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FIRST SEMESTER **B.Tech (Group B)**

MID SEMESTER EXAMINATION

MR-115 BASIC MECHANICAL ENGINEERING

Time : 1 Hour 30 Minutes Max. Marks : 20

Note : Answer any **FIVE** questions from each part.
All questions carry two marks each
Assume suitable missing data, if any.

PART - A

1. Answer any file of the following
   a. (i) Define thermodynamic system, surrounding and boundary
   (ii) State the difference between extensive and intensive property of a thermodynamic system.
   b. Define quasistatic process and state its salient characteristics.
   c. A gas undergoes a reversible non-flow process according to relation p=(-3V + 150) where V is the volume in m^3 and p is the pressure in bar.
   Determine the work done when volume change from 3 to $6m^3$
   d. Show that internal energy is a property of the system.
   e. A perfect gas undergoes the following three separate and distinct processes to execute a cycle.
   (i) constant volume during which 80KJ of heat is supplied to the gas.
   (ii) constant pressure during 85KJ of heat is lost to the surroundings and 20KJ of work done on it.
   (iii) Adiabatic process which restores the gas back to initial state.
   Evaluate the work done during adiabatic process and value of internal energy at the all state points if initially its value is 96KKJ
   f. A nozzle is device for increasing velocity of a flowing stream. At inlet of nozzle, the fluid parameters are :
   Enthalpy = 2850KJ/kg : Velocity = 50m/s
   At discharge end the enthalpy is 2650 KJ/kg. Calculate the velocity of fluid at exit from nozzle.

PART – B

Answer any five f the following :

2. [a] What are primary and secondary manufacturing processes?
   [b] What is pattern. Why allowances are provided on pattern? Write only name of different types of pattern.
   [c] Explain the function of the following :
   (1) Core (2) Gates (3) Riser (iv) Spruee (v) Runner

[d] What is welding? Classify welding processes.

[e] What do you understand by Gas welding? Describe equipments required for oxy-acetylene welding process.

[f] Explain function of lathe. Briefly explain any three operations on lathe.

[g] Write short notes on any two of the following :

(i) Milling process

(ii) Shaping process

(iii) Drilling process

(iv) Boring process

(v) Fabrication of Nuts and Bolts