R1021

Sub. Code
509201

M.Sc. DEGREE EXAMINATION, APRIL – 2024

Second Semester

Zoology

ANIMAL PHYSIOLOGY

(CBCS – 2022 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

Answer **all** the following objective type questions by choosing the correct option.

1. Pancreatic juice contains which enzyme that break emulsified fats (CO1, K1)

   (a) Lipase (b) Trypsin

   (c) Pepsin (d) Amylase

2. Villi helps in ———— function. (CO1, K2)

   (a) Absorption of food

   (b) Nutrient delivery to blood

   (c) Moving food to large intestine

   (d) None of these

3. Which of the following blood cells play important role in blood clotting? (CO2, K1)

   (a) Macrophages (b) Thrombocytes

   (c) Neutrophils (d) Erythrocytes

4. This plasma protein plays important role in blood clotting (CO2, K2)

(a) Albumin (b) Globulin

(c) Fibrinogen (d) None of these

5. The universal acceptor blood group is (CO3, K1)

(a) A (b) B

(c) AB (d) O

6. This blood vessel carries deoxygenated blood (CO3, K2)

(a) Pulmonary artery (b) Pulmonary vein

(c) Aorta (d) None of these

7. In muscle contraction this ion is essential (CO4, K2)

(a) Cl (b) Na

(c) Ca (d) Br

8. In the striated muscle the functional unit of contractile system is (CO4, K2)

(a) Z-line (b) Sarcomere

(c) Cross bridge (d) Myofibril

9. The basic unit of nervous system is (CO5, K2)

(a) Glial cell (b) Neuron

(c) Meninges (d) Cerebrospinal fluid

10. What is the common neurotransmitter? (CO5, K3)

(a) GABA (b) Serotonin

(c) Acetylcholine (d) All the above

Part B (5 × 5 = 25)

Answer **all** the questions not more than 500 words each.

11. (a) Briefly discuss about the buccal digestion in human. (CO1, K2)

Or

(b) Discuss about the functions of blood plasma. (CO1, K2)

12. (a) Draw the structural anatomy of heart. (CO2, K2)

Or

(b) Draw and illustrate the structure of kidney. (CO2, K4)

13. (a) What are the different types of muscles present in the body? (CO3, K2)

Or

(b) Briefly discuss about the transmission of nerve impulse. (CO3, K2)

14. (a) Give a short account on homeotherms. (CO4, K3)

Or

(b) How the fish tolerate cold and freezing conditions? (CO4, K4)

15. (a) Give a short account on trophic hormones. (CO5, K2)

Or

(b) Briefly discuss about the chronobiology. (CO5, K4)

Part C (5 × 8 = 40)

Answer **all** questions not more than 1000 words each.

16. (a) Discuss about digestion and absorption of food in human body. (CO1, K3)

Or

(b) Discuss about the constituents of human blood. (CO1, K2)

17. (a) Write about the principle and significance of Electro Cardio Gram (ECG). (CO2, K3)

Or

(b) Draw the structure of nephron and discuss about the excretory system. (CO2, K4)

18. (a) Discuss the sliding filament theory of muscle contraction. (CO3, K2)

Or

(b) Give a detail account on neuromuscular signal transmission. (CO3, K3)

19. (a) Discuss about the thermoregulation in poikilotherm and homeotherm. (CO4, K4)

Or

(b) Describe the osmotic regulation of marine and aquatic fishes. (CO4, K2)

20. (a) Give an account on the mechanism of hormone action. (CO5, K2)

Or

(b) Discuss about the different types of biological clocks and write about their importance. (CO5, K2)

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R1022

Sub. Code
509202

M.Sc. DEGREE EXAMINATION, APRIL – 2024

Second Semester

Zoology

IMMUNOLOGY

(CBCS – 2022 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

Answer **all** the following objective questions by choosing the correct option.

