



HDV-003-001109

Seat No. _____

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

November / December – 2017

IC.P - 101 : Industrial Chemistry

Faculty Code : 003

Subject Code : 001109

Time : $2\frac{1}{2}$ Hours]

[Total Marks : 70

- Instructions :**
- (1) All the questions are compulsory.
 - (2) Figures to the right indicate maximum marks.
 - (3) Draw labeled diagram wherever necessary.
 - (4) Assume suitable data.
 - (5) Question-1 carries 20 marks.
 - (6) Question-2 and 3 carry 25 marks each.

1 Answer the following questions : 20

- (1) Percentage of carbon in crude oil is around _____ to _____.
- (2) Give full form of CHU.
- (3) "Platforming process is used for thermal cracking of heavy oil". Is this statement true or false?
- (4) Analysis of moisture content in coal comes under _____ analysis.
- (5) Cracking involves rupture of _____ and _____ bonds of heavy hydrocarbon.
- (6) Gross calorific value of fuel is _____ than Net calorific value. (Higher or Lower)
- (7) Raw materials used for manufacturing of Nitro cellulose are _____ and _____.
- (8) For unsteady state operation, Input= Output. This statement is true/False?
- (9) Mixing operation is also known as _____
- (10) 'During material balance of drying, output side products contain _____ and _____.

- (11) Adopt _____ units in case of problems with reaction in material balance calculations. (Weight/Mole)
- (12) Fuel is a combustible substance. True/False?
- (13) Evaporation is an example of _____ (Unit operation/ Unit process)
- (14) Packing materials should have high corrosion resistance. True/False?
- (15) Sometimes distillation technique requires reflux to give almost _____ product.
- (16) Solvent cant used for extraction purpose. True/False?
- (17) Density difference of solvents must be _____ for easy separation in case of extraction.
- (18) Kestner long tube evaporator is also known as _____
- (19) Output side products of filtration operation during material balance calculations are _____ and _____.
- (20) State the law of conservation of mass for material balance calculations.

- 2** (a) Answer any **three** : **6**
- (1) Define reforming process with an example.
 - (2) Define: Lean or Dry Gas.
 - (3) Write reaction for combustion of fuel.
 - (4) Define : (a) Volume% (b) Gram mole
 - (5) Give two merits of short tube evaporator.
 - (6) Enlist factors affecting selection of solvent for extraction.
- (b) Answer any **three** : **9**
- (1) Explain shell process for removal of H₂S from natural gas stream.
 - (2) Discuss thermal reforming of gasoline in detail with diagram.
 - (3) Give three advantages of liquid fuel.
 - (4) Explain weight fraction in detail.
 - (5) Define : (a) Distillation (b) Absorption
 - (6) Give three characteristics of ideal packing materials.

(c) Answer any **two** : **10**

- (1) Explain platforming process in detail with diagram.
- (2) Explain fractional distillation of crude oil in detail with diagram.
- (3) Discuss sieve, valve and bubble cap with diagrams.
- (4) Centrifuge filter is fed with a slurry containing 25% solids by weight and wet solids obtained after filtration are analyzed to contain 8% moisture by weight and filtrate is found to contain 200 ppm solids. If centrifuge machine produces 100 kg per hour desired wet product and quantity of slurry to be handled is 5000 kg per batch.

Calculate :

- (i) Time required for filtration and
- (ii) Loss of solid in filtration per batch.
- (5) Explain spray and packed extraction towers with neat diagrams.

3 (a) Answer any **three** : **6**

- (1) Define fuel with two examples.
- (2) Give any six types of alcohol.
- (3) Give three disadvantages of gaseous fuel.
- (4) Discuss material balance of crystallization with rectangular block diagram.
- (5) Give two demerits of wiped film evaporator.
- (6) Draw only diagram of Rotating disc contactor.

(b) Answer any **three** : **9**

- (1) Give short note on ash, its content, properties and types.
- (2) Explain manufacturing of cellobiose in brief.
- (3) Enlist classification of fuel.
- (4) Write minimum three rules for doing material balance calculations.
- (5) Explain steam distillation with diagram.
- (6) Discuss climbing film evaporator with neat diagram.

(c) Answer any **two** :

10

- (1) Explain horizontal chamber coke oven for manufacturing of coke by carbonization.
 - (2) Explain manufacturing of methyl alcohol with its properties, uses and availability.
 - (3) Discuss multiple effect evaporators with neat diagram.
 - (4) Explain continuous distillation with rectification.
 - (5) Discuss derived quantities in detail.
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