Reg. No. : | | | | | | | | | | |

Question Paper Code: 51931

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2016

Third Semester

Chemical Engineering

15UCH301 - INTRODUCTION TO CHEMICAL ENGINEERING

(Regulation 2015)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. The concept of unit operations was first presented by

   (a) G.E.Davis (b) W.H.Walker
   (c) A.D.Little (d) W.K.Lewis

2. Rate of a process is the ratio between the driving force and

   (a) resistance (b) conductance
   (c) process time (d) transfer coefficients

3. In natural convection heat transfer, difference in _____ causes energy exchange in the medium.

   (a) pressure (b) velocity
   (c) volume (d) density

4. Air contains _____ by volume.

   (a) 23% O_2 and 77% N_2 (b) 21% O_2 and 79% N_2
   (c) 25% O_2 and 75% N_2 (d) 79% O_2 and 21% N_2

5. An example for unit process in chemical industries is

(a) oxidation (b) distillation
(c) reverse osmosis (d) sublimation

6. For the efficient transfer of heat, from one fluid to another fluid _____ equipment is used

(a) evaporator (b) dryer
(c) heat exchanger (d) centrifuge

7. _____ software package is used to simulate the material and energy balances of chemical processing plants.

(a) Oracle (b) Aspen plus
(c) Acrobat reader (d) LaTeX

8. The process used to produce high quality, high-performance thin films in semiconductor (electronics) industry is

(a) ion implantation (b) dielectric etching
(c) doping (d) chemical vapor deposition

9. An example for semi solid form of chemical product is

(a) soap bar (b) perfume
(c) tooth paste (d) hair spray

10. Flotation method is preferred for the concentration of _____ ores.

(a) sulfide (b) oxide (c) silicate (d) nitrate

PART - B (5 x 2 = 10 Marks)

11. What is the role of mathematics in chemical engineering?

12. Define rate of a chemical reaction. Give its SI unit.

13. Define unit operation and unit processes. Give one example for each.

14. How can chemical engineers prevent pollution to our environment?

15. List out the career opportunities for chemical engineers in various sectors.

PART - C (5 x 16 = 80 Marks)

16. (a) Explain the various activities taking place in a chemical process industry and discuss the classification of chemical industries based on the product being manufactured. (16)

Or

(b) Write a detailed note on: (i) rate of reaction (ii) chlorination reaction (iii) combustion reaction and (iv) isomerization reaction. (16)

17. (a) Describe the role of mathematical methods in analyzing experimental data and chemistry concepts in analyzing product quality. (16)

Or

(b) Explain the concept and applications of material balance and energy balance equations in process equipment design. (16)

18. (a) Draw a neat flow sheet for the manufacture of sulfuric acid by the contact process and explain the steps involved. Mention the industrial uses of sulfuric acid. (16)

Or

(b) Describe the principle and applications of following unit operations in process industries: evaporation, drying, distillation and absorption. (16)

19. (a) (i) Briefly discuss the applications of computers and its accessories in chemical process industries. (8)

(ii) With examples explain the versatility of chemical engineers. (8)

Or

(b) Describe the role of chemical engineering innovations in food production and processing technology. (16)

20. (a) Discuss the following range of scales in chemical compound manufacture and processing system: molecular level, unit operation level and manufacturing level. (16)

Or

(b) Write a detailed note on role of chemical engineer in

(i) Environmental engineering (8)

(ii) Energy engineering (8)