BACHELOR OF TECHNOLOGY (C.B.C.S.) (2014 COURSE)
B.Tech.Sem - VI ELECTRICAL : WINTER- 2022
SUBJECT : SWITCHGEAR & PROTECTION

Day : Thursday | Time : 10:00 AM-01:00 PM

Date : 24-11-2022 | **W-13326-2022** | Max. Marks : 60

1) All questions are **COMPULSORY**.
2) Figures to the right indicate **FULL** marks.
3) Draw neat and labeled diagram **WHEREVER** necessary.
4) Assume suitable data if necessary.

Q.1 **a)** Explain the construction and working of HRC fuse along with its characteristics. Also state its applications. **[06]**

b) A 3-phase, 5000kVA, 6.6kV generator having 12% sub-transient reactance. A 3-phase short circuit occurs at its terminals, calculate short circuit MVA and short circuit current. **[04]**

OR

a) With neat diagram explain the construction and working of contactor. **[06]**

b) Explain the various essential qualities of protections required in power systems. **[04]**

Q.2 **a)** Explain: **i)** Plug Setting Multiplier **ii)** Time Multiplier Setting. **[04]**

b) Draw and explain the trip circuit of circuit breaker. **[06]**

OR

Explain the construction and working of watt-hour meter type induction type relay. Also derive its torque equation. **[10]**

Q.3 **a)** Explain the rotor earth fault protection in case of alternator. **[04]**

b) Explain the causes of failures in 3 phase induction motor. **[06]**

OR

Describe with the help of a neat diagram the connections of differential protection of a star – delta transformer. A 3 phase, 33kV/6.6kV, Star/Delta power transformer is protected by differential protection. The CTs on LV side have a current ratio of 300/5. What must be the current ratio of the CTs on HV side and how should be connected? **[10]**

Q.4 With neat diagram explain the differential protection and high impedance differential protection of bus bar. **[10]**

OR

With neat diagram explain the time graded protection of transmission line. **[10]**

Q.5 Describe the various causes of internal over voltages on power systems. **[10]**

OR

What are the various draw backs of ungrounded system? How to overcome such drawbacks in power system protection? **[10]**

Q.6 Explain in detail how substations are classified. **[10]**

OR

What are the different types of busbar arrangements used in substations? Explain with diagram. **[10]**

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