

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Mid Semester Examination – Oct 2018

Course: B. Tech in Chemical

Sem: III

Subject Name: Mechanical Operation

Subject Code: BTCH 304

Max Marks: 20

Date:-

Duration:- 1 Hr.

Instructions to the Students:

1. Make suitable assumption if required.
2. Neat diagrams and equations in answer.

	(Level/CO)	Marks
<b>Q.1 Fill in the blank space</b>		<b>6</b>
1. Average particle size, specific surface area of a mixture may be based on _____ or _____	Remembering	
2. Testing sieves are made of _____ screens.	Applying	
3. A shear stress applied at the surface of mass is transmitted throughout a _____ of particles unless failure occurs.	Applying	
4. When granular solids are piled up on a flat surface, the side of the pile are at definite _____ angle with horizontal.	Analyzing	
5. Size reduction is one of the least _____ of all the unit operations.	Remembering	
6. The term _____ refers to a variety of size reduction machines for intermediate duty.	Understanding	
<b>Q.2 Solve Any Two of the following.</b>		<b>3 X 2</b>
(A) Comparison of ideal and actual screens.	Analyzing	
(B) Explain in detail filter media requirement and materials used in process industries.	Applying	
(C) Explain the hydro clones in details.	Understanding	
<b>Q.3 Solve Any One of the following.</b>		<b>8</b>
(A) Derive equation for pressure drop through filter cake.	Applying	
(B) Explain in detail separation of solids from gases by cyclone separator.	Understanding	

\*\*\* End \*\*\*

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Mid Semester Examination – Oct 2018

Course: B. Tech in - Chemical

Sem: III

Subject Name: Chemical Process Calculation

Subject Code: BTCH302

Max Marks: 20

Date:-

Duration:- 1 Hr.

Instructions to the Students:

1. All questions are compulsory.
2. Attempt all in question one .
3. Solve any two from question 2 and solve any one from question 3.
4. Assume suitable data wherever required.

Q.1 Attempt following Questions.

(Level/CO) Marks

1. One 'Therm' is equivalent to a)  $10^5$  BTU b)  $10^5$  kcal c)  $10^9$  BTU d)  $10^9$  kcal

Remember 6

2. Recycling in a chemical process facilitates.....

Application

a) increased yield b) enrichment of product c) heat conservation d) all (a), (b) &(c)

3. Raoult's law is obeyed by a \_\_\_\_\_ solution.

Understand

a) saturated b) molar c) normal d) none of these

4. S.T.P. corresponds to..... a) 1 atm. absolute pressure & 15.5°C. b) 760 mm Hg gauge pressure & 15.5°C c) 760 torr & 0°C d) 101.325 kPa gauge pressure & 15.5°C

Evaluation

5. 1 kgf/cm<sup>2</sup> is not equal to.....

Understand

a) 1 torr b) 1 bar c) 10000 mm wc d) 100 KPa = 100 000 N/m<sup>2</sup>

6. Volume percent for gases is equal to the .....

a) weight percent Analysis

b) mole percent c) weight percent only for ideal gases d) mole percent only for ideal gases

Q.2 Solve Any Two of the following.

3 X 2

(A) Define various unit systems.

Remember

(B) Describe Bypass and Purge operations.

Understand

(C) Spent acid from fertilizer unit has following composition by weight H<sub>2</sub>SO<sub>4</sub> 20%, NH<sub>4</sub>SO<sub>4</sub> 45%, H<sub>2</sub>O 30% and Organic compounds 5% calculate total acid content of spent acid in terms of H<sub>2</sub>SO<sub>4</sub> after adding acid content chemically bound in Ammonium Hydrogen Sulphate.

Application

Q.3 Solve Any One of the following.

8

(A) Estimate density of Chlorine gas at temperature of 503 K and 15.2 MPa pressure by using

Evaluation

1) Ideal Gas law 2) Vander waals equation  $a = 0.6534 \text{ (M}^3\text{)}^2 \text{ MPa / (kmol)}^2$

$b = 0.0543 \text{ M}^3\text{/Kmol.}$

(B) Pure CO<sub>2</sub> may be prepared by treating limestone with Aqueous sulphuric acid containing CaCO<sub>3</sub> and MgCO<sub>3</sub>, remainder being inert insoluble material acid used contained 12% H<sub>2</sub>SO<sub>4</sub> by Weight residue from process had following composition CaSO<sub>4</sub> 8.56%, MgSO<sub>4</sub> 5.23%, H<sub>2</sub>SO<sub>4</sub> 1.05%, Inert 0.53%, CO<sub>2</sub> 0.12% and water 84.5%. During process mass was warmed and CO<sub>2</sub> and water vapor are removed calculate analysis of limestone.

