



Seat No.: \_\_\_\_\_

No. Of Printed Pages :02

[ 11 ]

SARDAR PATEL UNIVERSITY

B.Sc. (SEMESTER-5) EXAMINATION- 2022

US03CICV51: (Chemical Plant Auxiliaries & Manufacturing)

Date : 19/11/2022, Saturday

Time : 10:00 A.M. TO 01:00 P.M.

Total Marks: 70

Note: Figures to the right indicate full marks of the questions.

Q.1 Multiple Choice Questions. (All are compulsory)

[10]

- Hard water may be softened by passing it through \_\_\_\_\_.  
(a) Limestone (b) Ion exchange process  
(c) Calgon (d) Rock salt
- Which of the following gas is used in the fire extinguisher?  
(a) Nitrogen (b) Oxygen (c) Carbon dioxide (d) Hydrogen
- Scale formation in boilers causes:  
(a) No loss of heat (b) Wastage of heat  
(c) increase in efficiency (d) None of Above
- Which of the following refrigerants has the lowest freezing point?  
(a) R-11 (b) R-12 (c) R-22 (d) Ammonia
- The pressure at the inlet of a refrigerant compressor is called as \_\_\_\_\_.  
(a) Suction pressure (b) Discharge pressure  
(c) Critical pressure (d) Back pressure
- The coefficient of performance is always \_\_\_\_\_ one.  
(a) Equal to one (b) Less than  
(c) Greater than (c) None of these
- A vortex type of agitation is done in \_\_\_\_\_.  
(a) Schmid nitration (b) Biazzini nitration (c) Electrolysis (d) None of these
- Amination by reduction involves the synthesis of \_\_\_\_\_ by reductive methods?  
(a) Toluene (b) Phenols (c) Amines (d) Alkyl
- The rate of Nitration depends on \_\_\_\_\_.  
(a) Cooling (b) Concentration (c) Pressure (d) Heating
- The Nitration reaction serves to introduce one or more \_\_\_\_\_ groups into a reacting Molecule.  
(a) Nitro group (b) Nitrite group (c) Amino group (d) Methyl group

- Q.2**      **Short Answer Questions.**      (Attempt any 10 out of 12)      [20]
1. Define the term temporary and permanent hardness.
  2. Enlist various sources of water.
  3. Define the term Calorific value.
  4. Enlist the various types of refrigerants.
  5. Write a difference between petrol engine and diesel engine.
  6. Define the term Suction volume.
  7. Define the term Nitration.
  8. Write mechanism of Sulfonation.
  9. Give the advantages of batch process over continuous process for nitration.
  10. Define term etherification giving suitable examples.
  11. Define the term Hydrolysis.
  12. How hydrogenation reaction takes place? Explain it.
- Q.3**      **Answer the given questions**      [5]
- A. Explain in details about major boiler troubles.      [5]
  - B. Write a comparison between solid, liquid and gaseous fuels.      [5]
- OR**
- A. Write a note on bomb calorimeter with neat diagram.      [5]
  - B. Write a note on characteristics of good fuel.      [5]
- Q.4**      **Answer the given questions**      [5]
- A. Explain about single stage single acting reciprocating compressor with suitable diagram.      [5]
  - B. Explain various classification of Boiler.      [5]
- OR**
- A. Explain various classification of compressor.      [5]
  - B. What is difference between heat engine, refrigerator and heat pump?      [5]
- Q.5**      **Answer the given questions**      [5]
- A. Explain industrial Production of Nitrobenzene from Benzene.      [5]
  - B. Write manufacturing of p-nitro Acetanilide from Acetanilide.      [5]
- OR**
- A. Describe industrial analysis of aniline with diagram.      [5]
  - B. Write a short note on Oxy-nitration.      [5]
- Q.6**      **Answer the given questions**      [5]
- A. Explain hydrogenation of vegetable oil.      [5]
  - B. Explain industrial production of Chlorobenzene.      [5]
- OR**
- A. Write a note on industrial production of Benzoic acid.      [5]
  - B. Discuss in details about manufacturing of Ethyl acetate.      [5]