Q. Code:132661

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

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

Eighth -Semester

ME18004 – ADVANCED IC ENGINES

(Mechanical Engineering)

(Regulation 2018/2018A)

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

COURSE OUTCOMES	STATEMENT	RBT LEVEL
CO 1	The students can understand the various operations and combustion chambers of spark ignition engines.	**1**
CO 2	The students will be capable to analyze the various operations of compression ignition engines, stratified charge engine, and low heat rejection engine.	**2**
CO 3	The students will be familiar with various alternate fuels for IC engines and also interpret mechanism of various pollutant formation and their control.	**2**
CO 4	The students can analyze the effects of various sensors in I.C engine systems..	**2**
CO 5	The student can interpret the concepts of Electronic Engine Management systems and recent trends in I.C Engines.	**2**

PART- A(10x2=20Marks)

(Answer all Questions)

		CO	RBT LEVEL
1.	What are the different air fuel ratio on which engine can be operated?	**1**	**1**
2.	What are the design considerations for the good combustion chambers of the SI engine	**1**	**1**
3.	What are the basic requirements of good injection system?	**2**	**1**
4.	Draw the P-Ø curve(combustion stages) of C.I. engine.	**2**	**2**
5.	Write the advantages and disadvantages of LPG used in IC engines.	**3**	**1**
6.	Compare methanol and ethanol as a substitute to gasoline engine.	**3**	**2**
7.	What is the function of Cam position sensor?	**4**	**1**
8.	Differentiate between open loop and closed loop control system.	**4**	**2**
9.	Write a short note on pressure pickup used in engine measurement.	**5**	**2**
10.	What are the advantages of NO_x absorbers used in diesel engine?	**5**	**1**

PART- B (5x 14=70Marks)

			Marks	CO	RBT LEVEL
11. (a)	**(i)**	Explain the stages of combustion in SI engines with the help of P-Ø curve.	**(7)**	**1**	**2**
	(ii)	With a neat sketch explain the multi point fuel injection system.	**(7)**	**1**	**1**

(OR)

(b)	Briefly explain the factors that affect knocking in SI engine (time factors, density factor and composition factors).	**(14)**	**1**	**1**

12. (a)	**(i)**	Explain the factors which affect the delay period in C.I. engines.	**(7)**	**2**	**2**
	(ii)	What are the various methods of Turbo charging? Discuss their merits and demerits.	**(7)**	**2**	**2**

(OR)

(b)	What are the different types of combustion chambers used in C.I. engines? Explain them with sketches.	**(14)**	**2**	**1**

13. (a)	Discuss about the difficulties of using alcohol in diesel engines, and explain the different methods of ethanol usage in diesel engine.	**(14)**	**3**	**2**

(OR)

(b)	**(i)**	What is smoke and explain the principle used in the measurement of smoke?	**(7)**	**3**	**2**
	(ii)	Explain the formation of HC emission in IC engines.	**(7)**	**3**	**2**

14. (a)	Explain the following sensor with neat sketches (i) Hall effect sensor (ii) Hot wire anemometer (iii) Throttle position sensor (iv) Air mass flow sensor	**(14)**	**4**	**2**

(OR)

(b)	Draw the block diagram of Engine management systems and explain the various sensors used in Engine management systems.	**(14)**	**4**	**2**

15. (a)	**(i)**	Explain the operations of common rail direct injection (CRDI) engines.	**(7)**	**5**	**2**
	(ii)	Explain the advantages of using Homogeneous charge compression ignition engines.	**(7)**	**5**	**2**

(OR)

(b)	**(i)**	With the neat sketch explain in detail about gasoline direct engine.	**(7)**	**5**	**2**
	(ii)	Write the short note on Hybrid electric vehicle.	**(7)**	**5**	**2**

PART- C (1x 10=10Marks)

(Q.No.16 is compulsory)

		Marks	CO	RBT LEVEL
16	Using pressure crank angle diagram explain different stage of combustion observed a typical CI engine. why is undesirable to have a fourth phase of combustion(combustion during late expansion stroke)?	**(10)**	**2**	**2**

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