

Signature of Invigilators

Roll No.

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(In figures as in Admit Card)

1. ....

## LIFE SCIENCE

2. ....

### Paper III

Roll No. ....

(In words)

**D—0402**

Name of 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 :

1. આ પૃષ્ઠના ઉપલા ભાગે આપેલી જગ્યામાં તમારી ક્રમાંક સંખ્યા (રોલ નંબર) લખો.
2. તમે જે વિકલ્પનો ઉત્તર આપો તેનો સ્પષ્ટ નિર્દેશ કરો.
3. ટૂંક નોંધ કે નિબંધ પ્રકારના પ્રશ્નોના ઉત્તર દરેક પ્રશ્નની નીચે આપેલી જગ્યામાં જ લખો. વધારાના કોઈ કાગળનો ઉપયોગ કરશો નહીં.
4. અંદર આપેલી સૂચનાઓ ધ્યાનથી વાંચો.
5. આ ઉત્તરપોથીને અંતે આપેલું પૃષ્ઠ કાચા કામ માટે છે.
6. આ ઉત્તરપોથીમાં ક્યાંય પણ તમારી ઓળખ કરાવી દે એવી રીતે તમારું નામ કે કોઈ ચોક્કસ નિશાની કરી હશે તો તમે આ પરીક્ષા માટે ખેરલાયક સાબીત થશો.
7. કેલક્યુલેટર અથવા ઈલેક્ટ્રોનિક્સ સાધનો જેવા ઉપયોગ કરવો નહીં.
8. નકારાત્મક ગુણાંક પદ્ધતિ નથી.
9. પ્રશ્નપત્ર લખાઈ રહે એટલે આ ઉત્તરપોથી તમારા નિરીક્ષકને આપી દેવી. પરીક્ષાખંડની બહાર કોઈપણ પ્રશ્નપત્ર લઈ જવું નહીં.

#### FOR OFFICE USE ONLY Marks Obtained

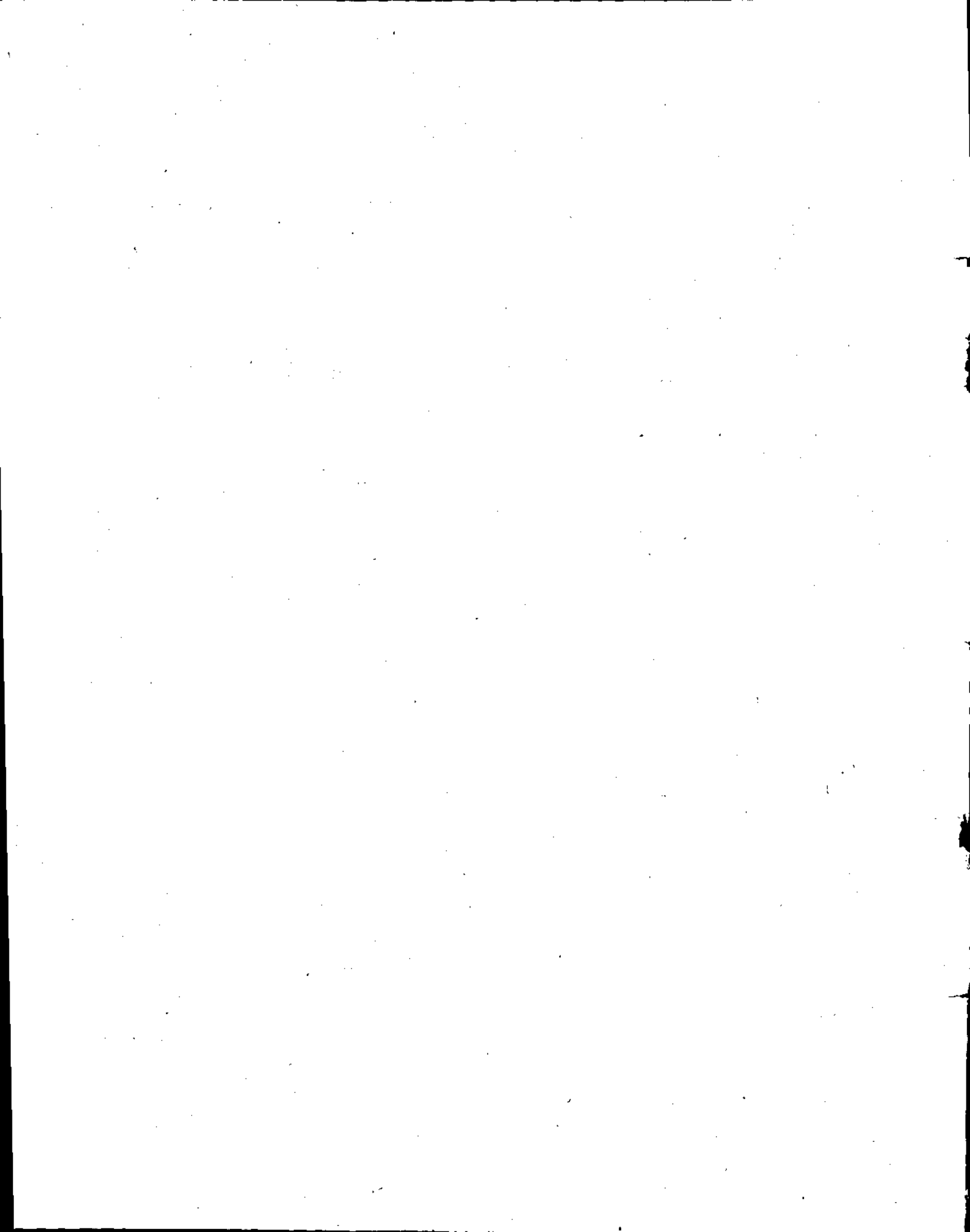
Question Number	Marks Obtained	Question Number	Marks Obtained	Question Number	Marks Obtained
1		26		51	
2		27		52	
3		28		53	
4		29		54	
5		30		55	
6		31		56	
7		32		57	
8		33		58	
9		34		59	
10		35		60	
11		36			
12		37			
13		38			
14		39			
15		40			
16		41			
17		42			
18		43			
19		44			
20		45			
21		46			
22		47			
23		48			
24		49			
25		50			

