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BIEEE-006

DIPLOMA IN ELECTRICAL ENGINEERING

(DELVI)

Term-End Examination

December, 2015

BIEEE-006 : SWITCHGEAR AND PROTECTION

Time : 2 hours *Maximum Marks : 70*

Note : *Attempt any* ***seven*** *questions. All questions carry equal marks. Use of scientific calculator is allowed.*

1. Define and explain the following terms as applied in protective relaying : $4 \times 2\frac{1}{2} = 10$

(a) Pick-up value

(b) Current setting

(c) Plug setting multiplier

(d) Time setting multiplier

2. Describe the construction and principle of operation of an induction type directional over-current relay. *5+5=10*

3. Explain the principle of operation of an impedance relay with the help of its characteristic. Also draw a typical reactance relay characteristics. *7+3=10*

4. Draw a schematic diagram of a phase comparison that carries current protection and explain the function of each block/apparatus shown in the schematic diagram. *10*

5. An 11 kV, 100 MVA alternator is grounded through a resistance of 5 Ω. The C.T. have a ratio of 1000/5. The relay is set to operate when there is an out of balance current of 1 A. What percentage of the generator winding will be protected by percentage differential scheme of protection ? *10*

6. What is the effect of resistance in the star point earthing ? Suggest a scheme for differential protection of a generator transformer unit. Draw and explain the scheme. *2+2+6=10*

7. With the help of a neat sketch, explain the construction and working of a Buchholz relay used in protection of transformers. *10*

8. Explain the construction and working of a bulk oil circuit breaker and give its applications. *8+2=10*

9. With the help of neat sketches, explain the construction and working of vacuum and SF_6 circuit breaker in brief. *5+5=10*

10. Write short notes on any ***two*** of the following : *2×5=10*

(a) Circulating current protection of bus bar

(b) Directional earth fault relay

(c) 30° connection diagram of directional relay

(d) Recovery rate theory of current interruption