No. of Printed Pages : 4

BIEEE-006

DIPLOMA IN ELECTRICAL ENGINEERING (DELVI)

00166

Term-End Examination

June, 2016

BIEEE-006 : SWITCHGEAR AND PROTECTION

Time : 2 hours *Maximum Marks : 70*

Note : *Question no. **1** is **compulsory**. Answer any **four** questions from questions no. 2 to 7. Use of scientific calculator is allowed.*

1. Fill in the blanks with most suitable option. *7×2=14*

(a) Electromagnetic relays are _____ .

(i) attracted armature type

(ii) digital type

(iii) Neither (i) nor (ii)

(b) Buchholz relays are used for the protection of a _____ .

(i) generator

(ii) transformer

(iii) transmission line

(c) Compressed air is used in

(i) vacuum circuit breaker

(ii) air break circuit breaker

(iii) air blast circuit breaker

(d) _____ is used to sense the fault.

(i) Relay

(ii) Circuit breaker

(iii) Fuse

(e) The load connected to the secondary of a CT is called _____ .

(i) pick up value

(ii) burden

(iii) reset value

(f) An amplitude comparator compares the _____ of two input quantities.

(i) magnitudes

(ii) phase angles

(iii) Both (i) and (ii)

(g) Impedance relays are _____ .

(i) directional

(ii) non-directional

(iii) Neither (i) nor (ii)

2. Explain the following in the context of relay coordination : $4 \times 3\frac{1}{2} = 14$

(a) Time grading

(b) Current grading

(c) Combination of time and current grading

(d) Pick up current

3. Derive the general relay equation for directional relays. Explain the construction and operation of an induction type directional overcurrent relay. *14*

4. (a) Derive the basic equation of a mho relay and explain its characteristics. *7*

(b) Explain the carrier current protection of transmission lines in detail. *7*

5. (a) Explain the working of differential protection for a 3-phase star connected generator. *7*

(b) Explain the construction and operation of a Buchholz relay. *7*

6. Explain the phenomenon of arc quenching in circuit breakers using

(a) energy balance theory, and

(b) recovery rate theory. *2×7=14*

7. A 132 kV alternator is connected to a circuit breaker. The inductive reactance up to the circuit breaker is 4·5 Ω per phase. The capacitance up to the circuit breaker between phase and neutral is 0·01 μF. Calculate

(a) frequency of restriking voltage transient, and

(b) maximum value of RRRV. *2×7=14*
