

Reg. No.....

Name.....

B.Sc. DEGREE END SEMESTER EXAMINATION OCTOBER 2017
SEMESTER – 3: CHEMISTRY (COMPLEMENTARY COURSE FOR PHYSICS)

COURSE: 15U3PCHE3.1 – ADVANCED PHYSICAL CHEMISTRY - 1

Common for Regular (2016 Admission) & Supplementary / Improvement (2015 Admission)

Time: Three Hours

Max Marks: 60

SECTION A

*(Answer **all** the questions. 1 mark each)*

1. Define coefficient of viscosity.
2. What are intrinsic semiconductors?
3. Define centre of symmetry.
4. What are the Miller indices of a plane making intercepts $(1/2) a$, $(1/2) b$ and $(\infty) c$ with the three Crystallographic axes?
5. Write down the symmetry elements of BF_3 .
6. Explain the term Eutectic point.
7. State Moore's Law.
8. Give the Freundlich adsorption equation and specify the terms

$(1 \times 8 = 8)$

SECTION B

*(Answer any **Six** questions. 2 marks each)*

9. Write any four applications of nano materials.
10. Explain the cleaning action of soap.
11. Calculate the number of atoms in unit cell of FCC.
12. Write briefly on the point group C_{nh}
13. Distinguish between SEM and TEM
14. What is electrophoresis? Explain.
15. What is a phase rule? Elucidate the implication of a line on the phase diagram of one component system.
16. The sodium metal crystallises in BCC lattice with cell edge, 4.29 \AA . What is the radius of sodium atom.

$(2 \times 6 = 12)$

SECTION C

*(Answer any **Four** questions. 5 marks each)*

17. Discuss the factors that affect adsorption.
18. Derive Bragg's equation.

19. Explain the phase diagram of water system. What is the significance of triple point in water system?
20. What are quantum dots? Give its important applications.
21. What are the applications of colloids?
22. Explain how the structure of NaCl is elucidated with the help of X-ray diffraction.

(5 × 4 = 20)

SECTION D

(Answer any two questions. 10 marks each)

23. a) Write a note on magnetism shown by different materials (5)
b) Explain symmetry elements with suitable examples. (5)
24. a) Write short note on crystal defects. (5)
b) Using the Band theory explain the conductivity of conductors and semiconductors. (5)
25. a) Draw the phase diagram of lead-silver system and discuss. Write any one application of this phase diagram. (6)
b) Briefly describe any four applications of distribution law. (4)
26. Write briefly on
a) Classification of liquid crystals. (4)
b) Write the mathematical form of Langmuir adsorption isotherm. What are the limitations of Langmuir's theory? (3)
c) Sol gel method for the synthesis of nano materials (3)

(10 × 2 = 20)
