Total No. of Questions :5]

SEAT No. :

P1034

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F.Y.B.Sc.

[BIOTECHNOLOGY]

Bb : 106 - Biophysics and Instrumentation

(2013 Pattern) (Semester - I)

Time : 3 Hours] *[Max. Marks :80*

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Draw neat & labelled diagrams wherever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Use of scientific claculator is allowed.***

Q1) Attempt all of the following. **[8 × 2 = 16]**

a) State Bohr's first postulate.

b) What is electromagnetic spectrum?

c) What is half life of radio - active element?

d) Name any two instruments used as radiation detector.

e) Enlist any two types of thermometer.

f) What is A.A.S.?

g) Enlist basic types of microscope.

h) State Pauli's exclusion principle.

Q2) Attempt Any Four of the following. **[4 × 4 = 16]**

a) Derive the relation between radius of Bohr's orbit and principle quantum number.

b) Give principle, construction and working of flurometer.

c) Write the properties of α, β & r = rays.

P.T.O.

d) Write a note on clinical thermometer.

e) Explain Bohr - Sommerfeld model.

f) Define P^H and P^{OH}. Write the relation between P^H and P^{OH} which indicate different degree of aqueous solution.

Q3) Attempt Any Four of the following. **[4 × 4 = 16]**

a) Explain construction and working principle of the compound microscope.

b) Explain RCF and sedimentation concept in centrifuge.

c) Write a note on a membrane potential.

d) Why body temperature regulation is important, explain.

e) Using Rydberg's formula calculate wavelength of first and second spectral line of hydrogen spectrum in Lyman series.

[Given $R=1.09678 \times 10^7\ m^{-1}$]

f) Calculate the time required for 10% of a sample of thorium to disintegrate. Assume half life of thorium to be 1.4×10^{10} years.

Q4) Attempt any two of the following. **[2 × 8 = 16]**

a) Explain vector atom model.

b) Explain GM counter.

c) Describe SEM.

d) Write the application of electromagnetic spectrum in any four regions.

Q5) Attempt any one of the following. **[1 × 16 = 16]**

a) What are radioactive isotopes? Give its biological applications.

b) Define aberrations of microscope & explain following two types of aberrations.

i) Chromatic aberration.

ii) Spherical aberration.