Application

\*\*\* End \*\*\*

**DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE**

**Mid Semester Examination – Oct 2018**

**Course: B. Tech. in Chemical Engineering**

**Sem: III**

**Subject Name: Elective –I Renewable Energy Sources**

**Subject Code:BTCHE306B**

**Max Marks: 20**

**Date:-13/10/2018**

**Duration:- 1 Hr.**

**Instructions to the Students:**

1. Illustrate your answers with neat sketches, diagram etc., wherever necessary.
2. If some part or parameter is noticed to be missing, you may appropriately assume it and should mention it clearly.

		(Level/CO)	Marks
<b>Q. 1</b>	<b>Attempt following Questions by choosing option</b>		<b>1 X 6</b>
	1. Which of the following statement is the definition of Energy (a) Stored Work (b) Ability to do work to move object (c) a & b Both (d) None of these	Understand	
	2. What is one example of Biomass (a) Electricity (b) Trees (c) Wind (d) Water	Remember	
	3. By which process solar energy is converted into chemical energy (a) Evaporation (b) Greenhouse effect (c) Photosynthesis (d) None of these	Evaluate	
	4. The burning of fossil fuel produces _____ in atmosphere (a) Sulphur & Nitrates (b) CO <sub>2</sub> (c) Acid Rain (d) All of the above	Understand	
	5. What is one disadvantage of renewable energy (a) Electricity & power could become much cheaper (b) 3 <sup>rd</sup> world countries could have affordable energy (c) Many people could become energy independent (d) Most sources are expensive to get started	Remember	
	6. Which of the following are renewable energy source (a) Solar (b) Gas (c) Coal (d) Nuclear (e) Wind (f) Water	Understand	
<b>Q.2</b>	<b>Solve Any Two of the following.</b>		<b>3 X 2</b>
	(A) Classify biomass conversion technologies and explain it in brief	Evaluate	
	(B) What are the instruments used for measuring solar radiations? Describe any two with sketches	Understand	
	(C) What are renewable and nonrenewable energy sources? Give applications.	Remember	
<b>Q. 3</b>	<b>Solve Any One of the following.</b>		<b>1 X 8</b>
	(A) Explain briefly the construction of working of horizontal and vertical axis wind turbine with neat sketches. Discuss advantage and disadvantage of it.	Synthesize	
	(B) What is gasification? What are chemical reactions take place during gasification? Describe how the downdraft type gasifier operates. Draw its diagram	Remember	
<b>*** End ***</b>			

**DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE**

Mid Semester Examination – Oct 2018

Course: B. Tech in chemical engineering

Sem: III

Subject Name: Fluid Flow Operation

Subject Code: BTCHC303

Max Marks: 20

Date:-10/10/2018

Duration:- 1 Hr.

**Instructions to the Students:**

1. Question 1 is compulsory and carries 6 marks
2. Solve any two from question 2 and solve any one question from question 3.
3. Figures to right indicate marks
4. If any data is missing, you may assume it and mention it in your answer sheet. Usual symbols apply

		(Level/CO)	Marks
			6
<b>Q. 1</b>	<b>Pick the correct alternative for the following question</b>		
	1.continuity equation deals with law of conservation of a. mass    b. momentum    c. energy    d. none of the above.	understanding	
	2.Bernoulli's theorem deals with law of conservation of a. mass    b. momentum    c. energy    d. none of the above.	understanding	
	3.an ideal fluid is defined as the fluid which a. is compressible b. is incompressible c. is incompressible and non -viscous d. has negligible surface tension	Remembering	
	4. A stream line is a line a. which is along the path of particle b. which is always parallel to the main direction of flow c. across which there is no flow d. on which tangent drawn at any point gives the direction of velocity.	Remembering	
	5.Reynolds number can be expressed as ratio of a. inertia force to viscous force b. viscous force to inertia force c. viscous force to gravitational force d. gravitational force to viscous force	understanding	
	6.laminar flow is characterized by the nonexistence of a. eddies b. fluctuating velocities c. fluctuating pressure d. all a,b,c	understanding	
			<b>3 X 2</b>
<b>Q.2</b>	<b>Solve Any Two of the following.</b>	understanding	
(A)	Distinguish between laminar and turbulent flows	Remembering	
(B)	Derive momentum equation for fluid flow.	Analyzing	
(C)	A pipeline carrying oil of specific gravity 0.87 changes in diameter from 200 mm diameter at position A to 500 mm diameter at position B which is 4 meter at higher level if the pressure at A and B are 9.81 N/cm <sup>2</sup> and 5.886 N/cm <sup>2</sup> respectively and discharge is 200 lit/sec. determine loss of head.		
			<b>8</b>
<b>Q. 3</b>	<b>Solve Any One of the following.</b>	Analyzing	
(A)	Write short note on Flow through packed and fluidized beds	Analyzing	
(B)	Derive Darcy-Weisbach equation for frictional head loss. Find the head loss due to friction in pipe of diameter 300 mm and length 50 m through which water is flowing at a velocity of 3 m/s using Darcy-Weisbach equation.		

\*\*\* End \*\*\*