

B.E DEGREE EXAMINATIONS: NOV /DEC 2024

(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 and lubricants 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. Classify the engine according to its cylinder arrangement | CO1 [K ₂] |
| 2. Recall the term Compression ratio | CO1 [K ₂] |
| 3. Infer the effect of turbulence on flame speed in S.I engines. | CO2 [K ₃] |
| 4. Plot the reaction rate at various stages of combustion in S.I Engines. | CO2 [K ₂] |
| 5. Infer the effect of Engine speed on ignition delay in C.I Engine. | CO3 [K ₂] |
| 6. Compare CRDI with conventional diesel injection system | CO3 [K ₃] |
| 7. Infer the type of cooling system adopted in Two wheelers. | CO4 [K ₃] |
| 8. Identify the method to improve viscosity of engines oils | CO4 [K ₂] |
| 9. Mention the techniques used in I.C engines for Engine downsizing | CO5 [K ₂] |
| 10. In S.I engines effect of supercharging cannot be increased above certain limit justify. | CO6 [K ₂] |

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

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|-----|----|---|----|-----|-------------------|
| 11. | a) | Illustrate the various components and working of an I.C Engines. | 10 | CO1 | [K ₂] |
| | b) | Explain the technique used to reduce harmful gases from I.C engines. | 6 | CO1 | [K ₂] |
| 12. | a) | Summarize the effect of engine variables on knocking in S.I Engine. | 8 | CO3 | [K ₂] |
| | b) | Briefly explain the Stages of combustion in CI Engine | 8 | CO3 | [K ₂] |
| 13. | a) | With a schematic layout explain the working of a Common Rail Direct Injection System | 8 | CO2 | [K ₂] |
| | b) | With a neat sketch explain the types of direct combustion chamber for C.I engine. | 8 | CO2 | [K ₂] |
| 14. | a) | Explain the operation of lubrication system implemented in 2 stroke 2 wheeler S.I engine of 100 cc and four stroke C.I engine of 1300 cc of a four wheeler. | 8 | CO4 | [K ₃] |
| | b) | Explain about the types of Cooling system used in I.C engine with a neat sketch | 8 | CO4 | [K ₂] |
| 15. | a) | Illustrate the operation and types of a Turbocharger with a neat sketch | 8 | CO5 | [K ₂] |
| | b) | List down and explain the types of superchargers with a neat sketch | 8 | CO5 | [K ₂] |
| 16. | a) | Explain about various properties of lubricants used in I.C engines. | 8 | CO6 | [K ₂] |
| | b) | Infer the injection system used in modern two wheelers used in S.I Engines and list down its merits. | 8 | CO3 | [K ₂] |
