

Scheme – I

Sample Question Paper

Programme Name : Diploma in Textile Technology

Programme Code : TC

Semester : Third

Course Title : Industrial Chemistry

Marks : 70

22362

Time: 3 Hrs.

Instructions:

- (1) All questions are compulsory.
- (2) Illustrate your answers with neat sketches wherever necessary.
- (3) Figures to the right indicate full marks.
- (4) Assume suitable data if necessary.
- (5) Preferably, write the answers in sequential order.

Q.1) Attempt any FIVE of the following.

10 Marks

- a) Define the term 'hardness of water'
- b) Define the term 'calorific value' of fuel.
- c) Draw the chemical structure of :
 - 1) Ammonium sulphate
 - 2) Sodium carbonate.
- d) Define the term 'saponification value' of oil.
- e) List the chemical properties of soaps.
- f) Define the term 'volumetric analysis'.
- g) Define the term 'Coordination number'

Q.2) Attempt any THREE of the following.

12 Marks

- a) Distinguish between Scale and Sludge.
- b) Select the characteristics of fuel while using it for boiler feed purpose.
- c) Explain the following chemical properties of sulphuric acid with relevant chemical reactions. 1) Neutralization 2) Reaction with Zn .
- d) Describe foaming property of soap with labeled diagram.

Q.3) Attempt any THREE of the following.

12 Marks

- a) Describe the following types of titration with relevant examples
 - 1) Acid base titration
 - 2) Precipitation titration.
- b) Explain the factors affecting the stability of complex ion and coordination compounds
- c) Differentiate between primary and secondary standards with relevant examples.
- d) Two fabric samples A & B are supplied to test the wetting property. Fabric sample A does not undergo wetting while sample B undergo wetting within no time. Suggest the method to improve wetting property of sample A. Predict the reason of better wetting property of sample B .

Q.4) Attempt any THREE of the following.**12 Marks**

- Classify the fuels based on their physical state with relevant examples
- Constant Burette reading by an expert is 10.5ml. Observed burette reading for the same titration is 10.8 ml. Determine accuracy and precision in the performed titration.
- A sample of fuel contains C = 60% O = 33% H = 6% S = 0.5% N = 0.3% & Ash = 0.3%. Calculate the Higher Calorific Value and Lower Calorific Value of fuel.
- A water sample contains dissolved salts of Calcium. Suggest the procedure for determining the dissolved calcium salts in water.
- Describe the role of sodium hexa metaphosphate as a water softener.

Q.5) Attempt any TWO of the following.**12 Marks**

- Show the reactions indicating ion exchange occurring in cationic exchanger and anionic exchanger.
- Complete following chemical reactions
 - $\text{Na}_2\text{CO}_3 + \text{HCl} \longrightarrow$
 - $\text{H}_2\text{O}_2(\text{aq}) + 2\text{e}^- \longrightarrow$
 - $\text{H}_2\text{O}_2(\text{aq}) + 2\text{H}^+ + 2\text{e}^- \longrightarrow$
- Suggest the procedure to determine the purity of acetic acid using following chemicals : 1) Oxalic acid 2) Caustic 3) Phenolphthalein

Q.6) Attempt any TWO of the following.**12 Marks**

- Choose relevant chemicals along with their formulae for following wet process
 - Scouring
 - Mercerizing
 - Bleaching.
- Select the type of titration required for determination of saponification value of oil. Describe the procedure of determining saponification value of castor oil.
- A sample of water contains the following impurities in mg/lit

$\text{Ca}(\text{HCO}_3)_2 = 4.86$	mol.wt = 162
$\text{Mg}(\text{HCO}_3)_2 = 5.8$	mol.wt = 146
$\text{CaSO}_4 = 6.80$	mol.wt = 136
$\text{CaCl}_2 = 3.14$	mol.wt = 111
$\text{KCl} = 10.0$	mol.wt = 75
$\text{MgSO}_4 = 8.40$	mol.wt = 120

Calculate the temporary & permanent hardness of water.

Scheme – I

Sample Test Paper - I

Programme Name : Diploma in Textile Technology

Programme Code : TC

Semester : Third

Course Title : Industrial Chemistry

Marks : 20

22362

Time: 1 Hour

Instructions:

- (1) All questions are compulsory.
- (2) Illustrate your answers with neat sketches wherever necessary.
- (3) Figures to the right indicate full marks.
- (4) Assume suitable data if necessary.
- (5) Preferably, write the answers in sequential order.

Q.1 Attempt any FOUR.

08 Marks

- a) List the water quality parameters.
- b) Draw a structures of (i) sodium hydrosulphite and (ii) hydrogen peroxide.
- c) Define fuel with relevant example.
- d) Define the term 'reverse osmosis'.
- e) Define 'Higher Calorific value' and 'Lower Calorific Value'.
- f) State the role of H_2O_2 in textile wet process.

Q.2 Attempt any THREE.

12 Marks

- a) A water sample contains following calcium and magnesium salts. Suggest the method of removing these salts from water.

1) $CaSO_4$ 2) $MgSO_4$ 3) $Ca(HCO_3)_2$ 4) $Mg(HCO_3)_2$ 5) $CaCl_2$

- b) Compare solid fuel and liquid fuel.
- c) Explain chemical properties of following chemicals.

1) Sulphuric acid 2) Hydrochloric acid

- d) A sample of water contains the following impurities in mg/lit

$Ca(HCO_3)_2=15$ mol.wt =162

$Mg(HCO_3)_2= 10$ mol.wt =146

$CaSO_4 = 10$ mol.wt =136

$MgSO_4= 12$ mol.wt =120

$NaCl= 14$ mol.wt =58.5

Calculate the temporary & permanent hardness of water.

Scheme – I

Sample Test Paper - II

Programme Name : Diploma in Textile Technology

Programme Code : TC

Semester : Third

Course Title : Industrial Chemistry

Marks : 20

22362

Time: 1 Hour

Instructions:

- (1) All questions are compulsory.
- (2) Illustrate your answers with neat sketches wherever necessary.
- (3) Figures to the right indicate full marks.
- (4) Assume suitable data if necessary.
- (5) Preferably, write the answers in sequential order.

Q.1 Attempt any FOUR.

08 Marks

- a) Define coordination compound with example
- b) List the different types of titration.
- c) Draw the structure of sodium salt of EDTA
- d) Define the term 'iodine value' of oil.
- e) Define the terms fat and oil.

Q.2 Attempt any THREE.

12Marks

- a) Describe the process of hydrogenation of oils. Name oils which can be hydrogenated
- b) Explain the following properties of soap
1) Soap solution as a colloidal electrolyte
2) Wetting agent.
- c) Differentiate between Accuracy and Precision with relevant example
- d) Explain the uses of coordinating compounds.