[Total No. of Questions - 5] [Total No. of Printed Pages - 2]
(2123)

1395

B. Tech 5th Semester Examination

Unit Operation (O.S.)

TE-5007

Time : 3 Hours **Max. Marks : 100**

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Attempt any five questions in all selecting one question from each of section A, B, C & D. Section E is compulsory.

SECTION - A

1. (a) Write the characteristics of a standard unit and mention the different system of units. **(10)**

   (b) Verify dimensionally the relation $t = 2\pi\sqrt{l/g}$ for the time period of a simple pendulam. Here l is length of pendulam and g is acceleration due to gravity. **(10)**

   OR

   (a) Write the uses of dimensional equations and discuss the checking of correctness of physical equation.
   $\left(p + \frac{a}{v^2}\right)(v - b) = RT$ and
   Calculate the dimensions of constant a and b. Where symbols have their usual meanings. **(10)**

   (b) Convert 1 Joule energy into ergs. **(10)**

SECTION - B

2. (a) Write Fourier's law for heat conduction and define thermal conductivity, thermal diffusivity and concept of thermal resistance. **(12)**

(b) Write short notes—

(i) Steady and unsteady flow

(ii) Newton's law of viscosity. **(8)**

OR

Write pump theory for centrifugal and also write about positive displacement compressors with its equations. **(20)**

SECTION - C

3. (a) What is the flash distillation & continuous distillation? Explain. **(10)**

(b) Write principles of solid liquid extraction with suitable example. **(10)**

OR

(a) Write principles of drying and also explain temperature patterns in dryers. **(10)**

(b) Write about different adsorption equipments. **(10)**

SECTION - D

4. (a) Write short notes on following terms—

(i) Sensible heating and sensible cooling.

(ii) Humidification and dehumidification. **(8)**

(b) Define mechanical seperation and filteration. Explain and sketch coupola furnace. **(12)**

OR

(a) Define the term crystalization and give the principle of crystalization. **(8)**

(b) Write theory of Wet-Bulb temperature and also write equipments for humidification operations. **(12)**

SECTION - E

5. Write short notes—

(a) Material and Energy balance.

(b) Manometer with figure.

(c) Adsorption isotherms

(d) Nucleation. **(4×5=20)**