DDA-003-2011012 Seat No. _____

B. Sc. (Sem.-I) (CBCS) Examination

August - 2022

BSIC-101 : Industrial Chemistry

Faculty Code : 003
Subject Code : 2011012

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

Instructions : (1) Question paper carries total 10 questions.
(2) All the questions have general option & carry 14 marks each.
(3) Answer any 5 questions out of total 10 questions.
(4) Draw labeled diagrams wherever necessary & Assume suitable data.

1 (a) Answer the following questions : **4**
(1) What is mercaptan?
(2) Enlist types of cracking and reforming processes.
(3) Enlist different chemicals derived from petroleum.
(4) Define distillation process, give examples

(b) Answer in brief : **2**
(1) Explain composition of petroleum in brief.

(c) Answer in detail : **3**
(1) Write a note on fluidized bed reactor.

(d) Write a note on : **5**
(1) Explain in detail: oil refineries in India.

2 (a) Answer the following questions : **4**
(1) Enlist different auxiliary facilities required in refineries.
(2) Enlist division of metallurgy.
(3) Define physical metallurgy.
(4) Define chemical metallurgy.

(b) Answer in brief : **2**
(1) Write a brief note on different processing units in oil refineries.

(c) Answer in detail : 3

(1) Write a note on froth flotation process in brief.

(d) Write a note on : 5

(1) Explain refining of metal in detail.

3 (a) Answer the following questions : 4

(1) Enlist classification of fuel

(2) What is non-coking coal ?

(3) Define calorific value

(4) Define: BTU

(b) Answer in brief : 2

(1) Write various products which can be derived from coal.

(c) Answer in detail : 3

(1) Explain GCV & NCV.

(d) Write a note on : 5

(1) Explain proximate analysis of coal in detail.

4 (a) Answer the following questions : 4

(1) Write types of alcohol.

(2) Write types of starch.

(3) Give structure of isopropyl alcohol.

(4) Give structure of butyl alcohol.

(b) Answer in brief : 2

(1) Enlist types of coal with its ranking.

(c) Answer in detail : 3

(1) Explain manufacturing of coal gas.

(d) Write a note on : 5

(1) Explain carbonization of coal in detail.

5 (a) Answer the following questions : 4

(1) What is evaporation? Give one example.

(2) Enlist merits and demerits of climbing film evaporator.

(3) Enlist merits and demerits of multiple effect evaporators.

(4) Give molecular weight of NaOH, HCl & HNO_3.

(b) Answer in brief : 2

(1) Enlist application of Evaporation.

(c) Answer in detail : 3

(1) Explain in brief Fundamental quantities.

(d) Write a note on : 5

(1) Discuss weight fraction & weight percent in detail.

6 (a) Answer the following questions : 4

(1) Define: molarity

(2) Write definition & formula of Kg atom.

(3) Give unit of density

(4) Force = mass X _____.

(b) Answer in brief : 2

(1) Write a short note on (1) gram atom (2) gram mole.

(c) Answer in detail : 3

(1) Explain Calandria evaporator in detail.

(d) Write a note on : 5

(1) Discuss weight fraction & weight percent in detail.

7 (a) Answer the following questions : 4

(1) Write a law of conservation of mass & its formula.

(2) Material balance is also known as ____.

(3) Feed solution + solvent = Extract phase + raffinate phase is the formula of _____.

(4) Give definition of distillation

(b) Answer in brief : 2

(1) Write a short note on Mixing (Definition, block diagram) for material balance without chemical reaction.

(c) Answer in detail. 3

(1) Explain in brief absorption operation for material. balance without chemical reaction.

(d) Write a note on : 5

(1) Discuss various outline procedure for material balance calculation.

8 (a) Answer the following questions : 4

(1) Filtrate is also known as _____.

(2) Drying is carried out for removal of _____ associated with wet solid with the help of hot air.

(3) Absorption is _____ operation.

(4) Weak liquor + Concentrated stream = desire product is the formula of _____.

(b) Answer in brief : 2

(1) Draw block diagram of evaporation.

(c) Answer in detail : 3

(1) Write any two categories of material balance problem.

(d) Write a note on : **5**

(1) 2000 kg of wet solids containing 70 % solids by weight are fed to tray dryer where it is dried by hot air. The product finally obtained to contain 1 % moisture by weight. Calculate (a) Kg of water removed from wet solids & (b) Kg of product obtained)

9 (a) Answer the following questions. **4**

(1) Vapor is converted into liquid in _____ apparatus.

(2) PRV stands for _____.

(3) Steam for steam distillation is produced in _____.

(4) "In gas absorption, if the depth of tray is high, absorption is low" True or false?

(b) Answer in brief : **2**

(1) Define: (i) Mole fraction (ii) Weight fraction

(c) Answer in detail : **3**

(1) Explain steam distillation in detail.

(d) Write a note on : **5**

(1) Explain separation of Acetone and Methanol with process flow diagram.

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

(1) Production of clove essence from clove is example of _____ unit operation.

(2) In Extraction, Selectivity should be _____.

(3) In Extraction, Separation is done by _____ difference.

(4) The solubility of solute gas in a solvent should be _____.

(b) Answer in brief : **2**

(1) What is extraction? Explain with one example.

(c) Answer in detail : **3**

(1) Explain Relative merits and demerits of plate and packed towers.

(d) Write a note on : **5**

(1) Explain Mixer-settler in detail.