1. Antibodies are formed from ————————. (CO1, K1)

   (a) Macrophage

   (b) T-Cells

   (c) B-cells

   (d) Null cells

2. Lymph nodes are ———————— lymphoid organs. (CO1, K2)

   (a) Primary

   (b) Secondary

   (c) Tertiary

   (d) None of these

3. CD4 T cells are called (CO2, K1)

(a) T-helper cells

(b) T-cytotoxic cells

(c) T-suppressor cells

(d) None of these

4. Cell mediated immunity is performed by (CO2, K2)

(a) B-cells

(b) T-cells

(c) Antibodies

(d) None of these

5. Antimicrobial activities of sweat and lacrimal glands are called ———————— immunity. (CO3, K1)

(a) Acquired

(b) Innate

(c) Cell mediated

(d) Humoral

6. The immunity obtained after the infection is called (CO3, K2)

(a) Passive

(b) Acquired

(c) Humoral

(d) Innate

7. Which one of the antibodies involved in Type I hyper sensitivity? (CO4, K2)

(a) IGM

(b) IG G

(c) IG E

(d) None of these

8. MRC class I molecules are found in (CO4, K2)

(a) Macrophages

(b) B-cells

(c) T-cells

(d) All nucleated cells

9. These cell numbers reduced during AIDS (CO5, K2)

(a) T-cytotoxic

(b) T-helpers

(c) B-cells

(d) Macrophage

10. The normal and abnormal cells in the fluid can be identified through (CO5, K3)

(a) FTIR

(b) Flow cytometry

(c) ELISA

(d) None of these

Part B (5 × 5 = 25)

Answer **all** the questions not more than 500 words each.

11. (a) Draw and illustrate the structure of antibody. (CO1, K3)

Or

(b) Briefly discuss about primary lymphoid organs. (CO1, K2)

12. (a) Write short note on Natural killer cells. (CO2, K2)

Or

(b) Compare the immunity as a fort protecting itself from the enemy attack. (CO2, K4)

13. (a) Briefly discuss about immune-prophylaxis. (CO3, K2)

Or

(b) Write short note on autoimmunity. (CO3, K2)

14. (a) Discuss about the significance of MHC. (CO4, K3)

Or

(b) Write an account on cell mediate immunotherapy for cancer treatment. (CO4, K4)

15. (a) Briefly discuss about immunohistochemistry. (CO5, K2)

Or

(b) Discuss about the advantages of hybridoma technology. (CO5, K4)

Part C ($5 \times 8 = 40$)

Answer **all** the questions not more than 1000 words each.

16. (a) Discuss about the cells involved in the immune system of the body. (CO1, K3)

Or

(b) Give a detail account about the different types of antibodies. (CO1, K2)

17. (a) Write elaborately about the antigen antibody interactions. (CO2, K3)

Or

(b) Compare and contrast the humoral and cell mediated immunity. (CO2, K4)

18. (a) Write an account on different types of vaccines. (CO3, K2)

Or

(b) Discuss about the immune response during bacterial and viral infections. (CO3, K3)

19. (a) Give an account on tumour and transplantation immunology and their advances. (CO4, K4)

Or

(b) Write an account on different types of hypersensitivity. (CO4, K2)

20. (a) Give a detailed account of different types of ELISA. (CO5, K2)

Or

(b) Discuss about the RIA and Western Blotting technology and their uses. (CO5, K2)

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R1023

Sub. Code
509203

M.Sc. DEGREE EXAMINATION, APRIL – 2024

Second Semester

Zoology

DEVELOPMENTAL BIOLOGY

(CBCS – 2022 onwards)

Time : Three Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

Answer **all** the following objective type questions by choosing the correct option

