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| SUBJECT CODE B-09-17 | SUBJECT LIFE SCIENCES | PAPER II |
| HALL TICKET NUMBER | | QUESTION BOOKLET NUMBER 209357 |
| OMR SHEET NUMBER | | |
| DURATION 1 Hour 15 Minutes | MAXIMUM MARKS 100 | NUMBER OF PAGES 16 |
| | | NUMBER OF QUESTIONS 50 |

This is to certify that, the entries made in the above portion are correctly written and verified.

Candidate's Signature

Name and Signature of Invigilator

INSTRUCTIONS FOR THE CANDIDATES

1. Write your Hall Ticket Number in the space provided on the top of this page.
2. This paper consists of fifty multiple-choice type of questions.
3. 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 this cover page. Do not accept a booklet without sticker-seal and do not accept an 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.
 - (iii) After this verification is over, the Test Booklet Number should be entered in the OMR Sheet and the OMR Sheet Number should be entered on this Test Booklet.
4. 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.
5. Your responses to the items are to be indicated in the OMR Answer Sheet given to you. If you mark at any place other than in the circle in the OMR Answer Sheet, it will not be evaluated.
6. Read instructions given inside carefully.
7. Rough Work is to be done in the end of this booklet.
8. 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.
9. The candidate must handover the OMR Answer Sheet to the invigilators at the end of the examination compulsorily and must not carry it with you outside the Examination Hall. The candidate is allowed to take away the carbon copy of OMR Sheet and used Question Paper Booklet at the end of the examination.
10. Use only Blue/Black Ball point pen.
11. Use of any calculator or log table etc., is prohibited.
12. There is no negative marks for incorrect answers.

