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BIEEE-005

DIPLOMA IN ELECTRICAL ENGINEERING (DELVI)

00255

Term-End Examination

December, 2014

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 allowed.*

1. Choose the correct answer from the given alternatives. *7×2=14*

(a) The luminous intensity of a lamp is expressed in

(i) Watts

(ii) Lumens

(iii) Lux

(iv) Candela

(b) The illumination of a surface at any point is proportional to the _____ of the angle between the normal at that point and the direction of the luminous flux.

(i) sine

(ii) cosine

(iii) tangent

(iv) cotangent

(c) A traction motor must be capable of developing _____ starting torque.

(i) high

(ii) low

(iii) very low

(iv) medium

(d) Which of the following motors provides the highest starting torque :

(i) DC series motor

(ii) DC shunt motor

(iii) DC compound motor

(iv) Universal motor

(e) Welding electrodes are made of material having _____ electrical conductivity.

(i) high or low

(ii) low

(iii) high

(iv) None of the above

(f) Projection welding is advantageous for which of the following reasons :

(i) Projection makes the welding process simple.

(ii) It is possible to join several welding points in projection welding.

(iii) More output is obtained since more than one weld is done at a time.

(iv) All of the above

(g) For high performance, the efficiency of a desert cooler should be

(i) greater than 80%

(ii) not less than 70%

(iii) 50%

(iv) None of the above

2. (a) What is meant by stroboscopic effect ? How is this effect eliminated in fluorescent tube lighting ?

(b) Enumerate the various factors to be considered while designing flood and street lighting. *2×7=14*

3. (a) The power required for dielectric heating of a slab of resin 150 cm^2 in area and 2 cm thick is 200 W, frequency of 30 MHz. The material has a relative permittivity of 5 and pf of 0·05. Determine the necessary voltage and current flowing through the material. If the voltage is limited to 600 V, what will be the value of the frequency to obtain the same heating ?

(b) With a neat sketch, describe the construction and principle of operation of Ajax Wyatt furnace. *2×7=14*

4. (a) What are the fundamental differences between electric arc welding and resistance welding ?

(b) What are the advantages of using coated electrodes ? Mention different types of coatings used. *2×7=14*

5. What are the advantages of regenerative braking ? Explain how regenerative braking can be obtained in DC locomotives. *14*

6. Discuss the construction and operation of a domestic air-conditioner and draw its wiring diagram. *14*

7. Write short notes on any ***two*** of the following : *2×7=14*

   (i) Group and individual drives

   (ii) Electric supply for Arc welding

   (iii) Halogen lamp

   (iv) Speed-time curve of a train