B.TECH. SEM -VI ELECTRICAL 2014 COURSE (CBCS) :
SUMMER - 2018
SUBJECT: SWITCHGEAR AND PROTECTION

Day : **Friday** | **S-2018-2413** | Time: **02.30 PM TO 05.30 PM**
Date : **01/06/2018** | Max. Marks: 60

N.B.:

1) All questions are **COMPULSORY**.
2) Assume suitable data, if necessary.
3) Figures to the right indicate **FULL** marks.
4) Use of non-programmable **CALCULATOR** is allowed.
5) Draw a neat labeled diagrams **WHEREVER** necessary.

Q.1 **a)** Explain essential qualities of protective relaying. **(06)**

b) Write a short note on Current limiting reactors. **(04)**

OR

a) Explain methods of arc extinction in case of circuit breaker. **(06)**

b) Explain auto- reclosing in circuit breaker. **(04)**

Q.2 **a)** Determine the time of operation of 5A over-current relay having plug setting of 150% and TMS=0.4. The CT ratio is 400/5 and the fault current is 6000A. At TMS = 1, the operating time at various PSM are as shown below. **(06)**

PSM	2	4	5	8	10	20
Time of operation(Sec)	10	5	4	3	2.8	4.0

b) Draw and explain the trip circuit of circuit breaker. **(04)**

OR

a) Explain following over-current protective schemes **(06)**
i) Time graded system ii) Current graded system

b) Write a short note on Anti-Aliasing Filter **(04)**

Q.3 **a)** Explain the phenomenon of over fluxing in transformer and protection against it. **(06)**

b) A 3ph 66kV/11kV star-delta connected transformer and protected by differential protection. The CTs on LT side have a ratio of 420/5. Determine the CT ratio on HT side also draw this protection scheme. **(04)**

OR

a) A 3ph 10MVA, 11kV alternator is provided with restricted earth fault protection, The percentage of winding protected against phase to earth fault is 80%. The relay trips for 20% out of balance current. Calculate the resistance to be added in neutral to ground connection. **(06)**

b) Explain the rotor earth fault protection in case of alternator. **(04)**

Q.4 With a neat diagram explain the differential protection and fault bus protection of bus bar. **(10)**

OR

Explain in detail the three stepped distance protection of transition line. **(10)**

Q.5 Explain in detail how lightening stroke occurs on power system? Also explain what is mean by direct and indirect lightening stroke? **(10)**

OR

Explain the necessity of neutral earthing? And also explain different methods of neutral earthing in brief. **(10)**

Q.6 How substations are classified? What are the various parameters to be considered for selection of site for substation? **(10)**

OR

How PC applications can help in short circuit studies for designing relay scheme? **(10)**

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