

One Year Diploma, Auto Mobile 2014
Model Answer

Subject:- Automobile Electrical and Vehicle Testing Paper Code:- 402103

Paper - III

Sets (I) / (H)

1 MCQ / Objective questions.

1x10 = 10 marks

(i) For 4-cylinder in-line engine, the firing order is

(a) 1-2-3-4

(b) 1-4-3-2

(c) 1-3-4-2

(d) 1-2-4-3

(i) d

(vi) a

(ii) a

(vii) a

(iii) c

(viii) ~~b~~ d

(iv) d

(ix) b

(x) a

(2) (a) What is the function of ignition system? 5 marks

The function of the ignition system is produce the high voltage current required for ignition and to direct the current to the spark plug in the engine cylinders at the proper instant, under all load and speed conditions.

An air gap in an electric circuit cause a very great resistance, as air is a very bad conductor of electricity.

(2) (b) Differentiate between battery ignition and magneto ignition system:- 5 marks

Battery ignition system	Magneto ignition system
1. Current is obtained from the battery	1. Current is generated by the magnets
2. Sparking is good even at low speed	2. Poor sparking at low speed

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Pages- III Sets (I) / (II)

Perhaps Extra answer

Battery Ignition System	Magneto Ignition System
3. Starting of engine is easier	3. Difficult starting
4. If the battery is discharged, the engine cannot be started.	4. No such difficulty as battery is not needed.
5. Occupies more space	5. Occupies less space
6. Complicated wiring	6. Simple wiring.
7. Less costly	7. More costly
8. Spark intensity falls as the engine speed rises.	8. Spark intensity improve the engine speed rises.
9. Used in cars, buses & trucks	9. Used in motor cycle, scooter, & cars

2 (c). ~~Ques~~ What are the pollutants emitted by gasoline and Diesel engines into the atmosphere? 5 marks.

The pollutants emitted by gasoline & diesel engines as follows:

- ① Hydrocarbons
- ② Carbon monoxide
- ③ Nitrogen oxide (NO₂)
- ④ Particulates

Sources of pollutants

1. Engine

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Sets (I) / (II)

2(b) Why is resistance needed in a circuit? 5 marks

Without resistance, the circuit is incomplete. In case of no resistance in a circuit, it will be short circuited & will catch fire. Resistance may be many forms e.g. bulb which gives light energy; Fan which converts electrical energy into mechanical energy; heater which will convert electrical energy into heat energy and so on.

3(a) compare dynamo with alternator. 5 marks

In practice, voltage can be induced in either of two ways.

1. By moving a coil of wire through a magnetic field.
2. By keeping the coil stationary and moving the magnetic field.

The old (D.C) direct current generator operated on the first principle. The D.C. generator induced voltage in coils of wire as the assembly (armature) rotated in a stationary magnetic field.

A.C. (Alternating current) generator operates on the second principle. The magnetic field (rotor) is rotated and voltage is generated in the stationary coil (stator).

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Sets (I) / (II)

3(b) Name the components of starting ^{system} in an automobile.

5 marks

Main components of starting system are:

- (i) Fully charged battery
- (ii) ignition & starter switch
- (iii) ignition system
- (iv) starter motor
- (v) charging system
- (vi) lighting and other system
- (vii) starter system boundary

3(c) Name different ^{light} commonly used on a modern ~~passer~~ car.

5 marks

Different lights used are:

- (i) Head lamp/light
- (ii) Side lamp/parking lamp/light
- (iii) Dimmer/dipper lamp/light
- (iv) Brake light
- (v) Back light
- (vi) Signal light
- (vii) Body light
- (viii) Number plate light
- (ix) Fog light

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Sets (I) / (II)

Group - B

Answer any two questions

[0 x 2 = 20 marks]

4. Describe in brief with neat sketches, the battery ignition system that uses contact-breaker point system.

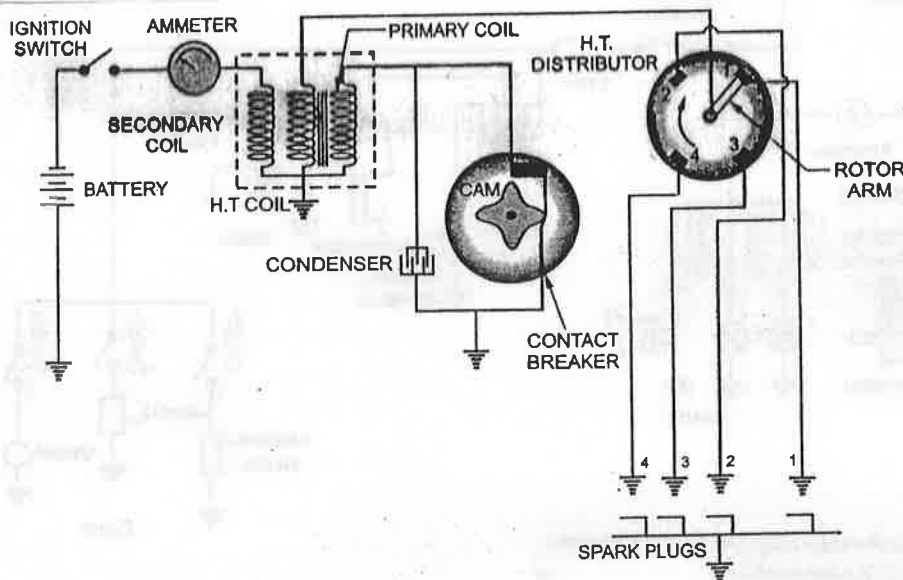


Fig. 25.1 Battery ignition system for four-cylinder engine.

