

SUBJECT CODE	SUBJECT	PAPER																
A-09-02	LIFE SCIENCES	II																
HALL TICKET NUMBER		QUESTION BOOKLET NUMBER																
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DURATION	MAXIMUM MARKS	NUMBER OF PAGES	NUMBER OF QUESTIONS															
1 HOUR 15 MINUTES	100	16	50															

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

Candidates Signature

Name and Signature of Invigilator

Instructions for the Candidates

అభ్యర్థులకు సూచనలు

- Write your Hall Ticket Number in the space provided on the top of this page.
- This paper consists of fifty 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** :
 - 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.
 - 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.**
 - 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.
- 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 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 Answer Sheet, it will not be evaluated.
- Read instructions given inside 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.
- 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.
- Use only Blue/Black Ball point pen.**
- Use of any calculator or log table etc., is prohibited.**
- There is no negative marks for incorrect answers.**

- ఈ పుట పై భాగంలో ఇవ్వబడిన స్థలంలో మీ హాల్ టికెట్ నంబరు రాయండి.
- ఈ ప్రశ్న పత్రము యాభై బహుళైచ్ఛిక ప్రశ్నలను కలిగి ఉంది.
- పరీక్ష ప్రారంభమైన ఈ ప్రశ్నపత్రము మీకు ఇవ్వబడుతుంది. మొదటి ఐదు నిమిషములలో ఈ ప్రశ్నపత్రమును తెరిచి కింద తెలిపిన అంశాలను తప్పనిసరిగా **సరిచూసుకోండి.**
 - ఈ ప్రశ్న పత్రమును చూడడానికి కవర్ పేజీ అంచున ఉన్న కాగితపు సీలును చించండి. స్టికర్ సీలులేని మరియు ఇదివరకే తెరిచి ఉన్న ప్రశ్నపత్రమును మీరు అంగీకరించవద్దు.
 - కవర్ పేజీ పై ముద్రించిన సమాచారం ప్రకారం ఈ ప్రశ్నపత్రములోని పేజీల సంఖ్యను మరియు ప్రశ్నల సంఖ్యను సరిచూసుకోండి. పేజీల సంఖ్యకు సంబంధించి గానీ లేదా సూచించిన సంఖ్యలో ప్రశ్నలు లేకపోవుట లేదా నిజప్రతి కాకపోవుట లేదా ప్రశ్నలు క్రమపద్ధతిలో లేకపోవుట లేదా ఏదైనా తేడాలుండటం వంటి దోషపూరితమైన ప్రశ్న పత్రాన్ని వెంటనే మొదటి ఐదు నిమిషాల్లో పరీక్షా పర్యవేక్షకునికి తిరిగి ఇచ్చివేసి దానికి బదులుగా సరిగా ఉన్న ప్రశ్నపత్రాన్ని తీసుకోండి. తదుపరం ప్రశ్నపత్రము మార్చబడదు అదనపు సమయం ఇవ్వబడదు.
 - పై విధంగా సరిచూసుకొన్న తర్వాత ప్రశ్నపత్రం సంఖ్యను OMR పత్రము పై అదేవిధంగా OMR పత్రము సంఖ్యను ఈ ప్రశ్నపత్రము పై నిర్దిష్టస్థలంలో రాయవలెను.
- ప్రతి ప్రశ్నకు నాలుగు ప్రత్యామ్నాయ ప్రతిస్పందనలు (A), (B), (C) మరియు (D) లుగా ఇవ్వబడ్డాయి. ప్రతిప్రశ్నకు 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
- ప్రశ్నలకు ప్రతిస్పందనలను ఈ ప్రశ్నపత్రముతో ఇవ్వబడిన OMR పత్రము పైన ఇవ్వబడిన వృత్తాల్లోనే పూరించి గుర్తించాలి. అలాకాక సమాధాన పత్రంపై చేరక చోట గుర్తిస్తే మీ ప్రతిస్పందన మూల్యాంకనం చేయబడదు.
- ప్రశ్న పత్రము లోపల ఇచ్చిన సూచనలను జాగ్రత్తగా చదవండి.
- చిత్తుపనిని ప్రశ్నపత్రము చివర ఇచ్చిన ఖాళీస్థలములో చేయాలి.
- OMR పత్రము పై నిర్ణీత స్థలంలో సూచించవలసిన వివరాలు తప్పించి ఇతర స్థలంలో మీ గుర్తింపును తెలిపే విధంగా మీ పేరు రాయడం గానీ లేదా ఇతర చిహ్నాలను పెట్టడం గానీ చేసినట్లయితే మీ అనర్హతకు మీరే బాధ్యులవుతారు.
- 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.
- నీలి/నల్ల రంగు బాల్ పాయింట్ పెన్ మాత్రమే ఉపయోగించాలి.
- లాగ్ రిఫ్లెక్స్ చేబుల్స్, క్యాలిక్యులేటర్లు, ఎలక్ట్రానిక్ పరికరాలు మొదలగునవి పరీక్షగదిలో ఉపయోగించడం నిషేధం.
- తప్పు సమాధానాలకు మార్కుల తగ్గింపు లేదు.



