ADAMAS UNIVERSITY PURSUE EXCELLENCE	**ADAMAS UNIVERSITY** **END-SEMESTER EXAMINATION: MAY 2021** (Academic Session: 2020 – 21)		
Name of the Program: (Example: B. Sc./BBA/MA/B.Tech.)	B.Tech	**Semester:** (I/III/ V/ VII/IX)	VI
Paper Title:	Thermal Engineering	**Paper Code:**	EME43102
Maximum Marks:	**40**	**Time duration:**	3
Total No of questions:	08	**Total No of Pages:**	02
(Any other information for the student may be mentioned here)			

Answer all the Groups

Group A

Answer all the questions of the following $5 \times 1 = 5$

1. a) Define Octane no.
b) How the fuel injection system function in CI Engine?
c) What is FAD?
d) List out any two differences between the two stroke engine and four stroke engine.
e) Represent the VCRS in p-h diagram

GROUP –B

Answer *any three* of the following $3 \times 5 = 15$

2. Briefly explain the stages of combustion in CI engines elaborating the effect of knocking.

3. Describe the process of Vapour Absorption Systems with neat sketch.

4. Explain the working of magneto ignition system with the neat sketch.

5. State the advantages of multistage air compression.

GROUP –C

Answer *any two* of the following $2 \times 10 = 20$

6. a) Describe the Diesel cycle with neat sketch [4]
b) Show that the efficiency of the cycle is given by the expression [6]

$$\eta_{Diesel} = 1 - \frac{1}{\gamma} \cdot \frac{1}{r^{\gamma-1}} \cdot \frac{r_c^{\gamma} - 1}{r_c - 1}$$

7. a) Explain the working principle of Single Stage Reciprocating Compressor with clearance. Plot a P-V diagram to represent the thermodynamic processes. [4]
b) A single stage double acting air compressor running at 120rpm and power input of 75kW, piston speed 200m/min, suction pressure 1 Bar and delivery pressure 10 Bar. Take volumetric efficiency as 85% and n=1.25. Find the cylinder bore and the clearance volume as a percentage of stroke volume. [6]

8. During the trial of a single cylinder four stroke oil engine the following results were obtained;
Cylinder dia= 20cm
Stroke= 40cm
MEP= 6Bar
Torque=407Nm
Speed= 250rpm
Oil Consumption= 4kg/h
CV of Fuel= 43MJ/kg
Cooling water flow rate= 4.5kg/min
Air used per kg of fuel= 30kg
Rise in cooling water temperature= 45 deg. C
Temperature of exhaust gases= 420 deg. C
Room Temperature= 20 deg. C
Mean specific heat of exhaust gas= 1 kJ/kg K
Specific heat of water= 4.18 kJ/kg K
Find the ip, bp and draw up a heat balance sheet for the test in kJ/h. [10]
