Roll No. | | | | | | | |

(Write Roll Number from left side exactly as in Admit Card)

Signature of Invigilators

1. _____

2. _____

PAPER – III

1410

Test Booklet No.

LIFE SCIENCES

Time : $2\frac{1}{2}$ Hours

Maximum Marks : 200

Instructions for the Candidates

1. Write your roll number in the space provided on the top of this page.
2. This paper consists of four **Sections – I, II, III & IV.**
3. Answers are to be written in the space provided against the questions.

No additional sheets are to be used.

4. Read instructions given inside carefully.
5. One sheet is attached at the end of the test booklet for rough work.
6. If you write your name or put any special mark on any part of the test booklet which may disclose in any way your identity, you will render yourself liable to disqualification.
7. You should return the test booklet to the invigilator at the end of the examination and should not carry any paper with you outside the examination hall.

FOR OFFICE USE ONLY

Marks Obtained

Question Number	Marks Obtained	Question Number	Marks Obtained	Question Number	Marks Obtained
1		10		19	
2		11		×	
3		12		×	
4		13		×	
5		14		×	
6		15		×	
7		16		×	
8		17		×	
9		18		×	

Total marks obtained .....

Signature of the Co-ordinator .....
(Evaluation)

LIFE SCIENCES

Paper – III

SECTION – I

Note : i) Answer all questions.

ii) Each question carries twenty marks.

iii) Each answer should be given in 500 words. $2 \times 20 = 40$

1. Describe the generation of action potential in a nerve fibre and discuss the conduction of their action potential along the nerve fibre.

OR

What are the characteristics of C_3 and C_4 plants ? Explain which of them is more advantageous and why. (Show the required pathway for CO_2 fixation if desired by you). 8 + 12

OR

What is migration ? State the physiological changes that occur during migration of fish Hilsa. Mention the problems for Hilsa fisheries in India. Suggest your views to manage these problems.

2. Discuss the role of insulin in carbohydrate and protein metabolisms.

OR

On the basis of genetic criteria, what are the two broad groups of Molecular markers ? Give examples. Describe the principle and methods of one technique of detecting polymorphism simultaneously at several loci. 5 + 15

OR

Which source of variation is derived in asexually reproducing organisms and self-fertilizing hermaphrodites ? Which phenomenon is needed to bring about variations in such forms ?

SECTION – II

Note : i) Answer all questions.

ii) Each question carries fifteen marks.

iii) Each answer should be given in 300 words. $3 \times 15 = 45$

3. Discuss the hormonal and neural regulation of ovulation.

OR

What is osmoregulation ? Discuss the role of kidney in the osmoregulation of vertebrates.

OR

Elaborate the phenomenon of double fertilization and its significance in angiospermic plants. Give diagram wherever necessary.

4. Describe the neural basis of frequency discrimination of sound in auditory system.

OR

Which is the most stable bond between atoms ? What is the value of ΔE ? When the energy is released during the formation of high energy bond, the value is negative. Give reason.

OR

Write a comprehensive note on the types and causes of gene mutation with particular reference to mutagenic agents.

5. What are counter current exchangers and multipliers ? Discuss the physiological bases of formation of hypertonic urine.

OR

Briefly write the theories explaining the organization of shoot apex.

OR

How do you relate the law of tolerance and law of minimum for the growth and reproduction of an organism ?

SECTION – III

Note : i) Answer all questions.

ii) Each question carries ten marks.

iii) Each answer should be given in 50 words. $9 \times 10 = 90$

6. Discuss the characteristics and significance of ECG waves.

What is light insensitive photomorphogenic mutant in *Arbidiopsis* ? State the role of phytochrome *B* in photomorphogenesis.

8. Define gastrulation. Describe different forms of gastrulation in animals.

9. Describe the trichromatic theory of colour vision in human.

10. What is site specific recombination ? Where does it occur ? Briefly describe the mechanism of pathways of site specific recombination.

11. What do you mean by molecular evolution ? State its advantages in evolutionary study.

12. Describe the molecular mechanism of differentiation of neurons from the neural ectoderm.

13. Write a concise note on different types of senescence encountered in higher plants.

14. What criteria are required in the data for the test of two-way analysis of variance ?

SECTION – IV

Note : i) Answer all questions.

ii) Each question carries five marks.

iii) Each answer should be given in 30 words. $5 \times 5 = 25$

15. Give an outline of β-oxidation pathway.

16. What is gluconeogenesis ?

17. What is meant by quantitative method of taxonomy ? How is it different from classical method ?

18. What is cry gene ? How is it useful for biological control of insect pest ?

19. Describe the oxygen dissociation curve and mention its significance.