Total number of printed pages–12

3 (Sem–5/CBCS) ZOO HE 2/3/4

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ZOOLOGY

(Honours Elective)

Answer the Questions from any one Option.

OPTION–A

(Animal Biotechnology)

Paper : ZOO–HE–5026

OPTION–B

(Endocrinology)

Paper : ZOO–HE–5036

OPTION–C

(Parasitology)

Paper : ZOO–HE–5046

Full Marks : 60

Time : Three hours

The figures in the margin indicate full marks for the questions.

Contd.

OPTION–A

(Animal Biotechnology)

Paper : ZOO–HE–5026

1. Answer the following questions as directed : 1×7=7

(a) Western blotting is used for detection of specific RNA sequence in a sample.
(True/False)

(b) During cDNA library construction, total mRNA is converted into double stranded DNA by the enzyme _____.
(Fill in the blanks)

(c) Sanger's method of DNA sequencing is also known as chain termination method.
(True/False)

(d) Mention the advantage of recombinant human insulin over bovine insulin in diabetic patients.

(e) What is contact inhibition of cell growth in cell culture ?

(f) Name the gene responsible for occurrence of cystic fibrosis disease.

(g) Sickle cell anaemia is caused due to single nucleotide polymorphism (SNP) mutation.
(True/False)

2. Answer the following questions : 2×4=8

(a) Mention the differences between knockout mice and transgenic mice.

(b) Name the *three* steps in PCR used for amplification of DNA segment.

(c) Write the role of serum in cell culture.

(d) What is cryopreservation in cell culture ?

3. Answer ***any three*** of the following questions briefly : 5×3=15

(a) What is gene therapy ? Mention the applications of gene therapy.

(b) What is primary cell culture ? Write about the growth curve of cells under *in vitro* condition.

(c) Mention the differences between genomic library and cDNA library.

(d) Illustrate the transformation technique by electroporation in gene manipulation.

(e) Write about the application of transgenic animals in production of pharmaceuticals with suitable examples.

4. *(a)* What is DNA fingerprinting ? Explain the procedure of DNA fingerprinting and its application with proper illustration. 2+6+2=10

Or

(b) Describe with proper illustration the Sanger's procedure of DNA sequencing. 3+7=10

5. *(a)* Mention the laboratory requirement for starting of animal cell cultures. Write about the different types of media used for animal cell culture. 5+5=10

Or

(b) Discuss briefly about the Agrobacterium mediated gene transfer technology for production of transgenic plants. 10

6. *(a)* What is sickle cell anaemia ? Write in brief about the molecular diagnosis of sickle cell anaemia. 2+8=10

Or

(b) Discuss the technique of Southern blotting and its applications. 6+4=10

OPTION–B

(Endocrinology)

Paper : ZOO–HE–5036

1. Choose the correct answer : 1×7=7

(a) Hyperglycemia is caused by

(i) increase in insulin secretion

(ii) decrease in insulin secretion

(iii) increase in glucagon secretion

(iv) increase in glucocorticoid secretion

(b) Which of the following pairs of endocrine gland is located in the brain ?

(i) Hypothalamus and thymus

(ii) Pituitary and parathyroid

(iii) Thyroid and pineal

(iv) Pituitary and pineal

(c) T_3 and T_4 hormones are derivatives of _____ amino acid.

(d) Blood pressure in human body is controlled by

(i) adrenal gland

(ii) thyroid gland

(iii) thymus gland

(iv) parathyroid gland

(e) Steroid hormones have their receptors

(i) on the target cell surface

(ii) in the cytoplasm

(iii) in the blood

(iv) All of the above

(f) _____ disease is an immune system disorder of the thyroid gland.

(g) The storage form of thyroid hormone is _____.

2. Answer the following questions : 2×4=8

(a) How are endocrine glands different from exocrine glands ?

(b) Mention *any two* cell types present in adenohypophysis and the hormones they secrete.

(c) Define neurohormones. Give *two* examples.

(d) State the role of pineal gland in the regulation of sleep cycle.

3. Write short notes on : ***(any three)*** 5×3=15

(a) Antagonistic nature of insulin and glucagon in regulation of blood sugar level.

(b) Histological structure of adrenal gland with suitable diagram.

(c) Transport of lipid soluble hormone in blood.

(d) Feedback mechanism of thyroid hormone.

(e) Hypothalamo-hypophyseal portal system.

4. (a) Describe the histological structure of thyroid gland. Mention its hormones with their functions. 5+5=10

Or

(b) Classify hormones. Explain the mechanism of action of hormones. 4+6=10

5. (a) What are catecholamines ? Explain the synthesis, action and regulation of catecholamine secretion. 1+3+3+3=10

Or

(b) Define hypothalamo-hypophyseal axis. Discuss the role of hypothalamic factors in regulation of endocrine functions of the anterior pituitary. 3+7=10

6. (a) Elucidate the hormonal regulation of menstrual cycle in female mammals. 10

Or

(b) Explain the hormonal control of calcium homeostasis.

OPTION-C

(Parasitology)

Paper : ZOO-HE-5046

1. Choose the correct option : 1×7=7

(i) Biological vector of sleeping sickness is

(a) Tsetse fly

(b) Horse fly

(c) House fly

(d) None of the above

(ii) The infective stage of *Plasmodium vivax* is

(a) Schizont

(b) Metacryptozoite

(c) Crypto zoite

(d) Sporozoite

(iii) The intermediate host of *Fasciolopsis buski* is

(a) man

(b) snail

(c) sheep

(d) pig

(iv) The female *Ascaris lumbricoides* has

(a) straight tail end

(b) curved tail end

(c) pineal setae in the tail

(d) genital papillae in the tail

(v) The vector that transmits murine typhus to humans is

(a) *Cimex lectularius*

(b) *Xenopsylla cheopis*

(c) *Pratylenchus* sp.

(d) *Pediculus humanus*

(vi) Ixodid ticks are known as

(a) soft ticks

(b) mites

(c) hard ticks

(d) argasid ticks

(vii) Which of the following leaves a round 'crater wound' mark by its parasitic attack ?

(a) Cookiecutter shark

(b) Candiru

(c) Vampire bat

(d) None of the above

2. Answer the following questions : 2×4=8

(i) What is the difference between parasite and parasitoid ?

(ii) Mention the characteristics of miracidium larva.

(iii) Name the primary host and intermediate host of *Trypanosoma gambiense.*

(iv) Which are known as 'Root-knot nematode' ? Mention its *one* importance.

3. Answer the following questions : ***(any three)*** 5×3=15

(i) Write about host-parasitic relationship with suitable examples.

(ii) What causes Kala-azar ? Give an account of the structure of the causative agent. 1+4=5

(iii) Name the disease caused by *Schistosoma haematobium.* Describe the structure of the organism. 1+4=5

(iv) Write about the pathogenicity and treatment of *Ancylostoma duodenale.*

(v) Give an account of the life cycle of *Pediculus humanus.*

4. *(a)* Describe the life cycle of *Plasmodium vivax* with suitable diagrams. 10

Or

(b) Describe the different forms of the organism which causes amoebic dysentery and write about its pathogenicity. 7+3=10

5. *(a)* Describe the life cycle of *Taenia solium* with labelled diagrams of different stages. 10

Or

(b) Give a detailed account of the life cycle of *Fasciolopsis buski* with labelled diagrams of different stages.

6. *(a)* Describe the life cycle of *Ascaris lumbricoides* with suitable labelled diagrams. 10

Or

(b) Describe the structure and life cycle of *Wuchereria bancrofti* with suitable diagrams. 3+7=10