అభ్యర్థులకు సూచనలు

1. ఈ పుట పై భాగంలో ఇవ్వబడిన స్థలంలో మీ హాల్ టికెట్ నంబరు రాయండి.
2. ఈ ప్రశ్న పత్రము యాభై బహుళైచ్ఛిక ప్రశ్నలను కలిగి ఉంది.
3. పరీక్ష ప్రారంభమున ఈ ప్రశ్నాపత్రము మీకు ఇవ్వబడుతుంది. మొదటి ఐదు నిమిషములలో ఈ ప్రశ్నాపత్రమును తెరిచి కింద తెలిపిన అంశాలను తప్పనిసరిగా పరిచూసుకోండి.
 - (i) ఈ ప్రశ్న పత్రమును చూడడానికి కవర్ పేజీ అంచున ఉన్న కాగితపు సీలును చించండి. స్టిక్కర్ సీలులేని మరియు ఇదివరకే తెరిచి ఉన్న ప్రశ్నాపత్రమును మీరు అంగీకరించవద్దు.
 - (ii) కవరు పేజీ పై ముద్రించిన సమాచారం ప్రకారం ఈ ప్రశ్నపత్రములోని పేజీల సంఖ్యను మరియు ప్రశ్నల సంఖ్యను పరిచూసుకోండి. పేజీల సంఖ్యకు సంబంధించి గానీ లేదా సూచించిన సంఖ్యలో ప్రశ్నలు లేకపోవుట లేదా నిజప్రతి కాకపోవుట లేదా ప్రశ్నలు క్రమపద్ధతిలో లేకపోవుట లేదా ఏదైనా తేడాలుండుట వంటి దోషపూరితమైన ప్రశ్న పత్రాన్ని వెంటనే మొదటి ఐదు నిమిషాల్లో పరీక్షా పర్యవేక్షకునికి తిరిగి ఇచ్చివేసి దానికి బదులుగా సరిగ్గా ఉన్న ప్రశ్నపత్రాన్ని తీసుకోండి. తదనంతరం ప్రశ్నపత్రము మార్చబడదు అదనపు సమయం ఇవ్వబడదు.
 - (iii) పై విధంగా పరిచూసుకొన్న తర్వాత ప్రశ్నాపత్రం సంఖ్యను OMR పత్రము పై అదేవిధంగా OMR పత్రము సంఖ్యను ఈ ప్రశ్నాపత్రము పై నిర్దిష్టస్థలంలో రాయవలెను.
4. ప్రతి ప్రశ్నకు నాలుగు ప్రత్యామ్నాయ ప్రతిస్పందనలు (A), (B), (C) మరియు (D) లుగా ఇవ్వబడ్డాయి. ప్రతి ప్రశ్నకు సరైన ప్రతిస్పందనను ఎన్నుకొని కింద తెలిపిన విధంగా OMR పత్రములో ప్రతి ప్రశ్నా సంఖ్యకు ఇవ్వబడిన నాలుగు వృత్తాల్లో సరైన ప్రతిస్పందనను సూచించే వృత్తాన్ని బాల్ పాయింట్ పెన్ తో కింద తెలిపిన విధంగా పూరించాలి.
ఉదాహరణ : (A) (B) (C) (D)
(C) సరైన ప్రతిస్పందన అయితే
5. ప్రశ్నలకు ప్రతిస్పందనలను ఈ ప్రశ్నపత్రముతో ఇవ్వబడిన OMR పత్రము పై ఇవ్వబడిన వృత్తాల్లోనే పూరించి గుర్తించాలి. అలాకాక సమాధాన పత్రంపై చేరొక చోట గుర్తిస్తే మీ ప్రతిస్పందన మూల్యాంకనం చేయబడదు.
6. ప్రశ్న పత్రము లోపల ఇచ్చిన సూచనలను జాగ్రత్తగా చదవండి.
7. చిత్తుపనిని ప్రశ్నపత్రము చివర ఇచ్చిన ఖాళీస్థలములో చేయాలి.
8. OMR పత్రము పై నిర్దిష్ట స్థలంలో సూచించవలసిన వివరాలు తప్పింపి ఇతర స్థలంలో మీ గుర్తింపును తెలిపే విధంగా మీ పేరు రాయడం గానీ లేదా ఇతర చిహ్నాలను పెట్టడం గానీ చేసినట్లయితే మీ అనర్హతకు మీరే బాధ్యులువుతారు.
9. పరీక్ష పూర్తయిన తర్వాత మీ OMR పత్రాన్ని తప్పనిసరిగా పరీక్ష పర్యవేక్షకుడికి ఇవ్వాలి. వాటిని పరీక్ష గది బయటకు తీసుకువెళ్లకూడదు. పరీక్ష పూర్తయిన తరువాత అభ్యర్థులు ప్రశ్న పత్రాన్ని, OMR పత్రం యొక్క కార్బన్ కాపీని తీసుకువెళ్లవచ్చు.
10. నీలి/నల్ల రంగు బాల్ పాయింట్ పెన్ మాత్రమే ఉపయోగించాలి.
11. లాగరిథమ్ టేబుల్స్, క్యాలిక్యులేటర్లు, ఎలక్ట్రానిక్ పరికరాలు మొదలగునవి పరీక్షగదిలో ఉపయోగించడం నిషేధం.
12. తప్పు సమాధానాలకు మార్కులు తగ్గింపు లేదు.





DO NOT WRITE HERE

LIFE SCIENCES

Paper - II

1. Which of the following statements is true ?

- (A) Free energy is kinetic energy
- (B) If a reaction is endergonic the products are of lower free energy than reactants
- (C) Entropy is the amount of order in energy
- (D) In exergonic reactions, free energy of the products is lower than the reactants

2. Match Column I with Column II.

| Column I | | Column II |
|----------------------------|-------|------------------------|
| (a) Thiamine Pyrophosphate | (i) | L-amino acid oxidases |
| (b) Biotin | (ii) | Trans aminases |
| (c) Pyridoxal phosphate | (iii) | Pyruvate carboxylase |
| (d) Flavin mono nucleotide | (iv) | Pyruvate Decarboxylase |

Codes :

- | | (a) | (b) | (c) | (d) |
|-----|-------|-------|------|-------|
| (A) | (ii) | (i) | (iv) | (iii) |
| (B) | (i) | (iii) | (iv) | (ii) |
| (C) | (iii) | (i) | (ii) | (iv) |
| (D) | (iv) | (iii) | (ii) | (i) |

3. Electron acceptors of the following metabolic activity :

| Activity | \bar{e} acceptor |
|---------------------------|--------------------|
| (a) Fermentation | (i) CO_2 |
| (b) Aerobic respiration | (ii) Pheophytin |
| (c) Anaerobic respiration | (iii) O_2 |
| (d) Photo excitation | (iv) Pyruvate |

Codes :

- | | (a) | (b) | (c) | (d) |
|-----|-------|-------|-------|-------|
| (A) | (iv) | (iii) | (i) | (ii) |
| (B) | (iv) | (ii) | (i) | (iii) |
| (C) | (iii) | (iv) | (i) | (ii) |
| (D) | (iv) | (i) | (iii) | (ii) |

4. When sodium ions rush into a myocyte through its channel, the cell membrane becomes :

- (A) Depolymerized
- (B) Depolarized
- (C) Paralyzed
- (D) Polarized



5. Assertion (A) :

The RNA polymerase I transcribes rRNAs except 5S rRNA.

