

Total number of printed pages = 5

63/2(SEM-3) ZOO-302

2022

(Held in 2023)

ZOOLOGY

(Theory Paper)

Paper Code : ZOO-302

(Animal Physiology and Immunology)

Full Marks - 80

Pass Marks - 32

Time - Three hours

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

1. Choose the correct options of the following (*all compulsory*) 1×6=6

(a) What is not true about NK cells ?

(i) Release perforin on target cells

(ii) Express TCR as do T cells

(iii) Lyse tumour cells and virally infected cells

(iv) Express Fc receptors

[Turn over

(b) When the biological effect of two cytokines is greater than the summation of their individual effect is known as

- (i) Pleiotropy (ii) Antagonism
(iii) Synergism (iv) Redundancy

(c) Binding site in class I MHC molecules for T cell co-receptor CD8 is

- (a) $\alpha 1$ (b) $\alpha 2$
(c) $\beta 2$ -microglobulin (d) $\alpha 3$

(d) The outermost connective tissue coat covering a whole skeletal muscle bulk is called

- (a) Perimysium (b) Epimysium,
(c) Endomysium (d) Dendromysium

(e) The central portion of the A-band in a skeletal muscle fibre is paler in colour, called

- (a) H-band (b) M-band
(c) Z-band (d) I-band

(f) Choose the correct statement from the following :

- (i) The myosin molecule is composed of six polypeptide chains—four heavy chains and two light chains.

(ii) The myosin molecule is composed of four polypeptide chains—two heavy chains and two light chains.

(iii) The myosin molecule is composed of six polypeptide chains—two heavy chains and four light chains.

(iv) The myosin molecule is composed of six polypeptide chains—three heavy chains and three light chains.

2. Answer the following questions (*all compulsory*) :
2×5=10.

(i) What do you mean by Hypervariable region ?
Mention its function. 1+1=2

(ii) What do you mean by Class switching ?
'Class switching from IgA to IgE and IgG does not occur'. Elaborate the statement.
1+1=2

(iii) What are Type I and Type II hypersensitivity ?
2

(iv) Differentiate between Prothrombin and Thrombin. 2

(v) What are the differences between intrinsic and extrinsic pathway ?
1+1=2

3. Answer any *six* of the following questions :

$$5 \times 6 = 30$$

(a) Differentiate between the following pairs :

$$2\frac{1}{2} + 2\frac{1}{2} = 5$$

(i) Antigen and Superantigen

(ii) B-cell and T-cell epitope.

(b) What is Hinge region? How does the structure and function of IgG differ from IgM?

$$1 + 4 = 5$$

(c) Write briefly about the Oxygen dependent and Oxygen independent mechanism of microbial killing by phagocytosis.

$$5$$

(d) Explain the mechanism of blood coagulation.

$$5$$

(e) How many types of hypoxia are found? Discuss the different factors associated with hypoxia.

$$1 + 4 = 5$$

(f) Differentiate between Neurogenic and Myogenic heart.

$$5$$

(g) What is vaccination? How do you differentiate inactivated and attenuated vaccines?

$$1 + 4 = 5$$

(h) Write short notes on :

$$3 + 2 = 5$$

(i) Isograft and Allograft, Major histocompatibility antigens.

(ii) Motor and Sensory nerve.

(i) How does chemical synapse differ from electrical synapse? Add a note on the mechanism of signalling at chemical synapses with a proper diagram.

$$2 + 3 = 5$$

4. Answer any *two* of the following questions :

$$10 \times 2 = 20$$

(a) Describe the structure and function of the retinal cell of eyes. How light and dark affect the functional structure of rhodopsin.

$$5 + 5 = 10$$

(b) What are the characteristics of normal electrocardiogram? Explain with suitable diagrams. How the rate of heart beat is determined from the ECG?

$$8 + 2 = 10$$

(c) Explain the evasive mechanisms of immune responses by bacteria and virus.

$$5 + 5 = 10$$

5. Answer any *one* of the following questions :

$$14 \times 1 = 14$$

(a) What do you mean by antigen processing and presentation? Discuss the mechanism of antigen processing and presentation by MHC I and MHC II to their target cell.

$$2 + 6 + 6 = 14$$

(b) Describe the structure of skeletal muscle with proper diagram.

$$6 + 8 = 14$$