

Total No. of Questions : 10]

SEAT No. :

P3598

[Total No. of Pages : 2

[4959]-1072

B.E. (Electrical)

SWITCHGEAR AND PROTECTION

(2012 Pattern)

Time : 2.30 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Answer Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8, Q9 or Q10.
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Figures to the right indicate full marks.
- 4) Use of electronic pocket calculator is allowed.
- 5) Assume suitable data, if necessary.

- Q1)** a) State the different causes of faults. [4]
b) Derive the expression for restriking voltage and RRRV. [6]

OR

- Q2)** a) A 220 KV, 50 Hz system have the reactance and capacitance upto the location of circuit breaker is $8\Omega/\text{ph}$ and $0.025 \mu\text{F}$ respectively. If magnetizing current of 10A is interrupted (instantaneous). Determine the following :- if the resistance 600Ω is connected across the contacts of circuit breaker. [4]
i) Voltage appearing across the pole of circuit breaker
ii) Damped frequency of oscillation
iii) Critical value of oscillation free resistance.
b) Explain construction and working of ACB. [6]

- Q3)** a) An 11 KV, 500 MVA 3sec circuit breaker suddenly closes on to a fault. Determine : [4]
i) The symmetrical breaking current
ii) The asymmetrical breaking current assuming 50% dc component.
iii) The peak making current as per IEC specification.
iv) The short time current rating.
b) Explain construction and working of induction type directional power relay. [6]

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OR

- Q4)** a) Explain different zones of protection. [4]
b) Explain the working principle of a current differential relay. [6]
- Q5)** a) Draw and explain wave shape of a lightning stroke. [8]
b) Discuss the merits and demerits of a static relay. [8]

OR

- Q6)** a) Draw and explain Rod-Gap Arrester. [8]
b) Explain with block diagram Numerical Relay. [8]
- Q7)** a) Explain restricted earth-fault protection for a transformer. [8]
b) A 6.6 KV, 10 MVA star-connected alternator has a reactance of $2\Omega/\text{ph}$ and negligible resistance. Merz price protection is used for protection of winding. The neutral grounding resistance is 5Ω . If only 10% of the winding is to remain unprotected, determine the setting of the relay. [8]

OR

- Q8)** a) Explain magnetic inrush and overfluxing phenomenon along with its disadvantages. [8]
b) Draw and explain single phasing protection for 3ϕ Induction motor. [8]
- Q9)** a) State the advantages of WAM. [4]
b) Explain the differential protection scheme of busbar using high impedance relay. [6]
c) Explain three stepped distance protection for transmission line with neat diagram. [8]

OR

- Q10)** a) State the algorithm for impedance numerical relay. [4]
b) Mention the types of overcurrent protection for Feeder using directional over current relay. Explain any one method in detail. [6]
c) Explain the effect of arc resistance and power swing on the performance of distance relay. [8]

