

# 22651

**12223**

**3 Hours / 70 Marks**

Seat No.

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- Instructions* – (1) All Questions are *Compulsory*.  
(2) Answer each next main Question on a new page.  
(3) Illustrate your answers with neat sketches wherever necessary.  
(4) Figures to the right indicate full marks.  
(5) Assume suitable data, if necessary.  
(6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

**Marks**

- 1. Attempt any FIVE of the following: **10****
- a) State use of :-
    - i) Circuit breaker
    - ii) Resistor, in automotive electrical circuits.
  - b) Explain working of SPDT switch.
  - c) List four precautions taken while charging a battery.
  - d) Restate material used for following elements of a lead-acid battery :-
    - i) Positive Plate
    - ii) Negative Plate
    - iii) Electrolyte
    - iv) Separator
  - e) List four main components of a starting system.
  - f) Discuss advantages of Automatic door lock system.
  - g) Explain function of MAP sensor.

P.T.O.

- 2. Attempt any THREE of the following:** **12**
- a) Draw a neat labelled wiring diagram of head light in automobiles.
  - b) Sketch a bi-metallic resistance fuel gauge circuit and explain its working.
  - c) Illustrate with simple circuit diagram the testing of short circuit defect.
  - d) Explain working of Lithium ion battery.
  - e) Illustrate with sketch regulator output test of an alternator. Predict the possible test results and their inference.
- 3. Attempt any THREE of the following:** **12**
- a) State function of starter drive. Draw a neat labelled diagram of bendix drive.
  - b) Explain working of transistor assisted ignition system with block diagram.
  - c) Explain working of computer controlled ignition system with block diagram.
  - d) Sketch and explain working principle of hall effect triggering device.
- 4. Attempt any THREE of the following:** **12**
- a) Draw a block diagram of GPS and list four applications of GPS in automobile field.
  - b) Describe working of automatic ON/OFF headlight and state reasons for providing time delay.
  - c) Draw a layout of electric two-wheeler and explain working of charging system of two electric bike.
  - d) Explain SAE J2012 standards diagnostic trouble codes with suitable example.

**5. Attempt any TWO of the following:****12**

- a) Explain working of windshield wiper with wiring diagram.
- b) Draw a neat labelled diagram of charging system in automobile. Explain concept of initial excitation and self excitation.
- c) Explain procedure of :-
  - i) Open circuit test
  - ii) Battery drain test for testing automobile battery.

**6. Attempt any TWO of the following:****12**

- a) Illustrate with sketch current draw test of starting system. Predict the possible test results and their inference.
  - b) Illustrate with sketch sound test of electronic fuel injector. Predict the possible test results and their inference.
  - c) Draw a simple circuit diagram of Throttle Position Sensor. Write the TPS testing procedure using scan tool and state the acceptable voltage range at idle and wide open TPS position.
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