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LIFE SCIENCES
Paper – II

1. Choose the correct sequence in signal transduction pathway.

- I. Hormone
- II. 7 TM Receptor
- III. G protein
- IV. cAMP
- V. PKA

- (A) I → II → III → IV → V
- (B) II → III → IV → V → I
- (C) III → IV → V → I → II
- (D) IV → V → I → II → III

2. Identify the correct order of seminal tract in male reproductive system.

- (A) Vas deferens, Ejaculatory duct, Epididymis, Urethra
- (B) Epididymis, Vas deferens, Ejaculatory duct, Urethra
- (C) Ejaculatory duct, Vas deferens, Epididymis, Urethra
- (D) Epididymis, Ejaculatory duct, Vas deferens, Urethra

3. The correct sequence of gastrulation in Frog is

- I. Involution
- II. Epiboly
- III. Invagination
- IV. Convergence

- (A) III & IV are correct
- (B) I & II are correct
- (C) I, II & III are correct
- (D) IV & I are correct

4. Origin of first seed plants occurred during

- (A) Carboniferous
- (B) Ordovician
- (C) Devonian
- (D) Silurian

5. The 11th conference of parties to CBD meeting was held at

- (A) Bangalore
- (B) Kolkata
- (C) New Delhi
- (D) Hyderabad



6. Write the order of Rhizosphere effect in applied agriculture

I. Algae

II. Fungi

III. Bacteria

IV. Actinomycetes

(A) I, II, III, IV

(B) II, III, IV, I

(C) III, IV, II, I

(D) IV, III, II, I

7. In the cell cycle of a typical eukaryote, the sequence of events operating at the time of cell division is

(A) S phase → G2 phase → G1 phase → M phase

(B) S phase → M phase → G1 phase → G2 phase

(C) S phase → G2 phase → M phase → G1 phase

(D) S phase → G1 phase → M phase → G2 phase

8. Specify the order of fractionation upon application of the following organelles in cell-free extract in differential centrifugation

I. Nucleus

II. Golgi

III. Peroxisomes

IV. Mitochondria

(A) II, III, IV and I

(B) III, II, IV and I

(C) I, IV, III and II

(D) I, IV, II and III

9. Match inventors in List I with discoveries in List II.

List I

List II

I. Knoll and Ruska

1. Restriction endonuclease

II. Meellis

2. Electron microscopy

III. Arber and Smith

3. Reverse transcriptase

IV. Baltimore

4. PCR

I II III IV

(A) 2 4 1 3

(B) 3 4 2 1

(C) 3 4 1 2

(D) 2 4 3 1



10. Arrange the following “suffixes” of names of taxonomic ranks from top rank to low in the light of ICBN rules

1. “ales”
2. “oideae”
3. “opsida”
4. “aceae”

- (A) 1, 2, 3, 4
(B) 1, 3, 2, 4
(C) 3, 1, 4, 2
(D) 3, 2, 1, 4

11. Specify sequential order of occurrence of the following events for utilisation of lactose by *E. coli* cells

- I. Synthesis of all biomolecules needed for growth
- II. Metabolism of galactose and glucose through glycolytic pathway
- III. Hydrolysis of lactose to galactose and glucose
- IV. Transport of lactose into *E. coli* cells

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

12. Given below are two statements :

Assertion (A) : DNA fragments / molecules are usually separated on Agarose gels but not on polyacrylamide gels in an electrical field.

