Reg. No……..…… Name……..…… **19U332**

B. Sc. DEGREE END SEMESTER EXAMINATION - OCTOBER 2019

SEMESTER – 3, CHEMISTRY (COMPLEMENTARY FOR B.Sc. PHYSICS)

COURSE: 15U3CPCHE3.1 – ADVANCED PHYSICAL CHEMISTRY - 1

(For Regular - 2018 Admission and Supplementary / Improvement 2017, 2016 & 2015 Admissions)

Time: Three Hours Max. Marks: 60

SECTION A

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

1. What are nano composites?
2. Define phase.
3. What is a crystalline solid? Give an example.
4. What are the Weiss indices of a crystal plane which cut through the crystal axes at (2a,2b, c)?
5. What is symmetry element?
6. Give an example for gel and emulsion colloidal systems.
7. What is surface tension?
8. What is the effect of temperature on the viscosity of liquids?

(1 × 8 = 8)

SECTION B

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

9. Write a note on the cleansing action of soap?
10. Draw the graph for water system. Define triple point.
11. What is Nernst distribution Law? Discuss its application to study of association of a solute.
12. Calculate the interplanar spacing for a cubic system, of edge length 'a' for unit cell between the following sets of planes. a) 321 b) 232
13. To which point group does benzene belong to? List out the symmetry elements of benzene.
14. Plot the graph for a Freundlich adsorption isotherm.
15. Give 2 application of liquid crystals?
16. What is TEM and what is its principle?

(2 × 6 = 12)

SECTION C

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

17. How is the distribution law used in the process of extraction? Derive an expression for the amount of solute left un-extracted after a number of extractions.
18. Write a note on the seven crystal systems.
19. What are the factors influencing adsorption? Discuss.

20. Illustrate the following symmetry operations using any ***two*** examples: inversion and proper axis of rotation.
21. Write a short note on nanomedicine.
22. Discuss on the classification of liquid crystals. Explain each type and give their structure.

. (5 × 4 = 20)

SECTION D

*(Answer any **two** questions. 10 marks each)*

23. Draw and discuss the phase diagram of lead-silver system. How is this applied to the Pattinson's process of desilverisation of lead?
24. a) Discuss the band theory of solids (5)
    b) What are stoichiometric defects and non- stoichiometric defects? Explain (5)
25. a) Discuss the peptisation and Bredig's arc method of preparation of colloids (5)
    b) Write a note on the electrical and optical properties of colloids. (5)
26. Discuss on the synthesis of nanomaterial's.

(10 × 2 = 20)

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