Reason (R) :

The RNA polymerase III transcribes tRNA, 5S rRNA and sn RNAs.

- (A) Both (A) and (R) are true and (R) is the correct explanation of (A).
- (B) Both (A) and (R) are true but (R) is not the correct explanation of (A).
- (C) (A) is true but (R) is false.
- (D) (A) is false but (R) is true.

6. Assertion (A) :

Nucleic acids, DNA contains deoxyribose and RNA contains ribose.

Reason (R) :

DNA is always double-stranded and RNA is always single-stranded.

- (A) Both (A) and (R) are true and (R) is correct explanation of (A)
- (B) Both (A) and (R) are true but (R) is not correct explanation of (A)
- (C) (A) is false but (R) is true
- (D) (A) is true but (R) is false

7. One of the following is a sheet forming collagen :

- (A) Type I
- (B) Type II
- (C) Type III
- (D) Type IV

8. Match the following from List-I with the List-II.

| List-I | List-II |
|-------------------------|-------------------------------|
| (a) Polio | (i) Recombinant Vaccine |
| (b) Hepatitis-B | (ii) Snake bite |
| (c) Antiserum injection | (iii) Live attenuated vaccine |
| (d) Interferon | (iv) Antiviral agent |

Codes :

- | | (a) | (b) | (c) | (d) |
|-----|-------|-------|------|-------|
| (A) | (iii) | (i) | (ii) | (iv) |
| (B) | (iii) | (ii) | (iv) | (i) |
| (C) | (ii) | (iii) | (i) | (iv) |
| (D) | (ii) | (iv) | (i) | (iii) |



9. The correct sequence of events during fertilization in mammals is :

- (A) Capacitation, activation of egg, acrosomal reaction and entry of sperm in egg
- (B) Capacitation, acrosomal reaction, activation of egg and entry of sperm in egg
- (C) Acrosomal reaction, activation of egg, capacitation and entry of sperm in egg
- (D) Activation of egg, acrosomal reaction, entry of sperm in egg and capacitation

10. Assertion (A) :

Pruning of hedge is practised to promote lateral branching

Reason (R) :

When apical meristem is removed, the cytokinin level of lateral bud will be increased

- (A) Both (A) and (R) are correct and (R) is correct explanation of (A)
- (B) Both (A) and (R) are correct but (R) is not correct explanation of (A)
- (C) (A) is true but (R) is false
- (D) (A) is false but (R) is true

11. Assertion (A) :

Dichrophenyl Dimethyl Urea (DCMU) acts as a strong inhibitor of photosynthesis

Reason (R) :

DCMU disrupts the carboxylating activity of RuBisCo

- (A) Both (A) and (R) are true and (R) is the correct explanation of (A)
- (B) Both (A) and (R) are true but (R) is not the correct explanation of (A)
- (C) (A) is true but (R) is false
- (D) (A) is false but (R) is true

12. Match the following :

| List-I | List-II |
|--|---------------------|
| (a) Removal of apical dominance | (i) GA ₃ |
| (b) Induction of transverse geotropism | (ii) IAA |
| (c) Stimulation of internodal growth | (iii) Ethylene |
| (d) Induction of stomatal closure | (iv) Kinetin |
| | (v) ABA |

Codes :

| | (a) | (b) | (c) | (d) |
|-----|-------|-------|------|------|
| (A) | (ii) | (iv) | (v) | (i) |
| (B) | (iv) | (iii) | (i) | (v) |
| (C) | (v) | (i) | (iv) | (ii) |
| (D) | (iii) | (v) | (ii) | (i) |



