JAV-003-2011012 Seat No. _____

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

December - 2019

BS-IC - 101 : Industrial Chemistry

Faculty Code : 003

Subject Code : 2011012

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

Instructions : (1) Paper carries total 5 questions.
(2) All the questions are compulsory and carry 14 marks each.
(3) Draw labelled diagrams wherever necessary.
(4) Assume suitable data.

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

(1) Greek word Petra means _____ and Oleum means _____.

(2) "levorsen has given organic origin theory of petroleum" true or false?

(3) Enlist divisions of metallurgy.

(4) _____ metals can be obtained by reduction using carbon.

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

(1) Explain composition of petroleum with examples.

(2) Define: Mineral. Give examples of minerals.

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

(1) Write a note on catalytic cracking of heavy oil.

(2) Explain in detail: froth flotation process.

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

(1) Explain fractional distillation of crude oil in detail.

(2) Explain extraction of aluminum with detailed diagram.

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

(1) "Peat is low ranking coal than anthracite" is this statement true or false ?

(2) % Ash comes in _____ analysis (ultimate or proximate).

(3) _____ is toxic alcohol.

(4) Write structure of nitrocellulose.

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

(1) Enlist types of coal.

(2) Write properties and uses of cellulose.

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

(1) Explain proximate and ultimate analysis of coal.

(2) Write detailed process of manufacturing of ethanol.

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

(1) Explain carbonization of coal by horizontal coke oven.

(2) Explain manufacturing of cellulose acetate (artificial silk) in detail.

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

(1) Write unit of temperature in SI unit.

(2) Weight % is ratio of weight of component to _____.

(3) Write two merits of short tube evaporator.

(4) Film type evaporator is also known as falling film evaporator. True/False ?

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

(1) Write various applications of evaporation.

(2) Define : (a) Normality (b) Gm. mole

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

(1) 20 gm of caustic soda are dissolved in water to prepare 500 ml of solution. Find Normality and Molarity of solution.

(2) Discuss forced circulating evaporator with neat diagram.

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

(1) Explain multiple effect evaporators with diagram.

(2) Discuss fundamental and derived quantities in detail.

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

(1) Material balance is also known as mass balance. True/False?

(2) Input=Output is true for _____ condition. (Steady state/Unsteady state)

(3) Adopt _____ units in case of problems without chemical reaction.

(4) Mixing is also known as _____.

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

(1) State the law of conservation of mass with example.

(2) Write material balance calculation of distillation with diagram.

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

(1) Discuss material balance of filtration with rectangular block diagram.

(2) The ground nut seeds containing 45% oil and 45% solid are fed to expeller. The cake coming out of expeller is found to contain 80 % solids and 5% oil. Find the % recovery of oil.

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

(1) Explain outlines of procedure for material balance calculation.

(2) The feed to a continuous fractionating column analyses by weight 28% benzene and 72% toluene. The analysis of distillate shows 52% benzene and 5% benzene was found in bottom product. Calculate the amount of distillate and bottom product per 1000 kg of feed per hour. Also calculate the percent recovery of benzene.

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

(1) Flash distillation is also known as _____ distillation.

(2) Volatility is ratio of partial pressure of A to mole fraction of A. True/False?

(3) Write full form of RDC.

(4) Azeotrope is constant _____ mixture.

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

(1) Write any two characteristics of ideal packing.

(2) Enlist factors affecting selection of solvent for extraction.

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

(1) Explain steam distillation with diagram.

(2) Write a note on valve and bubble tray.

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

(1) Explain continuous distillation with rectification process with diagram.

(2) Discuss spray and packed tower with diagram.
