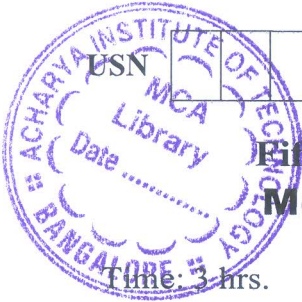


# CBCS SCHEME



21ME54

## Fifth Semester B.E. Degree Examination, June/July 2024 Modern Mobility and Automotive Mechanics

Max. Marks: 100

*Note: Answer any FIVE full questions, choosing ONE full question from each module.*

### Module-1

- 1 a. List the components of automotive engine. Mention their functions and materials used for manufacturing. (07 Marks)
- b. What is the necessity of cooling valve? Explain sodium cooled valve with neat sketch. (06 Marks)
- c. What are the functions of the lubricating system in an automobile? Explain with a neat sketch the splash lubricating system. (07 Marks)

OR

- 2 a. Explain with a neat sketch, working of a battery ignition system. (08 Marks)
- b. Explain different method of supercharging. (08 Marks)
- c. Explain the function of Engine Management System (EMS). (04 Marks)

### Module-2

- 3 a. With a neat sketch, explain the working of telescopic type shock absorber. (06 Marks)
- b. Difference between torque converter and fluid flywheel. (06 Marks)
- c. What is the function of differential? Explain its operation with neat diagram. (08 Marks)

OR

- 4 a. Explain with neat sketch, single plate clutch. (06 Marks)
- b. Explain the followings:
  - (i) Automatic Manual Transmission (AMT)
  - (ii) Automatic Transmission (AT)(08 Marks)
- c. Explain with neat sketch types of rear axles. (06 Marks)

### Module-3

- 5 a. Define the following and explain their effects on steering:
  - (i) Camber
  - (ii) King pin angle or steering axis inclination
  - (iii) Castor
  - (iv) Toe-in and Toe-out
  - (v) Included angle and scrub radius(10 Marks)
- b. Explain the principle of braking system. Write the functions of Brake and its requirement in automobile. (06 Marks)
- c. Difference between disc brake and drum brake. (04 Marks)

OR

- 6 a. Explain the different safety measures taken in modern vehicles. (05 Marks)
- b. Explain with neat sketch steering linkage used in the vehicle with rigid axle front suspension. (08 Marks)
- c. Explain the followings: (i) Seat belt (ii) Air bags (07 Marks)

**Module-4**

- 7 a. Write the exhaust gas pollutants and their effects on environment. (07 Marks)  
b. Explain with neat sketch Ethanol Engine Vehicles. (07 Marks)  
c. Explain the types of bio-fuels. (06 Marks)

OR

- 8 a. Explain with a line diagram of refining of crude oil. (07 Marks)  
b. Explain with neat sketch, CNG engine vehicles. (06 Marks)  
c. Explain with neat sketch, Hydrogen Engine Vehicles. (07 Marks)

**Module-5**

- 9 a. Explain the following:  
(i) Lead acid battery  
(ii) Lithium and metal air battery  
(iii) Nickel based battery (14 Marks)  
b. Explain the regenerative braking system in EV vehicles. (06 Marks)

OR

- 10 a. What are the types of motors used in electrical vehicles? Explain the BLDC motor with neat sketch. (08 Marks)  
b. Explain the necessity of battery cooling. (04 Marks)  
c. Explain the type of electrical vehicles. (08 Marks)

\*\*\*\*\*