One terminal of battery is earthed and other is connected to ignition switch. When ignition is on the current flows through ammeter and contact breaker point to primary coil. Due to more number of ^{turns} coil in secondary coil, the induced voltage is very high which goes through ~~the~~ distributor to spark plug. High voltage gives high current on the terminal of spark plug and as there is air gap on the other side of spark plug, spark occurs which ignites Air - fuel ~~and~~ mixture in the cylinder chamber.

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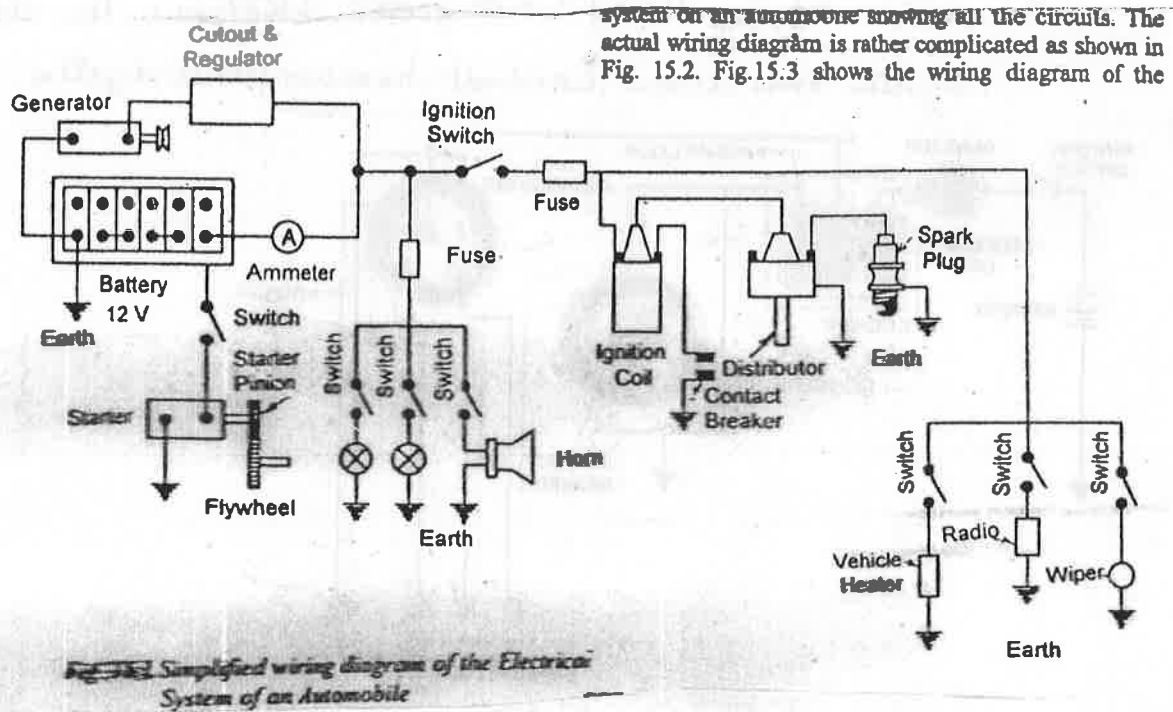
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Sets (I) / (II)

⑤ Make a neat sketch of simplified wiring diagram of the electrical system of an automobile.



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Sets (I) / (II)

6. Explain the term wheel alignment in a vehicle, in brief.

The front wheels must be in correct alignment in order to ensure easy steering, to give directional stability of the vehicle and minimum tyre wear. Front end or steering geometry is the term given to interrelated angles between axles, wheels and other front end parts. Front wheel alignment is obtained through accurate setting of the following angles, caster, camber, King-pin inclination, toe-in and toe-out on ~~turns~~ turns.

The term wheel alignment is used in connection with the stability and control of the vehicle while in motion. It means that while moving straight ahead, the wheels should be parallel. Satisfactory operation of a vehicle is possible only when it can be so controlled that it will maintain a true force on high way. Any looseness in the steering wheel, shake, wobble, or tendency of the vehicle to pull, either constantly or intermittently to ~~right~~ either side, is intolerable and tires the driver. In all types of suspensions, automotive manufacturer strive to accomplish two major objectives in suspension design. These objectives are:-

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Sets (I) / (II)

1. Stability with ease of steering control.
2. Maximum tyre life.

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