Total No. of Questions : 8]

SEAT No. :

P1423

[Total No. of Pages : 2

[6004]-513
B.E. (Electrical Engineering)
SWITCHGEAR & PROTECTION
(2019 Pattern) (Semester-VIII) (403148)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) ***Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8.***
2) ***Figures to the right indicate full marks.***
3) ***Neat diagrams must be drawn wherevr necessary.***
4) ***Assume suitable additional data, if necessary.***
5) ***Use of non-programmable calculator is allowed.***

Q1) a) What is auto reclosing of circuit breaker? Discuss multi shot auto reclosing. **[4]**

b) Mention the advantages and disadvantages of GIS as compared to conventional air insulated substation. **[6]**

c) With neat diagram explain the construction & working of Puffer type SF6 circuit breaker. **[8]**

OR

Q2) a) A 3 phase VCB is rated as 1500 A, 2000 MVA, 33 kV, 3 seconds. Determine **[4]**

i) Symmetrical breaking current

ii) Rated making current

iii) Short time current

iv) Rated normal current

b) What is difference between field testing and laboratory testing? Explain the relative merits of each. **[6]**

c) With neat diagrm explain the construction & working of Vacuum circuit breaker. **[8]**

Q3) a) Draw block diagram of static relay. Explain its working. State merits and demerits of static relay. **[10]**

b) Draw and explain block diagram of PMU. **[7]**

OR

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Q4) a) Draw a block diagam of numerical relay. Explain its woking. State its advantages over conventioinal and static relays. **[10]**

b) State Sampling theorem. What is Aliasing? Explain it with neat diagram. **[7]**

Q5) a) Restricted earth fault protection of 3 phase alternator gives 100% stator winding protection-Justify the statement stating True/False. **[4]**

b) Discuss various abnormal operating conditions & causes of failures in 3 phase induction motor. **[6]**

c) Suggest suitable protection scheme to protect power transformer against the magnetic inrush current phenomenon. With neat diagram explain the protection scheme in this case. **[8]**

OR

Q6) a) Discuss abnormal condition-Over speeding in case of 3 phase alternator. Suggest protection scheme in this case. **[4]**

b) List out different types of faults in alternator. Suggest suitable protection scheme to protect alternator against these faults. **[6]**

c) A three phase 33kV/3.3kV, star/delta connected transformer is protected by percentage differential protection. The CTs on LT side have ratio of 400/5. Determine he CT ratio on HT side. Draw the protection scheme. **[8]**

Q7) a) With suitable diagrams explain the effect of **[10]**

i) arc resistance

ii) power swing on the operation of distance relay.

b) Draw the schematic of PLCC. State advantages of PLCC. **[7]**

OR

Q8) a) Draw block diagram of numerical impedance relay. Explain its working. Draw its algorithm. **[10]**

b) With neat diagram explain three stepped distance protection scheme for transmission line. **[7]**

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