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## BRAINWARE UNIVERSITY

Term End Examination 2025-2026

Programme – Dip.ME-2024

Course Name – Automobile Engineering

Course Code - DME40201D

( Semester IV )

Full Marks : 60

Time : 2:30 Hours

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

### Group-A

(Multiple Choice Type Question)

1 x 15=15

1. Choose the correct alternative from the following :

- (i) State the function of chassis.
  - a) Controls speed
  - b) Holds all mechanical components
  - c) Provides passenger comfort
  - d) Stores fuel
- (ii) Identify the system that transfers power from engine to wheels.
  - a) Steering system
  - b) Transmission system
  - c) Suspension system
  - d) Braking system
- (iii) Identify the function of differential.
  - a) Cools motor
  - b) Allows wheels to rotate at different speeds
  - c) Charges battery
  - d) Controls suspension
- (iv) Identify the circulatory system of vehicle wiring.
  - a) Fuel lines
  - b) Brake pipes
  - c) Cooling pipes
  - d) Wiring harness
- (v) State the key function of ECU fuel injection control.
  - a) Charge battery
  - b) Operate lights
  - c) Cool engine
  - d) Dictate fuel quantity for combustion
- (vi) Identify the sustainability trend in automobiles.
  - a) No electronics
  - b) Hybrid and electric vehicles
  - c) More fuel consumption
  - d) Steam engines
- (vii) Identify automatic transmission.
  - a) DCT
  - b) Automatic transmission
  - c) Manual transmission
  - d) CVT
- (viii) Identify an example of forging product.
  - a) Gear housing
  - b) Crankshaft
  - c) Engine block
  - d) Cylinder head

- (ix) State the benefit of increased production speed in assembly.
- |                                     |                   |
|-------------------------------------|-------------------|
| a) Increases errors                 | b) Increases cost |
| c) Continuous flow maximizes output | d) Reduces output |
- (x) Identify the test that checks real world working conditions.
- |                            |                        |
|----------------------------|------------------------|
| a) Dimensional measurement | b) Performance testing |
| c) Material testing        | d) Visual inspection   |
- (xi) State the meaning of predictive maintenance.
- |                              |                                        |
|------------------------------|----------------------------------------|
| a) Manual inspection only    | b) Maintenance based on real time data |
| c) Maintenance at fixed time | d) Repair after breakdown              |
- (xii) State the first step in troubleshooting process.
- |           |             |
|-----------|-------------|
| a) Test   | b) Observe  |
| c) Listen | d) Diagnose |
- (xiii) State the current standard battery technology.
- |                        |                        |
|------------------------|------------------------|
| a) Lead acid battery   | b) NiMH battery        |
| c) Solid state battery | d) Lithium ion battery |
- (xiv) State the function of electronic power steering.
- |                            |                                       |
|----------------------------|---------------------------------------|
| a) Charges battery         | b) Uses electric motor for assistance |
| c) Uses hydraulic pressure | d) Stores energy                      |
- (xv) State the role of stability system.
- |                      |                                |
|----------------------|--------------------------------|
| a) Generate power    | b) Apply brakes                |
| c) Control direction | d) Secure handling and comfort |

#### Group-B

(Short Answer Type Questions)

3 x 5=15

2. Describe an independent suspension system. (3)
3. Explain function of shock absorbers. (3)
4. Determine differences between disc and drum brakes. (3)
5. A lithium-ion battery is charged at a constant voltage of 48 V and draws a current of 10 A for 3.5 hours. During discharge, the battery supplies 9 A at 45 V for 5 hours. Calculate the efficiency of the battery. (3)
6. Examine how transmission configuration affects vehicle efficiency. (3)

OR

- Analyze the impact of suspension design on stability. (3)

#### Group-C

(Long Answer Type Questions)

5 x 6=30

7. A 4-cylinder petrol engine of a Maruti Suzuki car has the following specifications: Cylinder bore = 73 mm and Stroke length = 81 mm, Calculate: a) Swept volume of one cylinder b) Total engine cubic capacity (CC) (5)
8. Explain the impact of aerodynamics on vehicle performance and fuel efficiency. (5)
9. Analyze the differences between preventive and predictive maintenance. (5)
10. Describe the working of a manual transmission system. (5)
11. Explain the function of ECU in modern automobiles. (5)
12. Examine manual, automatic and CVT transmissions. (5)

OR

- Analyze the advantages of 4-wheel drive over 2-wheel drive. (5)

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