

**Previous year questions (2016-2020)**

**Department of Zoology**

**Nambol L. Sanoi college, Nambol**

**QUESTION BANK**

**ZOOLOGY (HONOURS)**

**5<sup>th</sup> SEMESTER SIXTH PAPER**

**Zoo: 506 : Evolution, Adaptation, Ethology, Biotechnology and Bioinstrumentation**

**UNIT 1: EVOLUTION**

**MCQ (1 Mark)**

- 1) A shark, a dolphin and a sea turtle live in the same aquatic environment though they are distantly related, this type of adaptation is an example of adaptive radiation 2019
  - (i) aquatic adaptation
  - (ii) adaptive convergence
  - (iii) marine adaptation
- 2) The book, Origin of Species was published in 2019
  - (i) 1859
  - (ii) 1832
  - (iii) 1809
  - (iv) 1858
- 3) Recapitulation Theory' was formulated by 2020
  - (i) von Baer
  - (ii) Ernst Haeckel
  - (iii) Darwin
  - (iv) Lamarck

**Very short answer (1 mark)**

1. Which compound or substance is used as indicator in establishing natural relationship in precipitin test? 2016
2. Define interspecific struggle with one example. 2017
3. Name the scientist who proposed the theory of catastrophism. 2018
4. Who postulated the recapitulation theory? 2018
5. A species like mice or fruit fly may get isolated if they travel on a ship to a relatively virgin island. New speciation starts because the original new populations are not in contact anymore and do not interbreed. The original gene pool cut-off and certain rare genes that may have surfaced in the new population may cause it manifest modified characteristics and ultimately new species. Name the type of speciation. 2018
6. Darwin's finch of Galapagos Islands is an example of adaptive radiation. Who and in which year developed the concept of adaptive radiation? 2018
7. Define adaptive radiation. 2019
8. Who profounded recapitulation theory? 2019
9. Write the main drawback of Lamarck's a theory. 2019
10. Who profounded mutation theory? 2020
11. Define Speciation. 2020

**Short answer (3marks)**

1. Differentiate between adaptive convergence and adaptive divergence giving two points only. 2016
2. What is lac operon model? Mention one main feature of it. 2016

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|---|------|
| 3. Distinguish between serial homology and biochemical homology giving two points.      | 2016 |
| 4. Differentiate between Allopatric And Sympatric speciation by giving two points.      | 2017 |
| 5. Discuss the significance of 'genetic drift' by giving at least three points.         | 2017 |
| 6. Differentiate between homologous and analogous structures and give one example each. | 2018 |
| 7. Differentiate between Allopatric speciation and Sympatric speciation                 | 2019 |
| 8. Write short notes on Adaptive convergence  | 2020 |
| 9. Write short notes on Hardy-Weinberg principle  | 2020 |
| 10. How does vestigial organs provide evidence in support of organic evolution?         | 2020 |

**Long answer questions (6marks)**

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|--|------|
| 1. Discuss the embryological evidences in favour of organic evolution. | 2020 |
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**Long answer questions (12marks )**

- |   |      |
|---|------|
| 1. What is Hardy-Weinberg equilibrium? Discuss the equilibrium with suitable example.                                   | 2016 |
| 2. What is point mutation? Discuss the role of mutation in evolution.   | 2016 |
| 3. Describe the evolutionary history of modern man stating different paleontological records.                           | 2016 |
| 4. Define natural selection. Write brief accounts on directional stabilizing and disruptive types of natural selection. | 2017 |
| 5. Define Sewall Wright effect. Discuss its importance in the process of evolution.                                     | 2017 |
| 6. State the Hardy-Weinberg law. Describe the significance of this law in the process of evolution.                     | 2018 |
| 7. What is point mutation? Discuss the role of mutation in evolution.   | 2018 |
| 8. Define organic evolution. Explain the evidence of evolution of animals from physiological and biochemical concepts.  | 2018 |
| 9. Describe the evolutionary history of modern man from fossil records.   | 2018 |
| 10. State the Hardy-Weinberg law. Describe the significance of this law in the process of evolution.                    | 2018 |
| 11. What is point mutation? Discuss the role of mutation in evolution.  | 2018 |
| 12. Define organic evolution. Explain the evidence of evolution of animals from physiological and biochemical concepts. | 2018 |
| 13. Describe the evolutionary history of modern man from fossil records.  | 2018 |
| 14. Give an account of modern synthetic theory of evolution.  | 2020 |
| 15. What is point mutation? Discuss the role of mutation in evolution.  | 2020 |

