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10MN32

Third Semester B.E. Degree Examination, Dec.2013/Jan.2014

Mining Electrical Engineering

Time: 3 hrs.

Max. Marks:100

Note: Answer FIVE full questions, selecting at least TWO questions from each part.

PART – A

- 1 a. Mention any five Indian Electricity rules and application to Mining Industry. (05 Marks)
- b. Define the terms related to mine illumination. Mention the importance of electrical engineering in mining. (10 Marks)
- c. Write short notes on: i) Voltage limits; ii) Disconnection of supply. According to the Indian Electricity rules 1956. (05 Marks)
- 2 a. What is an electric drive? Explain with a block diagram. (07 Marks)
- b. What are the main factors which decide the choice of electric drive? (07 Marks)
- c. List out the difference between A.C. drives and D.C. drives. (06 Marks)
- 3 a. With a neat sketch of a coal mine shaft, explain the electric winder system in mines. (08 Marks)
- b. Compare A.C. mine hoists and D.C. mine hoists. (04 Marks)
- c. Explain various types of shears used in long wall mining method in underground mining operation. (08 Marks)
- 4 a. Explain the electric braking of D.C. motors and A.C. motors as per Electrical Rule 1956. (12 Marks)
- b. A 500 V shunt motor runs at its normal speed of 250 rpm and the armature current is 200 A. The resistance of the armature is 0.12Ω . Calculate the speed when a resistance is inserted in the field reducing the shunt field to 80% of normal value and the armature current is 100 A. (08 Marks)

PART – B

- 5 a. Explain the Ward-Leonard method of speed control. Also give their advantages and disadvantages. (12 Marks)
- b. Obtain the ratio of starting torque to full load torque. (08 Marks)
- 6 a. Explain with a neat sketch, the working principle of minimum oil circuit breaker. What are the advantages and disadvantages of it? (12 Marks)
- b. Explain the principles of underground signaling system in the mines. (08 Marks)
- 7 a. Explain underground power distribution. (08 Marks)
- b. Distinguish between flame proof apparatus and intrinsically safe apparatus. (06 Marks)
- c. Write short notes on underground cable. (06 Marks)
- 8 a. Explain the standards for mine lighting used in underground mines. (08 Marks)
- b. Explain Luminance measurements used in mines. (04 Marks)
- c. Write the design steps for lighting system in mines. (08 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

Dr. T. Thirumala Institute of Technology
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