1. A single cell to multiply and produce all of the differentiate cell in an organism is called (CO1, K2)

   (a) Totipotency (b) Pluripotency

   (c) Multipotency (d) Oligopotency

2. Stem cells have _____ types. (CO1, K2)

   (a) Four (b) Five

   (c) Ten (d) None of the above

3. Which one of the following is a nutritive medium for the ejaculated sperms (CO2, K2)

   (a) Seminal fluid (b) Fallopian tube

   (c) Vaginal fluid (d) Menstrual fluid

4. Naturally fertilization takes place in mammals (CO2, K2)

   (a) Oviduct (b) Vasa deferentia

   (c) outside of the body (d) All the above

5. Which of the following is develops first during organogenesis (CO3, K5)

(a) Cardiovascular system

(b) Digestive system

(c) Nervous system

(d) Reproductive system

6. Which type of cleavage found in mammals (CO3, K5)

(a) Holoblastic rotational

(b) Superficial

(c) Partial

(d) Meroblasic

7. *Caenorhabditis elegans* is model organism for _____ diseases. (CO4, K1)

(a) Insects (b) Birds

(c) Human (d) Soil-dwelling nematode

8. What is the key role of SOX 9 gene _____?(CO4, K1)

(a) Sex determination before birth

(b) Development of Skeleton

(c) Kidney Development

(d) Both (a) and (b)

9. Which of the following is an extracellular messenger of apoptosis (CO5, K4)

(a) Tumor necrosis factor

(b) L-serine

(c) D-serine

(d) Ribozyme

10. Which of the following is an inhibitor of apoptosis? (CO5, K5)

(a) Caspase (b) IAP

(c) Bfl 1 (d) DIABLO

Part B (5 × 5 = 25)

Answer **all** questions not more than 500 words each.

11. (a) Explain the cell lineages. (CO1, K2)

Or

(b) Briefly describe the types of Symmetry. (CO1, K2)

12. (a) Neatly sketch the ultrastructure of sperm. (CO2, K2)

Or

(b) How will you classify the eggs? Explain. (CO2, K2)

13. (a) Explain about organogenesis. (CO3, K5)

Or

(b) Enumerate the factors affecting cleavage. (CO3, K5)

14. (a) Write short note about mammalian placenta and their role. (CO4, K1)

Or

(b) Write an account on nuclear transplantation. (CO4, K1)

15. (a) Write an account on regeneration. (CO5, K4)

Or

(b) Describe the function of Bfl 1 protein. (CO5, K4)

Part C (5 × 8 = 40)

Answer **all** questions not more than 1000 words each.

16. (a) Define cell determination and cell differentiation. (CO1, K2)

Or

(b) Discuss briefly about stem cells and its function. (CO1, K2)

17. (a) Write an essay on Spermatogenesis with neat diagram. (CO2, K2)

Or

(b) Explain in detail about the metabolic and molecular changes during gastrulation. (CO2, K2)

18. (a) Discuss in detail about chemo-differentiation. (CO3, K5)

Or

(b) Write an essay on morphogenic gradients. (CO3, K5)

19. (a) Describe in detail about vulva formation in *Caenorhabditis egegams*. (CO4, K1)

Or

(b) Describe the eye lens formation in chick with neat diagram. (CO4, K1)

20. (a) Write an essay on recent molecular basis of aging. (CO5, K4)

Or

(b) Describe in detail about mechanism of apoptosis. (CO5, K4)

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R1024

Sub. Code
509204

M.Sc. DEGREE EXAMINATION, APRIL – 2024

Second Semester

Zoology

MICROBIOLOGY

(CBCS – 2022 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

Answer **all** the following objective type questions by choosing the correct option.

