

Reg. No.

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B.E. / B.TECH. DEGREE EXAMINATIONS, DEC 2019

First Semester

CY18151 – ENGINEERING CHEMISTRY*(Common to all branches except MR)***(Regulation 2018)****Time: Three Hours****Maximum : 100 Marks**Answer **ALL** questions**PART A - (10 X 2 = 20 Marks)**

	CO	RBT
1. Water softened by zeolite process is unfit for use in boilers. why?	1	U
2. What is calgon conditioning?	1	R
3. Why anodizing is best suited for aluminium?	2	U
4. What is differential aeration corrosion?	2	R
5. Define thermolysis.	3	R
6. What is nanotechnology?	3	R
7. State Stark Einstein's law of photochemical equivalence.	4	R
8. Write any two applications of IR spectroscopy?	4	U
9. Define cetane number.	5	R
10. How is water gas superior to producer gas?	5	U

PART B - (5 X16 = 80 Marks)

11. (a) (i) Describe the demineralization process of softening of hard water. How are spent resins regenerated? **(8)** **1** **R**
- (ii) Brief the following. **(8)** **1** **U**
- i. Scale and sludge
- ii. Carry over process

(OR)

- (b) (i) How is sea water purified using reverse osmosis. Explain with neat diagram. **(8)** **1** **U**
- (ii) Explain the various steps involved in domestic water treatment. **(8)** **1** **R**

12. (a) (i) Describe the mechanism of electrochemical corrosion by hydrogen evolution and oxygen absorption. (8) 2 R
(ii) Write short notes on galvanic corrosion? (8) 2 R
(OR)
- (b) (i) Explain the cathodic protection methods of controlling corrosion. (8) 2 U
(ii) What is electroless plating? Explain with suitable example. (8) 2 R
13. (a) (i) Explain any two methods of synthesizing nano particles. (8) 3 R
(ii) Write short notes on the following. (8) 3 R
i. Nano tubes
ii. Nano wires
(OR)
- (b) Discuss the applications of nano materials in various fields. (16) 3 U
14. (a) (i) State and explain the Beer-Lambert's law. (8) 4 R
(ii) Explain the mechanism of photosensitization with diagram and reactions. (8) 4 U
(OR)
- (b) (i) Describe the instrumentation and working of IR spectra with block diagram. (8) 4 R
(ii) Explain the principle of UV-Visible spectra with possible electronic transitions. (8) 4 U
15. (a) (i) Explain proximate analysis of coal? How is it carried out? What are its significance? (8) 5 R
(ii) Describe the manufacture of gasoline by Bergius process. (8) 5 R
(OR)
- (b) (i) A gaseous fuel has the following composition by volume. $\text{CH}_4 = 5\%$, $\text{H} = 20\%$, $\text{CO} = 25\%$, $\text{CO}_2 = 6\%$ and rest nitrogen. If 20% excess air is used for combustion, then calculate the volume of air required per m^3 of the fuel. (8) 5 U
(ii) Explain the manufacture of producer gas with a diagram. (8) 5 R