2017

(October)

ZOOLOGY

(Elective/Honours)

SIXTH PAPER

(Cell and Molecular Biology and Genetics)

Marks : 56

Time : 3 hours

The figures in the margin indicate full marks for the questions

Answer Question No. **1** and *any* **four** from the rest

1. Write in brief on any *three* of the following : 4×3=12

(a) Major Histocompatibility Complex (MHC)

(b) Genetic code

(c) Gene mutation

(d) Dosage compensation

(e) Paper chromatography

2. What is an operon? Give a detailed account of the Lac operon. 2+9=11

3. What is transcription? With the help of illustrations, describe the process of transcription in prokaryotes. What is the role of a promoter in transcription? 2+7+2=11

4. What is a karyotype? Describe how Down's syndrome, Turner's syndrome and Klinefelter's syndrome are genetic disorders in man. 2+3+3+3=11

5. What are immunoglobulins? Write a note on the structure and functions of the major classes of immunoglobulins found in man. 3+8=11

6. What is centrifugation? Describe the principle involved in centrifugation and add a note on the biological applications of centrifugation. 2+7+2=11

7. What do you mean by sex-linked inheritance? What are the main characteristics of sex-linked inheritance? With the help of illustrations, describe the pattern of inheritance of sex-linked genes taking one example each in *Drosophila* and man. 2+2+7=11

8. Write short notes on any *two* of the following : 5½×2=11

(a) Transposons

(b) Phenylketonuria

(c) Cytokines

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Answer Question No. **1** and *any* **four** from the rest

1. Write in brief on any *three* of the following : 4×3=12

(a) Genetic code

(b) Detection of mutation in *Drosophila* using Muller's ClB method

(c) Kappa particles in *Paramecium* as an example of extranuclear inheritance

(d) Major histocompatibility complex

(e) Centrifugation

2. What is DNA replication? Discuss the role of different enzymes and proteins involved in the process. 2+9=11

3. What is DNA damage? What are the different sources of DNA damage? Discuss various mechanisms of DNA repair. 1+2+8=11

4. What is sex determination? Elaborate on the sex determination system in human. Explain the characteristics of X-chromosomes in human female with reference to dosage compensation. 2+5+4=11

5. What is immunity? Distinguish between humoral and cell-mediated immune response. 2+9=11

6. What is translation? Describe the process of translation in prokaryotes with the help of illustrations. 2+9=11

7. Discuss the principles involved in microscopy. Differentiate between light and electron microscopy. 5+6=11

8. Write short notes on any *two* of the following : 5½×2=11

   (a) Colour blindness in man as an example of sex-linked inheritance

   (b) Down's syndrome

   (c) Genic balance theory

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(Cell and Molecular Biology and Genetics)

Marks : 56

Time : 3 hours

The figures in the margin indicate full marks for the questions

Answer Question No. **1** which is compulsory and *any* **four** from the rest

1. Write in brief on any *three* of the following : 4×3=12

(a) Haemophilia

(b) Fine structure of genes

(c) Dosage compensation

(d) Cytokines

(e) Kappa particles

2. What is lac operon? Discuss the mechanism of regulation of the lac operon. 2+9=11

3. Describe the DNA damage and repair mechanisms with suitable diagrams. 11

4. *(a)* Explain the cytogenetic basis of Down's syndrome and phenylketonuria in human. 6

   (b) Explain with suitable example the process of sex-linked inheritance in Drosophila. 5

5. *(a)* What do you understand by MHC? Discuss the structural and functional characteristics of MHC Class I and Class II antigens. 6

   (b) Discuss the mechanism of antigen-antibody reaction. 5

6. *(a)* Explain the principle and application of ion-exchange chromatography. 5

   (b) Compare light microscope with electron microscope. Discuss the significance of electron microscope in biology. 6

7. What is transcription? State the different steps of transcription mechanism in prokaryotes. 2+9=11

8. Write short notes on any *two* of the following : 5½×2=11

   (a) Sex determination in man

   (b) Immunoglobulins

   (c) Transposons

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2017

(October)

ZOOLOGY

(Honours)

FIFTH PAPER

(Functional Anatomy, Zoogeography and Adaptations)

