Q. Code: 647818

Reg. No. | | | | | | | | | | | | | |

B. E / B. TECH.DEGREE EXAMINATION, MAY 2023

Fifth Semester

AE18501 – AUTOMOTIVE ELECTRICAL, ELECTRONICS AND MICROCONTROLLER SYSTEMS

(Automobile Engineering)

(Regulation 2018)

TIME:3 HOURS **MAX. MARKS: 100**

CO1 Describe the basic principles of electrical, electronics and automotive dashboard instruments.

CO2 Identify the requirements and discuss the automotive starting system, charging system and lighting system.

CO3 Outline the application of electronics in automotive ignition and injection system.

CO4 Illustrate the working of sensors and microcomputer controlled devices in automobiles.

CO 5 Outline the working principle of safety systems employed in vehicles.

PART- A(10x2=20Marks)

(Answer all Questions)

		CO	RBT LEVEL
1.	Explain what is meant by the 'frequency response' of an operational amplifier.	**1**	**1**
2.	What is multiplex wiring system?	**1**	**1**
3.	State four advantages of a pre-engaged starter when compared with an inertia type.	**2**	**2**
4.	Explain how and why the output voltage of an alternator is regulated.	**2**	**2**
5.	With reference to the combustion process, describe the effects of ignition timing.	**3**	**2**
6.	State three advantages of fuel injection.	**3**	**2**
7.	Describe what is meant by 'Telematics'.	**4**	**2**
8.	State the main advantage of a thermal gauge.	**4**	**2**
9.	Point out crumble zone in a car .	**5**	**2**
10.	State what is meant by active and passive safety.	**5**	**2**

PART- B (5x 14=70Marks)

		Marks	CO	RBT LEVEL
11. (a)	Sketch the wiring diagram of car and explain with all the relays and distributors of the circuit.	**(14)**	**1**	**2**
	(OR)			
(b)	Explain the construction and working of any two digital dashboard instruments with neat sketches.	**(14)**	**1**	**2**

12. (a)	Illustrate the construction and working principle of Cut out relays, voltage and current regulators of a charging system.	**(14)**	**2**	**2**
	(OR)			
(b)	Explain the construction and working of a solenoid operated overrunning clutch with a neat sketch.	**(14)**	**2**	**2**
13. (a)	List all the main components of a basic electronic ignition system and explain the purpose and operation of each component.	**(14)**	**3**	**3**
	(OR)			
(b)	Discuss in detail the various components of an electronically controlled Gasoline Direct Injection system with a neat sketch.	**(14)**	**3**	**3**
14. (a)	Explain the following sensor with neat sketch.			
	(i) Knock sensor	**(7)**	**4**	**2**
	(ii) MAP sensor	**(7)**	**4**	**2**
	(OR)			
(b)	Discuss the operation of voice command/assist system and keyless entry systems with sketches.	**(14)**	**4**	**2**
15. (a)	Explain the construction and working principle of an air bag with electronic activating system.	**(14)**	**5**	**2**
	(OR)			
(b)	Explain the working of a seat belt locking mechanism triggered by cars movement during collision on other vehicle.	**(14)**	**5**	**2**

PART- C (1x 10=10Marks)

(Q.No.16 is compulsory)

		Marks	CO	RBT LEVEL
16.	With relevant sketches compare the early version of the fuel injection with the CRDi systems and explain on where, and why, changes have been made.	**(10)**	**3**	**3**

****