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Reg. No……
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DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/ MANAGEMENT/COMMERCIAL PRACTICE, APRIL - 2025

ELECTRICAL POWER UTILIZATION & SYSTEM PROTECTION

[Maximum Marks: **100**] [Time: **3** Hours]

PART-A

[Maximum Marks: **10**]

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

1. List two desirable characteristics of a fuse element.
2. Define pick up current in relay system.
3. Draw the diagram indicating grounding of neutral through resistance.
4. Write any two advantages of electric heating.
5. Define the term specific energy consumption with respect to electric traction. (5 x 2 = 10)

PART-B

[Maximum Marks: **30**]

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

1. Tabulate any three differences between fuse and circuit breaker.
2. Based on arc quenching medium list any four classifications of circuit breaker.
3. Write down any six basic requirements of protective relay systems.
4. Explain the three modes of heat transfer methods.
5. Illustrate the basic principle of electrolysis with an example.
6. List out any six advantages of electric drives.
7. Explain the suitability of DC series motor for electric traction. (5 x 6 = 30)

PART-C

[Maximum Marks: **60**]

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

UNIT – I

III. a. Explain the following terms related to fuse

i) Fusing Factor ii) Prospective current iii) Cut off current iv) Pre-arcing Time. (8)

b. Illustrate the construction of HRC fuses. (7)

OR

IV. a. Outline the High resistance method of arc extinction in circuit breakers. (8)

b. Illustrate the operation of SF6 Circuit Breakers. (7)

UNIT – II

V. a. Explain the four classifications of relays based on time of operation. (8)

b. Illustrate the working of Buchholz relay. (7)

OR

VI. a. With a neat sketch describe about induction type directional overcurrent relay. (8)

b. Illustrate the construction and working of rod gap lightning arrestors. (7)

UNIT- III

VII. a. Explain dielectric heating with a neat figure. (8)

b. List out any seven requirements of good heating material. (7)

OR

VIII. a. Illustrate the following welding processes.

i) Spot Welding ii) Seam Welding. (8)

b. State any seven applications of electrolysis. (7)

UNIT - IV

IX. a. Tabulate any four differences between individual and group drive. (8)

b. Explain the rheostatic method of braking for DC shunt and series motor. (7)

OR

X. a. Illustrate a typical speed time curve of an electric traction system. (8)

b. List out any seven requirements of a traction motor. (7)

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