# BRAINWARE UNIVERSITY

**Term End Examination 2021 - 22**
**Programme – Diploma in Electrical Engineering**
**Course Name – Switchgear and Protection**
**Course Code - DEE504**
**( Semester V )**

**Time : 1 Hr.15 Min.** **Full Marks : 60**

[The figure in the margin indicates full marks.]

**Group-A**

(Multiple Choice Type Question) 1 x 60=60

*Choose the correct alternative from the following :*

(1) Generator internal fault protection is usually based the principle of

a) Differential protection
b) Cross-differential protection
c) Negative sequence protection
d) All of these

(2) 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 "Ar cing ground" phenomenon is avoided

(3) Outdoor switchgear is generally used for voltage beyond

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

(4) The frequency of the carrier in the case of carrier current pilot scheme in the range of

a) 1to 2KHz
b) 15 to 25KHz
c) 25to 50 KHz
d) 50KHz

(5) A fuse is

a) Protective device
b) Current limit device
c) current
d) none of these

(6) The component which provides a signal to circuit breaker under the fault condition

a) Isolator
b) Fuse
c) Relay
d) CT

(7) The breaking capacity of the circuit breaker is in _____ and is measured in _____

a) R.M.S, kVA
b) R.M.S, MVA
c) Peak, kVA
d) Peak, MVA

(8) Semi-open cartridge type fuse can handle current up to _____



a) 1000 A
b) 2500 A
c) 4000 A
d) 10000 A

(9) In case of fault it is often desired that frame leakage protection should trip

a) Half the installed breakers
b) Only one breaker
c) All connected breakers
d) Two breakers

(10) Fusing factor of a fuse is mathematically defined by the equation:

a) Current rating of fuse * 4.44
b) 1/Current rating of the fuse
c) Min fusing current / Current rating of the fuse
d) Min fusing current * Current rating of the fuse

(11) 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

(12) What is / are the main disadvantage of using oil as

a) Need periodical replacement
b) Risk of formation of explosive mixture with air.
c) Possibility of causing hazards
d) All of these

(13) Which circuit breaker is preferred to be installed in extra-high voltage AC system?

a) Air blast circuit breaker
b) SF6 circuit breaker
c) Bulk oil circuit breaker
d) Minimum oil circuit breaker

(14) 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

(15) What is 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

(16) In a power system, the rate of rise of restriking voltage depends upon

a) Circuit power factor only
b) Switching condition only
c) Both Circuit power factor only and Switching condition only
d) None of these

(17) The following medium is employed for extinction of arc in air break circuit breakers?

a) Air
b) Oil
c) Water
d) None of these

(18) Circuit breakers are essentially

a) Current carrying contacts called electrodes
b) Arc extinguishers
c) Transformers to isolate two systems
d) Circuits to break the system

(19) The voltage across the circuit breaker pole after final current zero is

a) Restriking voltage
b) Recovery voltage
c) Supply voltage
d) None of these

(20) An 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

(21) A thermal protection switch provides protection

a) Over voltage
b) Temperature
c) Short circuit
d) Overload

(22) What is/are the main disadvantage(s) of using oil as the quenching medium in the circu it breakers?

a) Need periodical replacement.
b) Risk of formation of the explosive mixture with air.
c) Possibility of causing fire hazards.
d) All of the above.

(23) A circuit breaker is a

a) Protective device
b) Current limit device
c) current
d) none of this

(24) Which of the following CB is generally used in railways application

a) low oli CB
b) bulk oli CB
c) SF6 CB
d) air break CB

(25) 3phase CB is rated at 2000 MVA ,33KV the making current is

a) 89kA
b) 70kA
c) 35kA
d) 160 kA

(26) Arcing time is the time between

a) Separation of circuit breaker and extinction o f arc
b) Separation of circuit breaker and rise of reco very voltage
c) Normal current interruption and arc extinctio n
d) None of these

(27) Arc interruption is done by

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

(28) For single frequency transients, ratio of peak restriking voltage to time between voltage zero and peak voltage is called

a) Restriking voltage
b) Recovery voltage
c) Rate of rise restriking voltage
d) Active recovery voltage

(29) Rate of rise restriking voltage depends upon

a) Active recovery voltage
b) Natural frequency of oscillations
c) Both Active recovery voltage and Natural fre quency of oscillations
d) Rating of circuit breaker

(30) An ideal circuit breaker should offer

a) Zero & infinite impedance before & after int erruption respectively
b) Infinity & zero impedance before & after int erruption respectively
c) Equal impedance before & after interruption
d) None of these

