15972

BRAINWARE UNIVERSITY

Term End Examination 2025-2026
Programme – Dip.EE-2022/Dip.EE-2023
Course Name – Switchgear and Protection
Course Code - DEEPC503
(Semester V)

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) Recognize the basics of fault diverters.
- a) Circuit breakers
- b) Fast switches
- c) Relays
- d) Fuses

(ii) Define the isolators used in the transmission lines that are capable of breaking
- a) Fault current
- b) No current
- c) Charging current
- d) Load current

(iii) Identify circuit breaker is preferred to be installed in an extra-high voltage AC system.
- a) Air blast circuit breaker
- b) SF6 circuit breaker
- c) Bulk oil circuit breaker
- d) Minimum oil circuit breaker

(iv) 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

(v) Identify in which condition the instantaneous voltage in a circuit breaker depends.
- a) Restriking voltage
- b) Rate of rising restriking voltage
- c) Power factor
- d) Frequency

(vi) Define SF6 gas
- a) is lighter than hydrogen
- b) is lighter than air
- c) has density 2-times as compared to that of air
- d) has density 5 limes as compared to that of air.

(vii) Identify a relay used for the protection of motors against overload.
- a) Impedance relay
- b) Electromagnetic attraction type
- c) Thermal relay
- d) Buchholz's relay

(viii) Predict Merz-price protection is suitable.
- a) transformers
- b) alternators

c) feeders
d) transmission lines.

(ix) Choose the range of the outdoor switchgear is generally used for voltage.

a) 11 kV
b) 33 kV
c) 66 kV
d) 132 kV

(x) Identify the circuit breaker from the following options that produces the least arc energy.

a) Plain oil
b) Minimum oil
c) Air blast
d) Air break

(xi) Predict where the over-current fault is mostly happend.

a) Transformer
b) Overhead line equipment
c) Alternator
d) Motors

(xii) Predict for protection against the Buchholz relay is to be used.

a) Inter-turn fault
b) External faults
c) Rotor faults
d) Every internal fault

(xiii) Predict MHO relay is inherently.

a) Directional type
b) Non-directional type
c) Unidirectional type
d) None of these

(xiv) Choose the type of fault for which differential relays are used for the protection of equipment.

a) Internal faults
b) Over Current
c) Reverse Current
d) Reverse power

(xv) Identify the relay where both voltage and current signals are required.

a) A plane over the current relay
b) A differential relay
c) A directional relay
d) A biased directional relay

Group-B

(Short Answer Type Questions) 3 x 5=15

2. Define the term P.S.M. in relay. (3)
3. Explain the relay type according to construction. (3)
4. Explain the biasing coil in the relay. (3)
5. Define the main features of directional relays. (3)
6. Explain the operation of the shaded pole relay. (3)

OR

Explain the operating principles of the MHO relay. (3)

Group-C

(Long Answer Type Questions) 5 x 6=30

7. Explain with a diagram about the overcurrent relay. (5)
8. Explain the operating principle of oli circuit breaker. (5)
9. Explain the construction of the vacuum circuit breaker. (5)
10. Explain about the electromagnetic attraction type relay with a diagram. (5)
11. Describe the operating principles of the induction cup relay. (5)
12. Explain the main protection required for transmission line and describe a distance, protection relay. (5)

OR

Explain about the electromagnetic induction relay. (5)

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