GIET UNIVERSITY, GUNUPUR – 765022

B. Tech (Seventh Semester – Regular) Examinations, Nov – 2022

BPEEL7021 – Utilization of Electrical Energy

(EE)

Time: 3 hrs Maximum: 70 Marks

Answer ALL Questions

The figures in the right hand margin indicate marks.

PART – A: (Multiple Choice Questions) **(1 x 10 = 10 Marks)**

Q.1. Answer ***ALL*** questions [CO#] [PO#]

a. Solid angle is expressed in terms of CO2 PO1

i. Radians / meter ii. Steradian

iii. Radians iv. Degree

b. Properties of good heating element CO1 PO1

i. High resistance ii. High melting point

iii. Low temperature coefficient iv. All of the above

c. Types of train service CO4 PO1

i. Urban services ii. Online services

iii. sub-urban services iv. A and C

d. Which lamp has the best Colour Rendering Index (CRI)? CO3 PO1

i. LED ii. Incandescent

iii. Fluorescent iv. High pressure sodium vapour

e. Power equation of dielectric heating CO1 PO1

i. $P = VI \cos \Phi$ ii. $P = I^2R$

iii. $P = 3VI \cos \Phi$ iv. $P = 2\pi fCV^2 \delta$

f. Element of speed time curve CO4 PO1

i. Initial acceleration ii. Coasting

iii. Constant speed iv. All of these

g. The range of visual spectrum is CO3 PO1

i. 300nm - 1000nm ii. 300nm - 760nm

iii. 480nm - 1000nm iv. 480nm - 760nm

h. In Resistance heating the method of heat control is CO1 PO1

i. By change the number element ii. By changing tapping

iii. By inserting with external resistance iv. All of the above

i. Supply frequency in 25KV single-phase system is

i. 50HZ ii. 60HZ

iii. 25HZ iv. 16HZ

j. Arc welding is CO1 PO1

i. Plastic welding ii. Pressure welding

iii. Non pressure welding iv. None of these

PART – B: (Short Answer Questions) **(2 x 10 = 20 Marks)**

Q.2. Answer ***ALL*** questions [CO#] [PO#]

a. Why a series motor is preferred for the electric traction. CO4 PO1

b.	Give the classification of electric heating methods.	CO1	PO1
c.	Define Horizontal polar curve and vertical polar curve.	CO2	PO1
d.	What are the advantages of electric braking over mechanical braking	CO4	PO1
e.	Discuss inverse square law.	CO3	PO1
f.	What are the requirements of an ideal traction system?	CO5	PO1
g.	Define: i) Luminous intensity, ii) Luminous Flux.	CO2	PO1
h.	Give some applications of induction heating.	CO1	PO1
i.	What is lambert's cosine law of illumination?	CO2	PO1
j.	List out the properties of heating element.	CO1	PO1

PART – C: (Long Answer Questions) **(10 x 4 = 40 Marks)**

Answer ***ALL*** questions

		Marks	[CO#]	[PO#]
3. a.	A room with an area of 6 × 9 m is illustrated by ten 80-W lamps. The luminous efficiency of the lamp is 80 lumens/W and the coefficient of utilization is 0.65. Find the average illumination.	5	CO3	PO2
b.	Explain in brief how heating is done in the following cases: i) Resistance heating, ii) Induction heating	5	CO1	PO1
	(OR)			
c.	State and explain laws of Illumination.	5	CO2	PO1
d.	Write short notes on sub-traction for single-phase A.C systems.	5	CO4	PO1
4. a.	Give the construction and working of the Arc type lamps.	5	CO3	PO1
b.	A 20hp, 220v shunt motor takes a full load current of 82A, speed 1000rpm and armature resistance 0.1Ω, shunt field resistance 110Ω. It is to be braked by plugging. What is resistance must be placed in series to limit the current to 120A. Find initial value of starting torque.	5	CO4	PO2
	(OR)			
c.	Explain the electric braking by plugging?	5	CO4	PO1
d.	Name and describe various resistances welding process?	5	CO1	PO1
5. a.	Write the principle of electric incandescent lamp.	5	CO2	PO1
b.	What are discharge lamps? Explain.	5	CO3	PO1
	(OR)			
c.	Explain mechanical features of traction motors.	5	CO4	PO1
d.	Explain tractive effort for propulsion of train.		CO5	PO1
6. a.	What is difference between Resistance Welding and Arc Welding	5	CO1	PO1
b.	Explain the Dynamic electric braking?	5	CO4	PO2
	(OR)			
c.	Write a brief note on LED lighting.	5	CO3	PO1
d.	A 200V dc shunt motor running at 1000rpm takes an armature current of 17.5A. It is required to reduce the speed to 600rpm, what must be the value of resistance to be inserted in the armature circuit if the original armature resistance is 0.4Ω? Take armature current to be constant during the process.	5	CO4	PO2

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