

Reg. No. :

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R 3114

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2007.

Third Semester

Biotechnology

BT 1201 — PRINCIPLES OF CHEMICAL ENGINEERING

(Regulation 2004)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Convert 11°C to °F, °K.
2. What is conservation of mass and Energy?
3. What is recycling?
4. What is relative humidity?
5. State Raoult's law.
6. What is Specific heat?
7. What is compressible fluid? Give an example.
8. State two applications of Fluid mechanics in Chemical Engineering.
9. What is elutriation in fluidization?
10. What is NPSH in pumping? .

PART B — (5 × 16 = 80 marks)

11. (a) Explain in details various types of unit system used in Chemical Engineering practice with suitable examples. (16)

Or

- (b) Explain the concept of empirical method of fitting the data by various methods. (16)

12. (a) The dry bulb and wet bulb temperature of the air is found to be 30 and 25 degree Centigrade respectively. Find out (i) Humidity, (ii) Humid heat (iii) Percentage saturation, (iv) Percentage of moisture in the air. (16)

Or

- (b) Explain the basic principles of (i) Absorption (ii) Distillation (iii) Leaching and Extraction (iv) Drying. (16)
13. (a) (i) Calculate the heat required to raise the temperature of water of 10 kg from 30 to 40 degree centigrade. (6)
- (ii) Explain the concept of heat capacity, and how it is being calculated for various substances. (10)

Or

- (b) Explain various thermodynamics process like constant volume, constant pressure, isothermal and Adiabatic process. (16)
14. (a) (i) Explain streamline and potential flow. (6)
- (ii) What is friction factor? How it is calculated for both laminar and turbulent flow. (5)
- (iii) What is eddy viscosity? Explain. (5)

Or

- (b) (i) Give some examples multi-phase flow and Explain. (10)
- (ii) Explain drag formation and Cavitations in fluid flow. (6)
15. (a) Explain the operating characteristics of centrifugal pump. (16)

Or

- (b) Explain various phenomeno of fluidization in detail. (16)