25U215 (Pages: 2) Name : .....

Reg. No : .....

SECOND SEMESTER UG DEGREE EXAMINATION, APRIL 2026

(FYUGP)

(Regular/Supplementary/Improvement)

CC24UCHE2MN101 - QUANTUM MECHANICS, SOLID STATES AND GASEOUS STATES

(Chemistry - Minor Course)

(2024 Admission onwards)

Time: 2.0 Hours Maximum: 70 Marks

Credit: 4

Part A (Short answer questions)

Answer ***all*** questions. Each question carries 3 marks.

1. Explain why doesn't the wavenature of a moving cricket ball become evident to an observer? [Level:2] [CO1]
2. Give the time-dependent and time - independent schrodinger wave equations. Explain each terms. [Level:2] [CO1]
3. Interpret the number of atoms per unit cell in simple cubic lattice. [Level:2] [CO2]
4. Explain how metal excess defects occurred in crystals. [Level:2] [CO2]
5. Describe root mean square velocity. Give equation. [Level:2] [CO3]
6. Explain how collision freequency is related to temparature. [Level:2] [CO3]
7. A sample of helium gas has a volume of 520 cm^3 at 100°C. Calculate the temperature at which the volume will become 250 cm^3. Assume the pressure to be constant. [Level:3] [CO3]
8. Explain how compressibility factor is related to Boyle's temparature. [Level:2] [CO4]
9. Describe the limitations of van der Waal's equatins. [Level:2] [CO4]
10. Explain the term critical volume. Give an example. [Level:2] [CO4]

(Ceiling: 24 Marks)

Part B (Paragraph questions/Problem)

Answer ***all*** questions. Each question carries 6 marks.

11. Explain the phenomenon of photoelectric effect and how is establishes the particle nature of light. [Level:2] [CO1]

12. Discuss in detail about space lattice and unit cell and its paprameters. [Level:2] [CO2]

13. Describe in details about Axis of symmetry and centre of symmetry. [Level:2] [CO2]

14. Explain the applications of n-type and p-type semiconductors. [Level:2] [CO2]

15. Explain the basic postulates of Kinetic molecular model of gases [Level:2] [CO3]

16. Describe the distinctive features of ideal and real gases. [Level:2] [CO3]

17. Describe how Boyle tempartaure is related to critical temperature. [Level:2] [CO4]

18. Discuss how real gases deviate from Boyle's law. [Level:2] [CO4]

(Ceiling: 36 Marks)

Part C (Essay questions)

Answer any ***one*** question. The question carries 10 marks.

19. Discuss in details about magnetic propeties of materials. Explain different types of magnetic properties. [Level:2] [CO2]

20. Briefly describe collision properties of gases and expalin the effect of temarature and pressure on it. [Level:2] [CO3]

(1 × 10 = 10 Marks)

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