13. Human insulin gene has been isolated and it is present on the short arm of :

- (A) Chromosome 11
- (B) Chromosome 2
- (C) Chromosome 3
- (D) Chromosome 14

14. Identify the macromolecules that are affected by temperature over the normal range encountered by animals.

- (a) Carbohydrates
 - (b) Proteins
 - (c) Lipids
 - (d) Nucleic acids
- (A) (a) and (b) are correct
 - (B) (b) and (c) are correct
 - (C) (c) and (d) are correct
 - (D) (a) and (d) are correct

15. Linkage prevents :

- (A) Homozygous condition
- (B) Segregation of alleles
- (C) Hybrid formation
- (D) Heterozygous condition

16. Assertion (A) :

The low pH of stomach is optimal for many of the gastric enzymes and it is harsh enough to kill most of the bacteria and parasites that enter through diet

Reason (R) :

The bacterium *Helicobacter pylori* can also be killed by the acidity of gastric juices

- (A) Both (A) and (R) are true and (R) is the correct explanation of (A)
- (B) Both (A) and (R) are true but (R) is not the correct explanation of (A)
- (C) (A) is true but (R) is false
- (D) (A) is false but (R) is true



17. Four different species concept are given below. Select the correct sequence :

- (a) Species separate based on their use of different ecological niches
- (b) Differences in physical characteristics (or) molecular basis to distinguish species
- (c) Species are distinct if they are reproductively Isolated
- (d) Phylogenetic trees and analyses of ancestry serve to differentiate species

- (A) (b) (a) (c) (d)
- (B) (a) (b) (c) (d)
- (C) (b) (c) (d) (a)
- (D) (d) (c) (b) (a)

18. Assertion (A) :

The sudden origin of new species by some sort of saltation termed as macrogenesis

Reason (R) :

The production of new type by a complete genetic reconstruction by systemic mutation

- (A) Both (A) and (R) are true and (R) is the correct explanation of (A)
- (B) Both (A) and (R) are true and (R) is not correct explanation of (A)
- (C) (A) is true but (R) is false
- (D) (A) is false but (R) is true

19. The eggs are incubated in egg sac and larval stage is absent in which class of annelida ?

- (A) Acanthobdella
- (B) Hirudinea
- (C) Archannelida
- (D) Oligochaeta

20. Assertion (A) :

The generic name and specific epithet in a binomial have exactly the same spelling (words) called "tautonym"

Reason (R) :

Repetition of a specific epithet in an intraspecific epithet leads to automatically established name

- (A) Both (A) and (R) are correct and (R) is the correct explanation of (A).
- (B) Both (A) and (R) are correct but (R) is not correct explanation of (A).
- (C) (A) is true but (R) is false.
- (D) (A) is false but (R) is true.



21. Match the following :

- | List - I | | List - II | |
|---|-------|---------------------------------|--|
| (a) The amount of oxygen used by organisms in water under certain standard conditions; it provides an index of the amount of microbially oxidizable organic matter present. | (i) | Nitrogen Oxygen Demand (NOD) | |
| (b) The amount of chemical oxidation required to convert organic matter in water and waste water to CO ₂ | (ii) | Total Organic Matter (TOC) | |
| (c) The demand for oxygen in sewage treatment caused by nitrifying microorganisms | (iii) | Biochemical Oxygen Demand (BOD) | |
| (d) All carbon whether or not usable by microorganisms is carried out by oxidizing the organic matter in a sample at high temperature in an oxygen stream | (iv) | Chemical Oxygen Demand (COD) | |

Codes :

- | | (a) | (b) | (c) | (d) |
|-----|-------|-------|------|-------|
| (A) | (iii) | (iv) | (i) | (ii) |
| (B) | (iv) | (iii) | (i) | (ii) |
| (C) | (iii) | (iv) | (ii) | (i) |
| (D) | (ii) | (iv) | (i) | (iii) |

22. Assertion (A) :

Secondary productivity should not be divided into gross and net amounts. The total energy flow at heterotrophic level be designated as assimilation and not production.

Reason (R) :

Consumers use only food materials already produced with appropriate respiratory losses and convert this food energy to different tissues.

