Gandhi Institute of Engineering and Technology University, Odisha, Gunupur
(GIET University)

B. Tech (Seventh Semester - Regular) Examinations, November – 2025

22BELPE74021 – Utilization of Electrical Energy

(Electrical Engineering)

Time: 3 hrs Maximum: 70 Marks

Answer ALL questions

(The figures in the right hand margin indicate marks)

PART – A **(2 x 5 = 10 Marks)**

Q.1. Answer ***ALL*** questions	CO #	Blooms Level
a. Define Infrared heating.	CO1	K1
b. Define relative Luminous factor in illumination.	CO1	K1
c. Explain solid angle.	CO3	K1
d. Explain Candle Power in illumination.	CO4	K1
e. Define Baffles in integrating sphere construction.	CO5	K1

PART – B **(15 x 4 = 60 Marks)**

Answer ***all*** the questions	Marks	CO #	Blooms Level
2. a. Explain Induction heating process with neat diagram.	8	CO1	K1
b. Explain Dielectric heating with neat diagram.	7	CO1	K2
(OR)			
c. Define welding machine. Explain about various components used in welding machine.	8	CO2	K2
d. Explain the working principle of arc welding with suitable example.	7	CO2	K2
3.a. Explain colour wavelength, light, luminous flux, plane angle and solid angle in illumination.	8	CO2	K2
b. Explain the Cosine law in Illuminance.	7	CO2	K2
(OR)			
c. Explain the Horizontal and vertical Polar curves with suitable diagram.	8	CO3	K2
d. State and explain the working of integrating sphere.	7	CO3	K2
4.a. Explain about different types of light sources.	8	CO3	K2
b. Differentiate between AC and DC traction system.	7	CO3	K2
(OR)			
c. Explain the Salient features of traction motor.	8	CO4	K2
d. Explain plugging and braking mechanisms used in traction system	7	CO4	K2
5.a. The speed–time curve of train carries of the following parameters: 1. Free running for 10 min. 2. Uniform acceleration of 5.5 kmphp for 20 s. 3. Uniform deceleration of 5.5 kmphp to stop the train. 4. A stop of 8 min. Then, determine the distance between two stations, the average, and the schedule speeds.	8	CO5	K3
b. An electric train is to have the acceleration and braking retardation of 0.8 km/hr/sec and 5 km/hr/sec, respectively. If the ratio of the maximum speed to	7	CO5	K3

the average speed is 2.6 and time for stop is 20 s. Then determine the schedule speed for a run of 2.6 km. Assume the simplified trapezoidal speed–time curve.

(OR)

c.	Explain trapezoidal and quadrilateral speed time curves.	8	CO4	K2
d.	Explain DC and AC Electrification system in traction systems.	7	CO4	K2

--- End of Paper ---