**UNIT 2: ADAPTATION**

**MCQ (1 Mark)**

- |   |      |
|---|------|
| 1. The example of aggressive mimicry from the following is            | 2018 |
| (i) Sea dragon  |      |
| (ii) Monarch butterfly  |      |
| (iii) Viceroy butterfly   |      |
| (iv) Sargassum fish   |      |
| 2. In birds, during flight the wings are raised by the contraction of | 2019 |
| (i) pectoralis major  |      |
| (ii) pectoralis minor   |      |
| (iii) intrinsic muscle  |      |
| (iv) deltoid muscle   |      |
| 3. One of the most important characteristics of volant adaptation is  | 2020 |
| (i) pneumatic bones   |      |
| (ii) binocular vision   |      |

- (iii) presence of renal portal system
- (iv) absence of hepatic portal system

**Very short answer questions (1 mark)**

4. Name the English Naturalist who propounded the phenomenon of mimicry in 1862 on his studies of butterflies. 2016
5. Whales can live longer in the seawater due to the presence of a network of blood capillaries inside its inner abdominal cavity. Name the blood capillary. 2017
6. Name the organ which produces sound in Cicada. 2017
7. Why do cave animals have pale and ghost like appearance and almost blind? 2018
8. Name one permanent cave salamander. 2020
9. What is the most important function of blubber? 2020

**Short answer questions (2marks)**

1. What is camouflaging? 2017

**Long answer questions (6marks)**

1. Discuss the characteristic modifications of cursorial adaptation giving six points. 2016
2. What are the basic features of deep-sea and how the deep-sea forms are modified to overcome them? 2016
3. Describe the modification of foot in cursorial adaptation. 2020
4. Describe the structural modification of primary aquatic animals. 2020

**Long answer questions (12marks)**

1. Discuss the structural adaptations in the volant mode of life and desert way of living in animals. 2017
2. How do Bruce-Wallace and Adrian M. Srb define adaptation? What is inherited adaptation? Write the structural modifications of primary and secondary aquatic adaptations by giving five points each. 2018
3. Discuss the structural modification of desert and cursorial adaptation giving suitable examples. 2019

**UNIT 3: ETHOLOGY**

**MCQ (1 Mark)**

1. The term 'ethology' was introduced in its correct perspective by 2020
  - (i) Karl von Frisch
  - (ii) Konrad Lorenz
  - (iii) E. O. Wilson
  - (iv) Niko Tinbergen

**Very short answer questions (1 mark)**

1. The young ones of dragonflies fly at dawn, whereas the adults fly during the day. What type of rhythm does it show? 2016
2. What is circadian rhythm? 2018
3. Name the scientist who got the Nobel Prize for discovering and interpreting the language of honeybees' relating with their communication signal. 2018

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|---|------|
| 4. What is orientation behaviour?                                       | 2019 |
| 5. Name the scientist who first discovered 'waggle dance' in honeybees. | 2019 |
| 6. What does waggle dance of honeybee mean?                             | 2020 |

**Short answer questions (2/3marks)**

- |   |      |
|---|------|
| 1. Give one example each of 'innate' behaviour and learned' behaviour.  | 2016 |
| 2. What is the activity of Marker pheromone with regards to communication in ants?  | 2016 |
| 3. Write a short note Tactile communication   | 2016 |
| 4. Write about the operant conditioning behaviour in animals.   | 2017 |
| 5. Define 'zeitgeber concept'.  | 2017 |
| 6. Write about the imprinting behaviour in animals.   | 2017 |
| 7. Write one point on the significance of the study of animal behaviour. Mention any two endogenous factors which can control the behaviour of an animal. | 2018 |
| 8. Write a short note on either sex- pheromones or visual communication in insects.   | 2018 |
| 9. Differentiate between Circadian rhythms and Circannual rhythms   | 2019 |
| 10. Write a short note on Hormones and Pheromones With examples   | 2019 |
| 11. Write a short note on Functions of pheromones in insects  | 2020 |
| 12. Write three points of parental care as shown by nest-building fish.   | 2020 |

**Long answer questions (12 marks)**

- |   |      |
|---|------|
| 1. Write an essay on migration of fishes or parental care in fishes.                | 2016 |
| 2. Define migration. Write a brief account on Bird migration.                       | 2017 |
| 3. Write an essay either on parental care in fishes or migration of fishes.         | 2018 |
| 4. Write an essay on migration of birds. What are the advantages of migration       | 2019 |
| 5. Describe the courtship behaviour in fishes or birds by giving relevant examples. | 2020 |

