

PART – II

Total Number of
Questions : 40

Maximum Marks : 200

Time : 3 Hours

INSTRUCTIONS (നിർദ്ദേശങ്ങൾ)

1. Question cum Answer Booklets are processed by electronic means. The following instructions are to be strictly followed to avoid invalidation of answer scripts.
(ചോദ്യവും ഉത്തരവും അടങ്ങുന്ന ഈ ബുക്ക് ലെറ്റുകൾ ഇലക്ട്രോണിക് സാങ്കേതിക വിദ്യയുടെ സഹായത്തോടുകൂടെ മൂല്യനിർണ്ണയം നടത്തുന്നതിനാൽ ഇവ അസാധുവാകാതിരിക്കുവാൻ താഴെപ്പറയുന്ന നിർദ്ദേശങ്ങൾ പൂർണ്ണമായും പാലിക്കുക.)
2. The first page of this question cum Answer Booklet is an OMR data Sheet (Part I). All entries in the OMR sheet are to be made with blue or black ball point pen only.
(ഈ പുസ്തകത്തിന്റെ ഒന്നാമത്തെ പേജ് ഒരു ഒ.എം.ആർ. ഡാറ്റാ ഷീറ്റാണ് (പാർട്ട് I). ഇത് നീലയോ, കറുപ്പോ നിറത്തിലെ ബോൾ പോയിന്റ് പേന ഉപയോഗിച്ച് മാത്രമേ പൂരിപ്പിക്കാവൂ.)
3. Make sure that register number is bubbled correctly and completely; no correction is permitted.
(രജിസ്റ്റർ നമ്പർ രേഖപ്പെടുത്തുന്നതിനുള്ള കുமிழകൾ കൃത്യമായും പൂർണ്ണമായും കറുപ്പിച്ചിട്ടുണ്ടെന്ന് ഉറപ്പു വരുത്തുക. തിരുത്തലുകൾ അനുവദനീയമല്ല.)
4. Do not tamper the bar code printed on the OMR sheet and subsequent pages. Tampering of bar code will result in the invalidation of this booklet.
(ഈ പുസ്തകത്തിൽ എവിടെയും പ്രിന്റ് ചെയ്തിരിക്കുന്ന ബാർ കോഡിൽ ഒരു കാരണവശാലും തിരുത്തലുകളോ, മാർക്കുകളോ പാടില്ല. ഇതിനു വിരുദ്ധമായി ചെയ്യുന്ന പക്ഷം ഈ പുസ്തകം അസാധുവാകുന്നതാണ്.)
5. Answers should be written with blue or black ball point pen only.
(ഉത്തരങ്ങൾ നീലയോ, കറുപ്പോ നിറത്തിലെ ബോൾ പോയിന്റ് പേന ഉപയോഗിച്ച് മാത്രമേ എഴുതാവൂ.)
6. Do not write anything outside the margin of space provided for writing the answer and write only one line of answer between two lines.
(പുസ്തകത്തിൽ ഉത്തരം എഴുതുവാൻ നൽകിയിരിക്കുന്ന സ്ഥലത്തിനു വെളിയിൽ യാതൊന്നും തന്നെ എഴുതുവാൻ പാടില്ല. രണ്ടു വരകൾക്കിടയിൽ ഒരു വരി ഉത്തരം മാത്രമേ എഴുതുവാൻ പാടുള്ളൂ.)
7. Rough work should be done only in the specific page provided with.
(റഫ് വർക്കുകൾ ഇതിനായി നൽകിയിരിക്കുന്ന പേജിൽ മാത്രമേ ചെയ്യുവാൻ പാടുള്ളൂ.)

