

**R18**

Code No: 157AQ

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech IV Year I Semester Examinations, July/August - 2023

**AUTOMOBILE ENGINEERING**  
(Mechanical Engineering)

Time: 3 Hours

Max. Marks: 75

**Note:** i) Question paper consists of Part A, Part B.

ii) Part A is compulsory, which carries 25 marks. In Part A, Answer all questions.

iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

**PART – A**

**(25 Marks)**

- 1.a) State the functions of nozzle. [2]
- b) Mention the functions of chassis of automobile. [3]
- c) List the advantages of air cooling system. [2]
- d) Draw the circuit for functioning of horn. [3]
- e) Illustrate the importance of gear mechanism in automobiles. [2]
- f) What are the materials used for the manufacturing of the tyres? [3]
- g) What is the purpose of steering system? [2]
- h) Define cornering power and toe-out. [3]
- i) What are the main pollutants emitted by petrol engine? [2]
- j) Define rich mixture, Stoichiometric ratio and lean mixture. [3]

**PART – B**

**(50 Marks)**

- 2.a) Develop briefly the following three basic units of an automobile.  
i) The chassis and transmission ii) The engine iii) The electrical equipment.
- b) Examine the construction and working of a solex carburetor with the help of neat sketch. [5+5]

**OR**

- 3.a) Inspect the working of the solid injection system with a neat sketch.
- b) Identify the importance of transient mixture requirements in SI engines. [5+5]

- 4.a) Evaluate the circulation accomplished in a thermo-syphon system? Interpret the advantages and disadvantages of thermo-syphon system.
- b) Discover the various components of the battery ignition system and explain any three of them briefly. [5+5]

**OR**

- 5.a) Inspect the various types of radiators? Explain any one in detail.
- b) Interpret the construction and working of the Horn in the automobile. [5+5]

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- 6.a) Interpret the working of the synchromesh gear box with the help of neat sketch.
- b) Explain the working of the rigid axle front suspension system with the neat sketch. [5+5]

**OR**

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- 7.a) Infer the working of telescopic damper with a neat sketch.
- b) Examine the advantages and disadvantages of the epicyclic gear box. [5+5]

- 8.a) Interpret the working of the wheel cylinder used in a braking system of a car.
- b) Explain the layout the steering system and label the various parts. Also explain the working of the steering system. [5+5]

**OR**

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- 9.a) Interpret the Ackerman principle? Explain it in detail.
- b) Evaluate the construction and working principle of the disc brake. [5+5]

- 10.a) Interpret the phenomena of crankcase blow by? How can it be controlled?
- b) Judge the advantages and disadvantages of usage of hydrogen fuel in automobile. [5+5]

**OR**

- 11.a) Justify how the biomass can be an alternative fuel in automobiles.
- b) Determine the various methods by which SI engine emission can be controlled. [5+5]

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