**UNIT 4: BIOTECHNOLOGY**

**MCQ (1 Mark)**

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|--|------|
| 1. Restriction endonucleases are enzymes which                     | 2018 |
| a. remove nucleotides from the ends of the DNA molecule            |      |
| b. make cuts at specific position within the DNA molecule          |      |
| c. recognize specific nucleotide a sequence for binding DNA ligase |      |
| d. restrict the action of the DNA polymerase enzyme                |      |

**Very short answer questions (1 mark)**

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|---|------|
| 2. The alcohol content of which is highest amongst champagne, whiskey and wine?   | 2016 |
| 3. Give the name of the first transgenic cow.   | 2017 |
| 4. Write the full form of FMDV.   | 2017 |
| 5. What do you mean by cell banks?  | 2018 |
| 6. Biotechnology is a boon to diabetics. Give one important reason.   | 2018 |
| 7. Why is serum used as biological fluid as natural culture media in animal tissue culture?   | 2018 |
| 8. Why is serum added to animal cell culture media?   | 2019 |
| 9. Expand ELISA.  | 2019 |
| 10. How can a childless couple suffering from certain types of infertility have a child?  | 2019 |
| 11. Name the biotechnological technique/ forensic technique used in the identification of individuals from samples of their cells, blood, hair, skin, semen, etc. | 2019 |
| 12. Biotechnology is a boon to diabetics. Give one important reason.  | 2020 |
| 13. Nowadays synthetic insecticides are replacing by bioinsecticides. Give one reason for this.   | 2020 |
| 14. Do eukaryotic cells have restriction endonucleases? Justify your answer by giving one point.  | 2020 |

15. Name the class of immunoglobulin which is involved in hypersensitivity and allergy reaction. 2020

**Short answer questions (2/3marks)**

1. Mention two important uses of alcohol. 2016
2. Write short notes on Transgenic animals 2016
3. Write short notes on Algalization 2016
4. Write the scientific application and importance of IVF and ET in human beings. 2017
5. Write about the three applications of biotechnology. 2017
6. Genetic engineering 2017
7. Define hybridoma. 2017
8. Motivation and drive 2017
9. Genetic engineering will be of much importance in future. How would you account for this?  
Give three points to support your view 2018
10. What are Assisted Reproductive Technology (ART)? Suggest any two methods to assist infertile couples to have children. 2018
11. Nowadays synthetic insecticides are replacing by bioinsecticides. What are the reasons for this? 2018
12. Write short notes on (any three):
  - (a) Gene therapy 2019
  - (b) Uses of DNA fingerprinting
  - (c) Restriction endonuclease
  - (d) Transgenic animals
13. Write short notes on Transgenic animals. 2020

**Long answer questions (6 marks)**

1. Write the importance of bacteria in the field of biotechnology. 2020

**Long answer questions (12 marks)**

2. Enumerate the techniques of animal cell and tissue culture. 2016
3. Discuss the application of genetic engineering principles in medical sciences. 2016
4. Discuss the importance of virus and bacteria in the field of Modern Biotechnology. 2017
5. Describe the different steps involved in recombinant DNA technology. 2018
6. What is fermentation? Write an essay on commercial production of ethanol. 2018
7. Describe the principle technique of animal cell culture. 2019
8. What is assisted reproductive technology? Give five methods of assisted reproductive technology which help infertile couples to have children. 2020
9. Describe the different steps involved in recombinant DNA technology. 2020

**UNIT 5: BIOINSTRUMENTATION**

**MCQ (1 Mark)**

1. Prof. Zernike got the Nobel Prize in Physics for developing 2018
  - a. phase contrast microscope
  - b. simple microscope
  - c. compound microscope
  - d. electron microscope

**Very short answer questions (1 mark)**

2. What type of compounds are best separated by ion-exchange chromatography? 2016
3. Write one application of gel permeation chromatography. 2017

4. Write the application of spectro- photometer. 2019  
5. Write one application of chromatography. 2020

**Short answer questions (3marks)**

1. Write the general principle and application each of the following: 2016  
a. Spectrophotometer  
b. Centrifugation  
c. Chromatography
2. Write the general principle and one application for each of the following: 2017  
a. Microscopy  
b. Electrophoresis  
c. Centrifugation
3. Write in brief the general principles of each of the following: 2018  
a. Chromatography, Spectrophotometry, Centrifugation
4. Write the differences between Light microscope and Electron microscope 2019
5. Write the general principles of the following (any three): 2020  
(a) Microscopy  
(b) Electrophoresis  
(c) Centrifugation  
(d) Spectrophotometry

**Long answer questions (6 marks)**

1. Write the principles of (a) chromatography and (b) electrophoresis. 2019