

# Power System Protection - IAT1

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1. Various power system faults in increasing order of severity are [CO1,L2] \* 1 point

- LG,LL,LLG,LLL
- LLLG,LLG,LG,LL
- LLG,LLL,LL,LLG
- LL,LG,LLL,LLG



2. Which of the following method of protection is used to achieve earth fault operation? [CO1,L2] \* 1 point

- Core balance method
- Relay connected with neutral to ground
- Frame leakage method
- None of these

3. Protective relays are devices which detect abnormal conditions in electrical circuit by measuring [CO1,L2] \* 1 point

- a) Current during abnormal condition
- b) Voltage during abnormal condition
- c) Both (a) and (b) simultaneously
- d) Constantly the electrical quantities which differ during normal and abnormal conditions

4. A relay is used to [CO1,L2] \* 1 point

- Break the fault current
- Sense the fault
- Sense the fault and direct to trip the circuit breaker
- All of these

5. Plug setting of a relay can be changed by changing [CO1,L2] \* 1 point

- Air gap
- Back up stop
- Number of ampere turns
- All of these



6. What is the purpose of back up protection? [CO1,L2] \*

1 point

- To increase the speed
- To increase the reach
- To leave no blind spot
- To guard against failure of primary

7. What is the actuating quantity for the relays? [CO1,L2] \*

1 point

- Magnitude
- Frequency
- Phase angle
- All of these

8. The most efficient torque producing actuating structure for the induction type relays is [CO1,L2] \*

1 point

- Shaded pole structure
- Watt hour meter structure
- Induction cup structure
- Single induction loop structure

9. What do protective relays provide? [CO1,L2] \*

1 point

- Provide additional safety to the circuit breaker in its operation.
- Close the contacts when the actuating quantity attains a certain predetermined value.
- Limit the arcing current during the circuit breaker operation.
- Earth or ground any stray voltage.



10. In a single bus bar system there will be complete shutdown when [CO1,L2] \* 1 point

- fault occurs on the bus itself
- fault occurs on the neutral line
- two or more faults occur simultaneously
- fault occurs with respect to earthing

11. Time graded protection of a radial feeder can be achieved by using [CO1,L2] \* 1 point

- Definite time relay
- Inverse time relay
- Both definite and inverse time relays
- None of the above

12. Discrimination between main and back up protection is provided by the use of relays which are [CO1,L2] \* 1 point

- Fast
- Sensitive
- Slow
- None of the above

13. Short-circuit currents are due to [CO1,L2] \* 1 point

- Single phase to ground faults
- Phase to phase faults
- Three phase faults
- Any of these



14. Hey switchgear is device used for [CO1,L2] \*

1 point

- Interrupting an electrical circuit
- Switching an electrical circuit
- Reaching and controlling an electrical circuit
- Switching, controlling and protecting the electrical circuit and equipment

15. Least number of faults are generally reported for [CO1,L2] \*

1 point

- Transmission lines
- Cables
- Switchgears
- Transformers

16. Inverse time current relays are used for the protection of [CO1,L2] \*

1 point

- A. Feeders
- B. Transformers
- C. Alternators
- D. Both A and B

17. For protection of parallel feeders fed from one end, the relays required are [CO1,L2] \*

1 point

- Nondirectional relays at the source end and directional relay at the load end
- Nondirectional relay at both ends
- Directional relay at source end and nondirectional relay at load end
- Directional relay at both ends



18. Directional over current relays have two exciting coils connected across [CO1,L2] \* 1 point

- CT secondaries of two different phases
- VT secondaries of two different phases
- CT and VT secondaries of same phases
- CT and VT secondaries of two different phases

19. In an inverse definite minimum time, electromagnetic type over current relay, the minimum time feature is achieved because of [CO1,L2] \* 1 point

- Saturation of the magnetic circuit
- Proper mechanical design
- Appropriate time delay element
- Electromagnetic damping

20. Burden of a protective relay is the power [CO1,L2] \* 1 point

- Required to operate the circuit breaker
- Absorbed by the circuit of relay
- Developed by the relay circuit
- None of the above

21. The torque produced in shaded pole structure induction type relay is [CO1,L2] \* 1 point

- Proportional to the square of the current
- Proportional to the current
- Inversely proportional to the current
- Inversely proportional to the square of the current



22. The most efficient torque producing actuating structure for induction type relays is [CO1,L2] \* 1 point

- Shaded pole structure
- Watt hour meter structure
- Induction type structure
- Single induction loop structure

23. In an over current protection the setting of the earth fault relay is [CO1,L2] \* 1 point

- More than the phase fault relay
- Equal to the phase fault relay
- Less than the phase fault relay
- The two settings are unrelated to each other

