

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE- SEMESTER-VI EXAMINATION – WINTER 2025****Subject Code:3160209****Date:02-12-2025****Subject Name:Automotive Electricals and Electronics****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.

		<b>MARKS</b>
<b>Q.1</b>	(a) How to generation of electric energy in automobile electrical systems? (b) Enlist different types of cables and cable connectors used in automobile electrical systems. (c) Explain basic wiring Diagram layout of Two and Four wheeler electrical system with neat sketch.	<b>03</b> <b>04</b> <b>07</b>
<b>Q.2</b>	(a) Give the reason of Battery failure in vehicles. (b) Difference between lead acid battery and alkaline battery. (c) Explain the various methods of battery capacity rating.	<b>03</b> <b>04</b> <b>07</b>
	<b>OR</b>	
	(c) Explain central locking system of vehicle.	<b>07</b>
<b>Q.3</b>	(a) Brief about A.C. & D.C. horns, wind tone horn and electronic horn. (b) Explain the gravimetric test for battery. (c) Types of charging system. Explain any one in detail.	<b>03</b> <b>04</b> <b>07</b>
	<b>OR</b>	
<b>Q.3</b>	(a) What is characteristics electronic regulator? (b) Explain head lamp angle and its position. (c) Explain flywheel magneto charging system and Alternator.	<b>03</b> <b>04</b> <b>07</b>
<b>Q.4</b>	(a) What is the working principle of operation contactless electronic ignition system. (b) Discuss about current trends in automotive electronic engine management system. (c) Explain multi-port fuel injection system with neat sketch.	<b>03</b> <b>04</b> <b>07</b>
	<b>OR</b>	
<b>Q.4</b>	(a) Explain security warning system in brief. (b) Write short note on instrument panel lights and body interior lights. (c) Explain electromagnetic interference Suppression.	<b>03</b> <b>04</b> <b>07</b>
<b>Q.5</b>	(a) Describe Feedback carburetor systems. (b) Difference between speedometer and odometer. (c) Explain basic arrangement of sensor and also give detail of Crank angle position sensor of vehicles.	<b>03</b> <b>04</b> <b>07</b>

**OR**

<b>Q.5</b>	<b>(a)</b> Explain working principle of stepper motor.	<b>03</b>
	<b>(b)</b> Write short note on altitude sensor and flow sensor.	<b>04</b>
	<b>(c)</b> List various types of warning light-sensors and explain it.	<b>07</b>

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**GUJARAT TECHNOLOGICAL UNIVERSITY****BE- SEMESTER-VI (NEW) EXAMINATION – WINTER 2024****Subject Code:3160209****Date:20-11-2024****Subject Name:Automotive Electricals and Electronics****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.

		<b>Marks</b>
<b>Q.1</b>	(a) Explain function of alternator in a automobile.	03
	(b) What do you understand by positive and negative earth return systems?	04
	(c) Draw a neat wiring diagram of a four wheeler with all symbols.	07
<b>Q.2</b>	(a) Write down function of a) Fuse, b) Switch and c) Relay.	03
	(b) Explain working of spark plug with a diagram.	04
	(c) Explain with a neat sketch battery ignition system and explain function of each component.	07
<b>OR</b>		
	(c) Discuss various Battery Charging methods in detail.	07
<b>Q.3</b>	(a) List advantages of alkaline battery over lead acid battery.	03
	(b) Explain Battery Ratings.	04
	(c) With a neat sketch, Explain working of a speedometer.	07
<b>OR</b>		
<b>Q.3</b>	(a) Discuss the role of rectifier in charging system.	03
	(b) Define the following terms for starting motor a) Engine Brake away torque, b) Engine resisting torque, c) Motor Locked torque and e) Motor Driving Torque.	04
	(c) What is the need of Cranking motor drive mechanism? Explain working of Over running Clutch with a neat diagram.	07
<b>Q.4</b>	(a) A Starting motor is to be selected for a four stroke 1.2 ltr Diesel engine, list out the factors affecting the motor selection.	03
	(b) Explain Spark Advance mechanism.	04
	(c) Draw a neat diagram of lighting system of a automobile.	07
<b>OR</b>		
<b>Q.4</b>	(a) Write function of a) Cable connectors, b) Circuit breakers and c) Wiring Harness.	03
	(b) With a neat diagram, Explain the working of Oil pressure Gauge.	04
	(c) Explain construction and working of Alternator with a neat diagram.	07
<b>Q.5</b>	(a) Write a note on direction indicator used in automobile.	03
	(b) Discuss On Board Diagnostic system used in modern automobiles.	04
	(c) Explain Electronic fuel injection system, list out and also write functions of various sensors used in EFI.	07

**OR**

**Q.5** (a) List out various Electronic Dashboard instruments used in automobiles. **03**  
(b) Write a note on Engine management System. **04**  
(c) Explain with a neat diagram working of oxygen sensor. **07**

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Seat No.: \_\_\_\_\_

Enrolment No. \_\_\_\_\_

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**Time:02:30 PM TO 05:00 PM**

