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[25] SEAT No._____ No. of Printed Pages : 02

SARDAR PATEL UNIVERSITY

B.Sc. Industrial Chemistry

(Semester – 4TH) EXAMINATION

9th April 2019,Tuesday

Course No. : US04CICH02

(Chemical Plant Utilities)

Total Marks: 70 **Time:10:00 am to 1:00pm**

Q.1 Answer the given multiple choice questions. **[10]**

1. Temporary hardness in water is caused by the presence of
   A) Calcium Chloride b) Magnesium Chloride c) Both a) and(b d) none of these
2. Blow –down operation removes
   a)Scales b) Sodium carbonate c) Both a) and b) d) None of these
3. Lowest temperature at which the fuel must be pre-heated so that it starts burning
   a)Ignition temperature c) Critical temperature
   b) Safety Temperature d) None of these
4. A good fuel should posses
   a)High ignition temperature c)Moderate ignition temperature
   b)High calorific value d) Both b) and c)
5. Natural gas is composed of
   a)methane b) n-Butane c) n-propane d) None of these
6. The pressure at the outlet of a compressor is called
   a) Critical pressure c) suction pressure
   b) Back pressure d) discharge pressure
7. The Freon group of refrigerant are
   a)Halocarbon refrigerant c) Inorganic refrigerant
   b) Azeotrope refrigerant d)Hydrocarbon refrigerants
8. Which of the following is an external combustion engine?
   (a) Steam Power Plant (b) Diesel engine
   (c) Petrol engine (d) None of these
9. The Engine which uses petrol as a fuel is known as.....
   (a) Otto Engine (b) Stream Engine
   (c) Diesel Engine (d) Gas Engine
10. Which of the following is not a fire tube boiler?
    a) Simple vertical c) Locomotive
    b) Lancashire d) Cochran

Q.2 Attempt any Ten. **[20]**

i. Distinguish between Hard water and soft water.
ii. Discuss methods used for removal of oxygen from water.
iii. Explain Clerk's Method for hardness determination.
iv. "An ideal fuel should have moderate ignition temperature", why?
v. Define: Calorific value of fuel.
vi. Write uses of oxygen.
vii. Define Suction volume, Compression Ratio.

viii. Write classification of refrigerants.
ix Explain C.O.P. and Ton of Refrigeration.
X Write the function of Boiler.
xi Discuss about Dry and Wet Saturated steam.
xii Differentiate water tube boiler and fire tube boiler.

Q.3a)	Write a note on: Carry Over.	[5]
b)	Discuss corrosion.	[5]
	OR	
Q.3a)	Discuss Hot and Cold lime soda process in detail.	[10]
Q.4a)	Discuss Bomb Calorimeter.	[5]
b)	Write a note on: Characteristics of a good fuel.	[5]
	OR	
Q.4a)	List advantages and disadvantages of solid, liquid and gaseous fuels over each other.	[5]
b)	Write industrial uses of carbon dioxide and nitrogen.	[5]
Q.5a)	Write a note on: Vapour Compression Refrigeration Cycle.	[5]
b)	Derive an equation for work done by single stage single acting reciprocating compressor during isothermal compression.	[5]
	OR	
Q.5a)	Write a note on: Industrial refrigerant.	[5]
b)	Discuss multistage compression.	[5]
Q.6a)	Discuss classification of Boiler.	[5]
b)	Differentiate Petrol engine and Diesel engine.	[5]
	OR	
Q.6a)	Derive an equation for thermal efficiency of Otto Engine.	[5]
b)	Write a note on: Boiler mountings.	[5]

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