

**DIPLOMA IN ELECTRICAL ENGINEERING  
(DELVI)**

00279

**Term-End Examination**

**December, 2017**

**BIEEE-005 : UTILIZATION OF ELECTRICAL  
ENGINEERING**

*Time : 2 hours*

*Maximum Marks : 70*

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

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1. Choose the correct answer from the given alternatives :  $7 \times 2 = 14$
- (a) The area under the speed time curve represents the
- (i) Acceleration of the train
  - (ii) Time taken by the train
  - (iii) Distance travelled by the train
  - (iv) Crest speed

- (b) Candela is the unit of
- (i) Wavelength
  - (ii) Luminous intensity
  - (iii) Luminous flux
  - (iv) Frequency
- (c) In mainline train services, the
- (i) Acceleration and braking periods are long
  - (ii) Acceleration and braking periods are short
  - (iii) Free run and wasting periods are long
  - (iv) Both (ii) and (iii)
- (d) For improving the power factor of coreless type induction furnace
- (i) Capacitor is used
  - (ii) Inductor is used
  - (iii) Resistor is used
  - (iv) Transistor is used
- (e) Arc welding is also known as
- (i) Pressure welding
  - (ii) Plastic welding
  - (iii) Non-pressure welding
  - (iv) None of these

- (f) The vapour compression cycle does **not** consist of which fundamental process ?
- (i) Expansion
  - (ii) Vaporisation
  - (iii) Compression
  - (iv) Rectification
- (g) Which is **not** a type of resistance welding ?
- (i) Butt welding
  - (ii) Spot welding
  - (iii) Arc welding
  - (iv) Projection welding
2. (a) Describe metal filament lamps, highlighting the effect of temperature and choice of coiled coil filament. 7
- (b) What is Flood Lighting and where is it used ? 7
3. (a) What are the essential properties of resistance heating elements ? Explain the design procedure of the heating element when the power and voltage of oven is known. 8
- (b) Explain induction heating process. Name different methods of induction heating. 6
4. (a) State different types of traction systems. Give the advantages and disadvantages of electric traction system over other forms of traction systems. 7

- (b) State and explain different factors to be considered while selecting motors in electric drives. 7
5. (a) Draw the speed – time curve for the following train services and compare them : 7
- (i) Mainline service
- (ii) Suburban service
- (b) State different factors to be considered while selecting motors in electric drives. 7
6. (a) What is a Refrigerant ? Give the properties of refrigerants and name any two refrigerants used in domestic and industrial cooling. 7
- (b) Two lamp posts are 16 m apart and are fitted with a 100 C.P. lamp, each at a height of 6 m above ground. Calculate the illumination on the ground
- (i) Under each lamp,
- (ii) Midway between the lamps. 7
7. (a) Define air-conditioning. On what factors does air-conditioning depend ? 8
- (b) Define the following :  $3 \times 2 = 6$
- (i) Solid Angle
- (ii) Coefficient of Utilization
- (iii) Mean Horizontal Candle Power (M.H.C.P.)
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