MBM-003-10120012 Seat No. _____

B. Sc. (Sem. II) (CBCS) Examination

March / April - 2018

BS-IC-201 : Industrial Chemistry

Faculty Code : 003
Subject Code : 10120012

Time : $2\frac{1}{2}$ Hours] [Total Marks : **70**

1 (a) Answer the following questions : **4**

(1) Give examples of input devices in computer.

(2) "Windows is operating system of computer." Is this statement true or false?

(3) Fuel can be available in solid, liquid and _____ form.

(4) The nature of deepwell water will be _____

(b) Answer in brief : (any one out of two) **2**

(1) Explain concept of internet in detail. Give examples of search engines.

(2) Write two industrial uses of steam.

(c) Answer in detail. (Any one out of two) **3**

(1) Explain uses of Microsoft office Excel and word.

(2) Explain caustic soda method for water softening with reaction.

(d) Write notes on : (Any one out of two) **5**

(1) Draw diagram of computer system with input and output devices.

(2) Explain zeolite method for water softening with neat diagram.

2 (a) Answer the following questions : **4**

(1) "Physisorption is multilayer adsorption." Is this statement true or false?

(2) "Permanent chemical bond is necessary for chemical adsorption." Is this statement true or false?

(3) Give types of solution with examples.

(4) Which catalyst is used in Haber process?

(b) Answer in brief : (any one out of two) **2**

(1) Enlist factors affecting adsorption. Explain any two in brief.

(2) Define :

(a) True solution

(b) Lyophobic colloidal solution.

(c) Answer in detail : (any one out of two) **3**

(1) Explain Brownian motion and Tyndall effect observed in colloidal solution.

(2) Explain autocatalysis in detail.

(d) Write notes on : (any one out of two) **5**

(1) Explain Freundlich adsorption isotherm in detail with diagram.

(2) Define adsorption and explain applications of adsorption in detail.

3 (a) Answer the following questions : **4**

(1) In case of material balance without chemical reaction, units of all components are taken in moles. True/false.

(2) The ratio of moles of desired product to undesired product is known as _____

(3) Latent heat is denoted by _____ symbol.

(4) In sensible heat, there is no _____ change occurs.

(b) Answer in brief : (any one out of two) **2**

(1) Define :

(a) Flow process

(b) Heat of mixing

(2) Discuss limiting reactant with example.

(c) Answer in detail : (any one out of two) **3**

(1) Derive an equation for relationship between C_P and C_V.

(2) Discuss % conversion with example.

(d) Write notes on : (any one out of two) **5**

(1) Explain detailed note on various forms of energy.

(2) In production of Sulfur trioxide, 100 kmoles of SO_2 and 100 kmoles Of O_2 are fed to the reactor. If the percent conversion Of SO_2 is 80, calculate the composition of product stream on mole basis.

$$SO_2 + \frac{1}{2} O_2 \rightarrow SO_3$$

4 (a) Answer the following questions : **4**

(1) _____ cooling results into formation of less number of nuclei, which result in large size crystals formed.

(2) The ratio of humidity of air to humidity of saturated air is known as _____

(3) _____ drum is not suitable for sticky materials.

(4) Lumpy and pasty materials can be dried in _____ dryer.

(b) Answer in brief : (any one out of two) **2**

(1) Enlist merits and demerits of spray dryer.

(2) Give classification of crystallizer based on super-saturation.

(c) Answer in detail : (Any one out of two) **3**

(1) Draw only diagram of Sparkler horizontal plate filter.

(2) Discuss free and equilibrium moisture content.

(d) Write notes on : (any one out of two) **5**

(1) Explain Swenson-Walker crystallizer in detail.

(2) Discuss plate and frame filter press with neat diagram.

5 (a) Answer the following questions : **4**

(1) A disperser draws more power than a kneader type mixer. True/False

(2) The presence of air in pump is known as _____

(3) Which pump produces higher pressure than centrifugal pump?

(4) Heat transfer means transfer of heat between two hot and _____ fluids.

(b) Answer in brief : (any one out of two) **2**

(1) Draw only diagram of jet ejector.

(2) Write merits and demerits of plate type heat exchanger.

(c) Answer in detail : (any one out of two) **3**

(1) Draw only diagram of shell and tube heat exchanger.

(2) Discuss Ribbon blenders in detail.

(d) Write notes on : (any one out of two) **5**

(1) Discuss Finned Tube Heat exchanger with neat diagram.

(2) Explain Reciprocating pump in detail.