Total number of printed pages–15

3 (Sem–5 /CBCS) ZOO HE 2/HE 3/HE 4

2021

(Held in 2022)

ZOOLOGY

(Honours Elective)

Answer the Questions from any one Option.

OPTION–A

Paper : ZOO–HE–5026

DSE (H) – 2

(Animal Biotechnology)

Full Marks : 60

Time : Three hours

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

1. Fill in the blanks : 1×7=7

   (a) Taq polymerase was isolated from ———— bacterium.

   (b) ———— was the first commercially available genetically engineered product.

Contd.

(c) Causative organism for crown gall disease is ————.

(d) The insert capacity of YAC is ———.

(e) For activation of type-II RE, ———— is/are needed.

(f) In production of Bt cotton, the Bt gene is derived from ————.

(g) Following DNA double strand break, the DNA repair mechanism is initiated by ———.

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

(a) Write the principle of Western blotting.

(b) What are expression vectors ?

(c) What is DNA microarray ?

(d) How is nomenclature of restriction enzymes done ?

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

(a) Write briefly the steps involved in PCR.

(b) Differentiate between genomic and cDNA library.

(c) Compare between Northern and Southern blotting techniques.

(d) Give a note on colony hybridization.

(e) What is gene therapy ? Write the applications of gene therapy in medicine.

4. What are restriction enzymes ? Give a note on frequency and plane of cutting of restriction enzymes. Write different applications of restriction enzymes. 2+4+4=10

Or

Discuss Sanger's method for sequencing DNA. 10

5. What is biotechnology ? Give a brief note on the scopes of biotechnology. 2+8=10

Or

What are the properties of a good vector ? Discuss the properties of plasmid, M13 and bacteriophage. 4+6=10

6. What is transgenic animal ? Write a note on different transfection methods for the development of transgenic animals. 2+8=10

Or

What is DNA fingerprinting ? Discuss different methods of DNA fingerprinting. 2+8=10

OPTION–B

Paper : ZOO–HE–5036

(Endocrinology)

Full Marks : 60

Time : Three hours

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

1. Choose the correct answer : 1×7=7

(a) Thyroid hormone deficiency in adult causes

(i) myxedema

(ii) cretinism

(iii) Graves' disease

(iv) acromegaly

(b) Which cells of the islets of Langerhans secrete glucagon ?

(i) Alpha cells

(ii) Beta cells

(iii) C cells

(iv) D cells

(c) Which of the following hormones is a steroid ?

(i) ACTH

(ii) Glucagon

(iii) Oxytocin

(iv) Estradiol

(d) Melanocyte-stimulating hormone (MSH) is secreted by

(i) adenohypophysis

(ii) pars intermedia of pituitary

(iii) adrenal gland

(iv) thyroid gland

(e) Thyroid hormone synthesis involves the iodination of

(i) tyrosine

(ii) alanine

(iii) tryptophan

(iv) methionine

(f) In adrenal gland, glucocorticoids are secreted by

(i) *Zona glomerulosa*

(ii) *Zone fasciculata*

(iii) *Zone reticularis*

(iv) *Medulla*

(g) Low level of adrenal cortex hormone causes

(i) Goitre

(ii) Addison's disease

(iii) Cushing syndrome

(iv) Tetany

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

(a) What are different chemical classes of hormones ?

(b) Mention the anterior pituitary hormones.

(c) Distinguish between diabetes mellitus and diabetes insipidus.

Contd.

(c) Which of the following hormones is a steroid ?

(i) ACTH

(ii) Glucagon

(iii) Oxytocin

(iv) Estradiol

(d) Melanocyte-stimulating hormone (MSH) is secreted by

(i) adenohypophysis

(ii) pars intermedia of pituitary

(iii) adrenal gland

(iv) thyroid gland

(e) Thyroid hormone synthesis involves the iodination of

(i) tyrosine

(ii) alanine

(iii) tryptophan

(iv) methionine

(f) In adrenal gland, glucocorticoids are secreted by

(i) *Zona glomerulosa*

(ii) *Zone fasciculata*

(iii) *Zone reticularis*

(iv) *Medulla*

(g) Low level of adrenal cortex hormone causes

(i) Goitre

(ii) Addison's disease

(iii) Cushing syndrome

(iv) Tetany

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

(a) What are different chemical classes of hormones ?

