2E3202

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2E3202

B.Tech. II Sem (Main) Examination, July - 2022
2FY2-03/Engineering Chemistry

Time : 3 Hours **Maximum Marks : 70**

Attempt all Ten questions from Part A, Five questions out of Seven questions from Part B and Three questions out of Five questions from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/ calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205).

PART - A
(Answer should be given up to 25 words only)

ALL questions are compulsory. **(10×2=20)**

1. What is the cause of hardness of water? **(2)**
2. How silica can be removed from water? **(2)**
3. What are the units of hardness? **(2)**
4. Name any two primary solid fuels. **(2)**
5. What is octane rating for petrol? **(2)**
6. What are the consequences of corrosion? **(2)**
7. Define annealing of glass. **(2)**
8. What are clinkers? **(2)**
9. What are Electrophilic reagents? **(2)**
10. Define flash point and fire point. **(2)**

PART - B
(Analytical/Problem solving questions)

Attempt any **Five** questions: **(5×4=20)**

1. With the help of a neat diagram, describe fractional distillation of crude petroleum and name the various products obtained. **(4)**
2. What is priming and foaming? Discuss their disadvantages. **(2+2=4)**

3. What is break point chlorination. Explain with suitable diagram. (4)

4. Discuss the following in brief. (2+2=4)
   a) Borosilicate glass
   b) Optical glass

5. Explain setting and hardening of cement. (4)

6. Write short notes on: (2+2=4)
   a) Cloud Point and Pour Point
   b) Viscosity and viscosity Index.

7. Discuss the mechanism of dry corrosion. (4)

PART - C

(Descriptive/Analytical/Problem Solving/Design question)

Attempt any **Three** questions: (3×10=30)

1. Calculate the amount of lime (84% pure) and soda (92% pure) required for treatment of 20,000 litres of water, whose analysis is as follows:

   $Ca(HCO_3)_2$ = 40.5 ppm; $Mg(HCO_3)_2$ = 36.5 ppm; $MgSO_4$ = 30.0 ppm; $CaSo_4$ = 34.0 ppm; $CaCl_2$ = 27.75 ppm, and Nacl = 10.00 ppm. (10)

2. A sample of coal was found to contain C = 92%, H = 5% and Ash = 3%. When this coal was tested in laboratory for its calorific value in Bomb calorimeter, following data were obtained:

Weight of coal burnt	=	0.95 g
Weight of water taken	=	700 g
Water equivalent of bomb and calorimeter	=	2,000 g
Rise in temperature	=	2.48 °C
Cooling correction	=	0.02 °C
Fuse wire correction	=	10.0 Cal
Acid correction	=	60.0 Cal

   Calculate the net and gross calorific values of the coal in cal/g. Assume the latent heat of condensation of steam as 580 cal/g. (10)

3. How would you determine the calorific value of coal by Bomb calorimeter? Explain with the help of a neat diagram. (10)

4. How is water softened by lime-soda process? Describe with suitable diagrams and chemical reactions. (10)

5. Describe the synthesis, properties and uses of paracetamol. (10)
