

P- II (1+1+1)H/14

2014

ZOOLOGY (Honours)

Third Paper

Full Marks : 90

Time : Four Hours

The figures in the margin indicate full marks.

Group - A

(Cell Biology and Histology)

1. Answer any *four* questions : $2 \times 4 = 8$

- (a) What are cyclin and cyclin dependent kinases ?
- (b) Define mordant with example.
- (c) What do you mean by G-protein coupled receptors ?
- (d) Write the composition of Bouin's fixative.
- (e) Define resolution of a microscope.
- (f) Distinguish between active transport and passive transport.

2. Answer any *four* questions : $4 \times 4 = 16$

- (a) Mention the characteristic features of cancer cells.
- (b) Give the basic principle of "Phase Contrast" microscope.

P.T.O.

(2)

- (c) Distinguish between oxidative phosphorylation and substrate level phosphorylation. $2+2=4$
- (d) What is shadow casting? State its purpose. $2+2=4$
- (e) Write the structure and functions of micro-tubules. $2+2=4$
- (f) State the importance of fixation and staining in histological techniques. $2+2=4$
3. Answer any *two* questions : $10\frac{1}{2}\times 2=21$
- (a) Define cell-cycle. What are the phases of cell cycle? Mention the characteristics of different phases of cell cycle. How is cell cycle regulated? $1+1\frac{1}{2}+4+4=10\frac{1}{2}$
- (b) Describe the ultrastructure of mitochondrion. Mention the role of mitochondria in cellular energy transactions. $4\frac{1}{2}+6=10\frac{1}{2}$
- (c) Distinguish between microfilaments and intermediate filaments. Describe the structure of microfilaments. State the role of microfilaments in cellular locomotion. $3+4+3\frac{1}{2}=10\frac{1}{2}$
- (d) Write the difference between prokaryotic cell and eukaryotic cell. Draw and describe the structure of a prokaryotic cell. $3+3+4\frac{1}{2}=10\frac{1}{2}$

(3)

Group -B

(Genetics and Immunology)

4. Answer any *four* questions : $2\times 4=8$
- (a) Distinguish between co-dominance and incomplete dominance.
- (b) What are F_c and F_{ab} regions in an antibody molecule?
- (c) Define multiple alleles with examples.
- (d) What do you mean by innate and adaptive immunity?
- (e) Write the role of TDF gene in human sex determination.
- (f) What is APC? Give an example. $1+1=2$
5. Answer any *four* questions : $4\times 4=16$
- (a) Write the effects and causes of Klinefelter Syndrome. $2+2=4$
- (b) Distinguish between CD_8^+ cells and CD_4^+ cells.
- (c) State the principle and applications of ELISA. $2+2=4$
- (d) Write a note on Gynandromorph.
- (e) What are pleiotropic genes? State their significance. $2+2=4$

P.T.O.

(4)

(f) Describe briefly the ADCC mechanism of tumour cell destruction by NK cells.

6. Answer any *two* questions : $10\frac{1}{2} \times 2 = 21$

(a) Define crossing over. Describe the molecular mechanism of recombination. What is site specific recombination ? $2 + 6\frac{1}{2} + 2 = 10\frac{1}{2}$

(b) Describe the process of sex determination in humans. State the role of 'Y' chromosome in this case. $7 + 3\frac{1}{2} = 10\frac{1}{2}$

(c) State the basic principle of vaccination. Distinguish between vaccination and immunization. Describe the advantages and disadvantages in using DNA Vaccines. $2 + 3 + (3\frac{1}{2} + 2) = 10\frac{1}{2}$

(d) Define immunogen. What are haptens? Write the characteristic features to be an immunogen. State the role of Rh-antigen in erythroblastosis foetalis. $1 + 2 + 2\frac{1}{2} + 5 = 10\frac{1}{2}$

P- II (1+1+1)H/14

2014

ZOOLOGY (Honours)

Fourth Paper

Full Marks : 90

Time : Four Hours

The figures in the margin indicate full marks.

Group - A

(Ecology)

1. Answer any *four* questions :

2×4=8

- (a) Distinguish between commensalism and mutualism.
- (b) Define population and biotic community.
- (c) What is a parasitoid? Give an example. 1+1=2
- (d) Comment on ecological niche.
- (e) What is biotic potential ?
- (f) Distinguish between 'J' shaped and 'S' shaped growth curves.

2. Answer any *four* questions :

4×4=16

- (a) What is ecological succession ? State the different stages of ecological succession. 2+2=4
- (b) Write a note on Carbon cycle.

P.T.O.

(2)

(c) What do you mean by age pyramid? Describe briefly different types of age pyramids. $1+3=4$

(d) Write a short note on survivorship curve.

(e) State the density dependent and density independent process of regulation of population.

(f) State Gloger's rule and Bergman's rule. $2+2=4$

3. Answer any two questions : $10\frac{1}{2}\times 2=21$

(a) Describe the role of temperature and light on the growth and development of animals. Add a note on circadian rhythm. $4+4+2\frac{1}{2}=10\frac{1}{2}$

(b) Distinguish between food chain and food web. What do you mean by grazing and detritus food chains? Add a note on trophic levels. $3+3+4\frac{1}{2}=10\frac{1}{2}$

(c) Write the characteristics of biotic community. What is competitive exclusion? Explain competitive exclusion in light of Gause's principle. $4+1+5\frac{1}{2}=10\frac{1}{2}$

(d) Differentiate between habitat and territoriality. What do you mean by fundamental and realized niches? Describe any one biome of the world. $2+2+6\frac{1}{2}=10\frac{1}{2}$

(3)

Group - B

(Zoogeography, Wild life and Biodiversity)

4. Answer any four questions : $2\times 4=8$

(a) What do you mean by Keystone Species ?

(b) Define 'Necton' and 'Benthos'.

(c) Name two characteristic bird representatives of Australian realms.

(d) Write the full forms of CITES and BNHS.

(e) What do you mean by biodiversity hotspot ?

(f) Mention the subdivisions of Oriental realm.

5. Answer any four questions : $4\times 4=16$

(a) What do you mean by endangered, vulnerable and rare species? Give examples in each cases.

(b) Explain the role of barrier in animal dispersal.

(c) Write a note on biosphere reserve.

(d) Explain the detection of age of fossils by "carbon dating" process.

(e) Mention the characteristic fauna of Mesozoic era. What was the time scale of this era ? $3+1=4$

(f) "India is regarded as megadiversity zone in the world"— justify.

P.T.O.

(4)

6. Answer any *two* questions : $10\frac{1}{2} \times 2 = 21$

(a) Define zoogeographical realm. Discuss the geographical boundaries, climatic conditions and faunal peculiarities of Oriental realm.

$2 + 8\frac{1}{2} = 10\frac{1}{2}$

(b) Define conservation. Distinguish between in-situ and ex-situ conservation with examples. Describe the role of zoological gardens in supplementing the conservation initiatives of endangered fauna in India.

$1 + 3 + 6\frac{1}{2} = 10\frac{1}{2}$

(c) Give a brief account of the mechanism of continental drift as described by Wagner and Hess. Explain the role of continental drift in animal drift.

$6\frac{1}{2} + 4 = 10\frac{1}{2}$

(d) Write note on any *three*.

(i) Bering strait,

(ii) IUCN

(iii) Indian Biodiversity Act-2002,

(iv) Project Tiger.

$10\frac{1}{2}$