Total Marks Obtained.....

Signature of the co-ordinator.....

(Evaluation)

SEAL



## LIFE SCIENCE

### Paper III

Note :— (a) Answer any 20 questions out of the given 60 questions.

(b) All questions carry equal marks.

(c) Answer each question in about 200 words (2 pages).

1. Give a general account of floristic diversity of Southern Gujarat.
2. Describe different embryo types seen in dicotyledons.
3. Discuss various views on stomatal movements. Add a note on the role of constituent CO<sub>2</sub> fixation pathway.
4. Discuss the principles of numerical taxonomy.
5. Give an account of self-incompatibility in plants.
6. Examine application of plant tissue culture in agriculture.
7. Give an account of various edible fungi.
8. Give method and mechanism of histochemical localization of any two metabolites in relation to cell organelle in plant tissues.
9. Examine critically uses of male sterility in plants.
10. Discuss origin of cultivated wheat.
11. Elucidate role, symptoms of toxicity and deficiency of any two trace elements in plants.
12. Give an illustrative account of crustacean larvae.
13. Discuss the biological role of bioluminescence giving suitable examples.
14. Discuss the endocrine control of digestion in mammals.
15. Give experimental evidence emphasising the role of chorda-mesoderm in amphibian development.
16. Discuss the physiological alterations associated with avian migration.
17. Discuss the significance of mimicry in animal life.
18. Discuss the spectrum of parental care exhibited by vertebrates.

19. What do you understand by the term IPM ? Discuss it with reference to agricultural pests.
20. Describe the life-cycle of the silkworm.
21. Give an account of adaptive radiation in reptiles.
22. Describe the composition and functions of blood in a mammal.
23. Discuss the organization of societies in Hymenoptera.
24. Give an account of major drug yielding plants of Gujarat.
25. Describe the morphology and functioning of T-tubular system in a skeletal muscle.
26. Give an account of extant forms of Indian gymnosperms.
27. In the present scenario discuss the importance of blood matching and analysis before marriage. Add a note on genetic counselling.
28. Enumerate differences in chemical composition of cell membranes of animals, plants and microbes.
29. Describe different phases of cell cycle in the eukaryotic cell. Add a note on the genes responsible for its regulation.
30. Discuss recent trends in microbial classification.
31. Discuss various mechanisms of plant growth promotion by rhizobacteria.
32. Give an account of cell-mediated and humoral immune response.
33. Define isozymes, demonstrate their detection and physiological significance.
34. Write short notes on :
  - (i) Three-dimensional structure of *t*-RNA;
  - (ii) Ramachandran plot.

35. Describe in brief, regulation of branched chain amino acid synthesis.
36. What are energy rich bonds ? Discuss their role in manipulating cell functions.
37. Describe different types of DNA repair mechanisms in Eukaryotes.
38. Describe various experiments and their results for deciphering genetic code.
39. What is operon ? Describe the structure of tryptophan operon. Add a note on the importance of attenuation in its regulation.
40. Give a brief account of initiation, promotion and progression phases of chemical carcinogenesis.
41. Distinguish between :
- (i) Topoisomerase and Gyrase;
  - (ii) Class I and II restriction endonucleases.
42. Justify : "*E. coli* and yeast are the best expression systems for hyperproduction of bioactive molecules."
43. Describe methods to generate established cell lines, cell clones and primary culture. Add a note on their applications.
44. What is the role of Na/K ATPase in maintenance of resting membrane potential ? Justify its significance in secondary active transport.
45. Explain the principle of gel filtration chromatography and its applications.
46. Write brief comments on southern and northern blotting and their applications.
47. How does ionizing radiation cause damage to biological system ? Describe direct and indirect effects of ionizing radiation.
48. Explain :
- (i) Test of significance;
  - (ii) Probability distribution.

49. Comment :
- (i) Analysis of variance;
  - (ii) Regression analysis.
50. Discuss the management of estuarine fisheries of west-coast of India.
51. Give an account of gradual biodegradation of Chilka lake.
52. Describe hypo and hyperthyroidism and its effects in man.
53. Write the principle and applications of phase contrast microscopy.
54. Describe the process of fixation, block making, section cutting and staining of animal tissues.
55. Describe the principle and applications of ion exchange and affinity chromatography.
56. Discuss the concept of a stable ecosystem citing a lake as an example.
57. Discuss the objectives and methods of Environmental Impact Assessment.
58. State and explain the principle enunciated by Hardy and Weinberg. Add a note on its significance.
59. Justify the mushrooming of urea fertilizer industry even in the presence of nitrogen fixing microflora.
60. Describe the causative agent, symptoms and control measures of any *two* pathogenic organisms affecting human beings.