



PAPER ID-310483

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Subject Code: KEE079

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BTECH**(SEM VII) THEORY EXAMINATION 2023-24****UTILIZATION OF ELECTRICAL ENERGY & ELECTRIC TRACTION****TIME: 3 HRS****M.MARKS: 100****Note: 1.** Attempt all Sections. If you require any missing data; then choose suitably.**SECTION A****1. Attempt all questions in brief.**

Q no.	Question	Marks	CO
a.	Explain the conduction mode of heat transfer.	2	1
b.	What are the causes of the failure of the heating elements?	2	1
c.	Define Faraday's First law of electrolysis.	2	2
d.	Write the advantages of electrical heating.	2	2
e.	Define luminous intensity.	2	3
f.	Write some words about flood lighting.	2	3
g.	Write the reason for the selection of tungsten as the filament material.	2	4
h.	What is meant by the scheduled speed of a train?	2	4
i.	What are the various traction systems?	2	5
j.	Define the function of the starter in Traction Motors.	2	5

SECTION B**2. Attempt any three of the following:**

a.	Discuss the different types of arc furnaces. Explain to anyone in detail with a neat and clean diagram.	10	1
b.	Discuss the various methods of electric resistance welding with neat sketches. Give its merits and demerits concerning arc welding.	10	2
c.	Explain the steps of design of indoor lighting and outdoor lighting systems with a suitable diagram.	10	3
d.	Write the tractive effort of a train and its functions. Derive an expression for the tractive effort developed by a train unit.	10	4
e.	Discuss the mechanical and electrical features of the electric relative suitability of (i) D.C series motor (ii) A.C series motor.	10	5

SECTION C**3. Attempt any one part of the following:**

a.	What are the different types of induction furnaces? Explain to anyone in detail.	10	1
b.	Discuss the radio-frequency heating in detail with suitable diagrams.	10	1

4. Attempt any one part of the following:

a.	Illustrate carbon arc welding and metal arc welding with suitable diagrams.	10	2
b.	Discuss the principle and working of electro-deposition in the electrolyte process with a neat and clean sketch.	10	2

5. Attempt any one part of the following:

a.	What are the different components of an air conditioning plant? Explain the working of each component.	10	3
b.	A room with an area of 6×9 m is illuminated 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.	10	3

6. Attempt any one part of the following:

a.	Explain the working principle and advantages of Diesel Electric Traction.	10	4
b.	Illustrate the working of a single-phase system of track electrification with its applications.	10	4



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BTECH

(SEM VII) THEORY EXAMINATION 2023-24

UTILIZATION OF ELECTRICAL ENERGY & ELECTRIC TRACTION

TIME: 3 HRS

M.MARKS: 100

7. Attempt any *one* part of the following:

a.	Explain the working principles and characteristics of linear induction motors for traction purposes.	10	5
b.	A locomotive of 100 tones can just accelerate a train of 500 tones with an acceleration of 1 km/s^2 up gradient of 10%. The adhesive weight of the locomotive is 70% of total dead weight, tractive resistance is 45 newtons/ton and inertia is 10%. If this locomotive is helped by another locomotive of 130 tones with 100% adhesive weight, find out: (i) Trailing weight that can be hauled up the same gradient under the same conditions. (ii) The maximum gradient, trailing hauled load remains unchanged.	10	5

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