Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V EXAMINATION – SUMMER 2025

Subject Code:3150210 Date:20-05-2025

Subject Name:Automobile Engines

Time:02:30 PM TO 05:00 PM Total Marks:70

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Simple and non-programmable scientific calculators are allowed.**

Q.1	**(a)**	In what respect four stroke cycle CI engine differ from that of an SI engine?	**03**
	(b)	Draw the otto cycle on p-V and T-s diagrams and mark the various processes.	**04**
	(c)	Explain Valve timing diagram for 4-stroke C. I. Engine with neat sketch.	**07**
Q.2	**(a)**	What are different air fuel mixture on which an engine can be operated?	**03**
	(b)	Explain working principle of Mechanical fuel pump with neat sketch.	**04**
	(c)	With a neat sketch explain the working principle of a simple carburetor.	**07**
		OR	
	(c)	Explain throttle body injection system with neat sketch.	**07**
Q.3	**(a)**	Give difference between Air and solid injection system.	**03**
	(b)	Enlist properties of C.I engine fuels & define any three.	**04**
	(c)	Draw a schematic diagram of fuel feed pump and explain its working principle.	**07**
		OR	
Q.3	**(a)**	What is the purpose of using a governor in CI engines? What are the two major type of governors?	**03**
	(b)	What is the purpose of a fuel injector? Mention the various parts of an injector assembly.	**04**
	(c)	Explain construction and working of Fuel Injector with neat sketch.	**07**
Q.4	**(a)**	What are the various components to be lubricated in an engine?	**03**
	(b)	Compare the wet sump and dry sump lubrication system.	**04**
	(c)	Enlist types of cooling system & explain Thermo-syphon cooling system with neat sketch.	**07**
		OR	
Q.4	**(a)**	What is delay period and what are the factors that affect it?	**03**
	(b)	Explain factors affecting flame propagation in C.I. Engine.	**04**
	(c)	Explain the stages of combustion with P-θ diagram in S.I. engines	**07**
Q.5	**(a)**	How does the actual scavenging process differ from the theoretical one? Explain by means of suitable graph.	**03**
	(b)	What is meant by supercharging? What is its effect on engine performance?	**04**
	(c)	What is turbocharging? State the types of turbocharging and explain any one with neat sketch.	**07**

OR

Q.5	**(a)**	Explain the principle involved in the measurement of brake power.	**03**
	(b)	Briefly discuss the various efficiency terms associated with an engine.	**04**
	(c)	With a neat sketch, explain an Eddy current dynamometer.	**07**

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Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V (NEW) EXAMINATION – SUMMER 2024

Subject Code: 3150210 Date:23-05-2024

Subject Name: Automobile Engines

Time:02:30 PM TO 05:00 PM Total Marks:70

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Simple and non-programmable scientific calculators are allowed.**

Q.1	**(a)**	In what respect four stroke cycle CI engine differ from that of an SI engine?	**03**
	(b)	Draw the otto cycle on p-V and T-s diagrams and mark the various processes.	**04**
	(c)	Explain Valve timing diagram for S.I Engine with neat sketch.	**07**
Q.2	**(a)**	What are different air fuel mixture on which an engine can be operated?	**03**
	(b)	Explain working principle of Mechanical fuel pump with neat sketch.	**04**
	(c)	With a neat sketch explain the working principle of a simple carburetor.	**07**
		OR	
	(c)	Explain MPFI system for petrol engine with neat sketch.	**07**
Q.3	**(a)**	Give difference between Air and solid injection system.	**03**
	(b)	Enlist properties of C.I engine fuels & define any three.	**04**
	(c)	Draw a schematic diagram of fuel feed pump and explain its working principle.	**07**
		OR	
Q.3	**(a)**	What is the purpose of using a governor in CI engines? What are the two major type of governors?	**03**
	(b)	What is the purpose of a fuel injector? Mention the various parts of an injector assembly.	**04**
	(c)	Explain construction and working of Fuel Injector with neat sketch.	**07**
Q.4	**(a)**	What are the various components to be lubricated in an engine?	**03**
	(b)	Compare the wet sump and dry sump lubrication system.	**04**
	(c)	Enlist types of cooling system & explain Thermo-syphon cooling system with neat sketch.	**07**
		OR	
Q.4	**(a)**	What is delay period and what are the factors that affect it?	**03**
	(b)	Explain factors affecting flame propagation in C.I. Engine.	**04**
	(c)	Explain the stages of combustion with P-θ diagram in S.I. engines	**07**
Q.5	**(a)**	Define scavenging. State different types of scavenging.	**03**
	(b)	What is meant by supercharging? What is its effect on engine performance?	**04**
	(c)	What is turbocharging? State the types of turbocharging and explain any one with neat sketch.	**07**

OR

Q.5	**(a)**	Explain the principle involved in the measurement of brake power.	**03**
	(b)	Briefly discuss the various efficiency terms associated with an engine.	**04**
	(c)	With a neat sketch, explain an Eddy current dynamometer.	**07**

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Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE – SEMESTER- V EXAMINATION-SUMMER 2023

Subject Code: 3150210 Date: 28/06/2023

Subject Name: Automobile Engines

Time: 02:30 PM TO 05:00 PM Total Marks: 70

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Simple and non-programmable scientific calculators are allowed.**