**Total Marks:70**

**Instructions:**

1. Attempt all questions.
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<b>Q 1</b>	<b>(A)</b> Justify the need of fog lamp	<b>03</b>
	<b>(B)</b> Explain plug fouling.	<b>04</b>
	<b>(C)</b> Explain color coding of wiring system	<b>07</b>
<b>Q 2</b>	<b>(A)</b> Draw layout of wiring diagram of four wheeler vehicle	<b>03</b>
	<b>(B)</b> Explain parking brake indictor	<b>04</b>
	<b>(C)</b> Explain Central Locking system	<b>07</b>
	<b>OR</b>	
	<b>(C)</b> Describe about two filament modern head light.	<b>07</b>
<b>Q 3</b>	<b>(A)</b> Brief about instrument panel lights	<b>03</b>
	<b>(B)</b> Explain Throttle position sensors	<b>04</b>
	<b>(C)</b> Explain bendix drive types of drive mechanism	<b>07</b>
	<b>OR</b>	
<b>Q 3</b>	<b>(A)</b> Justify the need of alternator	<b>03</b>
	<b>(B)</b> Describe Fuel metering sensor	<b>04</b>
	<b>(C)</b> Explain the working of windscreen wiper	<b>07</b>
<b>Q 4</b>	<b>(A)</b> Describe Feedback carburetor systems (FBC)	<b>03</b>
	<b>(B)</b> Describe Crank Angle Position Sensors with Neat Sketch.	<b>04</b>
	<b>(C)</b> Explain Different Types of Battery Charging Technic	<b>07</b>
	<b>OR</b>	
<b>Q 4</b>	<b>(A)</b> Why diesel engine required high ampere battery?	<b>03</b>
	<b>(B)</b> Explain Throttle position sensors,	<b>04</b>
	<b>(C)</b> Explain electronic horn with Neat Sketch.	<b>07</b>
<b>Q 5</b>	<b>(A)</b> Explain Oxygen Sensors.	<b>03</b>
	<b>(B)</b> Explain Electromagnetic interference Suppression	<b>04</b>
	<b>(C)</b> Explain cold starting devices: Glow plug & choke	<b>07</b>
	<b>OR</b>	
<b>Q 5</b>	<b>(A)</b> Explain Cam angle RPM Testers used as Testing Devices in Vehicles.	<b>03</b>
	<b>(B)</b> Explain Spark Advance Mechanism and Cam Angle in Ignition System.	<b>04</b>
	<b>(C)</b> Explain Electronic spark timing control	<b>07</b>

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**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-VI(NEW) EXAMINATION – WINTER 2022****Subject Code:3160209****Date:13-12-2022****Subject Name:Automotive Electricals and Electronics****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**

<b>Q.1</b>	(a) What is the need of charging circuit?	<b>03</b>
	(b) Draw any six electrical symbols and name it.	<b>04</b>
	(c) Explain working principle of battery with neat sketch.	<b>07</b>
<b>Q.2</b>	(a) Enlist types of cables used in automobile electrical system with its color codes.	<b>03</b>
	(b) Draw a wiring diagram of 4 wheeler vehicle.	<b>04</b>
	(c) Explain the working of cut out relay, voltage regulator and current regulator.	<b>07</b>
	<b>OR</b>	
	(c) Write Short Note on Fog Lamps and Side Indicator Lamp with circuit diagram.	<b>07</b>
<b>Q.3</b>	(a) Explain working of glow plug and choke.	<b>03</b>
	(b) Explain Bedix drive mechanisms.	<b>04</b>
	(c) Explain spark plug with neat sketch.	<b>07</b>
	<b>OR</b>	
<b>Q.3</b>	(a) Explain working of solenoid used in electronic system.	<b>03</b>
	(b) Explain battery ratings.	<b>04</b>
	(c) Write the difference between alternator and generator.	<b>07</b>
<b>Q.4</b>	(a) Explain the working of odometer.	<b>03</b>
	(b) Give the types of sensors. Explain about oxygen sensors.	<b>04</b>
	(c) Explain Insulation of cables and Earthing system.	<b>07</b>
	<b>OR</b>	
<b>Q.4</b>	(a) Explain windscreens wiper.	<b>03</b>
	(b) Explain the working of fuel gauge with neat sketch.	<b>04</b>
	(c) Give Principle of starting system. Write short note on starter motor and its circuits.	<b>07</b>
<b>Q.5</b>	(a) Explain central locking system of vehicle.	<b>03</b>
	(b) Write short note on onboard diagnostic system.	<b>04</b>
	(c) State the various parts of electronics ignition system & explain their function.	<b>07</b>
	<b>OR</b>	
<b>Q.5</b>	(a) Write short note on recent trend on automotive electronic engine management system.	<b>03</b>
	(b) List various types of horns and explain working of any one.	<b>04</b>
	(c) Compare lead acid battery, dry battery and alkaline battery.	<b>07</b>

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