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3 Hours / 100 Marks   Seat No. ☐☐☐☐☐☐☐☐

Instructions :   (1) *All* questions are *compulsory*.

(2) Answer *each* next main question on a *new* page.

(3) Figures to the *right* indicate *full* marks.

(4) Assume suitable data, if *necessary*.

(5) Mobile Phone, Pager and any other Electronic Communication devices are *not* permissible in Examination Hall.

Marks

1. Answer **any ten** of the following :   **20**

   a) Define "Sensible heat" and heat capacity.

   b) State Newton's law of cooling.

   c) Enlist types of pipe fittings.

   d) Define 'skin friction' and 'drug friction'.

   e) State Fourier's law of heat conduction.

   f) State principle of centrifugal pump.

   g) Define density and viscosity of liquids.

   h) Define 'Adsorption' and 'Absorption'.

   i) Define 'Dew point' and 'Wet bulb temperature'.

   j) Define 'Extraction' and 'Evaporation'.

   k) Define heat transfer coefficient. State its significance.

   l) Write the classification of flow measuring devices.

   m) Define latent heat of vaporization. Write its value for water.

2. Answer **any four** of the following :   **16**

   a) Distinguish between molecular diffusion and eddy diffusion.

   b) Explain the importance of fluid flow to textile.

   c) Explain the Rheology of Newtonian fluids.

   d) Describe Reynold's experiment for fluid flow through pipes.

   e) Name two filter media. Explain their use in textiles.

   f) Explain the concept of energy losses and friction factor.

Marks

3. Answer **any four** of the following :   **16**

  a) With a neat and labelled diagram, explain the construction and working of a centrifugal pump.

  b) Compare free and forced convection.

  c) Give the Bernoullis equation of continuity and explain its significance.

  d) Explain various filter aids and filter media with appropriate examples.

  e) Explain the mechanism of heat flow through thick slab and thick cylindrical pipe.

  f) Explain the construction and working of orifice meter.

4. Answer **any four** of the following :   **16**

  a) Describe the concept of Black Body Radiation.

  b) Describe the diffusion theory of drying.

  c) Explain principle of reverse osmosis. State applications of reverse osmosis in textile industry.

  d) Define crystallization. State two commercial applications of crystallization.

  e) Explain the applications of convection heat transfer in textile industry,

  f) Explain the concept of energy conservation in textile.

5. Answer **any four** of the following :   **16**

  a) Describe humidity and humidification. Explain its importance in textile industry.

  b) Explain two applications of membrane separation technique to textile industry.

  c) Graphically represent flow behaviour of

    i) Pseudoplastic   ii) Dilatant.

  d) Explain capillary theory of drying.

  e) Explain two basic laws of radiation.

  f) Define :

    i) Real fluid   ii) Ideal fluid.

6. Answer **any four** of the following :   **16**

  a) Define :

    i) Compressible fluid

    ii) Incompressible fluid. Give one example of each.

  b) Draw a neat sketch any four types of pipe fittings.

  c) Explain construction and working of venturi meter.

  d) Define modes of heat transfer with example.

  e) Classify mass transfer operation with examples.

  f) Describe working of stenter with respect to heat transfer.

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