B.TECH. SEM -I COMPUTER/ INFO. TECH./ ELECTRONICS / BIO MEDICAL / E & TC) 2014 COURSE (CBCS) : WINTER - 2017

SUBJECT: ENGINEERING CHEMISTRY

Day: Thursday
Date: 18/01/2018

Time: 10.00 AM TO 01.00 PM
Max. Marks: 60

W-2017-2000

N.B:

1) All questions are **COMPULSORY.**
2) Figures to the right indicate **FULL** marks.
3) Use to the non-programmable **CALCULATOR** is allowed.
4) Neat diagram must be drawn **WHEREVER** necessary.
5) Assume suitable data if necessary.

Q.1 **a)** Explain phosphate conditioning method for water softening. **(05)**

b) An exhausted zeolite bed is regenerated by passing 5.2 litres of NaCl solution having concentration 120 gm NaCl per litre. The bed gets exhausted by treatment of 1000 litres of water sample. Calculate hardness of water. **(05)**

OR

Q.1 **a)** Write note on Caustic embrittlement. **(05)**

b) What are causes, disadvantages and prevention of scales and sludge formation? **(05)**

Q.2 **a)** Explain the roles of C_2S,C_3S,C_3A and C_4AF in hydration of cement. State the role of gypsum in setting of cement. **(05)**

b) Define Portland cement with chemical composition and compound constituents. **(05)**

OR

Q.2 **a)** What are the different types of defects in perfect crystal lattice? **(05)**

b) The Bragg's angle corresponding to the first order reflection from the plane of crystal is 20^0. When the x-rays of wavelength 1.68^0 are used. Calculate the interplaner spacing. **(05)**

Q.3 Give the significance of ultimate analysis of fuel. How is the percentage of carbon and hydrogen determine in this analysis? **(10)**

OR

Q.3 How the calorific value of gaseous fuel is measured by Boy's gas calorimeter? Give its principle, construction and working. **(10)**

P.T.O.

Q.4 What is corrosion? Explain hydrogen evolution and oxygen absorption mechanism of electrochemical corrosion. **(10)**

OR

Q.4 Distinguish between anodic and catholic metallic coatings. Which is more preferred? **(10)**

Q.5 **a)** Define reference electrode. Give construction and working of calomel electrode. **(05)**

b) Write note on Lead-acid storage cell. **(05)**

OR

Q.5 **a)** Explain the conductometric titration with titration curve for weak acid and strong base. **(05)**

b) State the postulates of Arrhenius ionic theory. **(05)**

Q.6 What is conformational isomerism? Discuss the conformational isomerism in n-butane. **(10)**

OR

Q.6 **a)** Define and explain the following terms: **(06)**

i) Geometrical isomerism ii) Racemic mixture

iii) Meso compound

b) Assign E and Z configuration of each of the following. **(04)**