

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

POWER 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. Name the alloy of materials for fuse element having small current rating.
2. State making capacity of a circuit breaker.
3. Define protective relay.
4. State arcing ground.
5. Define lightning.

(5×2 = 10)

PART — B

(Maximum marks : 30)

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

1. Explain the term prospective current of a fuse with the help of a cut-off characteristics curve.
2. Write any five comparisons between a fuse and a circuit breaker.
3. Illustrate resistance switching in circuit breakers.
4. Describe the working of an inverse-time relay.
5. Explain the need for current setting in protective relays.
6. Describe switching surge in an open line of a power system.
7. Draw and explain direct stroke and indirect stroke.

(5×6 = 30)

PART — C

(Maximum marks : 60)

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

UNIT — I

- III (a) Define the following terms :
- | | | |
|------------------------------------|----------------------|---|
| (i) Current rating of fuse element | (ii) Fusing current | |
| (iii) Fusing factor | (iv) Pre arcing time | 8 |
- (b) Explain the working of a HRC fuse with the help of a neat sketch. 7

OR

- IV (a) Illustrate the reasons of choosing silver as a fuse element. 8
- (b) List out and explain the desirable characteristics of a fuse element with examples. 7

UNIT — II

- V (a) Illustrate high resistance method of arc extinction. 8
- (b) Describe the working of a SF₆ circuit breaker with suitable sketches. 7

OR

- VI Define the following terms :
- | | | |
|-----------------------|----------------------------|---|
| (i) Breaking capacity | (ii) Short-time-rating | |
| (iii) Making capacity | (iv) Normal current rating | 8 |
- (b) Explain the working of a axial-blast circuit breaker with suitable sketches. 7

UNIT — III

- VII (a) Explain a typical relay circuit with the help of a neat sketch. 8
- (b) Draw and explain the working of a definite-distance type impedance relay. 7

OR

- VIII (a) Illustrate the working of an induction type directional over current relay with proper sketches. 8
- (b) Describe the PSM curve of a typical relay. 7

UNIT — IV

- IX (a) Explain the working of a Buchholz relay with the help of a neat sketch. 8
- (b) List out and explain the different protection systems for transformers. 7

OR

- X (a) State voltage surge and also explain a typical lightning surge with the help of a waveform. 8
- (b) Draw and explain the working of a rod gap lightning arrester. 7