17617

21819

3 Hours / 100 Marks Seat No. | | | | | | | | |

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. a) **Attempt any THREE of the following:** **12**

(i) Describe working of mercury switch with neat sketch.

(ii) Write chemical reaction during battery discharging. State material used in lead acid battery for:

1) Positive plate

2) Negative plate

3) Plate grid

4) Electrolyte

(iii) What is cranking? State the purpose of neutral safety switch in starting system.

(iv) Explain function of Ballast resistor and condenser in ignition system.

Marks

b) **Attempt any ONE of the following:** **6**

(i) 1) List four circuit defects, explain effect of unnecessary resistance in circuit.

1) Fig. No. 1 shows a testing of feed wire with open circuit defect. Redraw the figure and write voltage that will be indicated by voltmeter at positions 1, 2 and 3.

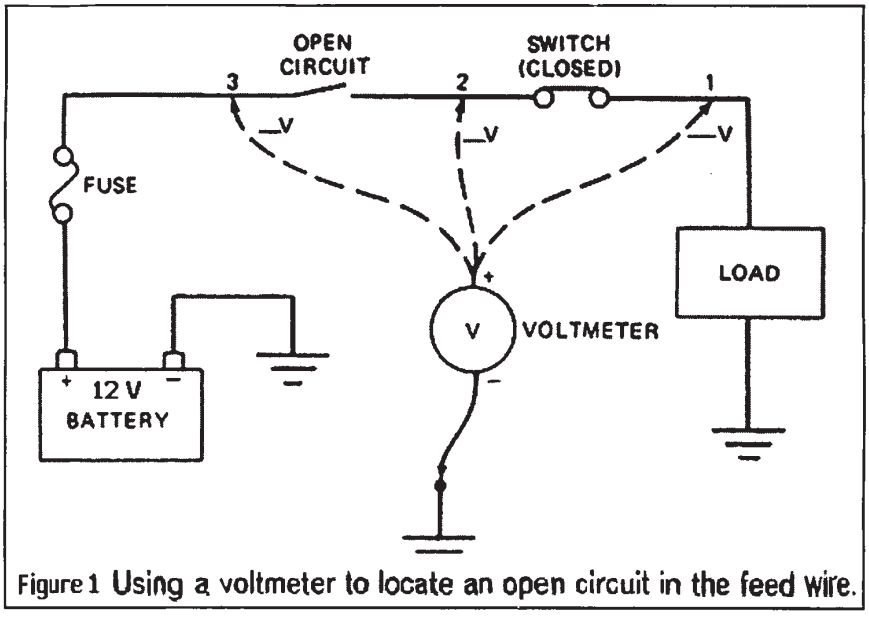

Figure 1 Using a voltmeter to locate an open circuit in the feed wire.

Fig. No. 1

(ii) What is jump starting? Explain its precautions and procedure with sketch.

2. Attempt any FOUR of the following: **16**

a) Explain working of electro chromic mirror.

b) Describe working of balancing coil type fuel gauge with neat sketch.

c) Explain concept of initial excitation and self excitation of alternator.

d) Compare relay with solenoid.

e) Compare fuse with circuit breaker.

f) Describe construction and working of overrunning clutch with simple sketch.

Marks

3. Attempt any FOUR of the following: **16**

a) Describe working of automatic ON-OFF head lamp system. Why time delay circuitry is provided in it?

b) Describe DTC structure as detected by SAEJ 2012.

c) Explain working principle of mechanical speedometer gauge with simple sketch.

d) Write functions of:

(i) Crank shaft position sensor

(ii) Camshaft position sensor

(iii) Detonation sensor

(iv) Cylinder identification sensor.

e) Describe operation of distributor less ignition system with block diagram.

4. a) Attempt any THREE of the following: **12**

(i) State salient features of keyless entry system.

(ii) Describe working of park assist system.

(iii) Explain construction and working of exhaust gas oxygen sensor.

(iv) Explain the sound test of electronic fuel injector. Write its significance.

b) **Attempt any ONE of the following:** **6**

(i) The following defects were observed in starting system. List two possible causes and remedies for each.

1) Starter spins but does not crank the engine

2) Starter cranks the engine slowly

3) Starter does not spin

(ii) State the need of ignition timing advance. Explain working of centrifugal advance and vacuum advance mechanism in distributor with simple sketch.

Marks

5. Attempt any FOUR of the following: **16**

a) Draw a labeled sketch of optical fiber cable. List its three advantages.

b) Draw a block diagram of GPS and label it.

c) Explain sulphation. Write its causes.

d) Write procedure for testing a coolant temperature sensor.

e) What is voltage regulation? Explain working of computer regulation.

f) How is continuity test and ground test conducted on stator? What results are shown by a good stator during tests?

6. Attempt any FOUR of the following: **16**

a) List four battery rating methods and explain CCA.

b) Explain operation of charge indicator light with simple wiring block diagram.

c) List four battery tests and explain how and when battery drain test is conducted.

d) Compare conventional and electronic ignition system.

e) Describe with neat sketch working of hall effect switch.