Circuit Breaker MCQ PDF

1. Low voltage circuit breakers have rated voltage of less than

(a) 220 V (b) 400 V

(c) **1000 V** (d) 10,000 V

2. The fault clearing time of a circuit breaker is usually

(a) few minutes (b) few seconds

(c) one second (d) **few cycles of supply voltage**

3. When a HVAC circuit breaker is tested for endurance, it is tested for at least

(a) **1000 opening-closing operations**

(b) 100 opening -closing operations

(c) 10 opening -closing operations

(d) 5 opening-closing operations

4. For high voltage ac circuit breakers, the rated short circuit current is passed for

(a) 0.01 seconds (b) 0.1 seconds

(c) **3 seconds** (d) 30 seconds

5. SF6 gas is

(a) yellow in color

(b) has pungent odor

(c) is highly toxic

(d) **non-inflammable**

6. The pressure of SF6 gas in circuit breakers is of the order of

(a) 100 mm Hg

(b) 1 kg/cm^2

(c) **3 to 5 kg/cm^2**

(d) 30 to 50 kg/cm^2

7. 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 times as compared to that of air**

8. In a vacuum circuit breaker, the vacuum is of the order of

(a) 10 mm Hg (b) 10^{-2} mm Hg

(c) 10^{-6} mm Hg (d) **10^{-9} mm Hg**

9. In a HRC fuse the time between cut-off and final current zero is known as

(a) total operating time

(b) **arcing time**

(c) pre-arcing time

(d) any of the above.

10. Fusing factor of a HRC fuse is

(a) **Minimum fusing current/Current rating**

(b) Minimum fusing current/Minimum rupturing time

(c) Maximum fusing current/Minimum fusing current

(d) Minimum fusing current/Prospective current of a circuit

11. Under normal conditions, a circuit breaker should be inspected

(a) every day

(b) every week

(c) **once in 6 months or 12 months**

(d) once in 6 years to 7 years.

12. The contact resistance of a circuit breaker is of the order of

(a) **20 micro ohms ± 10**

(b) 20 milli ohms ± 10

(c) 20 ohms ± 10

(d) 200 ohms ± 10

13. The insulation resistance of a high voltage circuit breaker is

(a) 1 kΩ (b) 10 kΩ

(c) 20 Mega ohms (d) **2000 Mega ohms**

14. In a circuit breaker if the insulation resistance between phase terminal and earthed frame is less than the specified limit, the probable cause could be

(a) moisture

(b) dirty insulation surface

(c) carbon or copper particles sticking to the internal surface

(d) **any of the above**.

15. The normal frequency RMS voltage that appears across the breaker poles after final arc extinction has occurred, is

(a) **recovery voltage**

(b) restriking voltage

(c) supply voltage

(d) peak voltage.

16. The transient voltage that appears across the contacts at the instant of arc extinction is called

(a) recovery voltage

(b) **restriking voltage**

(c) supply voltage

(d) peak voltage.

17. In a circuit breaker the active recovery voltage depends upon

(a) power factor

(b) armature reaction

(c) circuit conditions

(d) **all of the above.**

18. A fuse wire posses

(a) **inverse time characteristics**

(b) direct time characteristics

(c) neither of the above**.**

19. Fuse protection is used for current ratings up to

(a) 10 A (b) 20 A

(c) 50 A (d) **100 A**

20. The fuse current in amperes is related with fuse wire diameter D as

(a) $I \alpha 1/D$ (b) $I \alpha D$

(c) $\mathbf{I \alpha D^{3/2}}$ (d) $I \alpha D^2$

21. A fuse wire should have

(a) low specific resistance and high melting point

(b) low specific resistance and low melting point

(c) high specific resistance and high melting point

(d) **high specific resistance and low melting point**

22. The number of cycles in which a high speed circuit breaker can complete its operation is

(a) **3 to 8** (b) 10 to 18

(c) 20 to 30 (d) 40 to 50

23. For extra high voltage lines which circuit breaker is preferred?

(a) Bulk oil circuit breaker

(b) Vacuum circuit breaker

(c) **SF6 circuit breaker**

(d) Minimum oil circuit breaker

24. A material best suited for manufacturing of fuse wire is

(a) Aluminum

(b) **Silver**

(c) Lead

(d) Copper

25. In a circuit breaker the current which exists at the instant of contact separation is known as

(a) restriking current

(b) **breaking current**

(c) surge current

(d) recovery current

26. Breaking capacity of a circuit breaker is usually expressed in terms of

(a) Amperes

(b) Volts

(c) MW

(d) **MWA**

27. The contact resistance is least affected by

(a) the mechanical force applied

(b) the shape of the contact faces

(c) the amount of surface contamination

(d) **the ambient temperature**.

28. As the force on contact is increased, the contact resistance will

(a) increase linearly

(b) increase exponentially

(c) remain unchanged

(d) **decrease**.

