22362

24225

03 Hours / 70 Marks Seat No. | | | | | | | | |

Instructions – (1) All Questions are *Compulsory.*

(2) Answer each next main Question on a new page.

(3) Illustrate your answers with neat sketches wherever necessary.

(4) Figures to the right indicate full marks.

(5) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. Attempt any FIVE of the following: **10**

a) Define Chemical Oxygen Demand.

b) Define Fuel and state its unit.

c) Draw the chemical structure of:

i) Hydrogen peroxide

ii) Sodium sulphate

d) Define iodine value of Oil.

e) Define colloidal electrolyte with an example.

f) Define secondary standard with an example.

g) Define the term coordination compounds.

2. Attempt any THREE of the following: **12**

a) State the difference between temporary and permanent hardness of water.

b) Describe the ash content of boiler fuel sample.

c) Explain chemical properties of hydrochloric acid.

d) Describe wetting property and detergent property of detergents.

P.T.O.

Marks

3. Attempt any THREE of the following: **12**

a) Describe with a neat sketch the procedure to evaluate wetting property of nylon.

b) Compare accuracy and precision giving suitable examples of both.

c) Describe following types of titration giving suitable examples of both.

i) Redox titration

ii) Complexo metric titration

d) Describe Wernes's coordination theory.

4. Attempt any THREE of the following: **12**

a) Classify fuels based on their characteristics.

b) Calculate the gross and net calorific value of a coal which analyses:
C = 74%, H = 6%, N = 1%, O = 9%, S = 0.8%, Moisture = 2.2% and ash = 8%.

c) Calculate the molarity of an acetic acid solution if 34.57 ml of this solution are needed to neutralize 25.19 ml of 0.1025 M sodium hydroxide.
$CH_3COOH(aq) + NaOH(aq) \rightarrow Na^+(aq) + CH_3COOH^-(aq) + H_2O(L)$

d) Explain four applications of coordinating compound in textiles.

e) Describe with a neat sketch the process to select sequestering agent of relevant strength.

Marks

5. Attempt any TWO of the following: **12**

a) Explain with sketches the methods to determine total solids, suspended and dissolved solids present in a water sample.

b) Select the procedure to determine the purity of sulfuric acid using following chemicals:

i) NaOH

ii) Phenolphthalein

Write the suitable chemical reaction involved in the above reaction. Write the equation to calculate the percentage purity of H_2SO_4.

c) Describe one quantitative and one qualitative testing techniques for cotton fabric.

6. Attempt any TWO of the following: **12**

a) Calculate the temporary and permanent hardness of water in the given sample. Containing $MgSO_4$ = 25 mg/litre, $Mg(HCO_3)_2$ = 32 mg/litre, $CaCl_2$ = 55 mg/litre. KCl = 10.0 mg/litre
[Given at weights of Mg = 24, S = 32, O = 16, K = 39, Cl = 35.5, Ca = 40]

b) Describe two chemical properties each of the following:

i) Sodium carbonate

ii) Sodium sulphate

iii) Hydrogen peroxide

c) Select the type of titration required for determination of sap value of oil. Describe the procedure of determining saponification value of palm oil.