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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.

- (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 : $1 \times 7 = 7$

(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 : $2 \times 4 = 8$

- (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**) $5 \times 3 = 15$

- (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*.

(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 : $10 \times 3 = 30$

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

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

(iii) Describe the concept of arthropodan parasites. 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.

$2+6+2=10$