BRAINWARE UNIVERSITY

Term End Examination 2024-2025
Programme – Dip.EE-2022
Course Name – Utilization, Traction Heating and Drives
Course Code - DEEPE502A
(Semester V)

Full Marks : 60 **Time : 2:30 Hours**

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A
(Multiple Choice Type Question) 1 x 15=15

1. *Choose the correct alternative from the following :*

(i) Tell that longer coasting period for a train results in
   a) Higher schedule speed
   b) Lower specific energy consumption
   c) Higher retardation
   d) Higher acceleration

(ii) Identify the luminous efficiency of a fluorescence lamp is
   a) 30 lumens/watt
   b) 40 lumens/watt
   c) 60 lumens/watt
   d) 70 lumens/watt

(iii) Tell that what factor is defined as the ratio of the illumination when everything is clean to illumination under normal working conditions.
   a) Depreciation
   b) Maintenance.
   c) Utilization.
   d) Absorption factor.

(iv) Tell that in electrical resistance welding, material of the electrode should have
   a) higher electrical conductivities.
   b) higher thermal conductivities.
   c) sufficient strength to sustain high pressure at elevated temperatures.
   d) All of these

(v) Identify that low-frequency supply is necessary for direct core-type induction furnaces because
   a) With a normal frequency supply, the electromagnetic forces cause severe stirring action in the molten metal.
   b) Magnetic coupling between the primary and secondary circuits is poor.
   c) Both 1 and 2.
   d) None of these

(vi) Identify that the incandescent lamps (Filament lamps) operate normally at a power factor of

a) 0.5 lagging
b) Unity
c) 0.8 lagging
d) 0.8 leading

(vii) Identify that the desired illumination level on the working plane depends upon

a) Age group observers and Whether the object is stationary or moving
b) Size of the object to be seen and its distance from the observer
c) Whether the object is to be seen for longer duration or shorter duration of time
d) All these factors

(viii) Tell that one candle power source of light emits

a) 1 lumen/steradian
b) 1lumen/ radian
c) 1lumen1/candela
d) 1 lumen/meter

(ix) Select which lamp is best suited for lighting an International sports arena?

a) Incandescent
b) Metal Halide
c) Compact Fluorescent
d) LED

(x) Select that Candela/metre square is the unit of which photometric quantity

a) luminous intensity
b) flux
c) solid angle
d) candle power

(xi) Select what is the ratio of illuminance at a point 5m just below a lamp emitting 100 candelas and at a point 5m away from the first point on the same horizontal plane?

a) 1:2
b) $\sqrt{2}$: 1
c) 1: $2\sqrt{2}$
d) 2:1

(xii) Calculate the minimum anode current required to turn off SCR if the latching current value is 2 A.

a) 2 A
b) 3 A
c) 4 A
d) 5 A

(xiii) Identify what will happen, with the increase in speed of a DC motor?

a) Back emf increase but line current falls.
b) Back emf falls and line current increase.
c) Both back emf as well as line current increase.
d) Both back emf as well as line current fall.

(xiv) Identify which part will surely tell that given motor is DC motor and not an AC type?

a) Winding
b) Shaft
c) Commutator
d) Stator

(xv) Identify that drive which is most commonly used in electric vehicles.

a) Synchronous motor drive
b) Induction motor drive
c) Stepper motor drive
d) Hydraulic drive

Group-B

(Short Answer Type Questions) 3 x 5=15

2. Explain the terms-average speed in electric traction. (3)
3. Define the polar curve. (3)
4. Explain the cause of low power factor. (3)
5. Discuss about electrical braking system. (3)
6. Explain the contruction of CFL lamp. (3)

OR

Explain the construction of vertical core type induction furnace. (3)

Group-C
(Long Answer Type Questions) 5 x 6=30

7. Examine the types of lighting schemes. (5)

8. Explain the working of dielectric heating. (5)

9. A 250 V lamp has a total flux of 3000 lumens and takes a current of 0.8 ampere from 250 V mains. Calculate its luminous efficiency. (5)
10. Explain the procedure of Electric Arc Welding. (5)
11. Define the terms: Luminance, Illuminance, CRI, Color temperature and luminous flux. (5)
12. Explain the working of indirect resistance heating. (5)

OR

Explain about direct resistance heating. (5)

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