

**B.Tech. - VIEP - ELECTRICAL ENGINEERING
(BTELVI)**

00323

Term-End Examination

December, 2018

BIEEE-011 : ELECTRIC ENERGY UTILIZATION

Time : 3 hours

Maximum Marks : 70

Note : Attempt any seven questions. All questions carry equal marks. Use of scientific calculator is allowed. Assume any suitable data wherever not provided.

1. What are the advantages of composite system of traction employing 25 kV a.c. supply and d.c. traction motors ? Also list the disadvantages of 25 kV a.c. traction system. 10

2. A train weighing 400 tonnes has speed reduced by regenerative braking from 40 to 20 kmph over a distance of 2 km on a down gradient of 20%. Calculate the electrical energy and average power returned to the line. Tractive resistance is 40 N/tonne. Consider rotational inertia of 10% and efficiency of conversion of 75%. 10

3. At what power factor would you like to operate the electric arc furnace ? Give reasons to support your answer. 10
4. What type of electric supply is suitable for electric arc welding ? How does a saturable reactor control the magnitude of welding current ? 10
5. It is required to install floodlights at the front of a building having area $30 \text{ m} \times 20 \text{ m}$ to give brightness of 20 lumens/sq. metre. Coefficient of reflection of building surface is 0.2. Lamps of 500 W having lumen output of 8450 each are used. Taking beam factor as 0.6, waste light factor as 1.2 and maintenance factor as 0.8, calculate the number of lamps required. 10
6. What are the objectives to be achieved for good street lighting ? What precautions would you take when planning lighting of road curves and junctions ? 10
7. What are different applications of electrolysis ? Discuss the advantages of reverse current process of electroplating. 10

8. What is meant by 'Air-Conditioning' ? Explain the various types of air-conditioning along with applications as well. 10
9. Write short notes on any *two* of the following : 2×5=10
- (a) Induction Heating
 - (b) Electric Braking
 - (c) Estimation of tonnage capacity for air-conditioning
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