

Time: 3 Hours

Total Marks: 80

**Note:** Question No.1 is compulsory.  
Solve ANY THREE questions from the remaining questions.  
Figure to the right indicates full marks.

	<b>Marks</b>
<b>Q. 1</b> Solve ANY FOUR questions from following.	
a) Compare AC and DC systems of traction.	5
b) Discuss the factors affecting schedule speed of a train	5
c) What are the important features of tractive drive?	5
d) Explain railway SCADA system.	5
e) What are the disadvantages of bow collector ?	5
<b>Q. 2 a)</b> What are the advantages of composite system of traction employing 25KV AC supply and dc traction motors.	10
b) Name the various method of electric braking. Give the merits and limitations of regenerative braking.	10
<b>Q.3 a)</b> Define traction substation. What are the major equipment used in traction substation.	10
b) What are the different types of pantographs used and give their merits and demerits.	10
<b>Q4. a)</b> Explain the working principle of a DC track circuit. What are the factors affect the functioning of track circuit.	10
b) Explain the various train lighting systems ?	10
<b>Q5. a)</b> Explain the chopper method of control of DC motors. What are the merits and demerits of this method of control.	10
b) A train runs with average speed of 40 kmph. Distance between stations is 2 km. Value of acceleration and retardation are 1.5 Kmphps and 2.5 Kmphps respectively. Find the maximum speed of train assuming trapezoidal speed time curve.	10
<b>Q6. a)</b> Explain the importance of neatal section used in railway with a neat diagram.	10
b) What is the function of a signal ? Explain their positions	10