

DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/
MANAGEMENT/COMMERCIAL PRACTICE — APRIL, 2018

**ELECTRICAL POWER UTILIZATION
AND SYSTEM PROTECTION**

[Time : 3 hours

(Maximum marks : 100)

PART — A

(Maximum marks : 10)

Marks

I Answer *all* questions in one or two sentences. Each question carries 2 marks.

1. Define fuse.
2. Mention any two causes of insulation failure of a relay.
3. List the modes of heat transfer.
4. List the materials used for electric heating.
5. What is traction ?

(5×2 = 10)

PART — B

(Maximum marks : 30)

II Answer any *five* of the following questions. Each question carries 6 marks.

1. List the factors affecting current carrying capacity of a fuse element.
2. What are the advantages of SF6 circuit breaker ?
3. Write short note on the working of attracted armature type relay with a neat diagram.
4. What do you mean by primary and backup protection ?
5. State Faraday's Laws of electrolysis.
6. List the factors governing the selection of a motor for a drive.
7. What are the advantages of electric traction ?

(5×6 = 30)

[P.T.O.]

PART — C

(Maximum marks : 60)

(Answer *one* full question from each unit. Each full question carries 15 marks.)

UNIT — I

- III (a) With a neat sketch, explain HRC fuse and mention its merits and demerits. 8
(b) Compare fuse and circuit breaker. 7

OR

- IV (a) With a neat sketch, explain SF6 circuit breaker. 8
(b) Explain the advantages and disadvantages of fuses. 7

UNIT — II

- V (a) Explain the working of Buchholz-relay with a neat diagram. 8
(b) How is soil resistivity measured, explain with neat diagram (four spike method). 7

OR

- VI (a) Describe the working of Merz-prize protection of a transformer. 8
(b) Explain rod-gap lightning arrester and write the advantages. 7

UNIT — III

- VII (a) Explain the types of resistance heating. 8
(b) Explain about welding generator. 7

OR

- VIII (a) Write the application of dielectric heating. 8
(b) Explain the principle of electrolysis and mention its field of application. 7

UNIT — IV

- IX (a) With a neat figure explain the simplified speed-time curve for a mainline service. 8
(b) Explain the classification of electric drives. 7

OR

- X (a) The average speed of an electric train on a level track is 45 kmph between two stations which are 2.5 km apart. Draw the speed time curve with all values. It is accelerated at 3 kmphs and braked at 4 kmphs. 8
(b) Explain plugging for a DC shunt and series motor. 7