Signature of Invigilators

1. .....

2. .....

LIFE SCIENCE
PAPER–III
OCT–10/04

Roll No. ☐☐☐☐☐
(In figures as in Admit Card)

Roll. No. .....

.....
(in words)

Name of the Areas/Section (if any).....

Time Allowed : 2-1/2 hours] **[Maximum Marks : 200**

Instructions for the Candidates

1. Write your Roll Number in the space provided on the top of this page.
2. Write name of your Elective/Section if any.
3. Answer to short answer/essay type questions are to be written in the space provided below each question or after the questions in test booklet itself. No additional sheets are to be used.
4. Read instructions given inside carefully.
5. Last page 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. Use of calculator or any other Electronics Devices is prohibited.
8. There is no negative marking.
9. You should return the test booklet to the invigilator at the end of the examination and should not carry any paper outside the examination hall.

પરીક્ષાર્થીઓ માટે સૂચનાઓ :

૧. આ પૃષ્ઠના ઉપલા ભાગે આપેલી જગ્યામાં તમારી ક્રમાંક સંખ્યા (રોલ નંબર) લખો.
૨. તમે જે વિકલ્પનો ઉત્તર આપો તેનો સ્પષ્ટ નિર્દેશ કરો.
૩. ટૂંકનોંધ કે નિબંધ પ્રકારના પ્રશ્નોના ઉત્તર દરેક પ્રશ્નની નીચે આપેલી જગ્યામાં જ લખો. વધારાના કોઈ કાગળનો ઉપયોગ કરશો નહીં.
૪. અંદર આપેલી સૂચનાઓ ધ્યાનથી વાંચો.
૫. આ ઉત્તર પોથીમાં અંતે આપેલું પૃષ્ઠ કાચા કામ માટે છે.
૬. આ ઉત્તર પોથીમાં કયાંય પણ તમારી ઓળખ કરાવી દે એવી રીતે તમારું નામ કે કોઈ ચોકકસ નિશાની કરી હશે તો તમને આ પરીક્ષા માટે ગેરલાયક ગણવામાં આવશે.
૭. કેલકયુલેટર અથવા ઈલેકટ્રોનિકસ સાધનોનો ઉપયોગ કરવો નહીં.
૮. નકારાત્મક ગુણાંક પદ્ધતિ નથી.
૯. પ્રશ્નપત્ર લખાઈ રહે એટલે આ ઉત્તર પોથી તમારા નિરીક્ષકને આપી દેવી. પરીક્ષાખંડની બહાર કોઈ પણ પ્રશ્નપત્ર લઈ જવું નહીં.

FOR OFFICE USE ONLY
MARKS OBTAINED

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

SEAL

Total Marks obtained .....

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

LIFE SCIENCE

PAPER–III

Note : This paper contains four Sections. You are required to attempt *all* of them.

SECTION I

Note : Choose any *one* Unit and answer both the questions (Q. No. **1** and Q. No. **2**) of the same Units in **500** words. (2×20=40)

Unit I

1. Shuttling journey of chloride ions between plasma and erythrocytes never stops in the life of vertebrates. Comment.
2. How does a wave of depolarization spread along a nerve fiber ?

OR

Unit II

1. Discuss strain improvement, fermentation process and recovery method for penicillin or citric acid.
2. Explain how genetic recombination takes place in conjugation and transduction in bacteria.

OR

Unit III

1. Discuss carbon fixation in C_4 plants.
2. Discuss stratagies related to the development of pest resistant plants.

OR

Unit IV

1. Differentiate symmetrical and sequential models of allosteric regulation. Explain the regulation of aspartate transcarbamylase.
2. How are glycolysis and gluconeogenesis linked to muscle and liver metabolism ?

Q. No. 1. Unit .....

Q. No. 2. Unit .....

SECTION II

Note : Choose any *one* Unit and answer *all* the questions (Q. No. **3** to Q. No. **5**) of the same Unit in **300** words. (3×15=45)

Unit I

3. Glycolysis is inevitable cellular activity in the life of most of the organisms. Justify the statement.

4. What do you understand by the term RNA editing ?

5. RB, P^{53} and P^{21} are specific group of genes playing very important role in cell cycle. Discuss.

OR

Unit II

3. If photorespiration produces amino acids glycine, serine why is it described as an inefficient or wasteful process ? Discuss.

4. From the unlabelled flasks of phytohormones how can each be identified ? Suggest the best assay methods giving reasons.

5. How do microbes damage the crops ? Discuss at least one mechanism of pathogenicity in plants.

OR

Unit III

3. (A) A bacterial culture divides every 30 min. If the initial count is 10^2/ml, what will be the final count after 8 hrs ?

   (B) Which methods can be employed for determining growth of bacteria ?

4. When parmitate is oxidized by β-oxidation, how many ATPs will be produced ? Give reactions where ATP is generated.

5. Describe the adaptations to high temperature in thermophiles.

OR

Unit IV

3. Differentiate with evidence active and passive transport.

4. Discuss the mechanism underlying the following disease :

   (*a*) Tay Sach's disease

   (*b*) Phenyl Ketonuria

   (*c*) Muccopolysaccharidosis.

5. Explain how the following are used to map the active site of the enzyme :

   (*a*) TEPC

   (*b*) TPCK

   (*c*) Iodoacetate.

Q. No. 3. Unit .....

Q. No. 4. Unit .....

Q. No. 5. Unit .....

SECTION III

Note : Answer the following questions in **50** words each. Attempt *all* questions (Q. No. **6** to Q. No. **14**). (9×10=90)

6. What do you know about genetic code in Mitochondria ? Compare them with universal code.

7. What are molecular markers ? Discuss their use in study of DNA polymorphism.

8. Discuss the role of biotechnology in biodiversity conservation.

9. What are the fixatives ? Explain uses of fixatives in biological system.

10. Describe different variations in ELISA and their applications.

11. Explain how epinephrine increases the rate of glycogen degradation through CAMP.

12. Explain how insulin increases glycogen synthesis and decreases glycogen degradation.

13. Describe the polygon analysis for estimating fecundity of a fish.

14. Discuss the molecular mechanisms by which salt tolerance is achieved in halophiles.

SECTION IV

Note : Answer questions (Q. No. **15** to Q. No. **19**) given below in **30** words each. Attempt *all* questions. (5×5=25)

15. How are tissues loosened in soft rots of fruits ?

16. Define "Cloning Vehicle".

17. How does protooncogene become an oncogene ? Give an example.

18. Bioinformatics is a discipline that complements but does not supplement experimental research. Discuss.

19. Why semisynthetic antibiotics such as Rifampicin is produced ?

ROUGH WORK

SEAL