Total No. of Questions – [4]

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Paper Code - U127 - 103 (T1)

FEBRUARY 2018 / IN - SEM (T1)
F. Y. B.TECH. (COMMON) (SEMESTER - II)
COURSE NAME: Basic Mechanical Engineering
(2017 PATTERN)

Time: [1 Hour] [Max. Marks: 30]

(*) Instructions to candidates:
1) **Answer Q.1 OR Q.2, Q.3 OR Q.4**
2) **Figures to the right indicate full marks.**
3) **Use of scientific calculator is allowed**
4) **Use suitable data where ever required**

Q 1) a) Explain with neat sketch the working of Rotameter. [6]
b) List various applications of Mechanical Engineering. Explain any two of them. [6]
c) Compare Vernier caliper and Micrometer screw gauge. [4]

OR

Q2) a) Explain with neat sketch the working of LVDT. [6]
b) List various process of thermodynamic system. Explain any two process with the help of p-v diagram. [6]
c) Define the following terms
i. Thermodynamic System
ii. Surrounding
iii. Boundary
iv. Universe [4]

Q3) a) State Claussius statement and kelvin plank statement of second law of thermodynamics. Explain PMM-I and PMM-II. [6]
b) In an air motor cylinder the compressed air has an internal energy of 450 kJ/kg at the beginning of the expansion and internal energy of 220 kJ/kg after expansion. The net work done by the air during expansion is 120 kJ/kg. Calculate the heat flow from the cylinder. Also comment on result. [4]
c) An engine develops 100 kW when it receives heat at rate of 300 kW. Find the efficiency and heat rejected. If this engine is reversed to act as refrigerator with same rate of energy transfer, find the COP. [4]

OR

Q4) a) Explain with neat sketch joules experiment. Define Thermodynamic reservoir, heat engine, heat pump, refrigerator. [6]
b) A house hold refrigerator with COP of 1.5 removes heat from the refrigerated space at the rate of 80 kJ/min. Determine electrical power consumed by the refrigerator and the rate of heat transfer to kitchen air. [4]
c) A reverse heat engine operates between two reservoirs at 827^0c and 30^0c. Engine drives a Carnot refrigerator maintaining -13^0c and rejecting heat to reservoir at 30^0c. Heat input to the engine is 2500 kJ and the network available is 300 kJ. How much heat is transferred to refrigerator? [4]