1. What is the cell wall structural components of fungi? (CO1, K2)
   (a) peptidoglycan
   (b) cellulose
   (c) chitin
   (d) chitin, cellulose, or hemicellulose
2. The nucleic acid core of phages is covered by a protein coat known as ———— (CO1, K2)
   (a) capsomere (b) capsid
   (c) outer envelope (d) nuclear membrane
3. Which of the following are functions of water in the culture medium? (CO2, K3)
   (a) nutrients must be in aqueous solution
   (b) cofactor of enzymes
   (c) provides resistance to sudden transient temperature changes
   (d) it is a chemical reactant; nutrients must also be present in aqueous solution and provide resistance to sudden temperature changes

4. Which of the following are functions of Maintenance Media? (CO2, K3)

(a) used for assay of vitamins, amino acids

(b) used for determining the bacterial content

(c) used for determining the type of growth produced by bacteria

(d) used for the maintenance of the viability and physiologic and characteristics

5. Bollinger bodies are found in the cytoplasm of cells infected by which of the following viruses? (CO3, K5)

(a) variola virus (b) fowl pox virus

(c) rabies virus (d) herpes virus

6. Which of the following is not a characteristic symptom of Foot and Mouth disease? (CO3, K5)

(a) An eruption of vesicles over the lips

(b) Fever

(c) Increase in appetite

(d) Lameness

7. Cryptococcosis is a disease of ———————— (CO4, K4)

(a) bacterial infection (b) parasitic infection

(c) viral infection (d) mycotic infection

8. Endocarditis is caused by which of the following fungi? (CO4, K4)

(a) Candida albicans

(b) Penicillium notatum

(c) Penicillium chrysogenum

(d) Agaricus campestris

9. At what temperature pasteurization of milk takes place? (CO5, K2)

(a) 65.0 C (b) 37.0 C

(c) 62.8 C (d) 45.0 Cs

10. Acetic acid and lactic acid are used for ———— (CO5, K2)

(a) curing meats

(b) preservation of color

(c) preservation of pickles

(d) inhibiting mold growth

Part B ($5 \times 5 = 25$)

Answer **all** questions not more than 500 words each.

11. (a) Differentiate clearly the Gram-positive and Gram-negative bacteria. (CO1, K2)

Or

(b) List contributions to the field of microbiology by Antoine van Leeuwenhoek, Edward Jenner. Alexander Fleming, and Paul Ehrlich. (CO1, K2)

12. (a) What are culture media. Classify the types of culture media for bacteria with examples and their uses. (CO2, K3)

Or

(b) What are three different methods to diagnose a fungal infection? (CO2, K3)

13. (a) Virus is a link between living and non-living. Justify this statement. Describe the viral transmission and diseases. (CO3, K5)

Or

(b) Describe the pathogenesis, classification, laboratory diagnosis, and treatment of brucellosis. (CO3, K5)

14. (a) Describe the life cycle, laboratory diagnosis and treatment of ringworm. (CO4, K4)

Or

(b) Describe the etiology, life cycle, pathogenesis. laboratory diagnosis and treatment of toxoplasmosis. (CO4, K4)

15. (a) Explain what is meant by microbial food spoilage and microbes associated in Food spoilage. (CO5, K2)

Or

(b) Write a note on food preservation and its types. (CO5, K2)

Part C (5 × 8 = 40)

Answer **all** questions not more than 1000 words each.

16. (a) Explain the structure of bacterial cell with the aid of a neatly labelled diagram. Also mention the roles of these structures and methods of their detection. (CO1, K2)

Or

(b) Give an illustrated account of structure and life cycle of viruses. (CO1, K2)

17. (a) Explain in detail the techniques for molecular identification of Microorganisms. (CO2, K3)

Or

(b) Classify viruses. Describe the strategies adopted in the laboratory diagnosis of viral infections. (CO2, K3)

18. (a) Enlist the bacterial zoonotic diseases. Describe the pathogenesis, laboratory diagnosis, treatment and prophylaxis of anthrax. (CO3, K5)

Or

(b) Name the viruses causing Peste Des Pestis ruminants. Describe the pathogenesis, laboratory diagnosis. prophylaxis and treatment of PPR viral infection. (CO3, K5)

19. (a) Describe the life cycle. pathogenesis. laboratory diagnosis and treatment of entamoeba infection. (CO4, K4)

Or

(b) Describe the pathogenesis and laboratory diagnosis of candidiasis. (CO4, K4)

20. (a) What are microorganisms responsible for spoilage of milk and various methods involved in processing of milk? (CO5, K2)

Or

(b) Explain in detail the probiotic production. (CO5, K2)

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R1025

Sub. Code
509506

M.Sc. DEGREE EXAMINATION, APRIL – 2024

Second Semester

Zoology

Elective : ANIMAL BIOTECHNOLOGY

(CBCS – 2022 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

Answer **all** the following objective type questions by choosing the correct option.

