No. of Printed Pages : 4
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220954B

5th Sem. / Electrical
Subject : Electrical Traction System

Time : 3 Hrs. M.M. : 60

SECTION-A

Note: Multiple Choice Questions. All Questions are compulsory. (6x1=6)

Q.1 What is the primary advantage of electric traction over diesel traction? (CO1)

a) Higher speed

b) Higher efficiency and lower environmental impact

c) Lower maintenance

d) Lower cost

Q.2 Which system is known as the Kando system? (CO1)

a) DC system

b) Composite system

c) Single phase AC to DC system

d) Three-Phase system

Q.3 In which type of services is schedule speed most critical? (CO2)

a) Main line b) Sub-urban

c) Rural d) Urban

Q.4 Which motor is commonly used in electric traction for its high starting torque? (CO3)

a) DC shunt motor b) Synchronous motor

c) DC series motor d) Stepper motor

Q.5 What is the function of a pantograph in the electric traction system? (CO5)

a) To maintain train speed

b) To collect current from the over head catenary wire

c) To provide braking support

d) To control the traction motor

Q.6 Which type of braking combines rheostatic and mechanical methods? (CO4)

a) Hard braking b) Compressed air braking

c) Regenerative braking d) Vacuum braking

Section-B

Note: Objective/Completion type questions. All questions are compulsory. (6x1=6)

Q.7 List two types of electric traction systems. (CO1)

Q.8 Define average speed in the context of urban traction service. (CO2)

Q.9 Name two special features of traction motors. (CO3)

Q.10 What type of motor control is used in DC traction systems? (CO3)

Q.11 Identify one advantage of regenerative braking.(CO4)

Q.12 State the function of a conductor rail system. (CO5)

Section-C

Note: Short answer type Question. Attempt any eight questions out of Ten Questions. (8x4=32)

Q.13 Explain the key features of electric traction systems in India. (CO1)

Q.14 Describe the single-phase 25KV AC system and mention its advantages over the DC system. (CO1)

Q.15 Differentiate between urban and sub-urban traction services. (CO2)

Q.16 Discuss three factors that influence the schedule speed in traction system. (CO2)

Q.17 Illustrate the characteristics that make the DC series motor suitable for traction. (CO3)

Q.18 Compare vacuum braking with compressed air braking in terms of efficiency and safety. (CO4)

Q.19 Summarize the series-parallel control method used in DC traction systems. (CO3)

Q.20 Outline the process of regenerative braking and its energy-saving benefits. (CO4)

Q.21 List and describe two types of auxiliary equipment in the electric traction system. (CO5)

Q.22 Explain the role of the tap changer in AC locomotive traction control. (CO3)

Section-D

Note: Long answer questions. Attempt any two question out of three Questions. (2x8=16)

Q.23 Analyze the pros and cons of the Kando system in electric traction. (CO1)

Q.24 Explain in detail the working and importance of the overhead catenary wire and pantograph system in electric traction. (CO5)

Q25 Discuss the evolution of traction motor control system, focusing on DC and AC traction methods. (CO3)