QPC: RN20BTECH695 AR 20 Reg. No | | | | | | | | | | |

GIET UNIVERSITY, GUNUPUR – 765022

B. Tech (Seventh Semester – Regular) Examinations, November – 2023

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.	Supply frequency in 25KV single-phase system is i. 50HZ ii. 60HZ iii. 25HZ iv. 16HZ	CO1	PO2
b.	In Resistance heating the method of heat control is i. By change the number element ii. By changing tapping iii. By inserting with external resistance iv. All of the above	CO1	PO1
c.	The illumination due to good daylight is approximately equal to i. 100 lux ii. 200 lux iii. 300 lux iv. 400 lux	CO2	PO1
d.	Solid angle is expressed in terms of i. Radians / meter ii. Steradian iii. Radians iv. Degree	CO2	PO1
e.	The range of visual spectrum is i. 300nm - 1000nm ii. 300nm - 760nm iii. 480nm - 1000nm iv. 480nm - 760nm	CO3	PO1
f.	For regenerative braking, the motor which is not suitable is i. DC shunt motor ii. DC compound motor iii. DC series motor iv. AC shunt motor	CO3	PO1
g.	The main line service distance between two stops is? i. 5KM ii. 10KM iii. 5 to 10KM iv. More than 10KM	CO4	PO1
h.	Element of speed time curve i. Initial acceleration ii. Coasting iii. Constant speed iv. All of these	CO5	PO1
i.	The sun's rays reach the earth without heating the atmosphere, this is due to i. Convection ii. Radiation iii. Conduction iv. None of these	CO2	PO1
j.	The artificial source of light is i. Arc lamp ii. Incandescent lamp iii. Discharge lamp iv. All of these	CO2	PO1

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

Q.2. Answer ***ALL*** questions		[CO#]	[PO#]
a.	Give the classification of electric heating methods.	CO1	PO1
b.	Define conduction and convection.	CO1	PO1
c.	What is lambert's cosine law of illumination?	CO2	PO1
d.	Define the terms: Dead weight, Adhesive weight	CO2	PO1

e.	Why DC series motor is suited for traction applications. Justify?	CO4	PO1
f.	Classify the supply system for electric traction.	CO3	PO1
g.	What are the requirements of an ideal traction system?	CO5	PO1
h.	Write an expression for synchronous speed.	CO5	PO1
i.	State the advantages of electric heating.	CO1	PO1
j.	If one lamp connects between two phases it will glow or not?	CO2	PO1

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

Answer ***ALL*** questions		Marks	[CO#]	[PO#]
3. a.	Name and describe various resistances welding process.	5	CO1	PO1
b.	Distinguish in detail between Direct Resistance and Indirect resistance heating.	5	CO1	PO1
	(OR)			
c.	State five applications of dielectrically heating.	5	CO1	PO1
d.	List the different properties that are required for a good heating material.	5	CO1	PO1
4. a.	Explain working of fluorescent tube with circuit diagram. What is the function of a choke and starter in fluorescent tube?	5	CO2	PO1
b.	Define polar curves. Write its significance?	5	CO2	PO1
	(OR)			
c.	State at least four differences between Incandescent Lamp and Fluorescent tube.	5	CO3	PO1
d.	State and explain laws of Illumination.	5	CO2	PO1
5. a.	List the advantages and disadvantages of electric drive.	5	CO3	PO1
b.	What are the basic requirements of braking system?	5	CO3	PO1
	(OR)			
c.	Give the construction and working of the Arc type lamps.	5	CO3	PO1
d.	Name the advanced methods of speed control of traction motors.	5	CO3	PO1
6. a.	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
b.	Define following terms (i) MSCP (ii) MHCP	5	CO4	PO2
	(OR)			
c.	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
d.	What are special features of a traction motor?	5	CO4	PO2

--- End of Paper ---