Reason (R) : Agarose gels contain smaller size pores through which DNA molecules of larger size migrate easily.

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

13. Pick up the correct combinations from the following :

1. *Rhizophora mucronata* – halophyte
2. *Capparis aphylla* – xerophyte
3. *Salicornia herbacea* – hydrophyte
4. *Picea* species – sciophyte

- (A) 1, 2 and 3
(B) 1, 2 and 4
(C) 1, 3 and 4
(D) 1 and 3



14. Brinjal, cabbage, cauliflower lettuce, potato, radish and tomato belong to

- (A) only one plant family
- (B) two plant families
- (C) three plant families
- (D) four plant families

15. In pseudo allelism, genes are

- (A) structurally allelic and functionally non-allelic
- (B) structurally as well as functionally non-allelic
- (C) functionally allelic and structurally non-allelic
- (D) structurally as well as functionally allelic

16. Haemolysis is the process in which

- (A) All the blood cells are destroyed
- (B) Only RBC are destroyed
- (C) Only WBC are destroyed
- (D) Only platelets are destroyed

17. Consider the following statements :

Linkage is the phenomenon in which

1. The effect of linkage is more clearly noticeable in back cross generation
2. The intensity of linkage between two genes is indirectly proportional to the distance between them
3. Linked genes do not show independent segregation
4. The frequency of recombination between two linked genes can not exceed 50%

Which of the statements given above are correct ?

- (A) 1, 2 and 4
- (B) 2, 3 and 4
- (C) 1, 3 and 4
- (D) 1, 2 and 3

18. Match the following pathogen and related type of vaccine.

- | | |
|-------------------|-------------------------|
| I. Hepatitis – A | 1. Live attenuated |
| II. Rotavirus | 2. Inactivated |
| III. Tetanus | 3. Recombinant |
| IV. Hepatitis – B | 4. Inactivated exotoxin |

- | | I | II | III | IV |
|-----|---|----|-----|----|
| (A) | 1 | 2 | 3 | 4 |
| (B) | 2 | 3 | 4 | 1 |
| (C) | 2 | 1 | 4 | 3 |
| (D) | 4 | 3 | 2 | 1 |



19. Assertion (A) : Genetic engineering can be used to develop transgenic animals capable of producing proteins of pharmaceutical value, process called Pharming.

Reason (R) : Proteins of this type are not made in an active form by microorganisms or by plants.

Which of these statements are correct ?

- (A) A is correct but R is wrong
- (B) Both A and R are correct
- (C) Both A and R are wrong
- (D) R is correct but A is wrong

20. Match the following :

List I

- I. Latimeria
- II. Archaeopteryx
- III. HMS Beagle
- IV. Evening Primrose

List II

- 1. Connecting link
- 2. Mutation theory
- 3. Living Fossil
- 4. Charles Darwin

Codes :

	I	II	III	IV
(A)	1	3	4	2
(B)	3	1	4	2
(C)	1	3	2	4
(D)	3	1	2	4

21. Assertion (A) : Geographical isolation occurs when original population is divided by geological barrier.

Reason (R) : These population due to mutation in their gene pool do interbreed when they contact again.

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

22. Assertion (A) : Rapid extinction of species observed in tropical countries.

Reason (R) : Intensive agriculture practices are common in tropical countries.

- (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 true but (R) is false
- (D) Both (A) and (R) are false



23. Small intestine consists of these parts

- I. Duodenum
- II. Jejunum
- III. Ileum
- IV. Caecum

- (A) I, II and III are correct
- (B) I, II and IV are correct
- (C) I, III and IV are correct
- (D) II, III and IV are correct

24. Which one of the following cell is diploid ?

- (A) Primary polar body
- (B) Spermatid
- (C) Primary spermatocyte
- (D) Spermatozoa

25. Which of the following pair of plants are C_4 plants ?

- I. Maize, Sugarcane
- II. Pea, Rose
- III. Potato, Rice
- IV. Sorghum, Bajra

- (A) I & II are correct
- (B) III & II are correct
- (C) II & IV are correct
- (D) I & IV are correct

26. Which one of the following is correctly matched ?

- (A) The number of individuals in each population in any ecosystem is limited – carrying capacity
- (B) The common plant used as green manure – salicornia
- (C) Epiphytic orchids are abundantly seen – moist deciduous forest
- (D) Amphibious plant – Nymphaea

27. **Assertion (A)** : Overgrazing contributes to “endemism”.

