

AJAY KUMAR GARG ENGINEERING COLLEGE, GHAZIABAD

DEPARTMENT OF ME

Sessional Test 2

Program: B.Tech
 Session : 2024-25
 Subject : Fundamentals of Mechanical Engg.
 Max. : Marks: 50

Semester: I
 Section: S11-S20
 Subject Code: BME-101
 Time: 2 Hours

OBE Remarks:

Q.No	1	2	3	4	5	6	7	8	9	10	11	12
CO No.	CO2	CO2	CO3	CO3	CO3	CO2	CO2	CO2	CO3	CO3	CO2	CO3
Bloom's Level* (L1 to L6)	L1	L2	L1	L1	L3	L1	L1	L2	L3	L1	L4	L4
Weightage CO2: 26.5						Weightage CO3: 23.5						

*Bloom's Level: L1: Remember, L2: Understand, L3: Apply, L4: Analyze, L5: Evaluate, L6: Create

Note: Answer all the sections.

Section-A

(2*5=10)

1. What is Scavenging process.
2. Draw P-V diagram for 4-stroke CI engine with all thermodynamic processes.
3. State Hooke's law and it's assumptions.
4. Define 1 TR.
5. Compare COP of Refrigerator & Heat Pump.

Section-B

(5*5=25)

6. With a neat sketch discuss the working of 2-stroke SI engine.
7. Compare SI & CI engines.
8. Discuss functioning of following IC engine components (Piston, Cylinder, Connecting Rod, Crank).
9. Derive the relation between modulus of elasticity and modulus of rigidity.
10. Explain methods of refrigeration in detail.
 A heat pump working on a reversed Carnot cycle has a COP of 6. If it works as a refrigerator taking 1.5 kW of work input, the refrigerating effect will be?

Section-C

(7.5*2=15)

11. What are the different range of batteries used in electric vehicles and functions of battery management system.
 The engine of fiat car has 4-cylinder of 68 mm bore and 75 mm stroke. Compression ratio of engine is 8. Determine cubic capacity of engine and clearance volume of each cylinder.
12. Discuss vapour compression refrigeration system with all it's components.
 The bulk modulus for a material is $0.5 \times 10^5 \text{ N/mm}^2$. A 12 mm diameter rod is subjected to an axial pull of 14 kN & change in diameter is observed to be $3.6 \times 10^{-3} \text{ mm}$. Calculate poisson's ratio and modulus of elasticity.


 Faculty Sign


 HoD Sign