- (A) Both (A) and (R) are true and (R) is the correct explanation of (A)
- (B) Both (A) and (R) are true but (R) is not the correct explanation of (A)
- (C) (A) is true but (R) is false
- (D) (A) is false but (R) is true

23. Identify the correct statements regarding trends of succession :

- (a) A continuous change in the kinds of plants and animals
 - (b) A tending increase in the diversity of species
 - (c) An increase in the organic matter and biomass supported by the available energy flow
 - (d) Decrease in the net community production or annual yield
- (A) (a), (c), (d) are correct
 - (B) (b), (d) are correct
 - (C) (a), (b), (c) are correct
 - (D) (a), (b), (c), (d) are correct



24. The DNA of which organelle is studied in molecular clock ?

- (A) Cytoplasm
- (B) Mitochondria
- (C) Nucleus
- (D) Endoplasmic reticulum

25. Assertion (A) :

Phytochelatin synthase is useful for bioremediation of metal pollution.

Reason (R) :

Heavy metals cannot enter into cytoplasm due to thick cell wall.

- (A) Both (A) and (R) are true and (R) is the correct explanation of (A)
- (B) Both (A) and (R) are true, but (R) is not the correct explanation of (A)
- (C) (A) is false and (R) is true
- (D) (A) is true but (R) is false

26. Match the following lists :

List I

List II

- | | |
|--|---|
| (a) Recombinant Avidin | (i) Used for treating Gaucher's disease and produced in transgenic tobacco. |
| (b) Recombinant polyhydroxybutyrates(PHBs) | (ii) Produced in transgenic tomato, protects against virus. |
| (c) Recombinant glucocerebrosidase | (iii) Biodegradable plastics |
| (d) Recombinant Rabies virus glycoprotein | (iv) Used in diagnostic kits |

The correct match is :

- | | | | | |
|-----|-------|-------|-------|------|
| | (a) | (b) | (c) | (d) |
| (A) | (iii) | (ii) | (i) | (iv) |
| (B) | (iv) | (iii) | (i) | (ii) |
| (C) | (iii) | (iv) | (ii) | (i) |
| (D) | (ii) | (i) | (iii) | (iv) |



27. Match the following lists :

| List-I | | List-II | |
|---|-------|---|--|
| (a) Geiger counter | (i) | Cloning vector | |
| (b) Western blot | (ii) | Gene expression at the RNA level | |
| (c) Yeast artificial chromosomes (YACs) | (iii) | Detection of radioactive isotope | |
| (d) Quantitative RNA polymerase chain reaction (Q-RT-PCR) | (iv) | Detection of post-translational product of a gene | |

The correct match is :

| | (a) | (b) | (c) | (d) |
|-----|-------|-------|-------|------|
| (A) | (i) | (iv) | (iii) | (ii) |
| (B) | (ii) | (iii) | (iv) | (i) |
| (C) | (iii) | (iv) | (i) | (ii) |
| (D) | (iv) | (ii) | (iii) | (i) |

28. One of the following detectors is not used in HPLC system :

- (A) Electron capture detector
- (B) UV-Vis detector
- (C) Fluorescence detector
- (D) Refractive index detector

29. Arrange the following proteins in the increasing molecular weights,

- (a) Bovine serum albumin
 - (b) Egg albumin
 - (c) Immunoglobulin G
 - (d) Thyroglobulin
- (A) (c)→(a)→(d)→(b)
(B) (a)→(b)→(c)→(d)
(C) (d)→(c)→(a)→(b)
(D) (b)→(a)→(c)→(d)

30. Assertion (A) :

G1 phase corresponds to interval between mitosis and initiation of DNA replication

Reason (R) :

During G1 phase, cells are metabolically inactive

- (A) Both (A) and (R) are true and (R) is the correct explanation of (A)
- (B) Both (A) and (R) are true but (R) is not the correct explanation of (A)
- (C) (A) is true but (R) is false
- (D) (A) is false and (R) is true



31. Assertion (A) :

Tertiary structure is absolutely necessary for many biological activities of proteins.

Reason (R) :

Tertiary structure is more stable, due to existence of other kinds of bonds.

- (A) Both (A) and (R) are true, but (R) is not the correct explanation of (A)
- (B) Both (A) and (R) are true, and (R) is the correct explanation of (A)
- (C) (A) is true but (R) is false
- (D) (A) is false and (R) is true

32. Arrange the stages of prophase-I of meiosis in correct order :

- (a) Diplotene
- (b) Pachytene
- (c) Diakinesis
- (d) Leptotene
- (e) Zygotene

- (A) (e) (b) (a) (d) (c)
- (B) (d) (e) (b) (a) (c)
- (C) (d) (e) (b) (c) (a)
- (D) (e) (a) (c) (b) (d)

