

(2X10)

- 1) (i) State Stefan-Boltzmann's law
 (ii) Write four significance of Reynold's Number.
 (iii) What is kinematics viscosity
 (iv) Sketch the stress-strain diagram for Newtonian
 for non-Newtonian fluids.
 (v) Name four different Metallurgical f/c.
 (vi) What are the advantages of Preheated Combustion
 Air.
 (vii) Define Black Body.
 (viii) Write Expression for (i) Natural heat transfer Coefficient
 (ii) forced heat transfer Coefficient.
 (ix) Define Convection.
 (x) Identify Any 4 Minor losses in pipes due to fluid flow.

(5X6)

2) Answer Any 5/6

- (a) Explain Minor losses. Give Expression for head
 losses due to
 (i) Sudden Contraction
 (ii) Pipe head.
 (b) How waste heat Recovery Can Be done from
 furnace flue gas?
 (c) Determine the expression for Rate of flow through
 the Venturimeter.
 (d) Distinguish Between (i) Compressible flow &
 Incompressible flow.
 (ii) laminar flow & turbulent flow.
 (e) List the ~~dis~~ Advantage & Dis Advantage of Batch
 type f/c.
 (f) What is the principle Behind heat generation in Arc
 furnace.
 (g) Differentiate Between Natural & forced Convection.

3. Calculate the steady state conduction through composite walls. (10)
4. What are the advantages & disadvantages of Recuperator over Re-generator. (10)
5. Derive the ~~the~~ Euler's equation motion and then obtain Bernoulli's equation. (10)
6. How & why heat losses occurs in furnace. (10)
7. Short Note on any two -
 - Smelting f/c
 - Refining f/c
 - Reheating f/c(10)

1) Answer All Questions:

(2x10)

- State the Stefan-Boltzmann law of Radiation.
- Define laminar & Turbulent flow.
- What do you mean by forced convection?
Give An Example.
- What are the assumptions made in the derivation of Bernoulli's equation?
- What are the uses of Reheating furnaces?
- Write down the basic law of heat conduction.
- What is the heat transfer coefficient for Radiation?
- Name any two recuperative furnace.
- What are the advantages of Batch type furnaces?
- Define An Orifice,

(6x5)

2) Answer Any 5 Questions:

- State Kirchhoff's law and Wien's displacement laws of Radiation & write down their expressions.
- Derive an expression of Fourier's law for one dimensional steady state heat conduction through a plane wall with neat sketch.
- Compare between the Recuperator & Regenerators.
- Explain briefly the concept of Black Body & grey Body?
- Write short notes on (i) Smelting furnace.
(ii) Refining furnace.
- Differentiate between forced & free convection.
Mention their suitable examples?
- Define (i) Real flow (ii) Compressible flow
(iii) ideal flow (iv) Incompressible flow
(v) Uniform flow

3. Which type of waste heat Recovery is more efficient in practical use? Draw A Neat diagram. in support of your Answer. (10)
4. Write down short Notes on three different electric furnaces, with their Respective Applications And uses? (10)
5. Derive An Expression for Bernoulli's equation for steady flow of An incompressible fluid in a venturimeter. (10)
6. Describe Briefly why heat losses occurs in furnaces & how it can be Minimised? what is it's effect on furnace efficiency? (10)
7. Describe the working principle of pitot tube And it's various uses. (10)