Roll No. | | | | | | | | | | | | |

Total No. of Pages: 02
Total No. of Questions: 09

B. Tech. (Sem.-1st & 2nd)

Elements of Mech. Engg.

Subject Code: ME-101
Paper ID: [A0123]

Time: 3 Hrs. **Max. Marks: 60**

INSTRUCTIONS TO CANDIDATE:
Note:- *Question no 1 is compulsory. Further, paper consists of two sections. Section A has four questions and Section B also have four questions. Students are required to attempt five questions from Section –A and section B by selecting at least two questions from each section.*

Section –A (10x2=20)

Q.1.(a) What is closed system ?

(b) What are path properties?

(c) Define internal energy?

(d) Write the steady flow energy equation for compressor?

(e) Define isobaric process?

(f) What is the c.o.p. for heat pump?

(g) Draw the PV and TS diagram for Otto cycle?

(h) What are inversions?

(i) What is stress?

(j) Define possion's ratio?

Section –B (4x5=20)

Q.2. State Kelvin-Planck and Clausius statements of second low of thermodynamics? Also show equivalence between them.

Q.3. Derive the steady flow energy equation (SFEE) for

(a) Condenser

(b) Evaporator

Q.4. Steam at 8.5 bar and 200^0 C is throttled to 3 bar and then expanded adiabatically to 0.5 bar. Find out the changes in entropy and enthalpy during these two processes.

Q.5. What is thermodynamic system? Discuss its types?

Section –C

(2x10=20)

Q.6. Write down the expression for air standard efficiency for a diesel engine?

Q.7. (a) A gas engine working on otto cycle has : Cylinder borer (diameter) = 220 mm; Stroke length = 300mm, Clearance volume = 1600$cm^{3.}$ Find the air standard efficiency (Take y =1.4).

(b) What is kinematic chain? Explain it with the help of two examples?

Q.8. (a) What is mechanical advantage Explain the mechanism of worm and worm wheel?

(b) Explain the stress starin diagram for ductile materials?

Q.9. A steel rod 25 mm diameter and 2m long is subjected to an axial pull of 45 KN. Find :

(a) the intensity of stress

(b) the strain, and

(c) elongation

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