



**Academic Year (2022-23)**

Year: 3 Semester: V

## **Program: B. Tech. (ELECTRICAL ENGG.)**

Max. Marks: 75

## **Subject: Electric Traction and Utilization (PCEE5040T)**

Time: 10:30 am to 1:30 pm

Date: 12/01/2022

**Duration: 3 Hours**

**END SEM EXAMINATION – ODD SEM-V (Regular)**

**Instructions:** Candidates should read carefully the instructions printed on the question paper and on the cover page of the Answer Book, which is provided for their use.

- (1) This question paper contains 02 pages.  
**(2) All Questions are Compulsory.**  
(3) All questions carry equal marks.  
**(4) Answer to each new question is to be started on a fresh page.**  
**(5) Figures in the brackets on the right indicate full marks.**  
**(6) Assume suitable data wherever required, but justify it.**  
**(7) Draw the neat labelled diagrams, wherever necessary.**

Question No.		Max. Marks
Q1 (a)	Explain advantages of electric traction over other systems of traction.  OR  Draw the neat sketch of compound catenary construction and explain.	[05]  [05]
Q1 (b)	Explain 3 phase low frequency AC system of track electrification.	[10]
Q2 (a)	i. Derive the expression for Maximum speed of trapezoidal speed time curve ii. Explain suitable characteristic of following motors for traction purpose i) DC series motor                    ii) Linear Induction Motor  OR  Explain with neat diagram plugging and Rheostatic braking.	[06] [04]  [10]
Q2 (b)	Define:  i) Average Speed ii) Schedule Speed iii) Crest Speed	[05]
Q3 (a)	Explain Series parallel control method.  OR  Compare AC and DC track electrification system.	[05]  [05]
Q3 (b)	Sketch a simplified speed-time curve for main line service and in detail  OR  Explain Series- parallel transition process with suitable diagram.	[10]  [10]



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**R. C. PATEL INSTITUTE OF TECHNOLOGY, SHIRPUR**

An Autonomous Institute

[Affiliated to Dr. Babasaheb Ambedkar Technological University, Lonere]

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Q4 (a)	Write a short note regenerative braking in traction.  <b>OR</b> Draw and explain layout of traction substation.	[08]
Q4 (b)	Explain feeding and sectioning arrangement in traction substation	[07]
Q5 (a)	Solve any two.  i. Short note on Pantograph - current collecting device. ii. What is composite system of track electrification? iii. State desirable requirements of traction motor. iv. Write a note on Anti - collision system.	[05] [05] [05] [05]
Q5 (b)	Draw block diagram of electric locomotive and describe function of any five equipment's and accessories.	[05]