(b) Mention the anterior pituitary hormones.

(c) Distinguish between diabetes mellitus and diabetes insipidus.

(d) What is Leydig cell ? Which hormone stimulates their secretion ? 1+1=2

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

(a) Endocrine functions of posterior pituitary

(b) Histological structure of thyroid

(c) Physiological functions of mineralocorticoids

(d) Hormonal control of calcium homeostasis

(e) Functions of parathyroid hormones.

4. Answer ***any three*** from the following questions : 10×3=30

(a) What are hormone receptors ? Discuss different mechanisms of hormone actions. 2+8=10

(b) Describe the histological structure of adrenal gland with suitable diagram. Give an account of the endocrine functions of adrenal cortex and medulla. 5+5=10

(c) Describe the histology and endocrine functions of mammalian testes with suitable diagrams. 5+5=10

(d) What is hypothalamo-hypophyseal axis ? Discuss various physiological functions of the anterior pituitary hormones. 2+8=10

(e) Give an account of the endocrine functions of the pancreas. 10

(f) Discuss the molecular mechanism of action of protein hormone. 10

OPTION–C

Paper : ZOO–HE–5046

(Parasitology)

Full Marks : 60

Time : Three hours

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

1. Choose the correct answer : 1×7=7

(i) In malaria, the form of plasmodium that is transmitted from mosquito to human is

(a) sporozoite

(b) gametocyte

(c) merozoite

(d) hypnozoite

(ii) Each of the following parasites is transmitted by mosquito, except

(a) *Leishmania donovani*

(b) *Wuchereria bancrofti*

(c) *Plasmodium vivax*

(d) *Plasmodium falciparum*

(iii) Each of the following statements concerning *Ascaris lumbricoides* is correct, except

(a) *Ascaris lumbricoides* is one of the largest nematode

(b) *Ascaris lumbricoides* can cause pneumonia

(c) Both dogs and cats are intermediate hosts of *Ascaris lumbricoides*

(d) *Ascaris lumbricoides* is transmitted by ingestion of eggs

(iv) The intermediate host of fasciola is

(a) Lymnaea truncatula

(b) Pila globosa

(c) Lamellidens

(d) Helix

(v) Which of the following is false about *Ancylostoma duodenale* ?

(a) It is a blood-sucking worm

(b) Iron deficiency anemia occurs

(c) Prevented by drinking filtered water

(d) Stool examination is positive for occult blood

(vi) Ticks and mites belongs to which of the following classes of Arthropoda ?

(a) Arachnida

(b) Insecta

(c) Diplopoda

(d) Chilopoda

(vii) Culex sp. acts as a vector for

(a) loiasis

(b) malaria

(c) filariasis

(d) babesiosis

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

(i) Mention *four* parasitic diseases transmitted by vectors.

(ii) Write some preventive measures to control mosquito-borne diseases.

(iii) Define definitive host with example.

(iv) What is diarrhoea ? Give *two* examples of parasites producing watery diarrhoea.

3. Answer the following questions as directed : ***(Any three)*** 5×3=15

(i) Describe morphology and pathogenicity of *Wuchereria bancrofti.*

(ii) Give a brief account of parasitic vertebrates highlighting Mockingbird and Vampire bat.

(iii) Write about the life cycle, epidemiology and treatment of *Ascaris lumbricoides.*

Contd.

(iv) Write about the morphology, life cycle and treatment of *Giardia intestinalis.*

(v) Describe morphology, pathogenicity and laboratory diagnosis of *Fasciolopsis buski.*

4. Answer the following questions : 10×3=30

(i) Describe morphology, pathogenecity and laboratory diagnosis of *Leishmania donovani.* 4+4+2=10

(ii) Enlist blood and tissue protozoa. Describe morphology, pathogenecity and laboratory diagnosis of *Plasmodium vivax.* 2+6+2=10

(iii) Describe the concept of arthropodan parasities. Write about the biology, importance and control of arthropodan parasites citing an example. 3+7=10

(iv) Elaborate the concept of parasitoid and vector. Describe the mechanical and biological vectors with examples. 5+5=10

(v) What is parasitism ? Describe the host-parasite relationship with examples. What is the importance of studying host-parasite relationship. 2+6+2=10

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