

B.E. / B.TECH. DEGREE EXAMINATIONS, DEC 2020 (Held during April, 2021)

First Semester

CY18151 – Engineering Chemistry

(Common to all branches except Marine Engineering)

(Regulation 2018)

Time: Three hours

Maximum : 80 Marks

Answer **ALL** questions

PART A - (8 X 2 = 16 marks)

1. Hardness of water does not
 - a. have any bad effect in boiler
 - b. make cooking of foods difficult
 - c. make it unfit for drinking
 - d. cause difficulty in the washing of cloths with soaps
2. Which of the following best describes the top-down approach for the preparation of nanomaterials?
 - a. Gas phase agglomeration
 - b. Molecular self-assembly
 - c. Mechanical grinding
 - d. Molecular beam epitaxy
3. Which of the following are the reactions in which molecules absorbing light do not themselves react but induce other molecules to react?
 - a. Free radical reactions
 - b. Chain reactions
 - c. Reversible reactions
 - d. Photosensitized reactions
4. The ignition temperatures of four substances P, Q, R and S are 125 °C, 270 °C, 155 °C and 355 °C respectively. Which of the following pairs of substances catches fire at 250 °C?
 - a. Q and S
 - b. P and R
 - c. R and S
 - d. P and Q
5. Why a soft water need not be demineralized water?
6. How does the corrosion product influence further corrosion?
7. N₂ molecule is inactive to vibrational spectroscopy. Justify.
8. Give reasons why is CNG a better fuel to run vehicles than other fuels?

PART B - (4 X16 = 64 marks)

09. (a) (i) How is hard water converted into soft water by demineralization process? (8)
- (ii) Explain how the formation of deposits in steam boilers and heat exchangers influence boiler troubles? (8)

(OR)

- (b) Write informative notes on the oxidation corrosion mechanism of metals with a neat diagram. (16)
10. (a) (i) Enumerate solvothermal process for the preparation of nanoparticles. (8)
- (ii) Relate nanorods, nanowires and nanotubes and their applications (any two). (8)

(OR)

- (b) Demonstrate the synthesis, types and applications of CNT. (16)
11. (a) (i) Apply Jablonski diagram to explain the radiative and non-radiative processes. (8)
- (ii) Illustrate the mechanism of photosensitization reaction with any two examples. (8)

(OR)

- (b) (i) Comment on the various transitions occurred for organic molecules in UV spectroscopy along with their significance. (8)
- (ii) With a neat block diagram discuss the components and functions of IR spectrophotometer. (8)
12. (a) Suggest an analytical method to determine the elements present in a coal sample and mention their significances. (16)

(OR)

- (b) (i) Schematically explain the manufacturing of Producer gas. (8)
- (ii) Explain a suitable method to ensure the complete combustion of a fuel in automobiles. (8)