

92245

B.Sc. 4th Semester (Hons.)

Examination, May 2024

CHEMISTRY

Paper : P-II

PHYSICS OPTIONAL

Time allowed : 3 hours] [Maximum marks : 40

Note: Attempt five questions in all, selecting atleast one question from each unit. Question No. 1 is compulsory.

1. (a) What are different number systems ? 2×7=14
- (b) Give relational operator used in FORTRAN.
- (c) Calculate the probability that in tossing a coin 10 times we get all heads.

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- (d) What was the need to introduce quantum statistics ?
- (e) What is a phase space ?
- (f) On what factors does the mass of a photon depend ?
- (g) Explain why electrons cannot exist within the atomic nucleus ?

Unit-I

2. What is computer organization ? Explain different components of a computer using a block diagram. 6.5
3. Explain function and subroutine subprograms used in FORTRAN. Differentiate between them. 6.5

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Unit-II

4. (a) What is the difference between macrostate and microstate? Explain by giving one example. 3.5
- (b) Two cards are drawn from a pack of 52 cards in succession. Find the probability that both cards drawn are ace. 3
5. (a) Prove the relation between entropy and thermodynamic probability
 $S = k \log W.$ 4.5
- (b) What are the basic postulates of statistical physics? 2
6. Derive Planck's Law of radiation using B-E distribution. 6.5

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Unit-III

7. Define phase velocity and group velocity. Obtain expressions for both. Show that phase velocity of associated waves is always greater than the velocity of light in vacuum. 6.5
8. State Heisenberg's uncertainty principle and derive it from a hypothetical gamma ray microscope. 6.5

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