BRAINWARE UNIVERSITY

Term End Examination 2024-2025
Programme – Dip.EE-2022
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) Define Fault diverters are basically
a) Circuit breakers b) Fast switches
c) Relays d) Fuses

(ii) Identify the advantage of grounding a power system is that
a) Earth fault current can be used b) "Arcing ground" phenomenon is avoided
c) It provides symmetry to the line impedances d) Both Earth fault current can be used and "Arcing ground" phenomenon is avoided

(iii) Define the frequency of the carrier in the case of the carrier's current pilot scheme in the range of
a) 1to 2KHz b) 15 to 25KHz
c) 25to 50 KHz d) 50KHz

(iv) Identify the component that provides a signal to the circuit breaker under the fault condition
a) Isolator b) Fuse
c) Relay d) CT

(v) Explain Interturn faults on an alternator are _____ and are _____ detectable:
a) Common, easily b) Uncommon, easily
c) Uncommon, not easily d) Common, not easily

(vi) Explain Ionization in circuit breakers is facilitated by
a) Increase of field strength b) Increase of mean free path
c) High temperature d) All of these

(vii) Explain the Circuit breakers usually operate under

a) Steady short circuit current
b) Sub transient state of short circuit current
c) Transient state of short circuit current
d) None of these

(viii) Chose 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

(ix) Write Arc interruption is done by

a) High resistance interruption
b) Low resistance interruption
c) Both High resistance interruption and Low resistance interruption
d) None of these

(x) 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

(xi) Define the unit protection scheme that provides

a) primary
b) back up protection
c) simultaneous protection
d) remote protection

(xii) Define Which 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

(xiii) Define the making capacity of the circuit breaker.

a) Less than the asymmetrical breaking capacity of the breaker
b) Greater than the asymmetrical breaking capacity of the circuit breaker
c) Equal to the asymmetrical breaking capacity of thebreaker
d) Equal to the symmetrical breaking capacity of the breaker

(xiv) Define the full form of MCB.

a) Miniature contact breaker
b) Mini circuit breaker
c) Miniature circuit breaker
d) Mini contact breaker

(xv) Define the Plug setting of a relay can be changed by changing

a) Air gap
b) Back up stop
c) Number of ampere-turns
d) All of these

Group-B

(Short Answer Type Questions) 3 x 5=15

2. Describe about biased differential bus zone reduction. (3)
3. Explain the relay type according to construction. (3)
4. Explain the term IDMT in relay (3)
5. Define the primary protection. (3)
6. Explain the need of relay coordination. (3)

OR

Mention the shortcomings of the Merz Price scheme of protection applied to a power transformer? (3)

Group-C

(Long Answer Type Questions) 5 x 6=30

7. **Analyze difference between Circuit breaker and isolator.** (5)

8. Define what are the functions of protective relays in device protection. (5)
9. State the uses of buchholz relay. (5)
10. Explain what is REF relay. (5)
11. Explain the advantages of the Vacuum Circuit Breaker. (5)
12. Explain What fluxing protection is in the transformer. (5)

OR

Explain why busbar protection is needed. (5)

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