(31) The rate of rise of restriking voltage is usually expressed in terms of:

a) V / s
b) kV / ms
c) kV / μs
d) MV/ns

(32) The correct statement about Sulphur Hexaflouride 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

(33) The making capacity of a circuit breaker is

a) Less than the asymmetrical breaking capacit
b) Greater than the asymmetrical breaking capa

y of the breaker

city of the breaker

c) Equal to the symmetrical breaking capacity of the breaker

d) Equal to the asymmetrical breaking capacity

(34) The ground wire protection the transmission line

a) Direct lighting stroke

b) Indirect lighting stroke

c) Both Direct lighting stroke and Indirect lighting stroke

d) None of these



(35) Carrier current protection scheme is normally used for

a) HV transmission line

b) LV cable only

c) Both option a and b

d) None of these

(36) The standard current rating of an electromagnetic relay are

a) 5A and 15A

b) 15A and 20A

c) 1A and 5A

d) any one of these

(37) The selectivity of the system is increased by:

a) Considering the system as a single block

b) Dividing the system into various protection zones

c) Dividing system into two large blocks

d) None of these

(38) The protection system which compares the electrical quantity which enters and leaves any zone and then operates is:

a) Balanced voltage

b) Balanced current

c) Differential protection system

d) All of these

(39) The protection relay which has inherent directional characteristics

a) Mho relay

b) Reactance relay

c) Distance relay

d) All of these

(40) The magnetic circuit breaker has:

a) Instantaneous working action

b) Delays working action

c) Both of these

d) None of these

(41) Plug setting of a electromagnetic relay can be altered by varying

a) Number of ampere turns

b) Air gap of magnetic path

c) Adjustable back stop

d) None of these

(42) Pilot wire protection is basically used for the protection of

a) Transmission lines

b) Alternators

c) Switch gears

d) Transformers

(43) In a circuit breaker, are is initiated by the process of

a) Thermal emission

b) Alternators

c) Field emission

d) Transmission lines

(44) The ideal scheme of protection for overhead line is

a) Time graded over current protection

b) Distance Protection

c) Differential protection

d) None of these

(45) The busbar protection means protection of

a) busbar

b) isolating switch

c) circuit breaker

d) All of these

(46) The most dangerous fault in an alternator is

a) failure of file

b) stator winding fault

c) failure of prime mover

d) unbalanced loading

(47) MHO relay usually employed for the protection

a) short lines only
b) medium lines only
c) long lines only
d) any lines



(48) The percentage bias for a generator protection lies

a) 15 to 20%
b) 10 to 15 %
c) 5 to 10%
d) none of these

(49) Generally, the carrier current protection scheme is recommended for:

a) HV cables
b) HV transmission lines
c) Both of these
d) None of thes

(50) The under-voltage relay is recommended for:

a) Transformers
b) Motors
c) Feeder
d) Busbars

(51) Lightining arrestor should be located

a) Away from the circuit breaker
b) Near the transformer
c) Away from the transforme
d) Near the circuit breaker

(52) For remote operation, circuit breaker must be equipped with

a) Inverse shunt trip
b) Shunt trip
c) Time delay trip
d) Both Inverse shunt trip and Time delay trip

(53) The dielectric strength of air at 25°C and 76 cm of mercury is

a) 2.11 kV rms/cm
b) 21.1 kV rms/m
c) 211 kV rms/cm
d) 2110 kV rms/m

(54) An ideal circuit breaker should offer

a) Zero & infinite impedance before & after int erruption respectively
b) Infinity & zero impedance before & after int erruption respectively
c) Equal impedance before & after interruption
d) None of these

(55) Interrupting a low inductive current may lead to

a) Very high restriking voltage
b) Very high current
c) Rupture of circuit breaker
d) Current chopping

(56) Current chopping can be avoided by

a) Resistance switching
b) Inductive switching
c) Capacitive switching
d) Diode switching

(57) Recovery voltage is the value of the r.m.s. the voltage that re-appears across the poles o f a circuit breaker before

a) Restriking voltage
b) Final arc distinction
c) Rise of voltage
d) All of these

(58) The device used for operating the electrical devices is_____.

a) circuit breaker
b) switch
c) transformer
d) all are correct

(59) In low oil circuit breaker the quantity of oil is _____

a) low
b) high
c) zero
d) all are incorrect

(60) Induction Relay is used on _____ supply.

a) AC
b) DC
c) Three Phase
d) All are correct