

**Dr. Babasaheb Ambedkar Technological University's
Institute of Petrochemical Engineering Lonere (402103)
Sixth Sem Diploma in Electrical Engg. (2019-20)
Sub: - Switchgear and Protection DEE3201(New Pattern)**

1. Short Circuit Currents are due to
 - A Single phase to earth
 - B Phase to phase
 - C All the three phase to earth
 - D Any of the above

2. For operation of electrical machines and apparatus with full reliability in normal operating conditions , the following two requirement must be met
 - 1) Rated current \geq Actual load current
 - 2) Rated Voltage \geq Working voltage of the piece of equipment
 - A Both 1) and 2)
 - B Only 1)
 - C Only 2)
 - D None of the above

3. What is the percentage causes of Lightning fault?
 - A 12
 - B 20
 - C 25
 - D 28

4. What is the percentage causes of sleet, wind, mechanical(jumping conductor) fault?

- A 12
- B 20
- C 25
- D 28

5. What is the percentage causes of Apparatus Failure fault?

- A 12
- B 20
- C 25
- D 28

6. What is the percentage causes of Switching to a fault?

- A 12
- B 20
- C 25
- D 28

7. What is the percentage causes of Miscellaneous (tree falling on line, birdage sabotage, accidents etc.)fault?

- A 12
- B 20
- C 25
- D 28

8. The most common and dangerous fault, that occurs in a power system, is the.....

- A Open circuit Fault
 - B Short circuit Fault
 - C Both A and B
 - D None
9. Under normal operating conditions, power system equipment or lines carry normal voltages and currents which results in aof the system.
- A Short circuit
 - B safer operation
 - C Open circuit
 - D None
10. Back up protection is needed for
- A Over voltage
 - B Short circuits
 - C Over current
 - D All of these
11. What is the purpose of back up protection?
- A To increase the speed
 - B To increase the reach
 - C To leave no blind spot
 - D To guard against failure of primary
12. The first line of defense and is responsible to protect all the power

- system elements from all the types of faults is called as.....
- A Backup Protection
 - B Primary Protection
 - C Lag Protection
 - D None
13. The comes into play only when the..... fails
- A backup protection, primary protection
 - B primary protection, backup protection
 - C primary protection, main protection
 - D backup protection, secondary protection
14. Which of the following results in symmetrical fault?
- A Single phase to earth
 - B Phase to phase
 - C All the three phase to earth
 - D Two phases to earth
15. Short Circuit Currents are due to
- A Single phase to earth
 - B Phase to phase
 - C All the three phase to earth
 - D Any of the above
16. The most serious consequence of a major un-cleared short circuit fault could be

- A Blowing of fuse
 - B Fire
 - C Heavy voltage drop
 - D None of these
17. The most common type of fault is
- A L-G
 - B L-L
 - C L-L-G
 - D L-L-L-G
18. The maximum short circuit current occurs in the case of
- A A three phase bolted fault
 - B L-L-G Fault
 - C A L-L Fault
 - D A L-G fault
19. Which portion of transmission system is more prone to faults?
- A Alternator
 - B Transformer
 - C Underground Line
 - D Overhead Line
20. Series reactors are used to
- A Improve the transmission efficiency
 - B Improve the power factor of the power system

- C Improve the voltage regulation
- D Bring down the fault level within the capacity of the switchgear
21. Series reactors are installed at the strategic locations in a power system so as to
- A Discharge the capacitors
- B Pass neutralizing surges of opposite nature
- C Directly pass the fault surges to the ground
- D None of the above
22. For Limiting the Short circuits we use
- A Reactors
- B Resistors
- C Capacitors
- D Any of these
23. A protection system is characterized by two important parameters i.e. Dependability and Security.
- A True
- B False
- C None of the above
- D Option B
24. Which is main parts of power system?
- A Generating station
- B Load Center

- C Transmission and distribution system
D All of above
25. Abnormalities can do changes in
A Voltage
B Current
C Both A and B
D None of above
26. Abnormalities occurs due to
A Overloading of equipment
B Unbalance loading
C Loose connection
D Any of above
27. Fault occurs due to
A Insulation problem
B Overhead line problem
C Underground line problem
D Any of above
28. Lowest occurred fault in overhead line is
A LG
B LL
C LLG
D LLL

29. Which is symmetrical type fault?
- A LG
 - B LLL
 - C LLG
 - D LL
30. Which is Unsymmetrical type fault?
- A LG
 - B LL
 - C LLG
 - D Any of above
31. Which is Unsymmetrical type fault?
- A LG
 - B LL
 - C LLG
 - D Any of above
32. What is phase difference during symmetrical fault?
- A 90
 - B 120
 - C 150
 - D 180

