Roll No. | | | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 18

B.Tech. (Automobile Engineering) (Sem.–5)

AUTOMOTIVE PETROL AND DIESEL ENGINES

Subject Code : BTAE503-18

M.Code : 78227

Time : 3 Hrs. Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.**

SECTION-A

Answer briefly :

1) Sketch P-V and T-S diagram of Diesel cycle.

2) Define air standard efficiency.

3) Define Octane and Cetane number.

4) Why very rich mixture is required for Idling?

5) Discuss the requirements of an Ideal injection.

6) Define mean effective pressure and stoichiometric air fuel ratio.

7) Explain the function of combustion chamber.

8) What are two basic types of internal combustion engines?

9) Why supercharging of CI engines is done?

10) List a few anti-knock agents commonly added to gasoline.

SECTION-B

11) Define and explain the relation between :

    a. Mechanical efficiency

    b. Brake thermal efficiency.

12) An engine working on Otto cycle has the following conditions: Pressure at the beginning of compression is 1 bar and pressure at the end of compression is 11 bar. Calculate the compression ratio and air-standard efficiency of the engine. Assume $\gamma = 1.4$.

13) Compare SI and CI engines with respect to :

    a. basic cycle

    b. compression ratio

    c. fuel used

    d. fuel injection

14) Discuss the effect of spark advance on the performance of an Otto cycle engine. What is meant by the optimum spark advance?

15) How does exhaust temperature and mean effective pressure affect the engine performance? Explain.

SECTION-C

16) A petrol engine working on Otto cycle has an maximum pressure of 50 bar. Heat supplied is 1000 kJ/kg. If the pressure ratio during compression 12.286, find the compression ratio and also the ratio of peak temperature to inlet temperature. Take p1 = 1 bar and T1 = 27 °C.

17) Draw the Carnot cycle on p-V and T -s diagrams. Derive an expression for its efficiency. Comment on the significance of this result as it related to source and sink temperature.

18) "*Factors tending to increase detonation in SI engines tend to reduce knock in CI engines*" Comment on this statement considering delay period and flames front speed.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.