1. Component of plant cell absent in animal cell is (CO1, K1)

   (a) Cytoplasm (b) Cell membrane

   (c) Cell wall (d) Nucleus

2. Animals that have had their DNA manipulated to possess and express an extra (foreign) gene are known as ————————. (CO1, K1)

   (a) Transgenic animals

   (b) Animals

   (c) Infected animals

   (d) Bt animals

3. 95% transgenic animals are ————————. (CO2, K2)

   (a) Sheep (b) Rabbits

   (c) Pigs (d) Mice

4. The first recombinant DNA molecule was synthesized in the year ————————. (CO2, K2)

(a) 1962 (b) 1972

(c) 1982 (d) 1992

5. Recombinant plasmids are added to a bacterial culture that has been pretreated with ———————— ions. (CO3, K2)

(a) iodine (b) magnesium

(c) calcium (d) ferric

6. The foundation for the development of cell culture technique was laid by? (CO3, K2)

(a) Roux (b) Arnold

(c) Ross (d) Harrison

7. The ratio of CO2: O2 used in cell culture system should be (CO4, K5)

(a) 1:5 (b) 1:13

(c) 1:19 (d) 1:25

8. The Taq polymerase enzyme is obtained from (CO4, K5)

(a) Thermus aquaticus

(b) Thiobacillus ferrooxidans

(c) Bacillus subtilis

(d) Pseudomonas subtilis

9. In which of the following models might paralogues mask the effect of a genetic manipulation? (CO5, K4)

(a) Knockouts only

(b) Knockins only

(c) Knockouts and knockins

(d) Transgenic models

10. Which gene was introduced in the first transgenic cow? (CO5, K4)

(a) Human α-lactalbumin
(b) B-1-antitrypsin
(c) A-1-antitrypsin
(d) Cryl ac

Part B $(5 \times 5 = 25)$

Answer **all** questions not more than 500 words each.

11. (a) Explain the role of GEAC. (CO1, K1)

Or

(b) Write a note on transgenic animals. (CO1, K1)

12. (a) Explain about the nucleic acid manipulating enzymes. (CO2, K2)

Or

(b) Give a note on restriction digestion. (CO2, K2)

13. (a) Generalize the DNA fingerprinting. (CO3, K2)

Or

(b) Illustrate the chromosome walking and jumping. (CO3, K2)

14. (a) Explain the primary culture and subculture. (CO4, K5)

Or

(b) Give an account on Humulin. (CO4, K5)

15. (a) Elaborate knock in and knock out technology. (CO5, K4)

Or

(b) Write in detail the applications of transgenic animals. (CO5, K4)

Part C (5 × 8 = 40)

Answer **all** questions not more than 1000 words each.

16. (a) Explain the animal cell structure with a neat schematic diagram. (CO1, K1)

Or

(b) Outline the principle of recombinant technology. (CO1, K1)

17. (a) Clearly explain the steps involved in the gene cloning with example. (CO2, K2)

Or

(b) Elaborately explain the gene library construction. (CO2, K2)

18. (a) Illustrate the chain termination sequencing method. (CO3, K2)

Or

(b) Classify PCR and its variants. (CO3, K2)

19. (a) Write an essay on the types of animal cell culture methods. (CO4, K5)

Or

(b) Briefly explain the history of animal tissue culture. (CO4, K5)

20. (a) What are transgenic mice? Discuss in brief the procedure of its transgenesis and its applications. (CO5, K4)

Or

(b) Explain about the various types of stem cell methods. (CO5, K4)

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