29. Minimum arcing voltage for platinum is 16 V. It can therefore concluded that when the voltage is below 16 V

(a) it will not possible to interrupt the circuit

(b) it will not possible to pass the current

(c) **it will be possible to interrupt any value of current without arcing**

(d) it will be possible to interrupt any value of current without bringing contact closer to each other.

30. The arc voltage produced in the circuit breaker is always

(a) **in phase with arc current**

(b) leading the arcing current by 90 degrees

(c) lagging the arcing current by 90 degrees

31. Sparking between contacts can be reduced by

(a) inserting a resistance in the line

(b) inserting a capacitor in series with the contacts

(c) **inserting a capacitor in parallel with the contacts**

32. For magnetic blow out of the arc, magnetic field is produced

(a) in the load circuit

(b) parallel to the axis of the arc

(c) **at right angles to the axis of the arc**.

33. Sparking occurs when a load is switched off because the circuit has

(a) **high inductance**

(b) high capacitance

(c) high resistance

34. The power factor of the arc in circuit breaker is

(a) always zero

(b) **always unity**

(c) always lagging

(d) always leading

35. Air blast circuit breaker is usually used for

(a) instantaneous duty

(b) permanent break

(c) intermittent duty

(d) **repeated duty**

36. Flame proof switch gears are usually preferred

(a) on transmission lines of low voltage

(b) substations

(c) **in mines**

() in high MVA capacity circuits

37. Pressure of air in air blast circuit breakers is usually

(a) 1 to 5 kg/cm^2

(b) 5 to 10 kg/cm^2

(c) 10 to 30 kg/cm^2

(d) 35 to 100 kg/cm^2

37. Air used in air blast circuit breaker

(a) must have least carbon dioxide

(b) must have ionized

(c) must have oil mist

(d) **must be free from moisture**.

38. In a circuit breaker the time duration from the instant of fault to the instant of energizing of the trip coil is known as

(a) lag time

(b) lead time

(c) **protection time**

(d) operation time

39. In a circuit breaker the time duration from the instant of fault to the instant of extinction of arc is known as

(a) lag time

(b) lead time

(c) **total clearing time**

(d) operation time

40. In a circuit breaker the time duration from the instant of fault to the instant of closing of contact is known as

(a) recycle time

(b) total time

(c) gross time

(d) **reclosing time**.

41. For a high speed circuit breaker the total clearing time is nearly

(a) **1 to 2 cycles**

(b) 5 to 10 cycles

(c) 10 to 15 cycles

(d) less than 50 cycles

42. If the power factor is zero, the active recovery voltage will be

(a) minimum

(b) 0.5

(c) 0.707

(d) **maximum**

43. Which of the following circuit breaker will produce the least arc energy

(a) Minimum oil circuit breaker

(b) **Air blast circuit breaker**

(c) Plain oil circuit breaker

(d) All will produce same energy.

44. For a circuit breaker 'break time' is

(a) same as opening time

(b) opening time + arc duration

(c) **opening time + arc duration + resistor current duration**

45. The breaking capacity of a circuit breaker in MVA (3 phase) is given by

(a) rated service voltage x rated symmetrical current

(b) 1.1 x rated service voltage x rated symmetrical current

(c) √2 x rated service voltage x rated symmetrical current

(d) **√3 x rated service voltage x rated symmetrical current**

46. Which relay is used for feeders?

(a) MHO relay

(b) **Translay relay**

(c) Merz Price Protection

(d) Buchholz relay

47. MHO relay is used for

(a) rectifiers

(b) circuit breakers

(c) **transmission lines**

(d) feeders

48. Merz Price protection is used on

(a) substations

(b) capacitor banks

(c) induction motors

(d) **generators**

49. The advantage of neutral earthing is

(a) simplified design of earth fault protection

(b) over-voltage due to lightening can be discharged to the earth

(c) freedom from persistent arcing ground

(d) **all of the above**.

50. The protection against over-voltage due to lightening is provided by

(a) use of surge diverters

(b) low tower footing resistance

(c) use of over head ground wires

(d) **any of the above**.

51. Which of the following is a conducting medium for electric current?

(a) low temperature gas

(b) high temperature gas

(c) dissociated gas

(d) **plasma**.

52. In circuit breakers the contact space is ionized by

(a) thermal ionization of gas

(b) thermal emission from the surface of contacts

(c) field emission from the surface of contacts

(d) **any of the above**.

53. Which of the following statement about SF6 gas is incorrect?

(a) it is a non-toxic gas

(b) it is non-inflammable

(c) it has density 5 times that of air at 20,^oC

(d) **it has dark yellow color**.

54. SF6 gas is transported in

(a) gas cylinders

(b) **liquid form in cylinders**

(c) solid form in boxes

(d) air cylinders.

55. During arc extinction SF6 gas

(a) decomposes into S and F ions

(b) **decomposes into SF4 and SF2**

(c) gets oxidized

(d) reduces to SF3.

