Total No. of Questions : 12]

SEAT No. :

P2666

[Total No. of Pages : 2

[5154]-36

B.E. (Mechanical Engineering)

DESIGN OF PUMPS, BLOWERS AND COMPRESSORS

(2008 Pattern) (Semester - I) (402044C) (Elective - I)

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

Instructions to candidates:

1) ***Solve Q.1 or Q.2, Q.3 or Q.4 and Q.5 or Q.6 from section-I and Q.7 or Q.8, Q.9 or Q.10 and Q.11 or Q.12 section - II.***
2) ***Use two separate answer book for section-I and section-II.***
3) ***Use of scientific calculator, steam table, mollier chart is allowed.***
4) ***Figures to right indicate full marks.***

SECTION - I

UNIT - I

Q1) a) Write a note on Dimensionless parameters. **[8]**

b) Explain the following terms

i) Stage velocity

ii) Velocity triangles **[8]**

OR

Q2) a) Derive the expression for the energy transfer between fluid and rotor. **[8]**

b) Explain the use of performance characteristics curves for pumps. **[8]**

UNIT - II

Q3) a) Write a note on losses in pumps. **[8]**

b) The diameters of an impeller of a centrifugal pump at inlet & outlet are 30 mm & 60 mm respectively. Determine the minimum starting speed of the pump if it works against the head of 30 m. **[8]**

OR

Q4) a) Explain axial thrust methods to minimize axial thrust. **[8]**

b) For a single acting reciprocating pump piston diameter is 150 mm, stroke is 300 mm, rotational speed is 50 RPM and water is to be raised through 18 m. determine theoretical discharge, if the actual discharge is 4 lit / sec. Determine volumetric efficiency and slip if mechanical efficiency is 80%. **[8]**

P.T.O.

UNIT - III

Q5) a) Write the steps involve in thermal designing of the pump. **[8]**

b) How to select a pump for corrosive fluid applications? **[10]**

OR

Q6) a) Write the steps involve in hydraulic designing of the pump. **[8]**

b) Explain procedure for design optimization of the pumps. **[10]**

SECTION - II

UNIT - IV

Q7) a) Classify blowers. **[8]**

b) Write a note on rotor design airfoil theory. **[8]**

OR

Q8) a) Explain the terms surge and stall with respect to blowers. **[8]**

b) Enlist the various applications of the fans & blowers. **[8]**

UNIT - V

Q9) a) Enlist the steps involved for selection of blowers. **[8]**

b) How computer programs for iterative and interactive design helps in designing the fans & blowers. **[8]**

OR

Q10)a) Write a note on computer programs for iterative and interactive design. **[8]**

b) Write a note on **[8]**

i) Stage pressure rise

ii) Stage parameters

UNIT -VI

Q11)a) Draw & explain enthalpy - entropy diagram for centrifugal compressors. **[8]**

b) Explain working of axial flow compressors with diagram. **[10]**

OR

Q12)a) Draw & explain performance curves of centrifugal compressors. **[8]**

b) Enlist the design features of axial flow compressors. **[10]**