H.T.No. | | | | | | | | | | |

Code No: EE1527 **GEC-R14**

III B. Tech II Semester Regular Examinations, April 2017

SWITCHGEAR AND PROTECTION

(Electrical and Electronics Engineering)

Time: 3 Hours **Max. Marks: 60**

Note: All Questions from **PART-A** are to be answered at one place.
Answer any **FOUR** questions from **PART-B.** All Questions carry equal Marks.

PART-A

6 × 2 = 12M

1. Explain about propagation of surges.
2. a) Resistance switching is normally employed in
   A) Bulk oil breakers B) Minimum oil breakers
   C) Air blast breakers D) All breakers
   b) What are the different theories that explain arc extinction process?
3. a) List out various types of distance relays
   b) Impedance relays can be used for ------ lines
4. a) A CT is connected in… with the line
   A) series B) a cross
   C) not connected D) both A and B
   b) Merze price current scheme protection is used in
   A) transformer B) alternator
   C) both A and B D) bus bars
5. Match List-I (*Relays*) with List-II (*Protection*) and select the correct answer using the codes given below the lists :

List-I (*Relays*)	*List-II* (*Protection*)
A. Buchholz relay	1. Feeder
B. Translay relay	2. Transformer
C. Carrier current phase comparison relay	3. Ring main distributor
D. Directional over current relay	4.Longoverhead transmission line.

Codes :

A B C D	*A B C D*
(A) 2 3 4 1	(B) 4 1 2 3
(C) 2 1 4 3	(D) 4 3 2 1

6. a) Draw the characteristic of voltage surge.
   b) In equipment grounding, the enclosure is connected to_____ wire.
   A) phase B) ground C) neutral D) all the above.

PART-B

4 × 12 = 48M

1. Explain the variation of current and voltage on an overhead line when one end of the line is a) short circuited b) open circuited and at the other end a source of constant emf V is switched in. (12M)

2. a) Compare the arc rupture in oil and air blast circuit breakers and summarize the relative advantages and disadvantages of these types of switch gear. (6M)

   b) Explain the operating duty of a circuit breaker. (6M)

3. a) Explain the operation of Induction cup type relay with neat diagram. (6M)

   b) Derive the expression for Induction type relays. (6M)

4. An alternator rated at 10kv protected by the balanced circulating system has its neutral grounded through a resistance of 10 ohms. The protective relay is set to operate when there is an out of balance current of 1.8 amps in th pilot wires, which are connected to the secondary windings of 1000/5 ratio current transformers. Determine i) the percent winding which remains unprotected, ii)the minimum resistance required to protect 80% of the winding? (12M)

5. a) What is meant by three zone protection? (4M)

   b) Draw a connection diagram of the translay system for the protection of 3-phase feeder and explain its working operation. (8M)

6. a) Why neutral grounding is necessary ? (6M)

   b) Explain the operation of rod gap arresters. (6M)

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