56. Dielectric strength of SF6 is

(a) less than that of air at atmospheric pressure

(b) **less than that of used in OCB**

(c) more than that of used in OCB

(d) more at lower pressure and low at higher pressure.

57. Which of the following is demerit of SF6 circuit breaker?

(a) sealing problem of gas

(b) in flux of moisture in the gas system is dangerous

(c) deterioration of quality of circuit breaker affects reliability of circuit breaker

(d) **all of the above**.

58. Sphere gaps are used for

(a) measurement of high DC voltages

(b) measurement of high AC voltages

(c) measurement of impulse voltages

(d) **all of the above**.

59. Which of the following is not valid in case of aluminum as compared to copper? Aluminum has higher

(a) resistivity

(b) coefficient of linear expansion

(c) **tensile strength**

(d) joint resistance.

60. The isolator is interlocked with circuit breaker and earthing switch. While opening the circuit, ……. opens first, then the …… and only after this …… can close.

(a) isolator, circuit breaker, earthing switch

(b) earthing switch, isolator, circuit breaker

(c) circuit breaker, earthing switch, isolator

(d) **circuit breaker, isolator, earthing switch**

61. Which of the following are the voltage waves of magnitude higher than the desirable value?

(a) over-voltages

(b) surges

(c) transients

(d) **all of the above**.

62. Over voltage transients may occur due to

(a) lightening

(b) switching

(c) arcing grounds

(d) **any of the above**.

63. Surge impedance of overhead transmission line is of the order of

(a) 20 to 30 ohms

(b) **300 to 500 ohms**

(c) 3000 to 5000 ohms

(d) 30 KΩ to 300 KΩ

64. The surge impedance of underground cable is of the order of

(a) **20 to 60 ohms**

(b) 200 to 600 ohms

(c) 2000 to 3000 ohms

(d) 30 KΩ to 300 KΩ

65. The surge impedance of a transmission line is given by

(a) √(LC) (b) **√(L/C)**

(c) √(C/L) (d) √(L+C)

66. Surge modifiers are used to

(a) reduce the current of wave front

(b) reduce the voltage of wave front

(c) **reduce the steepness of wave front**

(d) modify the shape of wave front.

67. The steepness of the wave front can be reduced by

(a) connecting a capacitance between line and earth

(b) connecting an inductor in series with the line

(c) **connecting an capacitor between line and earth or connecting an inductor in series with the line**

(d) connecting an inductor between line and earth and connecting a capacitor in series with the line.

68. The disadvantage offered by ungrounded system is

(a) frequent arcing grounds

(b) difficult earth fault relying

(c) voltage oscillations

(d) **all of the above**.

69. Solid grounding is used for voltages

(a) above 220 kV

(b) above 11 kV

(c) **below 660 V**

(d) below 115 V

70. Resistance grounding is used for voltages

(a) below 220 V

(b) upto 660 V

(c) **between 3.3 kV to 11 kV**

(d) above 66 kV

71. Switchover voltages are more hazardous than lightening surges in case of

(a) low voltage systems

(b) 11 kV systems

(c) unbalanced systems

(d) **EHV and UHV systems**.

73. Current limiting reactors may be

(a) air cooled, air cored

(b) oil immersed magnetically shielded

(c) oil immersed non-magnetically shielded

(d) **any of the above**.

74. Series reactors are installed at strategic locations of power system to

(a) **bring down the fault current level within the capacity of switchgear**

(b) directly pass the fault surges to the ground

(c) pass neutralizing surges of opposite nature

(d) discharge the capacitors.

75. Fault diverters

(a) **divert the current to the earth in the event of short-circuits**

(b) neutralize the surges by resistors

(c) modify the surge wave shapes

(d) none of the above.

76. In star connected system without neutral grounding, zero sequence currents are

(a) same as the peak value of phase currents

(b) same as the RMS value of phase currents

(c) vector sum of the phase currents

(d) **zero**.

77. In which portion of the transmission system faults occur most frequently?

(a) transformers

(b) **overhead lines**

(c) alternators

(d) underground cables.

78. Which portion of the transmission system is least prone to faults?

(a) switchgear

(b) CT, PT

(c) **alternators**

(d) feeders.

79. A 3 phase, 5000 kVA, 6.6 kV generator having 12% sub-transient reactance. A 3-phase short-circuit occurs at its terminals. Fault MVA is

(a) 21.5 (b) **41.66**

(c) 53.33 (d) 75.75

80. A 3 phase, 5000 kVA, 6.6 kV generator having 12% sub-transient reactance. A 3-phase short-circuit occurs at its terminals. Fault current is

(a) **3640 A** (b) 2460 A

(c) 1680 A (d) 880 A

81. The ohimic value of impedance to be connected in the neutral to ground circuit of a 2000 kVA transformer with earth fault relay set to 40% with respect to 400 V side will be

(a) **0.2 ohm** (b) 2.0 ohm

(c) 20 ohm (d) 200 ohms