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)

Marks

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 arrestor 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 kmphps and braked at 4 kmphps.   8

       (b)   Explain plugging for a DC shunt and series motor.   7

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