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INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal-500043, Hyderabad

B.Tech VII SEMESTER END EXAMINATIONS (REGULAR) - DECEMBER 2023

Regulation: UG-20

AUTOMOBILE ENGINEERING

Time: 3 Hours

(MECHANICAL ENGINEERING)

Max Marks: 70

Answer ALL questions in Module I and II

Answer ONE out of two questions in Modules III, IV and V

All Questions Carry Equal Marks

All parts of the question must be answered in one place only

MODULE – I

- Summarize the following indirect injection type combustion chamber in C.I engine with neat sketch i) Swirl chamber ii) Pre combustion chamber iii) Air cell or Energy cell
[BL: Understand| CO: 1|Marks: 7]
 - Give reasons for following :
 - For using single cylinder two stroke petrol engines on two wheelers.
 - For using multi cylinder diesel engines in commercial vehicles
[BL: Understand| CO: 1|Marks: 7]

MODULE – II

- Classify different types of water cooling systems used in an automobile. Explain any one of it with neat diagram
[BL: Understand| CO: 2|Marks: 7]
 - Illustrate the working of a magnetic coil ignition system with the help of a neat diagram.
[BL: Understand| CO: 2|Marks: 7]

MODULE – III

- List different types of clutches used in an automobile. Explain any one of them with neat diagram
[BL: Understand| CO: 3|Marks: 7]
 - Describe the construction of fluid fly wheel and mention its advantages and disadvantages.
[BL: Understand| CO: 3|Marks: 7]
- Interpret the functions of a Hotchkiss drive. Compare its merits with torque tube drive.
[BL: Understand| CO: 4|Marks: 7]
 - Demonstrate with the help of a neat layout about rigid axle suspension system. Compare rigid axle and independent suspension.
[BL: Understand| CO: 4|Marks: 7]

MODULE – IV

- Mention the condition for correct steering gear mechanism. Illustrate with the help of a neat layout about Ackerman steering gear mechanism.
[BL: Understand| CO: 5|Marks: 7]

(b) Discuss briefly about hydraulic brake system with the help of line diagram.

[BL: Understand| CO: 5|Marks: 7]

6. (a) Write short note on ABS and traction control. Distinguish between disc brake with drum brake.

[BL: Understand| CO: 5|Marks: 7]

(b) Elaborate the working of front independent suspension system with neat sketch. Mention the objectives and components of suspension system.

[BL: Understand| CO: 5|Marks: 7]

MODULE – V

7. (a) What is liquefied petroleum gas (LPG)? How is it produced? Discuss the operation of an LPG propelled vehicle with neat sketch.

[BL: Understand| CO: 6|Marks: 7]

(b) Outline the operation of hydrogen fueled vehicle with neat sketch. Enlist the two types of techniques for treating the exhaust gases to reduce the pollutants.

[BL: Understand| CO: 6|Marks: 7]

8. (a) Compare bio-diesel with diesel engine in performance ,combustion and emission characteristics.

[BL: Understand| CO: 6|Marks: 7]

(b) Enumerate the performance, combustion and emission characteristics of CI engines with alternate fuels.

[BL: Understand| CO: 6|Marks: 7]

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