

92245

B.Sc. 4th Semester (Hons.) (New Scheme) Examination,

May-2016

CHEMISTRY

Paper-P-II

Physics Optional

Time allowed : 3 hours]

[Maximum marks : 40

Note : Attempt five questions in all. Question No. 1 is compulsory. Student has to attempt one question from each unit.

1. (a) What do you mean by a priori probability ?
(b) Define inverse probability ? Why is it named so ?
(c) Define Binary number system.
(d) Explain the term constraints on a system.
(e) What do you mean by a space cell ?
(f) What is the difference between classical and quantum statistics ?
(g) What do you mean by a free particle ?
(h) What is Plank's hypothesis ?

Unit-I

2. (a) What is Array ? Explain one dimensional array and multidimensional array. How is it defined in FORTRAN? 6
(b) What is a sub-program ? 2

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3. (a) Discuss the various operators used in FORTRAN alongwith their symbols. 6
 (b) Define Do-loop ? 2

Unit-II

4. (a) Find the probability of tossing a coin 10 times to get (i) 5 heads, 5 tails (ii) 4 heads, 6 tails. 3
 (b) Explain addition and multiplication theorems of probability. 5
5. (a) Explain a priori and statistical probability and derive the relation between the two. 6
 (b) Find the probability of drawing a queen from a deck of 52 cards.

Unit-III

6. Derive the condition $\beta_1 = \beta_2$ for two systems in thermal contact. Explain why F is taken to be equal to $\left(\frac{1}{KT}\right)$ for defining a temperature scale ? 8
7. (a) What is critical temperature in B.E. gas degeneracy? 2
 (b) What is a black body? 2
 (c) Discuss different types of statistics. 4

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Unit-IV

8. State and explain the Heisenberg's uncertainty principle in case of a wave packet. Use it to find the ground state energy of linear harmonic Oscillator. 8
9. (a) If a photon and an electron both have same wavelength, then which of two will have more speed ? 2
 (b) If a Photon strikes an electron tightly bound to nucleus, what will be the effect on Compton's shift ?
 (c) If an Electron has a wavelength, does it also have a colour ? 3

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