (C) Cytochrome b6 – Cytochrome f – Plastoquinone – Plastocyanin
 - (D) Cytochrome b6 – Cytochrome f – Plastocyanin – Plastoquinone
48. Homologous recombination takes place in _____ chromosomes.
- (A) Bivalent
 - (B) Univalent
 - (C) Polyvalent
 - (D) Monovalent
49. “Simpson index” is used to measure
- (A) Population dynamics of species
 - (B) Diversity of species
 - (C) Richness of species
 - (D) Abundance of species
50. Flowers that will never open are called
- (A) Chasmogamous flowers
 - (B) Homogamous flowers
 - (C) Cleistogamous flowers
 - (D) Allogamous flowers
51. In crassulacean acid metabolism, the plant get carbon dioxide for photosynthesis during day time from
- (A) Malic acid
 - (B) Oxaloacetic acid
 - (C) Oxalic acid
 - (D) Pyruvic acid
52. GFP is used as a _____ protein in Drosophila.
- (A) Reporter
 - (B) Inhibitor
 - (C) Activator
 - (D) Enhancer
53. Cytotoxic T-cells kill their target cells by releasing to the target cells
- (A) Interleukens
 - (B) TNF α
 - (C) Perforin
 - (D) Chymotrypsin



54. Shine-Dalgarno sequence is
- (A) 5' – AGG AG GU – 3'
 - (B) 5' – ACC AU GG – 3'
 - (C) 5' – AAA GG CC – 3'
 - (D) 5' – GGA AC CA – 3'
55. Identify the correct eukaryotic cell cycle.
- (A) G₁ to S to G₂ to M to cytokinesis
 - (B) G₁ to G₂ to M to G₁ to cytokinesis
 - (C) G₂ to M to S to G₁ to cytokinesis
 - (D) G₁ to G₂ to S to M to karyokinesis
56. Which of the following is a disease of mitochondrial inheritance ?
- (A) Muscular dystrophy
 - (B) Cystic fibrosis
 - (C) Hemophilia
 - (D) LHON
57. Somatic hybridization is achieved through
- (A) Recombinant DNA technology
 - (B) Protoplast fusion
 - (C) Conjugation
 - (D) Grafting
58. The process in which undifferentiated cells are assigned developmental fates is called
- (A) Blastula
 - (B) Gastrula
 - (C) Determination
 - (D) Morphogenesis
59. Cholera toxin stimulates α_s of heterotrimeric G-protein in the intestine by
- (A) Phosphorylation
 - (B) ADP-ribosylation
 - (C) Glycosylation
 - (D) Prenylation
60. Lipid rafts and caveolae are examples of
- (A) Synthetic membrane
 - (B) Membrane microdomain
 - (C) Lipid vesicles
 - (D) Sub cellular membrane
61. Which of the following statements is true about microRNA ?
- i) They are approximately 22 nt long
 - ii) They are double stranded
 - iii) Enzyme involved in its production is Drosha
 - iv) When bound to RNA they always cause cleavage of RNA
- (A) i) and ii)
 - (B) i) and iii)
 - (C) ii) and iv)
 - (D) iii) and iv)



62. "Bicoid" mRNA is localised in the _____ region of Drosophila egg.
- (A) Anterior
 - (B) Posterior
 - (C) Dorsal
 - (D) Ventral
63. A gene is cloned in a plasmid vector between two restriction sites, ECOR I and BamH1. If the gene containing plasmid is subjected to double digestion, how many fragments of DNA will be obtained ?
- (A) 2
 - (B) 3
 - (C) 4
 - (D) None
64. In some species, one female will reproduce in a group where the other females have stopped reproduction to assist the reproductive female. This is an example of
- (A) Reciprocal altruism
 - (B) Sexual selection
 - (C) Kin selection
 - (D) Group selection
65. The copper containing protein that links electron transfer between PS II and PS I is
- (A) Plastoquinone
 - (B) Cytochrome a3
 - (C) Cytochrome b
 - (D) Plastocyanin
66. The enzyme 'Carbonic anhydrase' is related to
- (A) Ornithine cycle
 - (B) Kreb's cycle
 - (C) Bohr effect
 - (D) HMP-shunt
67. Of all the taxa the only one that exists as a biological unit in nature is
- (A) Family
 - (B) Kingdom
 - (C) Species
 - (D) Genus



68. Which one is not included in Nilgiri

Biosphere Reserve ?

- (A) Mudumalai and Mukurthi
- (B) Bannerghatta National Park
- (C) Wayanad
- (D) Bandipur National Park

69. Hamilton's rule is

- (A) $b + c = 1$
- (B) $b/c > 1/r$
- (C) $b - c > 1/r$
- (D) $b/c < 0$

70. The correlation coefficient 'r' ranges from

- (A) -1 to $+10$
- (B) -1 to $+1$
- (C) 0 to $+1$
- (D) $-\infty$ to $+\infty$

71. The fatty acid desaturases among plants and animals differ in one important mechanism.

- (A) Plants desaturate fatty acids towards the carboxyl end whereas animals desaturate towards the ω -end.
- (B) Plants desaturate fatty acids towards the ω -end whereas animals desaturate towards the carboxyl end
- (C) Plants desaturate fatty acids in the middle of the chain whereas animals desaturate at the ω -and carboxyl ends
- (D) Plants desaturate fatty acids at the ω -and carboxyl end whereas animals desaturate in the middle of the chain

72. In Kingfisher birds, father often retains his son to help the father to produce more young ones, while the father has an advantage in being able to reproduce more offspring. What is the advantage to the son ?

- (A) Son is obliged to the father and hence he helps
- (B) Son not sure of raising a family
- (C) This is an innate behaviour
- (D) Sibling or offspring have the same genetic relatedness and hence they are of equal advantage



73. The total number of species in an area

indicates

- (A) Species abundance
- (B) Species evenness
- (C) Species richness
- (D) Species diversity

74. Two parents are heterozygous to two genes A and B (AaBb). When they are crossed, what is the probability that among the offspring an individual will show both dominant traits (A – B –)

- (A) 1/16
- (B) 3/16
- (C) 9/16
- (D) 15/16

75. Nitrate reductase contains

- (A) Zinc
- (B) Molybdenum
- (C) Iron
- (D) Copper



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