33. Which is used for back up protection?
- A Relay
 - B Circuit breaker
 - C Both A and B
 - D None of above
34. When earth fault occurs, healthy phase voltage increased to
- A 2 times
 - B 3 times
 - C 1.73 times
 - D 1.5 times
35. Most used rated secondary current in CT is
- A 3A
 - B 5A
 - C 1A
 - D 2A
36. Most used rated secondary voltage in PT is
- A 110V
 - B 150V
 - C 230V
 - D 300V
37. The least expensive protection for over current in low-voltage system is

- A Rewirable fuse
 - B Isolator
 - C Circuit breaker
 - D Air-break switch
38. What is switchgear ?
- A An apparatus used for switching, controlling and protecting the electrical circuits and equipment.
 - B It detects the faults only
 - C It corrects the faults only.
 - D All of the above
39. In an AC circuit, the ratio of KW/kVA represents
- A Power Factor
 - B Load Factor
 - C Form Factor
 - D Diversity Factor
40. Which of the following type of reactors are popularly used in power systems?
- A Compensation reactors
 - B Current limiting reactors
 - C Suppression or Peterson reactors
 - D All of these
41. Primary protection is also called as

- A Main protection
 - B Secondary protection
 - C Backup protection
 - D All of the above
42. Oil immersed type reactor has the advantage of
- A Higher safety against flashover
 - B Smaller size with large thermal capacity
 - C Limiting the fault voltage
 - D Both (a) and (b) above
43. Single line diagram is also called as
- A One line diagram
 - B Multi line diagram
 - C Quadruple line diagram
 - D All of the above
44. From the following statements which are the main reasons due to which main protection fails
- A The main protective relay fails.
 - B The circuit breaker fails to operate
 - C The current or voltage supply to the relay fails.
 - D All of the above
45. The ratio of the rated primary voltage to the rated secondary voltage

- is known as.....
- A Turn ratio
 - B Windbag ration
 - C Transformation Ratio
 - D Both A and C
46. At the time of short circuit , voltage at the fault point is and current is magnitude flows through the network to the fault point.
- A Increased sharply, reduced to zero
 - B Reduced to zero, increased to high
 - C Same , reduced to zero
 - D increased to high, same
47. A relay is used to
- A Break the fault current
 - B Sense the fault
 - C Sense the fault and direct to trip the circuit breaker
 - D All of these
48. In impedance relay, current element torque should be
- A Equal to voltage element torque
 - B Greater than voltage element torque
 - C Less than voltage element torque
 - D None of these

49. 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
50. Distance relays are generally
- A Impedance type
 - B MHO type
 - C Reactance type
 - D All of these
51. Buchholz relay is used to protect against
- A Inter-turn fault
 - B External faults
 - C Rotor faults
 - D Every internal faults
52. MHO relay is inherently a
- A Directional type
 - B Non-directional type
 - C Unidirectional type
 - D None of these
53. Basic relay connection requirement is that the relay must operate for
- A Load

- B Internal faults
C Both (a) and (b)
D None of these
54. An impedance relay is used for
A Earth faults
B Interphase faults
C Both (a) and (b)
D None of these
55. Relay gets its operating energy from
A Transformer
B Alternator
C Overhead lines
D C.T., P.T.
56. Good relay should possess
A Speed & reliability
B Speed & sensitivity
C Adequateness & selectivity
D All of these
57. An instantaneous relay is
A Permanent moving magnet
B Induction cup
C Shaded pole

- D Moving coil
58. Induction cup relays responds to
- A Current
 - B Power
 - C Voltage
 - D Impedance
59. Time classification of relays includes
- A Instantaneous relays
 - B Definite time lag
 - C Inverse time lag
 - D All of these
60. Directional relays responds to
- A Power
 - B Voltage
 - C Current
 - D Reactance
61. Operating current in relay is
- A A.c. only
 - B D.c. only
 - C Both (a) and (b)
 - D None of these

62. For phase fault on long line, which relay is used?
- A MHO relays
 - B Reactance relays
 - C Impedance relays
 - D All of these
63. For motor protection, which relay is used?
- A Thermocouple type relays
 - B Bimetallic relays
 - C Electronic relays
 - D All of these
64. For protection against synchronizing power surges, which relay is used?
- A Split-phase relays
 - B Impedance relays
 - C Reactance relays
 - D MHO relays
65. In an impedance relay, fault current is maximum if fault occurs near the
- A Relay
 - B Center of the line
 - C Transformer
 - D None of these

