

Signature of Invigilators

1. ....

2. ....

## LIFE SCIENCE Paper III

Roll No.

(In figures as in Admit Card)

Roll No. ....

(In words)

**JY—04/4**

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

Time Allowed : 2½ 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 are 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. ટૂંક નોંધ 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 પોથીને અંતે આપેલું પૃષ્ઠ કાચા કામ માટે છે.
૬. આ ઉત્તર પોથીમાં ક્યાંય પણ તમારી ઓળખ કરાવી દે એવી રીતે તમારું નામ કે કોઈ ચોક્કસ નિશાની કરી હશે તો તમે આ પરીક્ષા માટે ગેરલાયક સાબીત થશો.
૭. કેલક્યુલેટર અથવા ઇલેક્ટ્રોનિક્સ સાધનો જેવાનો 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	Question Number	Marks Obtained
1.		21.		41.	
2.		22.		42.	
3.		23.		43.	
4.		24.		44.	
5.		25.		45.	
6.		26.		46.	
7.		27.		47.	
8.		28.		48.	
9.		29.		49.	
10.		30.		50.	
11.		31.		51.	
12.		32.		52.	
13.		33.		53.	
14.		34.		54.	
15.		35.		55.	
16.		36.		56.	
17.		37.		57.	
18.		38.		58.	
19.		39.		59.	
20.		40.		60.	

Total Marks Obtained.....

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

SEAL



## LIFE SCIENCES

### PAPER-III

*Note* :— (a) This paper consists *Sixty (60)* questions. Answer any *Twenty (20)* questions.

(b) All questions carry equal marks. Each question carries *Ten (10)* marks.

(c) Answer each question in about **200** (Two hundred) words.

1. Write in brief on biosystematics.
2. Trace in brief the evolution of vascular elements in different plant groups.
3. Compare a gymnospermic wood with an angiospermic wood.
4. Discuss pollen-pistil interactions.
5. Discuss the centre of origin of wheat.
6. Give a brief account of photorespiration.
7. Examine the role of temperature in floral induction.
8. Give the role of tissue culture in crop improvement.
9. Write briefly on synthetic seeds.
10. Give a brief account of protoplast fusion.
11. Give the scientific names of three drug plants of Gujarat. Name the part of the plant and its chemical constituents from where the drug is extracted.
12. Discuss various theories on plant senescence.
13. Describe the process of fossilization.
14. Give a brief account of the larval forms of echinoderms.
15. Give a brief account of adaptive radiation in Amphibia.
16. State the fundamental principles of mechanoreceptors.
17. Distinguish between the osmoregulation in freshwater and marine teleosts.

18. Write briefly about the role of Sertoli cells in the process of spermatogenesis.
19. "Hair and tooth development are examples of instructive tissue interaction." Justify the statement.
20. Write various physiological changes in a land vertebrate transported from main land to a high altitude region.
21. Describe the molecular organization of cell membrane.
22. Give a short account of biological control of insects.
23. Explain briefly mate selection in a non-human primate.
24. Give an account of the vegetative phase in the life history of *Plasmodium*.
25. Give a short account of major insect pests of paddy in Gujarat.
26. Define mutation and explain the major causes of spontaneous mutation.
27. Give the parasitic characters of tapeworm.
28. State briefly the methods of weed control in a fish pond.
29. Describe what is an ecosystem ? What are some of its characteristics ?
30. What is meant by the term green revolution and how has this affected world food supplies ? How has it affected soils ?
31. Give a brief account of integrated fish farming in India.
32. Enumerate the factors affecting the productivity of fresh water ecosystem.
33. What are ion channels ? Explain their different types.
34. What is genome ? How does the bacterial genome differ from that of eukaryotic genome with special reference to gene expression ?
35. Which organism would you prefer for industrial scale ethanol production by immobilized system and why ?

36. Why are monoclonal antibodies the best source of immunization ? How are they prepared ?
37. Define  $K_m$  and  $K_{cat}$ . How will you deduce these from the kinetic data ?
38. Enlist intramolecular interactions underlying secondary and tertiary structures of proteins.
39. Why is RNA more labile to nucleophilic attack ?
40. Explain what is gluconeogenesis ? Explain under what conditions this process occurs in microbes, plants and animals ?
41. What is salvage pathway for purine biosynthesis ?
42. How are thermodynamically unfavourable reactions brought about in a biological system ? Explain giving appropriate examples.
43. What is redox-potential ? How does it relate with energy state of the molecule ?
44. Draw a labelled diagram showing various components of a eukaryotic gene.
45. What is the role of untranslated region of mRNA ?
46. What is the difference between repression and attenuation ?
47. What is the difference between catabolic repression and feedback inhibition ? Explain with example.
48. How does DNA methylation influence gene expression in eukaryotes ?
49. Describe the phenotypic consequences of activities of AC and DS elements in maize.
50. Enlist various classes of oncogene products.
51. Discuss the role of cytochrome  $P_{450}$  and disposal of foreign chemicals entering the blood stream.
52. Discuss the molecular mechanisms involved in lysogenization and lytic process in lambda bacteriophage.

53. What do you understand by ex-vivo gene therapy ?
54. How is somatic nucleus used for cloning an animal ?
55. What is Bt toxin ? Illustrate how Bt transgenic plants are projected to be of use ?
56. Enumerate the differences between the spectrophotometer and colorimeter.
57. Differentiate between the properties of the alpha and beta particles.
58. Why does a living material require proper fixation prior to its histological study ? Describe various methods of tissue fixation for electron microscopy.
59. What is the importance of 'p' value in biostatistical analysis ?
60. Explain 'mean', 'mode' and 'median' and their application in biological analysis.