Reason (R) : Overgrazing affects the species diversity.

In the context of above statements, which one of the following statement is correct ?

- (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 correct explanation of (A)
- (C) (A) is true but (R) is false
- (D) (A) is false but (R) is true



28. Cell cycle regulators are

- (A) cdks
- (B) cyclins
- (C) cyclins and cdks
- (D) cyclases

29. Sperm lysins include

- I. Hyaluronidase
 - II. Acrosin
 - III. Pepsin
 - IV. Antifertilizin
- (A) I & II are correct
 - (B) II & III are correct
 - (C) III & IV are correct
 - (D) I & IV are correct

30. **Assertion (A)** : Translocation heterozygotes are semisterile and accompanied with multivalent association.

Reason (R) : The gametes formed through alternate disjunction are functional while those formed by adjacent disjunction are non viable.

- (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 true but (R) is false
- (D) (A) is false but (R) is true

31. Arrange the following in correct path of energy flow in an ecosystem :

- 1. decomposers
 - 2. herbivores
 - 3. producers
 - 4. carnivores
- (A) 3, 2, 4, 1
 - (B) 2, 3, 4, 1
 - (C) 1, 3, 2, 4
 - (D) 1, 2, 3, 4

32. Study the following lists and match them :

List I

- I. 20th century
- II. 18th century
- III. 17th century
- IV. 19th century

List II

- 1. Genetic engineering studies
- 2. Taxonomy and physiology
- 3. Role of chromosomes in heredity
- 4. Discovery of cell
- 5. Laws of Inheritance

Codes :

- | | I | II | III | IV |
|-----|---|----|-----|----|
| (A) | 1 | 2 | 4 | 5 |
| (B) | 3 | 2 | 4 | 5 |
| (C) | 1 | 2 | 5 | 4 |
| (D) | 3 | 4 | 2 | 5 |



33. Transcription activator protein
- (A) Transcribe a message off a DNA template
 - (B) Bring regions near in eukaryotic gene and allow gene to be transcribed
 - (C) Bind to ribosomes to activate the production of specific protein
 - (D) Are essential to function of tRNA during translation
34. Which of the following sequences is most common in territorial behaviour ?
- (A) Threat, combat, advertisement
 - (B) Advertisement, threat, combat
 - (C) Combat, threat, advertisement
 - (D) Threat, advertisement, combat
35. The faithful replication of genomic DNA is facilitated by
- I. Insertion of correct complementary bases as guided by the template DNA strand
 - II. Proof reading function of DNA pol III
 - III. Proof reading function of DNA pol I
 - IV. 5' → 3' exonuclease activity of DNA pol III
- (A) I and IV are correct
 - (B) II and III are correct
 - (C) II, III and IV are correct
 - (D) I, II and III are correct

36. **Assertion (A)** : The Larynx or voice box is responsible for the production of sound and the pitch of voice.

Reason (R) : Without vocal cords help the sound cannot be produced.

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

37. Match the following blood cells and their nucleus shape.

List I	List II
(Blood cell)	(Nucleus shape)
I. Neutrophils	1. Bi-lobed
II. Eosinophils	2. Kidney shape
III. Basophils	3. Multi lobed
IV. Lymphocytes	4. Oval shape

Code :

- | | I | II | III | IV |
|-----|----------|-----------|------------|-----------|
| (A) | 3 | 1 | 2 | 4 |
| (B) | 1 | 2 | 4 | 3 |
| (C) | 2 | 1 | 4 | 3 |
| (D) | 4 | 2 | 1 | 3 |



38. List I consists of some terms and List II includes their corresponding examples. Select the code showing correct matching.