33. Which of the following three cytokine profiles are induced by the *Mycobacterium tuberculosis* ?

- (a) IL-12 (b) IL-6
- (c) IL-2 (d) IL-17
- (e) IL-13 (f) IFN- γ

- (A) (b), (c) and (e)
- (B) (a), (b) and (f)
- (C) (c), (d) and (e)
- (D) (a), (c) and (f)

34. Match the extraembryonic foetal membrane with its functional significance in birds :

List I

List II

- | | |
|---------------|--|
| (a) Amnion | (i) Excretion |
| (b) Chorion | (ii) Protection against mechanical shock |
| (c) Yolk sac | (iii) Nutrition |
| (d) Allantols | (iv) Absorption of water, albumen and gases exchange |

Codes :

- | | | | | |
|-----|-------|-------|-------|-------|
| | (a) | (b) | (c) | (d) |
| (A) | (i) | (ii) | (iv) | (iii) |
| (B) | (ii) | (iv) | (iii) | (i) |
| (C) | (iii) | (i) | (ii) | (iv) |
| (D) | (iv) | (iii) | (i) | (ii) |



35. The enzyme which is located at the branch point between primary and secondary metabolism :

- (A) Phenyl alanine ammonia lyase
- (B) Polyphenol Oxidase
- (C) Chalcone Synthase
- (D) Superoxide dismutase

36. Match the following :

| List I | | List II |
|-------------------------|-------|-----------------------------|
| (a) Organ of Ruffini | (i) | Muscle position reception |
| (b) End bulb of kransse | (ii) | Heat reception |
| (c) Interoceptor | (iii) | Cold reception |
| (d) Proprioceptor | (iv) | Water current reception |
| | (v) | Hunger and thirst reception |

Codes :

- | | (a) | (b) | (c) | (d) |
|-----|------|-------|------|-------|
| (A) | (ii) | (iii) | (v) | (i) |
| (B) | (ii) | (iv) | (i) | (iii) |
| (C) | (iv) | (iii) | (ii) | (v) |
| (D) | (v) | (iii) | (iv) | (i) |

37. Match the following lists :

| List I | | List II |
|------------------------------|-------|--|
| (a) Bacterial transformation | (i) | Repressor protein |
| (b) Lysogeny | (ii) | Transposase and resolvase |
| (c) TnA transposition | (iii) | Generates a pool of progeny phage genomes that replicate and recombine |
| (d) Phage infection | (iv) | Low temperature and ca^{2+} |

The correct match is :

- | | (a) | (b) | (c) | (d) |
|-----|-------|------|------|-------|
| (A) | (iv) | (i) | (ii) | (iii) |
| (B) | (iii) | (ii) | (i) | (iv) |
| (C) | (ii) | (i) | (iv) | (iii) |
| (D) | (i) | (iv) | (ii) | (iii) |

38. Match the following List-I with that of List-II using codes :

| List-I | | List-II |
|------------------------|-------|-------------------------------|
| (a) Beedileaf tree | (i) | <i>Diospyros melanoxylon</i> |
| (b) Coral tree | (ii) | <i>Pterocarpus santalinus</i> |
| (c) Indian rubber tree | (iii) | <i>Santalum album</i> |
| (d) Sandal wood tree | (iv) | <i>Ficus elastica</i> |
| | (v) | <i>Erythrina indica</i> |

Codes :

- | | (a) | (b) | (c) | (d) |
|-----|------|-----|-------|-------|
| (A) | (ii) | (v) | (iv) | (iii) |
| (B) | (i) | (v) | (iii) | (iv) |
| (C) | (i) | (v) | (iv) | (iii) |
| (D) | (v) | (i) | (iv) | (iii) |



39. Microorganisms have evolved with the physical environment to provide control (Self-regulation) and to maintain conditions favourable to life on Earth is :

- (A) Gaia hypothesis
- (B) Allee principle
- (C) Lokka's hypothesis
- (D) Migg's theory

40. The following situations might lead to the evolution of monogyny in birds :

- (a) Male has to assist the female in rearing the offspring
- (b) Male guards the female against other males trying to mate with her
- (c) One male may not produce enough sperm required to fertilize all eggs produced by the female

Which of the above is/are correct ?

