

# BOARD OF TECHNICAL EDUCATION

PORVORIM-GOA

November, 2008 Examinations

Programme: AUTOMOBILE ENGINEERING

Course/Subject: AUTOMOBILE ELECTRICAL EQUIPMENTS (4063)

Time Duration: 3 Hrs.

Max. Marks: 100

INSTRUCTIONS: 1.All Questions are compulsory.  
2.Figures to the right indicate full marks.  
3.Assume suitable additional data if required.

- Q.No. 1. Answer ANY FIVE of the following:- (5x4=20)
- A battery hydrometer gives a reading of 1.110 when used to test a lead acid battery. Comment on the state of charge of the battery.
  - List out the various components of a battery ignition system.
  - Explain the function of the core in the ignition coil.
  - Explain the effect on a lead-acid battery if it is consistently undercharged.
  - Explain why an alternator can charge a battery even at low speeds?
  - Briefly classify the automobile cables.
- Q.No. 2. Answer ANY TWO of the following:- (2x8=16)
- Explain the construction of a lead-acid battery.
  - Explain in detail any one method of charging lead acid batteries.
  - Write a note on maintenance of lead-acid batteries.
- Q.No. 3. Answer ANY TWO of the following:- (2x8=16)
- Explain the principle of operation of an alternator with a neat sketch.
  - Explain with a neat sketch the operation of a regulator used with an alternator based charging system.
  - Explain the advantages of an alternator over a dynamo.
- Q.No. 4. Answer the following:- (2x8=16)
- With a neat diagram explain the operation of the starting solenoid.
  - Explain the working of a bendix drive.
- Q.No. 5. Write notes on ANY TWO of the following:- (2x8=16)
- Fuel gauge
  - Flasher circuit for direction indicator lamps.
  - Horn relay.
- Q.No. 6. Write notes on ANY TWO of the following:- (2x8=16)
- Maintenance free lead acid batteries.
  - Types of spark plugs.
  - Constant voltage charging system.
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PORVORIM-GOA

May/June, 2009 Examinations

Programme: AUTOMOBILE ENGINEERING

Course/Subject: AUTOMOBILE ELECTRIC EQUIPMENTS (4063)

Time Duration: 3 Hrs.

Max. Marks: 75

**INSTRUCTIONS:** 1. All Questions are compulsory.  
2. Figures to the right indicate full marks.  
3. Assume suitable additional data if required.

- Q.No. 1 Answer ANY FIVE: (5X3=15)
- A battery hydrometer gives a reading of 1.260 when used to check a lead - acid battery. Comment on the state of charge of the battery.
  - Explain why it is necessary to retard the spark for full - throttle operation under load.
  - Differentiate between the charging system cable and the ignition system cable.
  - Explain what is meant by ' Cam or dwell ' angle.
  - Explain the procedure for charging a sulphated battery.
  - Explain the drawback of a dynamo as an automotive charging unit.
- Q.No. 2 Answer ANY TWO: (2X6=12)
- Explain in detail the various factors causing failure of lead - acid batteries.
  - List out the the various tests performed on a lead - acid battery and explain any one in detail.
  - Explain the construction of a Ni-cd battery.
- Q.No. 3 Answer ANY TWO: (2X6=12)
- Explain with a neat circuit diagram and waveforms, how the A.C. output of an alternator is rectified.
  - Explain with a neat diagram, the construction of an alternator.
  - Write a detailed note on rectifiers used in an alternator based charging system.
- Q.No. 4 Answer the following. (2X6=12)
- Explain, with diagram, the construction and operation of an Over-running clutch drive.
  - Explain the principle of operation of a dc series motor.
- Q.No. 5 Write notes on:- (ANY TWO ) (2X6=12)
- Fog lamps
  - Speedometer
  - Wind screen washers
- Q.No. 6 Write notes on:- ( ANY TWO ) (2X6=12)
- Electronic ignition system
  - Charging systems for lead-acid batteries
  - Maintenance of S.L.I. batteries.