201€

ZOOLOGY

PAPER : ZOO 203

TOOLS AND TECHNIQUES

(Old Course)

Full Mark : 80

Time : 3 Hrs

Figures in the right hand margin indicate full marks for the question

1) Multiple choice questions (any eight) $1 \times 8 = 8$

a) Which one of the following microscopes produces 3 dimensional structures?

i) Transmission electron microscope

ii) Phase contrast Microscope

iii) Transmission electron microscope

iv) Light microscope

b) Which one of the following techniques does not utilize interaction between antigen and antibody?

i) Flow cytometry

ii) Immunoelectrophoresis

iii) Radioimmunoassay

iv) Enzyme-linked immunosorbent assay

c) Proteins can be visualized directly in gels by

i) Measuring their molecular weight

ii) Using electron microscope only

iii) Staining them with the dye

iv) None of the above

d) Which one of the following technique can be used to identify the mRNA molecule?

i) Western blotting ii) Southern blotting

iii) Northern blotting iv) All of the above

e) Which of the following is also known as the chemical method of DNA sequencing?

i) Maxam-Gilbert method

ii) Sanger's method

iii) Edman's degradation method

iv) None of the above

f) Which one of the following is correct regarding restriction enzymes?

i) Restriction enzymes are exonuclease enzymes

ii) It can cut nucleic acid chain forming sticky ends only

iii) Restriction enzymes always produce blunt ends

iv) Most restriction enzymes have 4-6 bp recognition sequence

g) During r-DNA technology the molecule to which the gene of interest is integrated is called-

i) Carrier ii) Vector

iii) Transformer iv) Plasmid

h) Which one of the following correct regarding gel retardation assay?

i) It is an enzymatic assay

ii) It is used for DNA-DNA interaction study only

iii) It is used for protein-protein interaction study only

iv) It is used for protein-nucleic acid interaction study

i) In a colorimeter, color filters are used because

i) It allows all the other color light to transmit through

ii) It increases the bandwidth of a particular incident light

iii) It allows only a particular light ray to pass through the filter

iv) All of the above

2. Answer the following short questions (any five) $2 \times 5 = 10$

a) Write three differences between light and electron microscope.

b) What is cryopreservation?

c) Write three importance of centrifugation in biological sciences.

d) What is antisense RNA?

e) What is the function of Ethidium bromide in DNA staining?

f) Give three functions of fluorescent molecules in molecular biology?

3) Answer the following questions (any four) $5 \times 4 = 20$

a) Write short notes on transmission electron microscope.

b) Write short notes on subcellular fractionation and its importance?

c) What is a dideoxynucleotide? How is it used to determine the sequence of a DNA molecule?

d) Write short notes on different culture media of cell culture.

e) What is isoelectric focusing and how does it differs from simple electrophoresis?

4) Answer the following long type question (any two)

$9 \times 2 = 18$

a) What do you mean by DNA sequencing? Explain the enzymatic methods of DNA sequencing with diagram. 1+8

b) What is the full form of RFLP? Explain the mechanism of RFLP and its use in molecular biology? 1+8

c) What is ELISA? Describe the working principle of different methods of ELISA. 2+7

5) Answer the following very long type questions

(any two) $12 \times 2 = 24$

a) What do you mean by hybridization? Describe the Southern blotting and zoo blotting technique with suitable diagrams. 2+5+5

b) What is a chromatography technique? Explain the ion exchange and affinity chromatography techniques. 2+5+5

c) What is transgenic organism? Explain the various methods of transgenesis. Add notes on transfection techniques. 2+ 5+5

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