- (A) Only 1 (B) Only 2
- (C) 1 and 2 (D) 1 and 3

41. An attenuated vaccine contains :

- (A) white blood cells that fight infection
- (B) antibodies that recognize invading microbes
- (C) live disease causing microbes with no virulence
- (D) a hormone that boosts immunity

42. RF coil is a component of one of the following instruments,

- (A) AAS
- (B) Nephelometer
- (C) ESR spectrometer
- (D) NMR spectrometer

43. Match the following lists :

List-I

List-II

- | | | |
|-----------------------|-------|--|
| (a) Okazaki fragments | (i) | Involved in restarting stalled replication forks |
| (b) DNA polymerases | (ii) | Required to start DNA synthesis |
| (c) Priming | (iii) | Control the fidelity of replication |
| (d) Primosome | (iv) | They are linked by ligase |

The correct match is :

- | | | | | |
|-----|-------|-------|-------|-------|
| | (a) | (b) | (c) | (d) |
| (A) | (iv) | (iii) | (ii) | (i) |
| (B) | (i) | (ii) | (iv) | (iii) |
| (C) | (ii) | (i) | (iii) | (iv) |
| (D) | (iii) | (iv) | (ii) | (i) |

44. The correct sequence of organelle processing that a secretory protein intended for export would undergo during its journey in a cell is,

- (a) Mitochondria
- (b) Golgi apparatus
- (c) Rough endoplasmic reticulum
- (d) Cell membrane

- (A) (c)→(b)→(d)
- (B) (a)→(b)→(c)→(d)
- (C) (c)→(a)→(b)→(d)
- (D) (a)→(c)→(d)

45. Calmodulin is a small cytosolic protein which is ubiquitous in eukaryotic cells. One of the following is true with calmodulin :

- (a) It has 148 amino acid residues
- (b) It binds with four Ca^{2+} ions
- (c) It inhibits cAMP phosphodiesterase
- (d) It inhibits myosin Light-Chain kinase

- (A) (a) and (b)
- (B) (b) and (c)
- (C) (c) and (d)
- (D) (a) and (d)

46. The gametophytic self incompatibility (GSI) does not differ from Sporophytic Self Incompatibility (SSI) in that :

- (A) There is complete failure of seed set on self pollination
- (B) There is break down of incompatibility on induction of polyploidy
- (C) There is codominance of alleles responsible for self incompatibility
- (D) Both conditions give 50% functional pollen in pollination on some other plants

47. Assertion (A) :

Anadromous migration is common in *salmo salar* because of strongest homing instinct for spawning

Reason (R) :

According to Heape (1961), one of the causes for fish migration is gametic development linked with homing

- (A) Both (A) and (R) are true and (R) is correct explanation of (A)
- (B) Both (A) and (R) are true but (R) is not correct explanation of (A)
- (C) (A) is false but (R) is true
- (D) (A) is true but (R) is false

48. Where do you find the infection of *Schistosoma mansoni* in the world ?

- (a) Africa (b) Japan
 (c) S.America (d) Canada
 (A) (a) and (c)
 (B) (c) and (d)
 (C) (a), (b) and (d)
 (D) (b), (c) and (d)

49. Match the following :

List-I
 (Special Projects for endangered species)

List-II
 (Location)

- | | |
|--------------------------------|--------------------------------------|
| (a) Project Elephant | (i) Tikerpada Sanctuary, Odisha |
| (b) Rhino Conservation Project | (ii) Gir National Park, Gujarat |
| (c) Crocodile Breeding Project | (iii) Kaziranga National Park, Assam |
| (d) Lion Project | (iv) Periyar National Park, Kerala |

Codes :

- | | | | | |
|-----|-------|-------|------|------|
| | (a) | (b) | (c) | (d) |
| (A) | (iv) | (iii) | (ii) | (i) |
| (B) | (iii) | (i) | (ii) | (iv) |
| (C) | (i) | (iii) | (iv) | (ii) |
| (D) | (iv) | (iii) | (i) | (ii) |

50. Following techniques provide indispensable sources of information about protein tertiary structure at high resolution :

- (a) Nuclear Magnetic Resonance (NMR)
 (b) Fluorescence Resonance Energy Transfer (FRET)
 (c) X-ray crystallography
 (d) Fourier Transform Infra-red Technique (FTIR)
 (e) ESR spectroscopy

The correct combination is :

- (A) (b), (d) (B) (c), (e)
 (C) (a), (c) (D) (b), (e)

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