Total No. of Questions: 6 *Total No. of Printed Pages:3*

Enrollment No.....

Faculty of Engineering

End Sem Examination Dec 2024

AU3CO30 Automotive Engines

Programme: B.Tech. Branch/Specialisation: AU

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? (a) Spark plug (b) Carburetor (c) Fuel injector (d) Ignition coil	**1**	1	1	1	1
	ii.	Gasoline engines are _____ than diesel engines. (a) Lighter (b) Unpredictable (c) Heavier (d) None of these	**1**	1	1	1	1
	iii.	_____ is connected to the connecting rod in splash type of lubrication. (a) F (b) Scoop (c) Bearing (d) None of these	**1**	1	1	1	1
	iv.	_____valve is provided to control the oil pressure of the lubricating oil. (a) Pressure-relief (b) Control (c) Directional control (d) Flow control	**1**	1	1	1	1
	v.	Which of the following factors affecting combustion in the CI engine? (a) Ignition quantity of fuel (b) Injection pressure of droplet size (c) Injection advance angle (d) All of these	**1**	2	1	2	1

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	**1**	2	2	2	1
vii.	_____ in supercharging pressure increases the tendency to detonate and pre-ignite. (a) Decrease (b) Increase (c) Unpredictable (d) None of these	**1**	2	2	2	1
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	**1**	2	2	2	2
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	**1**	2	2	2	2
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.	**5**	1	1	1	1
ii.	Describe in detail the types of injection system.	**5**	2	1	2	1
iii.	Elaborate the working principle of MPFI system.	**5**	2	1	2	1

Q.3 Attempt any two:

i.	Explain air and liquid cooling system with their advantages.	**5**	2	2	2	1
ii.	Explain and draw neat sketch of wet sump and dry sump lubrication systems.	**5**	2	2	2	1
iii.	Differentiate between thermo-syphon and forced circulation cooling system.	**5**	2	2	2	1

Q.4 Attempt any two:

i.	Write short note on abnormal combustion and flame propagation.	**5**	2	2	2	1
ii.	Explain different stages of combustion in SI engines.	**5**	2	2	2	1
iii.	Describe with neat sketch different combustion chambers.	**5**	3	2	2	1

Q.5 Attempt any two:

i.	Write advantages of turbo chargers over superchargers.	**5**	3	2	2	1
ii.	Explain different type of superchargers.	**5**	2	2	2	1
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?	**5**	3	2	2	2

Q.6 Attempt any two:

i.	Explain the concept of firing order in IC engines.	**5**	2	2	2	1
ii.	Explain the principle of balancing a number of masses rotating in one plane by another mass rotating in the same plane.	**5**	3	2	2	1
iii.	Explain balancing of reciprocating masses in detail.	**5**	3	2	2	1

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AU3C030 (Auto. Engines)

Scheme of Marking

Q.1 - i) – (c) (Fuel Injector) — 01

ii) (a) (Lighter) — 01

(iii) (b) escoop) — 01

(iv) (a) (Pressure Relief) — 01

(v) — (a) Ignition quality of fuel — 01

(vi) (a) Comp. ratio — 01

(vii) (a) Decrease — 01

(viii) (a) Increased — 01

(ix) — (c) piston effort — 01

(x) (b) Dynamic equi — 01.

(10)

Q.2 (i) — Any five differences 5x1

(ii) — Details 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 Both² — 02

Wet Sump. — 1.5

Dry Sump — 1.5

(iii) Difference any five — 1x5

Q.4 (i) Abnormal Combustion — 2.5
Flam propagation — 2.5

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

(iii) Diagram — 02
Description — 03

Q.5 (i) — Any five Advantage — 1x5

(ii) Diagram — 02
Type of Supercharger — 3.

(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