24. The most severe fault on the power system is [CO1,L2] \* 1 point

- three- phase short- circuit
- line to line fault
- double line to ground fault
- single line to ground fault

25. When a short circuit occur in a power system [CO1,L2] \* 1 point

- the voltage at the fault point is zero
- a very large current flows in system
- it results in overheating of equipment
- all of above



26. The fault on power system that gives symmetrical fault current is [CO1,L2] \*

1 point

- line to line fault
- three phase short-circuit fault
- single line to ground fault
- none of above

27. Unsymmetrical fault [CO1,L2] \*

1 point

- introduce unbalance in the system
- indicate abnormal conditions in the system
- are more frequent than symmetrical fault
- all of above

28. Directional relays are based on the flow of \*

1 point

- Power
- Current
- Voltage Wave
- None of the above





29. The current rating of an Overcurrent relay is 5A. The relay has a plug setting of 150% and the time setting (TMS) of 0.4. The CT ratio is 400/5 and a fault current of 6000A. At TMS=1, corresponding operating time at various PSM are given in the below. PSM 2, 4, 5, 8, 10, 20 ; Operating time in seconds 10,5,4,3,2.8, 2.4 (a) Determine relay current setting value. [CO1,L2] \* 2 points

- 10A
- 12A
- 7.5A
- 11A

30. Use Question No. 29 data and find the PSM value. [CO1,L2] \* 2 points

- 8
- 10
- 20
- 5

31. Use Question No. 29 data and find the operating time of the relay. [CO1,L2] \* 2 points

- 2.8 sec
- 1.12 sec
- 5 sec
- 3 sec



32. A relay is said to be high speed relay if its operation time is [CO1,L2] \* 1 point

- 1 to 2 cycles
- 2 to 3 cycles
- 1 to 3 cycles
- 2 to 5 cycles

33. The advantage of grounding a power system is that [CO1,L2] \* 1 point

- Earth fault current can be used to operate relays
- "Arcing ground" phenomenon is avoided
- It provides symmetry to the line impedances
- Both (a) and (b) above

34. Buchholz relay is used for the protection of [CO1,L2] \* 1 point

- Alternators
- Transformers
- Switch yard
- Transmission lines

35. In order that current should flow without causing excessive heating or voltage drop, the relay contacts should [CO1,L2] \* 1 point

- Have low contact resistance
- Be clean and smooth
- Be of sufficient size and proper shape
- Have all above properties



36. A transmission line is protected by [CO1,L2] \*

1 point

- Inrush protection
- Distance protection
- Time graded and current graded over current protection
- Both (B) and (C)

37. The steady state stability of the power system can be increased by [CO1,L2] \*

1 point

- Connecting lines in parallel
- Connecting lines in series
- Using machines of high impedance
- Reducing the excitation of machines

38. Relays can be designed to respond the changes [CO1,L2] \*

1 point

- Current
- Inductance
- Voltage
- All the above

39. The relay operating speed depends on [CO1,L2] \*

1 point

- the spring tension
- the rate of flux built up
- armature core air gap
- all the above



40. Circuit breakers are essentially [CO1,L2] \*

1 point

- Current carrying contacts called electrodes
- arc extinguishers
- circuits to break the system
- any of the above

41. The time of closing the cycle in modern circuit breaker is [CO1,L2] \*

1 point

- 0.003sec
- 0.001sec
- 0.01sec
- 0.03sec

42. Induction cup type relay is operated due to changes in [CO1,L2] \*

1 point

- current
- voltage
- Impedance
- all the above

43. The relay with inverse time characteristics will operate within [CO1,L2] \* 1 point

- 1.5sec
- 5 to 10 sec
- 5 to 20 sec
- 20 to 30 sec



44. Which of the following devices will receive voltage surge first travelling on the transmission line? [CO1,L2] \* 1 point

- Lightning Arresters
- Relays
- step-down transformer
- switch gear

45. The power loss is an important factor for the design of [CO1,L2] \* 1 point

- Transmission line
- Motor
- Generator
- Feeder

46. A balanced 3-phase system consists of [CO1,L2] \* 1 point

- Zero sequence currents only
- positive sequence currents only
- Negative and Zero sequence currents
- Positive, Negative and Zero sequence currents



47. Match the operating time expression with type of relay [CO1,L2] \*

1 point

Relay	Operating time T expression
1. General expression	i. $0.14/I^{0.02}-1$
2. IDMT	ii. $13.5/I^n-1$
3. Very Inverse	iii. $80/I^2-1$
4. Extremely inverse	iv. $k/I^n-1$

- 1-iv,2-i,3-ii,4-iii
- 1-i,2-ii,3-iii,4-iv
- 1-iii,2-i,3-iv,4-ii
- 1-iv,2-iii,3-ii,4-i

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