



B.E. DEGREE EXAMINATIONS: APRIL / MAY 2023

(Regulation 2018)

Fourth Semester

AUTOMOBILE ENGINEERING

U18AUI4201: Automotive Engines and Systems

COURSE OUTCOMES

- CO1:** Outline the various components of the engine and its functions.
CO2: Examine the combustion process in SI and CI Engine for understanding the performance and emission characteristics.
CO3: Summarize various fuel supply and injection system used in IC engines.
CO4: Identify the suitable lubrication and cooling system to be used in IC Engines.
CO5: Explain the concepts of Supercharging and Turbocharging.
CO6: Analyze the various properties of fuels used in I.C engines.

Time: Three Hours

Maximum Marks: 100

**Answer all the Questions:-
 PART A (10 x 2 = 20 Marks)
 (Answer not more than 40 words)**

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|---|----------|
| 1. State the importance of piston rings and list its major types. | CO1 [K1] |
| 2. Write a short note on the trap type general-purpose spark arresters. | CO1 [K2] |
| 3. List out the factors affecting the flame propagation. | CO2 [K1] |
| 4. Write a short note on Detonation/Knocking in SI engine. | CO2 [K2] |
| 5. What is swirl in CI engine? | CO3 [K1] |
| 6. Represent the ignition delay on the pressure-time plot, and discuss briefly. | CO3 [K2] |
| 7. List out the key properties of good lubricants. | CO4 [K4] |
| 8. With an aid of a sketch, state the functions of thermostat in the engine cooling system. | CO4 [K4] |
| 9. Write a short note on turbocharger failure and inspection. | CO5 [K4] |
| 10. Differentiate Between Octane Number and Cetane Number. | CO6 [K2] |

Answer any FIVE Questions:-
PART B (5 x 16 = 80 Marks)
(Answer not more than 400 words)

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|-----|---|----|-----|-------------------|
| 11. | Write a brief note on Four stroke petrol engine focusing on its construction, Working Cycle, Applications | 16 | CO1 | [K ₂] |
| 12. | Describe the following 'charge mode' of a direct-injected engine fuel.
a) Homogeneous charge mode
b) Stratified charge mode | 16 | CO2 | [K ₂] |
| 13. | Explain in detail the Different types of combustion chambers for CI Engines with an aid of sketch and list out its salient features. | 16 | CO3 | [K ₃] |
| 14. | a) With an aid of neat sketch, discuss in the working of wet sump any dry sump lubrication and state the key difference on the same.
b) Enumerate the Advantages and Disadvantages of Wet Sump and dry sump lubrication system. | 8 | CO4 | [K ₂] |
| 15. | a) Explain the construction and the working principle of Waste gate turbocharger with an aid of neat sketch.
b) Discuss in detail, how effectively the turbo lag is handled with the flow control method on a variable geometry turbo charger and represent the same with an aid of neat sketch. | 8 | CO5 | [K ₂] |
| 16. | With an aid of neat sketches, discuss in detail on the Stages of Combustion in CI engine. | 16 | CO3 | [K ₃] |