1. Evaluate the influence of water canal system and water vascular systems in animals for surviving in their habitats. (5 Marks)
2. Enumerate the reasons for the enormous diversity of Arthropods and Reptiles. (5 Marks)
3. Discuss the significance of *in-situ* and *ex-situ* conservation strategies in wildlife conservation, citing suitable examples. (5 Marks)
4. Explain the major threats to wildlife and suggest measures to mitigate them. (5 Marks)
5. Describe the different methods used for wildlife population monitoring, including direct and indirect counting techniques. (5 Marks)
6. Discuss the role of keystone, edge and umbrella species in maintaining ecological balance with examples. (5 Marks)
7. Provide an overview of wildlife conservation laws and policies in India, highlighting the Indian wildlife (Protection) Act, 1972 and the Biological Diversity Act, 2002. (5 Marks)
8. What is meant by indirect method of wildlife sampling? Describe the different types. (5 Marks)
9. Discuss any five types of animal communication with examples. (5 Marks)
10. Distinguish between home range and territory with examples. (5 Marks)
11. Why population control of wildlife is important? Discuss its methods. (5 Marks)
12. What is photogrammetry? How AI can support it? (5 Marks)
13. Cyanide is a potent poison that inhibits cytochrome c oxidase (Complex IV) in the electron transport chain. Explain how cyanide poisoning affects cellular respiration and ATP production. (5 Marks)

14. Explain the significance of the Ramachandran plot in understanding protein structure. What information can be derived from it about the conformational angles of amino acid residues? (5 Marks)
15. Fossils provide crucial evidence for evolution and past life forms. However, the process of fossilization is rare and depends on specific conditions. (5 Marks)
- (a) Explain the process of fossilization and the conditions necessary for it to occur.
 - (b) Discuss the significance of fossils in understanding evolutionary relationships with an example.
16. Mate choice and sexual selection play a significant role in the evolution of species. (5 Marks)
- (a) Differentiate between intrasexual and intersexual selection with suitable examples.
 - (b) Explain how sexual conflict arises during parental care and its impact on reproductive success.
17. The biological clock regulates various physiological processes in organisms. (5 Marks)
- (a) Explain the concept of synchronization in biological clocks and its significance.
 - (b) What is masking in biological rhythms? Provide an example to illustrate its role in modifying behavior.
18. Compare and contrast the roles of sympathetic and parasympathetic nervous system. (5 Marks)
19. Analyse the oxygen-hemoglobin dissociation curve and explain its physiological significance. (5 Marks)
20. Explain the structure and function of a nephron. (5 Marks)
21. A person is bleeding heavily. Apply your knowledge of physiology to explain the body's compensatory mechanisms. (5 Marks)

22. A patient shows symptoms of hyperthyroidism. Apply physiological knowledge to explain them. (5 Marks)
23. How does the classical pathway of complement system differ from the alternate and lectin pathways? (5 Marks)
24. What is the cause of DiGeorge syndrome and explain how it affects immunity? (5 Marks)
25. Explain the procedure of ICSI and give any two situations in which it is used in fertility treatments. (5 Marks)
26. What are the key morphogenetic movements during gastrulation and explain how they contribute to gastrulation? (5 Marks)
27. What is lethal genes? Explain any two lethal gene disorders in man. (5 Marks)
28. Discuss the genetic mechanism of ABO blood group system in man. (5 Marks)
29. What are the key components and steps involved in PCR and write any two applications? (5 Marks)
30. Explain the Sanger method of DNA sequencing. (5 Marks)
31. Differentiate between exponential and logistic growth in a population. (5 Marks)
32. What are r-strategists and K-strategists? Give examples. (5 Marks)
33. Describe ecological succession with stages and an example. (5 Marks)

34. Discuss the impact of Kerala Flood 2018 and disaster management strategies used. (5 Marks)
35. What is bioremediation? Explain its role in pollution control. (5 Marks)
36. Describe the structural components of the cytoskeleton and analyse their respective roles in maintaining cell shape and function. (5 Marks)
37. Mitosis and meiosis share fundamental mechanisms but serve distinct biological purpose. How do differences in chromosomal behavior during meiosis contribute to genetic diversity and why is this diversity crucial for evolution? (5 Marks)
38. Explain how the activation and inactivation cycle of heterotrimeric G proteins regulate intracellular signalling. (5 Marks)
39. Explain the three major types of post-transcriptional modifications in eukaryotic mRNA. Analyse how each modification contributes to gene regulation and mRNA stability. (5 Marks)
40. Describe the Operon model of gene regulation in prokaryotes using the lac operon as an example. Discuss how the lac operon is regulated under different physiological conditions. (5 Marks)