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CHEM101 Enrol. No. .....

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END SEMESTER EXAMINATION : April-May, 2023

APPLIED CHEMISTRY

Time : 3 Hrs. *Maximum Marks : 60*

Note: ***Attempt questions from all sections as directed. Use of scientific calculator is allowed. Made the suitable assumptions in case of missing data or whenever required.***

SECTION – A (24 Marks)

Attempt any **four** *questions out of* **five.**
Each question carries **06** *marks.*

1. What are scales and sludge's? How are they formed? What are the disadvantages and what are the methods of prevention of scale formation?

2. Explain principle and instrumentation of UV-visible spectrophotometer.

3. Discuss the factors influencing corrosion and their control.

P.T.O.

4. Calculate the temporary and total hardness of a water sample containing $Mg(HCO3)2$ = 73mg/L, $Ca(HCO3)2$ = 162mg/L, $MgC12$ = 95mg/L, $CaSO4$ = 136mg/L.

5. Define Flash point and fire point. Give its significance and explain how it is determined.

SECTION – B (20 Marks)

Attempt any **two** *questions out of* **three**.
Each question carries **10** *marks.*

6. (a) Write short notes on Ion exchange method, cations ions exchanger, anion ions exchange. (4)

(b) A sample of coal on analysed as follows: 2.7 g was weighed into silica crucible. After heating for 1 hr at 110°C the residue was weighed 2.415 g. The crucible next was covered with lid and strongly heated for 7 mins at 950°C. The residue weighed was 1.528 g. The crucible was heated then without cover until constant weight was obtained. The last residue was found to weigh 0.245 g. Calculate percentage result of above analysis. (6)

7. Explain with chemical equations and calculate the amount of lime and soda required for softening of 1,00,0001 of water containing the following: HCl = 7.3 mg/L, $Al_2(SO_4)_3$ = 34.2 mg/L, $MgCl_2$ = 9.5 mg/L, NaCl = 29.25 mg/L. Purity of lime is 90% and that of soda is 98%. 10% of chemicals are to be used in excess in order to complete the reaction quickly.

8. (a) Explain the mechanism of hydrodynamic lubrication and write a note on blended oils. (4)

(b) What do you mean by dry corrosion. What are the types of oxide layers formed? Discuss Pilling-Bedworth rule for the formation of oxide layers. (6)

SECTION – C (16 Marks)

(Compulsory)

9. (a) Write short notes on Ion exchange method, cations ions exchanger, anion ions exchanger. (6)

(b) Explain the factors affecting corrosion. (4)

P.T.O.

(c) What is proximate analysis? What are the parameter analysed and how is it carried out?

(6)