



BRAINWARE UNIVERSITY

Term End Examination 2025-2026

Programme – Dip.EE-2024

Course Name – Switchgear and Protection

Course Code - DEE40114

(Semester IV)

Full Marks : 60

Time : 2:30 Hours

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A

(Multiple Choice Type Question)

1 x 15=15

1. Choose the correct alternative from the following :

- (i) Indicate the basic work of a fuse.
 - a) Protective device
 - b) Current limit device
 - c) current
 - d) none of these
- (ii) Choose the following Circuit Breaker is generally used in railway application
 - a) low oli CB
 - b) bulk oli CB
 - c) SF6 CB
 - d) air break CB
- (iii) Choose Which of the following circuit breakers is highly reliable and has the least maintenance.
 - a) Oil circuit breakers
 - b) Air blast
 - c) Vacuum circuit breakers
 - d) SF6 circuit breakers
- (iv) Choose the Part of the circuit breaker helpful in breaking the current is
 - a) Trip Coil
 - b) Contacts
 - c) Handle
 - d) Medium
- (v) Define what the ideal circuit breaker should offer.
 - a) Zero & infinite impedance before & after interruption respectively
 - b) Infinity & zero impedance before & after interruption respectively
 - c) Equal impedance before & after interruption
 - d) None of these
- (vi) Choose the correct statement about Sulphur Hexafluoride gas.
 - a) It provides free electrons to the breaker
 - b) It absorbs free electrons
 - c) It increases current flow the through the arc
 - d) None of these
- (vii) Identify the main use of the under voltage relay.
 - a) Motor Protection
 - b) Transformer Protection
 - c) Transmission line
 - d) All of these
- (viii) Identify a relay used for the protection of motors against overload.

- a) Impedance relay
c) Thermal relay
- (ix) Predict the type of a fuse wire.
a) Low specific resistance and high melting point
c) High specific resistance and high melting point
- b) Electromagnetic attraction type
b) Low specific resistance and low melting point
d) High specific resistance and low melting point.
- (x) Choose the principle which is based on the generator's internal fault protection.
a) Differential protection
c) Negative sequence protection
- b) Cross-differential protection
d) All of these
- (xi) Choose the range of the outdoor switchgear is generally used for voltage.
a) 11 kV
c) 66 kV
- b) 33 kV
d) 132 kV
- (xii) Select what is the primary function of a pantograph?
a) Provide lighting
c) Convert DC to AC
- b) Collect current from OHE
d) None of these
- (xiii) Indicate the common arrangement where current limiting reactors are installed:
a) In series with busbars or feeders
c) Across transmission lines as shunt elements
- b) In parallel with transformers
d) Connected between earth and neutral
- (xiv) Identify a key disadvantage of Bulk Oil Circuit Breaker:
a) Compact design
c) Large quantity of oil increases risk of fire hazard
- b) High dielectric strength
d) Easy maintenance
- (xv) State one advantage of Minimum Oil Circuit Breaker:
a) Requires frequent oil replacement
c) Cannot be used for high voltage
- b) Reduces oil volume, hence less maintenance and lower fire risk
d) Poor arc-quenching ability

Group-B

(Short Answer Type Questions)

3 x 5=15

2. Discuss the Names of the different kinds of over-current relays. (3)
3. Discuss about the time setting of a relay. (3)
4. Define the term P.S.M. in relay. (3)
5. Explain working of electromagnetic type relay. (3)
6. Explain why short circuit calculations for symmetrical faults are simpler than for unsymmetrical faults. (3)

OR

Estimate the typical percentage occurrence of symmetrical 3-phase faults compared to other types of faults. (3)

Group-C

(Long Answer Type Questions)

5 x 6=30

7. Define a protected zone in the power system. (5)
8. Describe with proper diagram the protection of stator and rotor of a generator. (5)
9. Explain the operating principle of the Buchholz relay. (5)
10. Explain the operating principles of the Vacuum Circuit Breaker with a diagram. (5)
11. Explain with a diagram the operating principle of the differential relay. (5)
12. Illustrate the benefit of busbar protection. (5)

OR

Illustrate the benefit of transformer protection.

(5)
