Q. Code:982123

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

B.E. / B.TECH. DEGREE EXAMINATIONS, MAY 2024

Third Semester

AE18012 – ENGINE AND VEHICLE MANAGEMENT SYSTEMS

(Automobile Engineering)

(Regulation 2018/2018A)

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

COURSE OUTCOMES	STATEMENT	RBT LEVEL
CO 1	Discuss the fundamentals of control strategies applied in engines and automotive components.	**3**
CO 2	Explore the construction and working principle of automotive sensors.	**3**
CO 3	Discuss and compare the fuel control techniques featured in spark ignition engines.	**3**
CO 4	Discuss and compare the fuel control techniques featured in compression ignition engines.	**3**
CO 5	Explore the control system employed in comfort, security and safety of vehicle.	**3**

PART- A (10 x 2 = 20 Marks)

(Answer all Questions)

		CO	RBT LEVEL
1.	How does a microcontroller differ from a microprocessor?	**1**	**2**
2.	Define open and closed loop control strategies.	**1**	**2**
3.	What is lambda sensor? Write use of it in vehicles.	**2**	**1**
4.	What are all the engine parameters that can be measured for engine management system using thermistor?	**2**	**1**
5.	List the SI engine fuel system components.	**3**	**1**
6.	List the advantages of Electronic ignition systems.	**3**	**1**
7.	What is meant by Pilot injection?	**4**	**1**
8.	Sketch the typical fuel supply schematic for electronic diesel control systems.	**4**	**2**
9.	What is airbag system?	**5**	**1**

10.	What is meant by On board diagnostics?	**5**	**2**	

PART- B (5 x 14 = 70 Marks)

		Marks	CO	RBT LEVEL
11.(a)	Identify the most successful microprocessor architecture and discuss its working with a neat block diagram.	**(14)**	**1**	**3**
	(OR)			
(b)	Discuss a typical look up table used with PID control for engine management systems.	**(14)**	**1**	**3**
12.(a)	Describe the construction and working of a sensor based on piezo electric effect and its application in a car.	**(14)**	**2**	**3**
	(OR)			
(b)	Discuss the following sensor and its applications with neat sketch. (i) Throttle position sensor (ii) Knock sensor (iii) MAP sensor	**(14)**	**2**	**3**
13.(a)	Illustrate the construction and operation of the three-way catalytic converter. Also write how its operating efficiency is monitored and controlled?	**(14)**	**3**	**3**
	(OR)			
(b)	Identify the most suitable Bosch SI engine fuel injection system and Explain it.	**(14)**	**3**	**3**
14.(a)	Discuss in detail the various components of an electronically controlled common rail fuel injection system with a neat sketch.	**(14)**	**4**	**3**
	(OR)			
(b)	Justify the requirement of EGR in the CI engine Management system and how it controls the Emission from the CI Engine?	**(14)**	**4**	**3**
15.(a)	Identify and explain the suitable braking system which uses electronics to detect and prevent wheel lock up.	**(14)**	**5**	**3**
	(OR)			
(b)	Discuss the principle and operation of the following systems i) Cruise control systems.	**(14)**	**5**	**3**

ii) Collision avoidance systems using RADAR systems

PART- C (1 x 10 = 10 Marks)

(Q.No.16 is compulsory)

		Marks	CO	RBT LEVEL
16.	Identify and discuss the important engine parameters to be controlled in SI engines.	**(10)**	**1**	**2**

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