[Total No. of Questions - 5] [Total No. of Printed Pages - 3]
(2066)

16124(J) June 16

B. Tech 6th Semester Examination

Switchgear & Protection (NS)

EE-321

Time : 3 Hours Max. Marks : 100

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Attempt five questions in all selecting one question from each of the units 1, 2, 3 & 4 of the question paper and all subpart of question no. 5 (unit-5) which is compulsory.

UNIT - 1

1. (a) Derive an expression for torque produced by an induction relay. (10)

   (b) What are the different types of electromagnetic relays? Discuss their field of applications. (10)

OR

Compare the time current characteristics of inverse, very inverse and extremely inverse over current relays? Discuss their area of applications. (20)

UNIT - 2

2. What is magnetising inrush current? What measures are taken to distinguish between the fault current and magnetising inrush current? Discuss the protective scheme which protects the transformer against fault but does not operate in case of magnetising inrush current. (20)

[P.T.O.]

OR

(a) With a neat sketch, discuss the differential scheme for bus-zone protection. (10)

(b) What is frame leakage protection? Discuss its working principle and field of application. (10)

UNIT - 3

3. (a) Describe the operation of Hall Effect relay used as a phase comparator. Describe two types of static amplitude comparator. (10)

   (b) Explain clearly how a phase comparator is used in the protective relay systems. (10)

OR

(a) Differentiate between surge diverter and surge absorber. What are the characteristic of an ideal surge diverter? (10)

(b) How can the magnitude of over voltage due to direct and indirect lighting strokes on over head lines be calculated? (10)

UNIT - 4

4. (a) Discuss the recovery rate theory and energy balance theory of arc interruption in a circuit breaker? (10)

   (b) Explain the phenomenon of current chopping in a circuit breaker. What measures are taken to reduce it? (10)

OR

What is resistance switching? Derive the expression of critical resistance in terms of system inductance and capacitance, which gives no transient oscillation. (20)

UNIT - 5

5. Answer the following:

(i) What are the functions of protective relay?

(ii) What is meant by "relay setting"?

(iii) Define PSM.

(iv) What are the faults that are likely to occur in a power transformer?

(v) Why Bus bar protection needs special attention?

(vi) What is static relay?

(vii) What is meant by lightening?

(viii) What is the difference between a lightening arrester and surge absorber?

(ix) What is meant by rated voltage of a circuit breaker?

(x) How is the effect of over-voltage developed due to current chopping overcome? (10×2=20)