List I (Terms)	List II (Examples)
I. Guttation	1. Shrinkage of cells in hypertonic solution
II. Imbibition	2. Loss of water in transpiration
III. Plasmolysis	3. Swelling of seeds during germination
IV. Diffusion	4. Exudation of water from leaves

Codes :

	I	II	III	IV
(A)	4	3	1	2
(B)	3	1	2	4
(C)	1	3	4	2
(D)	2	3	1	4

39. Match the following :

I. Hapten	1. Necrosis
II. J-chain	2. Shoot apex
III. High conc. of Auxinin	3. Monovalent
IV. Sudden death of cells	4. IgA

	I	II	III	IV
(A)	1	2	3	4
(B)	4	3	2	1
(C)	3	4	2	1
(D)	2	3	1	4

40. **Statement (A)** : Both chlorophyll a and chlorophyll b contain C, H, O, N and Mg. However they differ structurally.

Reason (R) : Chlorophyll a and chlorophyll b differ with each other with regard to the number of carbon and nitrogen atoms.

In the context of above two statements which one of the following is correct ?

- (A) A is wrong R is correct
- (B) A is wrong B is wrong
- (C) A is correct B is wrong
- (D) A is correct B is correct



41. If in 8 hours an exponentially growing cell population increases from 2×10^6 to 2×10^9 cells/ml, calculate generation time

- (A) 51.6 min
- (B) 87.2 min
- (C) 21.8 min
- (D) 10.9 min

42. Given below are two statements, one labeled as Assertion (A) and other labeled as Reason (R).

Assertion (A) : In the zygote, there is no cytoplasmic contribution from parental side.

Reason (R) : The cytoplasmic part of the sperm is discarded just before fertilization.

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

43. Which one of the following is NOT correct matched pair ?

- (A) Sigma factor – Transcription
- (B) Rho factor – Translation
- (C) Amino acyl synthetase – Attachment of amino acid to tRNA
- (D) Primase – DNA replication

44. Which one of the pairs is NOT correctly matched ?

- (A) P element – Drosophila
- (B) Composite transposon – Tn10
- (C) Complex transposon – Tn3
- (D) Retro transposon – Mu

45. Given below are two statements.

Assertion (A) : In view of availability of amino acids – Histidine and Tryptophan in the medium, their synthesis by E. coli cells does not take place.

Reason (R) : Synthesis of the above two amino acids by E. coli cells is regulated by attenuation process.

- (A) A is wrong and R is correct
- (B) A is correct and R is correct explanation of A
- (C) A and R are wrong
- (D) A is correct and R is wrong



46. DNA microarray technique

- I. is used to assess transcription from multiple genes at a time
- II. works best for organisms whose genomes are completely sequenced
- III. Uses gene chip
- IV. Scanners employ lasers, special microscope and camera to create image of array

- (A) I, II, III, IV are correct
- (B) I, II, III are correct
- (C) I, III, IV are correct
- (D) I, III are correct

47. An operon consists of

- I. Promotor
- II. Functionally related structural genes
- III. Operator
- IV. Transcription of functionally related structural genes from a single promoter

- (A) I and II are correct
- (B) II and III are correct
- (C) I, II, III and IV are correct
- (D) I, II and IV are correct

48. Phaeoporphyrin nucleus of chlorophyll a contains _____ double bonds in a conjugated fashion.

- (A) 10
- (B) 11
- (C) 13
- (D) 9

49. In photosystem II of photosynthesis, the order of flow of electrons through different carriers

- (A) Plastoquinone, plastocyanin, cytochrome – 559, cytochrome – 553
- (B) Plastoquinone, cytochrome – 559, cytochrome – 553, plastocyanin
- (C) Plastocyanine, plastoquinone, cytochrome – 559, cytochrome – 553
- (D) Cytochrome – 559, cytochrome – 553, plastoquinone, plastocyanin

50. Xenobiotic compounds are recalcitrant because they are

- (A) Not recognized as substrate by micro organisms
- (B) Chemically not stable
- (C) Highly non-toxic to micro-organisms
- (D) Recognized as substrate by micro organisms



Space for Rough Work



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