



Registration No:

--	--	--	--	--	--	--	--	--	--

Total Number of Pages : 2

B.TECH

2nd Semester Regular Examination-April-May 2019
BBSBS1022 Engineering Chemistry
(Regulations 2018) Common to CSE/MECHANICAL ENGG.

Time : 3 Hours

Maximum : 100 Marks

Answer ALL Questions

The figures in the right hand margin indicate marks.

PART – A: (Multiple Choice Questions) 10 x 2=20 Mark

Q.1. Answer All Questions.

- a. Main reasons for boiler corrosion are: [CO1] [PO1]
(i) dissolved oxygen (ii) dissolved carbon dioxide (iii) acids from dissolved salts (iv) all of the above
- b. Which of the following has sp² hybridization i)CO₂ ii) SO₂ iii)CO iv)N₂O [CO1] [PO1]
- c. Bond strength increased with [CO1] [PO1]
i)Bond length increasing ii) Anti bonding electrons being higher in number iii) Bond order increasing iv) Bond angle increasing
- d. End point colour change observed in determining hardness by EDTA method is [CO2] [PO1]
(i) blue to red (ii) wine red to blue (iii) red to wine red (iv) blue to wine red
- e. Foaming can be avoided by [CO2] [PO1]
(i) avoiding rapid change in steaming rate (ii) maintaining low level in boiler (iii) removing oil from boiler water (iv) none of the above
- f. Galvanised utensils are not used because: [CO3] [PO1]
(i) iron dissolves in food (ii) Zinc dissolves in food (iii) Such utensils are not available (iv) none of the above
- g. Cathodic coatings are obtained by coating the base metal with a metal having (i) lower electrode potential (ii) higher electrode potential (iii) zero electrode potential (iv) none of the above [CO3] [PO1]
- h. Bakelite is [CO4] [PO1]
(i) phenol formaldehyde (ii) urea formaldehyde (iii) formaldehyde (iv) melamine
- i. Why is PVC used in chemical industries? (i) low maintenance cost (ii) high resistance towards chemicals (iii) PVC can be processed in any form (iv) all of the above [CO4] [PO1]
- j. The polymer in which the functional groups are all on the same side of the chain is called (i) atactic (ii) syndiotactic (iii) isotactic (iv) all of the above [CO4] [PO1]

PART – B: (Short Answer Questions) 10 x 2=20 Marks

Q.2. Answer All questions

- a. Find out the zero point energy of an electron moving in ID box of width 0.5nm. [CO1] [PO2]
- b. What is the no. of unpaired electrons present in O₂ molecule [CO1] [PO2]
- c. What do you mean by break point chlorination? [CO2] [PO1]
- d. 100ml of a hard water sample required 15 ml of 0.01M EDTA. Find out the hardness of the sample. [CO2] [PO1]
- e. What is calgon conditioning? [CO2] [PO1]
- f. What type of corrosion may take place when a rubber band is tied around a steel pipe? [CO3] [PO1]
- g. What is pilling-Bedworth rule? How does it help to predict corrosion? [CO3] [PO1]
- h. Why does iron corrode under drops of salt solution? [CO3] [PO1]
- i. Differentiate between thermoplastic and thermosetting plastic [CO4] [PO1]
- j. Why do low density and high density polyethenes differ in density? [CO4] [PO1]

**PART – C: (Long Answer Questions) 4x15=60 Marks**Answer ALL questions**Q.3**

- a. Differentiate between Atomic and Molecular orbital [CO1] [PO2]
6+9
- b. What is spectroscopy. Mention its advantages and applications [CO1] [PO1]

OR

- c. Explain rotational spectroscopy of diatomic molecules [CO1] [PO2]
10+5
- d. Describe Electronic spectroscopy with neat diagram of energy levels. [CO1] [PO2]

Q.4

- a. Discuss about lime soda process. Compare it with permutit process [CO2] [PO1]
10+5
- b. How are microorganisms removed for drinking water? [CO2] [PO2]

OR

- c. Discuss about ion exchange method of water softening. [CO2] [PO1]
10+5
- d. A water sample contains $\text{Ca}^{+2} = 40\text{ppm}$, $\text{Mg}^{+2} = 36\text{ ppm}$ and 91.5 ppm of HCO_3^- . Find out amount of lime and soda required for softening [CO2] [PO2]

Q.5

- a. Discuss about galvanic and concentration cell corrosion [CO3] [PO2]
10+5
- b. Discuss about sacrificial anodic protection method [CO3] [PO1]

OR

- c. What is an electrochemical cell? Derive Nernst equation. Calculate the emf of the cell at 25°C :
 $\text{Zn(s)} | \text{Zn}^{+2} (0.1\text{M}) || \text{Cu}^{+2} (0.001\text{M}) | \text{Cu(s)}$
Given $E^\circ (\text{Zn}^{+2}/\text{Zn}) = -0.76\text{V}$, Given $E^\circ (\text{Cu}^{+2}/\text{Cu}) = +0.34\text{V}$ [CO3] [PO2]
10+5
- d. Discuss about galvanization [CO3] [PO2]

Q.6

- a. Discuss about preparation, properties and uses of Teflon. Is it a thermosetting or thermoplastic polymer? Explain [CO4][PO1]
8+7
- b. Discuss about methods of polymerization. [CO4][PO1]

OR

- c. Discuss about preparation, properties and uses of Nylon6,6. How does its synthesis differ from nylon6? [CO4] [PO1]
10+5
- d. Discuss about fibre reinforced plastic. [CO4] [PO1]

==0==