Q.1	**(a)**	What do you mean by Engine Tune-Up?	**03**
	(b)	Explain Engine firing order and its significance.	**04**
	(c)	Explain valve timing diagram for four stroke petrol engine with neat sketch.	**07**
Q.2	**(a)**	Why cooling system is necessary? Classify types of cooling system	**03**
	(b)	Explain the working principle Carburetor.	**04**
	(c)	Explain distributor type injection pump with neat sketch.	**07**
		OR	
	(c)	Explain Wet sump and dry sump lubrication system with neat sketch.	**07**
Q.3	**(a)**	What do you mean by Injection pump calibration& phasing?	**03**
	(b)	Explain Thermosyphon cooling system.	**04**
	(c)	Explain working principle of Mechanical governor with neat sketch.	**07**
		OR	
Q.3	**(a)**	What is pre-ignition? How it occurs?	**03**
	(b)	Compare Air injection system & solid Injection system	**04**
	(c)	Explain Jerk type injection pump with its effective strokes.	**07**
Q.4	**(a)**	Explain Mist lubrication system.	**03**
	(b)	Explain MPFI systems for petrol engine.	**04**
	(c)	Explain Solex carburetor with neat sketch.	**07**
		OR	
Q.4	**(a)**	Enlist the effects of knocking on I.C Engine components.	**03**
	(b)	Explain following properties of C.I Engine fuel : Viscosity, Flash & Fire point, Cloud point	**04**
	(c)	Explain combustion phenomenon in C.I Engine with P-θ diagram.	**07**
Q.5	**(a)**	Define scavenging.	**03**
	(b)	Compare the knocking (abnormal Combustion) in S.I Engine & C.I Engine.	**04**
	(c)	Classify the superchargers. Explain Centrifugal supercharger with neat sketch.	**07**
		OR	
Q.5	**(a)**	Differentiate supercharger & turbocharger.	**03**
	(b)	Explain different types of scavenging methods.	**04**
	(c)	Enlist different methods of Turbo-charging. Explain - Pulse turbo charging method.	**07**

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Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V(NEW) EXAMINATION – SUMMER 2022

Subject Code:3150210 Date:13/06/2022

Subject Name:Automobile Engines

Time:02:30 PM TO 05:00 PM Total Marks: 70

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Simple and non-programmable scientific calculators are allowed.**

			MARKS
Q.1	**(a)**	What are the assumptions made for fuel-air cycles?	**03**
	(b)	Give the comparison between wet sump and dry sump lubrication system.	**04**
	(c)	Explain MPFI system for S.I. engine.	**07**
Q.2	**(a)**	Explain the following terms: (i) Rich Mixture (ii) Ignition limit (iii) Stochiometric mixture	**03**
	(b)	What is meant by supercharging? What is its effect on engine performance?	**04**
	(c)	Derive an equation for the variation in air standard efficiency of otto cycle on account of variation in C_v.	**07**
		OR	
	(c)	A single cylinder 4 – stroke cycle oil engine works on diesel cycle. The following readings were recorded during trial on full load: Area of indicator = 3 cm^2, Length of the diagram = 4 cm, Spring constant = 10 bar/cm^2-cm, Speed of the engine = 400 rpm, Load on the brake = 380 N, Spring reading = 50 N, Diameter of the brake drum = 120 cm, Fuel consumption = 2.8 kg/hr, Calorific value of fuel = 42000 kJ/kg, Diameter of the cylinder = 16 cm, Stroke of the piston = 20 cm. Find:- (i) F.P. of the engine, (ii) Mechanical efficiency, (iii) Brake thermal efficiency, (iv) Brake mean effective pressure.	**07**
Q.3	**(a)**	What are the different parameters considered to control the knock?	**03**
	(b)	Describe the Pintle and Pintaux nozzle with neat sketch and discuss their relative merits and demerits.	**04**
	(c)	Draw and explain valve timing diagram of 4-storke petrol engine	**07**
		OR	
Q.3	**(a)**	State the factors on which delay period depends in C.I. engine	**03**
	(b)	Explain the effect of fuel-air ratio on fuel air cycle analyses.	**04**
	(c)	State the different methods used for I. C. Engine cooling and Explain thermo-syphon cooling system.	**07**
Q.4	**(a)**	What are the limitations of simple carburettor?	**03**
	(b)	With a line diagram, explain the working of pneumatic governor.	**04**
	(c)	What is turbocharging? State the types of turbocharging and explain any one with neat sketch.	**07**
		OR	

Q.4	**(a)**	What are the different factors that affect the ignition lag S.I. engine combustion?	**03**
	(b)	Explain the function of following parts in simple carburettor: (i) Chock valve, (ii) Throttle valve, (iii) Float and float chamber, (iv) Nozzle tip	**04**
	(c)	With a line diagram explain the working of common rail fuel injection system used in C. I. Engine.	**07**
Q.5	**(a)**	Why rich mixture required for starting and during idling of an engine?	**03**
	(b)	Describe the different phases of Spray formation with neat sketch	**04**
	(c)	A 4- cylinder, 4 – stroke petrol engine 6 cm bore and 9 cm stroke was tested at constant speed. The fuel supply was fixed to 0.13 kg/min and plugs of 4-cylinder were successively short-circuited without change of speed. The power measurement were as follows: With all cylinder working = 16.25 kW, With No. of 1^{st} cylinder cut-off=11.55 kW, With No. of 2^{nd} cylinder cut-off=11.65 kW (B.P.), With No. of 3^{rd} cylinder cut-off=11.70 kW (B.P.), With No. of 4^{th} cylinder cut-off=11.50 kW (B.P.). Find:- (i) I.P. of engine, (ii) Mechanical efficiency, (iii) Indicated thermal efficiency, if C.V. of fuel used is 42000kJ/kg, (iv) Relative efficiency on I.P. basis assuming clearance volume 65 cm^3.	**07**
		OR	
Q.5	**(a)**	State the function of lubrication system in I. C. engine	**03**
	(b)	Explain detonation or Knocking in S.I. engine	**04**
	(c)	Explain construction and working of bosch fuel pump	**07**

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