BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATION)

CLASS: BE   SEMESTER: VII/ADD
BRANCH: EEE   SESSION : MO/2019

SUBJECT : EE8221 UTILISATION OF ELECTRICAL POWER

TIME: 1.5 HOURS   FULL MARKS: 25

INSTRUCTIONS:
1. The total marks of the questions are 30.
2. Candidates may attempt for all 30 marks.
3. In those cases where the marks obtained exceed 25 marks, the excess will be ignored.
4. Before attempting the question paper, be sure that you have got the correct question paper.
5. The missing data, if any, may be assumed suitably.

Q1   (a)   How does coefficient of adhesion depend on type of power modulator.   [2]
       (b)   Derive the expression for specific energy consumption on a level track for an electric   [3]
              train.

Q2   (a)   Compare between electric braking and mechanical braking.   [2]
       (b)   A local train uses motor and trailer coaches in the ratio of 1:2. The weight of a motor   [3]
              coach is 40 tonnes and that of trailer 35 tonnes. All the wheels in a motor coach are
              driving wheels. The train resistance is 30 N/tonne. Effective rotating mass is 10% of the
              dead weight. If the coefficient of adhesion is 0.2, calculate the maximum train
              acceleration on a level track.

Q3   Describe a chopper controlled dc traction drive with composite braking. How it is ensured   [5]
              to minimize energy dissipation in dynamic braking.

Q4   (a)   What are the advantages of PWM VSI induction motor drives? Give any four.   [2]
       (b)   Explain the operation of a load commutated inverter fed synchronous motor drive.   [3]

Q5   (a)   Explain the methods of temperature control of a resistance furnace.   [2]
       (b)   With neat sketches, describe the construction, principle of operation, application and   [3]
              control methods of a direct arc furnace.

Q6   (a)   Explain projection welding.   [2]
       (b)   Explain shielded metal arc welding.   [3]

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