Marks : 56

Time : 3 hours

The figures in the margin indicate full marks for the questions

Answer Question No. **1** which is compulsory and **four** from the rest

1. Write in brief on any *three* of the following : 4×3=12

(a) Barrier and Atoll reefs

(b) Piercing and sucking mouthparts in insects

(c) Protective mimicry

(d) Scales in fishes

(e) Poison apparatus in snakes

2. With suitable diagrams, describe the structure and functions of canal system in Porifera. 11

3. Describe the process of torsion and detorsion in gastropods. 11

4. What are accessory respiratory organs? Describe different types of accessory respiratory organs found in fishes. 2+9=11

5. Describe in detail the following : 5½+5½=11

(a) Affinities of Monotremata

(b) Desert adaptations

6. Describe in detail the comparative anatomy of kidney in vertebrates. 11

7. Describe the following : 5½+5½=11

(a) Parasitic adaptations

(b) Flight adaptation in birds

8. Write short notes on any *two* of the following : 5½×2=11

(a) Vision in insects

(b) Locomotion in Protozoa

(c) Affinities of Balanoglossus

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ZOOLOGY

(Honours)

FIFTH PAPER

(Functional Anatomy, Zoogeography and Adaptations)

Marks : 56

Time : 3 hours

The figures in the margin indicate full marks for the questions

Answer Question No. **1** and *any* **four** from the rest

1. Write in brief on any *three* of the following : 4×3=12

(a) Spicules of sponges

(b) Chewing and sucking mouthparts of insects

(c) Fins in fishes

(d) Four differences between poisonous/ venomous and non-poisonous/ non-venomous snakes

(e) Differences between protective and aggressive mimicry

2. Define polymorphism. Describe polymorphism in *Siphonophora* with the help of suitable diagrams. Add a note on the significance of polymorphism. 2+7+2=11

3. Describe the general characters and affinities of *Dipnoi*. 5+6=11

4. Describe in detail the following : 5½+5½=11

   (a) Coral reefs

   (b) Migration of fishes

5. Write critical notes on any *two* of the following : 5½×2=11

   (a) Affinities of Onychophora

   (b) Affinities of *Amphioxus*

   (c) Affinities of marsupials

6. What is zoogeography? Name the different zoogeographic realms of the world. Describe the faunal distribution in these realms. 1+3+7=11

7. Describe the following : 5½+5½=11

   (a) Aquatic adaptations of vertebrates

   (b) Structural features of a compound eye of insects

8. Write short notes on any *two* of the following : 5½×2=11

   (a) Locomotion in Protozoa

   (b) Dentition in Mammals

   (c) Coelomoducts in Annelida

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5/H–63 (v) (Syllabus–2015)

2019

(October)

ZOOLOGY

(Honours)

FIFTH PAPER

(Functional Anatomy, Zoogeography and Adaptations)

Marks : 56

Time : 3 hours

The figures in the margin indicate full marks for the questions

Answer Question No. **1** which is compulsory and *any* **four** from the rest

1. Write in brief on any *three* of the following : 4×3=12

(a) Pseudopodia in Protozoa

(b) Nephridia in Annelids

(c) Coral and coral reefs

(d) Vision in insects

(e) Neotropical region

2. Give an account of the different types of canal system found in sponges with suitable diagrams. 8+3=11

3. What is retrogressive metamorphosis? Discuss with reference to Ascidia with suitable diagram. 2+7+2=11

4. Describe in detail on any *two* of the following : 5½×2=11

(a) Torsion in gastropods

(b) Types of mouth parts in insects

(c) Parasitic adaptations

5. *(a)* Give a comparative account of Petromyzon and Myxine. 5½

(b) Write on the affinities in *Balanoglossus*. 5½

6. Define adaptation. Give an account of the adaptive modifications in terrestrial animals under the cursorial mode of life. 2+9=11

7. Define accessory respiratory organs in fish. Discuss different types of accessory respiratory organs with suitable diagrams. 2+7+2=11

8. Write short notes on any *two* of the following : 5½×2=11

(a) Parental care in amphibia

(b) Migration in birds

(c) Colouration and mimicry

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