SE

SEAT No._____ No. of Printed Pages : 2

[48]

SARDAR PATEL UNIVERSITY

M.Sc. IGBT, Second Semester

Day & Date: 09-April-2018, Monday

Time: 10:00 A.M. TO 01:00 P.M.

Subject: Biophysics

Subject Code: PS02CIGB25

Instructions:
[a] *Figure to the right indicates full marks.*
[b] *All questions are compulsory.*

Total Marks: 70

Q-1 Choose the correct answers **[08]**

1 Gauss is the unit of_____.

[a] flux [b] flux density [c] field strength [d] inductance

2 The wavelength of visible spectrum is _____ nm.

[a] 500 - 700 [b] 400 - 700 [c] 350 - 600 [d] below 300

3 In Ramsden's eyepiece, the equivalent focal length is _____.

[a] 3f/2 [b] 2f/3 [c] -f/4 [d] 3f

4 A magnetic field exists around_____.

[a] Iron [b] moving charges [c] copper [d] aluminum

5 The logarithm to the base 10 of the reciprocal of the transmittance is known as _____.

[a] wave number [b] Transmittance [c] Absorbance [d] None

6 X-rays have wavelength range _____.

[a] 10 nm to 100nm [b] 0.01nm to 10 nm [c] 10Å to 100 Å [d] None

7 The relation of axial length in unit cell of monoclinic crystal is_____.

[a] a=b=c [b] a=b≠c [c] a≠b≠c [d] a≠b=c

8 The number of atoms per unit cell in FCC crystal structure is _____.

[a] 1 [b] 6 [c] 2 [d] 4

Q-2 Attempt <u>Any SEVEN</u> out of the followings **[14]**

1. Define Hall effect.
2. Write the basic working principle of organic solar cell.
3. Explain the basic principle of spectroscopy.
4. Define Interference and Diffraction.
5. What is Hysteresis in magnetic substances?
6. State: Heisenberg's uncertainty principle.

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7. What is electromagnetic radiation?

8. Define emission and absorption spectra.

9. Define: Unit cell.

Q-3 A Write the Rayleigh's criterion for resolution. Derive the equation of resolving power of a telescope. [06]

B Explain cardinal points in a lens system with a suitable ray diagram. [06]

OR

B Derive the expression for coulomb charge. [06]

Q-4 A Discuss the types of monochromators involved in spectrophotometry. [06]

B Write a note on Electromagnetic radiation. [06]

OR

B (i) Calculate ν and E for UV-radiation of wavelength 200nm. [06]

(ii)State and derive Beer-Lambert law.

Q-5 A (i)Two spheres charged with equal and opposite charges experience a force of 89 N when they are placed 8 cm apart in a medium of relative permittivity 5. Determine the charge on each sphere. [06]

(ii) Find the work done in bringing a charge of $+10 \times 10^{-4}$ μC from infinity to a point 25 cm from a charge of $+3.0 \times 10^{-2}$ μC.

B Discuss the properties of diamagnetic and paramagnetic substances. [06]

OR

B Explain the X-ray diffraction (XRD) and its biological applications. [06]

Q-6 A Give an account of photomultiplier tube in detail with necessary diagram. [06]

B Explain the construction and working of Modern Coolidge tube. [06]

OR

B Calculate the atomic packing factor for BCC crystal structure. [06]

—X—