66. More faults occur in
- A Generators
 - B Under ground cables
 - C Transformers
 - D Over head lines
67. What is the actuating quantity for the relays?
- A Magnitude
 - B Frequency
 - C Phase angle
 - D All of these
68. Protective relays can be designed to respond to _____
- A Light intensity, impedance
 - B Temperature, resistance, reactance
 - C Voltage and current
 - D All of these
69. On what factor does the operating speed of the relay depend upon?
- A Rate of flux built up
 - B Armature core air gap
 - C Spring tension
 - D All of these
70. Which component ensures the safety of the line from damage?
- A Relay

- B Circuit breaker
- C Bus bar
- D Current transformer

71. The tripping circuit is_____

- A AC
- B DC
- C Either AC or DC
- D None of these

72. 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

73. Relays is preferred for phase fault on short transmission line

- A Induction type
- B Reactance
- C Impedance
- D None of the above

74. Fuse wire should possess

- A High specific resistance and high melting point
- B High specific resistance and low melting point
- C Low specific resistance and low melting point

- D Low specific resistance and high melting point
75. If strands are twisted, then fusing current will
- A Increase
 - B Reduce
 - C Remain same
 - D May increase or decrease
76. Fusing factor is defined as the ratio between
- A Maximum fusing current and rated voltage
 - B Maximum fusing current and rated current
 - C Minimum fusing current and rated current
 - D Minimum fusing current and rated voltage
77. Fuses can serve upto a current of
- A 25 A
 - B 50 A
 - C 75 A
 - D 100 A
78. Cut-off current in a fuse is the
- A Maximum value actually reached
 - B R.m.s. value actually reached
 - C Average value actually reached
 - D None of these

79. Best practicable material for a fuse wires is
- A Aluminium
 - B Copper
 - C Iron
 - D Tin
80. H.R.C. fuses has
- A High rating of current
 - B High rupturing capacity
 - C High resistance capacity
 - D None of these
81. Cartridge type fuse can be used upto a voltage of
- A 400 V
 - B 11 kV
 - C 20 kV
 - D 33 kV
82. Liquid type H.R.C. fuses are used upto a voltage of
- A 33 kV
 - B 66 kV
 - C 132 kV
 - D 200 kV
83. Selection of fuse is based on
- A Steady load

- B Fluctuating load
- C A & b
- D None of these

84. The primary function of a fuse is to

- A Open the circuit
- B Protect the appliance
- C Protect the line
- D Prevent excessive currents from flow through the circuit

85. The fuse rating is expressed in terms of

- A Current
- B Voltage
- C VAR
- D KVA

86. fuse is never inserted in

- A Neutral wire
- B Negative of DC circuit
- C Positive of DC circuit
- D Phase line

87. Fuses have got advantages of

- A Cheapest type of protection
- B Inverse time current characteristic

- C No Maintenance and Current limiting effect under short-circuit conditions
- D All of the above

88. Protection by fuses is generally not used beyond

- A 20 A
- B 50 A
- C 100 A
- D 200 A

89. A fuse wire possesses

- A Direct time characteristics
- B Inverse time characteristics
- C Either A or B
- D None of the above

90. The fuse wire in DC circuit is inserted in

- A Negative circuit only
- B Positive circuit only
- C Both A and B
- D Either A or B

91. On which off the following effects of electric current a fuse operates?

- A Photoelectric effect
- B Electrostatic effect
- C Heating effect

- D Magnetic effect
92. A fuse in a motor circuit provides protection against
- A Overload
 - B Short-circuit and overload
 - C Open circuit, short-circuit and overload
 - D None of the above
93. In HRC fuse the time between cut-off and final current zero is called the
- A Pre-arcing time
 - B Arcing time
 - C Total operating time
 - D None of the above
94. By which of the following methods major portion of the heat generated in a HRC fuse is dissipated ?
- A Radiation
 - B Convection
 - C Conduction
 - D None of the above
95. HRC fuses provide best protection against
- A Overload
 - B Reverse current
 - C Open circuits

D Short-circuits

96. If a combination of HRC fuse and a circuit breaker is employed, the circuit breaker operates for

- A Short circuit current
- B Low overload currents
- C Under all abnormal currents
- D All of the above

97. Which of the following is used in liquid fuses?

- A Transformer oil
- B Sulphur hexafluoride
- C Distilled water
- D Carbon tetrachloride

98. A fuse element should have..... melting point

- A High
- B Low
- C Same
- D None of the above

99. The rated voltage must be selected so that the maximum working voltage during operation does not exceed rated voltage by more than%.

