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BIEEE-005

DIPLOMA IN ELECTRICAL ENGINEERING (DELVI)

Term-End Examination

December, 2015

BIEEE-005 : UTILIZATION OF ELECTRICAL ENGINEERING

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 permitted. Assume suitable value, in case required data is missing. All questions carry equal marks.*

1. Select the most suitable option for the following questions : *7×2=14*

   (a) In a sub-circuit of electrical installation, the maximum number of lamp outlets that can be connected is

   (i) 5

   (ii) 10

   (iii) 15

   (iv) Unlimited

(b) The staircase switching is for the control of

(i) Lamp loads

(ii) Fan loads

(iii) Industrial drive loads

(iv) Street lighting

(c) The temperature in plasma arc welding is restricted to

(i) 200°C

(ii) 2,000°C

(iii) 20,000°C

(iv) No limit

(d) During resistance welding heat produced at the joint is proportional to

(i) I^2R

(ii) kVA

(iii) Current

(iv) Voltage

(e) One of the following 1-ϕ IM is ***not*** suitable for driving the compressor unit, of a refrigerator :

(i) Capacitor split-phase motors

(ii) Capacitor start and run motors

(iii) Resistance split-phase motors

(iv) Shaded-pole starting motors

(f) Electric locomotives in India are manufactured at

(i) Jamalpur

(ii) Bangalore

(iii) Chittaranjan

(iv) Gorakhpur

(g) One of the following is ***not*** a type of compressor :

(i) Reciprocating

(ii) Rotary

(iii) Centripetal

(iv) Centrifugal

2. (a) With the help of the connection diagram of a fluorescent lamp, choke and starter, explain the working principle of a fluorescent lamp. 7

(b) A street lighting system of 50 units with each lamp load of 500 W, 15 A at 230 V a.c. supply is to be designed by an electrician. As a supervisor, guide him to recommend the rating of the transformer (in kVA) for the feeder in case the load power factor is 0·9. 7

3. (a) Define the term welding and explain the various welding processes. 7

(b) Compare AC and DC welding. 7

4. (a) Discuss any two types of electrodes used in arc welding. $2 \times 3\frac{1}{2} = 7$

(b) Explain different methods of induction heating. 7

5. Discuss and distinguish between rheostatic and regenerative braking applied in electric traction. Give the advantage of regenerative braking. 14

6. (a) Define the following : 7

(i) Crest speed

(ii) Average speed

(iii) Schedule speed

(b) Explain clearly 'free running', 'coasting' and 'braking' with reference to electric traction system. 7

7. (a) Explain the four basic functions of a refrigeration cycle illustrating it with a block diagram. 7

(b) Explain the working of a central air-conditioning system with a neat sketch. 7