Total Pages—8

B. Tech

SCC 2001

Second Semester Examination, 2004

Chemistry-I

Full Marks : 70

Time : 3 hours

Answer Section—A which is compulsory and
any **five** from Section—B

The figures in the right-hand margin indicate marks

(Standard data : $h = 6 \cdot 626 \times 10^{-34}$ Js,
$R = 8 \cdot 314$ JK^{-1} mol^{-1}, $c = 3 \times 10^8$ m s^{-1},
1 amu $= 1 \cdot 6605 \times 10^{-27}$ kg, Atomic weight of
Cl $= 35$)

SECTION—A

1. Write short answers to the following questions, preferably in *one* sentence for each question : 2 × 10

   (a) Write down the relationship between the energy and the velocity of a photon.

(7. Over)

(b) Arrange the following in the decreasing order of energy :

(i) UV-visible ν

(ii) IR $_{9}$

(iii) Microwave

(iv) X-ray

(c) Which of the following pairs is iso-electronic ?

(i) N_2 and O_2

(ii) NO^+ and N_2

(iii) B_2 and C_2

(d) The lattice constant of an FCC lattice is 'a'. What is the length of the face-diagonal of the lattice ?

(e) 'Spontaneous processes are irreversible in nature.' Is this statement true ?

(f) C_P of an ideal gas is $5 \, cal \, mol^{-1} K^{-1}$. Calculate its C_V. Assume the gas to be ideal.