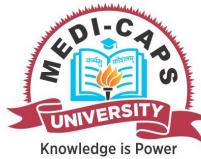


Enrollment No.....



Programme: B.Tech.

Branch/Specialisation: AU

Faculty of Engineering  
End Sem Examination Dec 2024

AU3CO30 Automotive Engines

**Duration: 3 Hrs.****Maximum Marks: 60**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d. Assume suitable data if necessary. Notations and symbols have their usual meaning.

	Marks	BL	PO	CO	PSO
Q.1 i. Which of the following does not relate to spark ignition engine?	1	1	1	1	1
(a) Spark plug      (b) Carburetor					
(c) Fuel injector      (d) Ignition coil					
ii. Gasoline engines are _____ than diesel engines.	1	1	1	1	1
(a) Lighter      (b) Unpredictable					
(c) Heavier      (d) None of these					
iii. _____ is connected to the connecting rod in splash type of lubrication.	1	1	1	1	1
(a) F      (b) Scoop					
(c) Bearing      (d) None of these					
iv. _____ valve is provided to control the oil pressure of the lubricating oil.	1	1	1	1	1
(a) Pressure-relief					
(b) Control					
(c) Directional control					
(d) Flow control					
v. Which of the following factors affecting combustion in the CI engine?	1	2	1	2	1
(a) Ignition quantity of fuel					
(b) Injection pressure of droplet size					
(c) Injection advance angle					
(d) All of these					

[2]

- vi. Which of the following factors affecting combustion in the CI engine?  
 (a) Compression ratio  
 (b) Intake temperature  
 (c) Jacket water temperature  
 (d) All of these
- vii. \_\_\_\_\_ in supercharging pressure increases the tendency to detonate and pre-ignite.  
 (a) Decrease  
 (b) Increase  
 (c) Unpredictable  
 (d) None of these
- viii. The \_\_\_\_\_ flame speeds make the petrol engine more sensitive to fuel-air ratio and engine cannot run on strong mixtures without knock.  
 (a) Increased  
 (b) Decreased  
 (c) Medium  
 (d) None of these
- ix. The net force acting on the crosshead pin is known as \_\_\_\_\_.  
 (a) Crank pin effort  
 (b) Crank effort  
 (c) Piston effort  
 (d) Shaft effort
- x. Correction couple is applied when masses are placed arbitrarily and to maintain \_\_\_\_\_.  
 (a) Static equilibrium  
 (b) Dynamic equilibrium  
 (c) Stable equilibrium  
 (d) Unstable equilibrium

1 2 2 2 1

Q.2

Attempt any two:

- i. Differentiate between SI and CI Engines.
- ii. Describe in detail the types of injection system.
- iii. Elaborate the working principle of MPFI system.

5 1 1 1 1  
 5 2 1 2 1  
 5 2 1 2 1

[3]

- Q.3 Attempt any two:  
 i. Explain air and liquid cooling system with their advantages.
- ii. Explain and draw neat sketch of wet sump and dry sump lubrication systems.
- iii. Differentiate between thermo-syphon and forced circulation cooling system.
- Q.4 Attempt any two:  
 i. Write short note on abnormal combustion and flame propagation.
- ii. Explain different stages of combustion in SI engines.
- iii. Describe with neat sketch different combustion chambers.
- Q.5 Attempt any two:  
 i. Write advantages of turbo chargers over superchargers.
- ii. Explain different type of superchargers.
- iii. A four-stroke, four cylinder SI engine has a brake thermal efficiency of 30% and indicated power is 40kW at full load. At half load it has a mechanical efficiency of 65%. What is the indicated thermal efficiency at full load?
- Q.6 Attempt any two:  
 i. Explain the concept of firing order in IC engines.
- ii. Explain the principle of balancing a number of masses rotating in one plane by another mass rotating in the same plane.
- iii. Explain balancing of reciprocating masses in detail.

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AU3CO30 (Auto. Engines)  
Scheme of Marking

- Q.1 - (i) - (c) (Fuel Injector) — 01  
 " (g) (lighter) — 01  
 (iv) (b) scoop — 01  
 (v) (a) (Pressure Relief) — 01  
 (vi) — (a) Ignition quality of fuel — 01  
 (vii) (a) Comp. ratio — 01  
 (viii) (a) Decrease — 01  
 (ix) (a) Increased — 01  
 (x) — (c) piston effort — 01  
 (xi) (b) Dynamic equi — 01

(10)

- Q.2 (i) — Any five differences 5x1  
 (ii) — Details of types of Injection system  
     •) Introduction — 01  
     •) Types & Diagram — 04  
 (iii) Introduction of MPFI — 01  
       Detail working with Diagram — 04

- Q.3 (i) Air cooling — 2.5  
 liquid cooling — 2.5  
 (ii) Diagram of Both? — 02  
       Wet Sump — 1.5  
       Dry Sump — 1.5  
 (iii) Difference any five — 1x5

Q.4

- (i) Abnormal Combustion — 2.5  
Flame propagation — 2.5

- (ii) P-D diagram — 02  
Explanation Stages 03.

- (iii) Diagram — 02  
Description — 03

Q.5

- (i) — Any two Advantage — 1x5

- (ii) · Diagram — 02  
Type of Supercharger — 03

- (iii) · Given Data — 01  
Indicated thermal efficiency — 04

Q.6

- (i) · firing order concept & Description — 05

- (ii) · Principle of balancing — 02  
Explanation — 03

- (iii) · Diagram — 01  
Explanation — 04