- A 0 - 5
- B 5 - 10

C 10 - 15

D 15 - 20

100. The contact resistance of a manually operated switch is

A Zero

B Very high

C Very low

D None of the above

101. Protective relays can be designed to respond to _____

A Light intensity, impedance

B Temperature, resistance, reactance

C Voltage and current

D All of these

102. For which among the following the current ratings are not required?

A Circuit breakers

B Relays

C Isolators

D Load break switch

103. Why is an isolator installed?

A To isolate one portion of the circuit from another

B As an substitute for the circuit breaker

- C It used on either sides of the circuit breaker
- D Both (a) and (c)

Assertion (A): In comparison to making capacity of a circuit breaker its breaking capacity is normally higher.

104.

Reason (R): The breaking capacity of a CB is expressed as $\sqrt{3} * VI * 10^{-6}$ MVA

- A Both A and R are true and R is the correct explanation of A
- B Both A and R are true and R is not the explanation of A
- C A is true but R is false
- D A is false but R is true.

105. 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 breaker
- C Equal to the asymmetrical breaking capacity of the breaker
- D Equal to the symmetrical breaking capacity of the breaker

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107. 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
- protection is the name given to a protection which backs up
108. the main protection whenever the latter fails in operation, is cut out for repairs etc.
- A Backup
 - B Front side
 - C Primary
 - D All of the above
109. Over current fault is most likely in
- A Transformer
 - B Overhead line equipment
 - C Alternator
 - D Motors
110. The correct statement about Buchholz relay
- A It can only be used with largely sized alternators
 - B It is installed with largely sized transformers which have no conservator tank
 - C It can detect incipient faults

D It should never be used with oil immersed transformers

111. Which of the following statement is/are true?

- A Switchgears are used in Industry.
- B Switchgears are used in Household.
- C Switchgears are used in Educational buildings.
- D All of these.

112. The condition of Power system in which equality constraints or inequality constraint is violated is called as condition.

- A Abnormal
- B Normal
- C Easy
- D None

113. The power factor of arc in circuit breaker is

- A Zero
- B Unity
- C Lagging
- D Leading

114. Which of the following devices will receive voltage surge first traveling on the transmission line?

- A Lightning arresters

- B Relays
 - C Step-down transformer
 - D Switchgear
115. Surge impedance can be calculated as _____
- A L/C
 - B C/L
 - C $\sqrt{L/C}$
 - D $\sqrt{C/L}$
116. In an alternator one of the advantages of distributing the winding is to
- A Improve voltage waveform
 - B Reduce noise
 - C Save on copper
 - D Reduce harmonics
117. In large generators protection provided against external faults is
- A Inter-turn fault protection
 - B Sensitive earth fault protection
 - C Biased differential protection
 - D All of the above
118. The power factor of an alternator is determined by its
- A Excitation

- B Speed
 - C Primemover
 - D None of the above
119. Which portion of transmission system is more prone to faults?
- A Alternator
 - B Transformer
 - C Underground Line
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120. Series reactors are used to
- A Improve the transmission efficiency
 - B Improve the power factor of the power system
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- A Reactors

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123. A protection system is characterized by two important parameters i.e. Dependability and Security.

- A True
- B False
- C None of the above
- D Option B

124. A relay is used to

- A Break the fault current
- B Sense the fault
- C Sense the fault and direct to trip the circuit breaker
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125. In impedance relay, current element torque should be

- A Equal to voltage element torque
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- C Less than voltage element torque
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126. Plug setting of a relay can be changed by changing

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 - B Interphase faults
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- A Speed & reliability
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 - C Adequateness & selectivity
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134. An instantaneous relay is
- A Permanent moving magnet

- B Induction cup
- C Shaded pole
- D Moving coil

135. Induction cup relays responds to

- A Current
- B Power
- C Voltage
- D Impedance

136. Time classification of relays includes

- A Instantaneous relays
- B Definite time lag
- C Inverse time lag
- D All of these

137. Directional relays responds to

- A Power
- B Voltage
- C Current
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138. Operating current in relay is

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B Frequency
C Phase angle
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B Temperature, resistance, reactance
C Voltage and current
D All of these
146. On what factor does the operating speed of the relay depend upon?
A Rate of flux built up

- B Armature core air gap
- C Spring tension
- D All of these

147. Which component ensures the safety of the line from damage?

- A Relay
- B Circuit breaker
- C Bus bar
- D Current transformer

148. The tripping circuit is_____

- A AC
- B DC
- C Either AC or DC
- D None of these

149. Plug setting of a electromagnetic relay can be altered by varying

- A Number of ampere turns
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- C Adjustable back stop
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- A High specific resistance and high melting point
 - B High specific resistance and low melting point
 - C Low specific resistance and low melting point
 - D Low specific resistance and high melting point