2008

ZOOLOGY

PAPER—Z - 301

Full Marks : 40

Time : 2 hours

Answer **all** questions

The figures in the right-hand margin indicate marks

Candidates are required to give their answers in their own words as far as practicable

GROUP—A

(*Computer Application and Bioinformatics*)

1. Show your acquiantances with any *two* of the following: 2 x 2

(*a*) MODEM

(*b*) Optical storage

(*c*) ASCII

(*d*) Pub Med.

2. Distinguish between the following (any *two*) : 4 x 2

(*a*) System software and Application software.

(*b*) Primary and Composite biological databases.

(*c*) Low and High level programming language.

(*d*) (*i*) Convert : $(4E9)_{16} = (?)_{10}$

(*ii*) Using complement system, perform :

$$\begin{array}{r} +06 \\ -11 \\ \hline ? \\ \hline \end{array}$$

3. Discuss briefly any *one* of the following : 8 x 1

(*a*) Classification of High level programming languages.

(*b*) (*i*) What do you mean by URL and FTP ?

(*ii*) Describe the two levels of programming languages in details.

(*iii*) Why is the command <stdio> given in C programming ? 8 + (2 + 5 + 1)

GROUP—B

(*Bio-Instrumentation*)

1. Answer the following questions (any *two*) : 2 x 2

(*a*) How do you measure the intermolecular interaction by an AFM related technique ?

(*b*) What are the effects of heat on gel electrophoresis ?

(*c*) State the basic features of a transmission electron microscope (TEM). How does it differ from SEM ?

(*d*) Explain the function of a phase-plate of the phase contrast microscope.

2. Answer the following questions (any *two*) : 4 x 2

(*a*) Discuss briefly the method of Agarose Gel Electrophoresis.

(*b*) Distinguish between :

(*i*) Adsorption Chromatography and Partition Chromatography.

(*ii*) Explain the nuclear spin and splitting of energy level in a magnetic field of NMR ?

(*c*) State the principle of operation of an atomic force microscope (AFM).

(*d*) Write short notes of the following (any *two*) :

(*i*) Cell fractionation

(*ii*) XYZ-Piezoelectric Scanner

(*iii*) R_f- value

(*iv*) OsO_4. $4 + (2 \times 2) + 4 + (2 \times 2)$

3. Answer any *one* question : 8×1

(*a*) How do you prepare the aftinity matrix in a biochemical laboratory? Describe the necessary steps related to immobilised metal ion affinity Chromatography (IMIAC). Write a short note in exclusion Chromatography.

(*b*) Briefly describe the production of X-ray. Draw the intensity versus wave length graph. Differentiate between white X-ray and characteristic X-ray. What is the dose of X-ray required for chest X-ray in human? How much time (days) is required to annullate the X-ray effect in human? $(2\frac{1}{2} + 3\frac{1}{2} + 2) + (2 + 2 + 2 + 1 + 1)$