Code No: **R32023** **R10** **Set No. 1**

**III B.Tech II Semester Supplementary Examinations, April-2017**

# UTILIZATION OF ELECTRICAL ENERGY

**(Electrical and Electronics Engineering)**

**Time: 3 hours** **Max. Marks: 75**

**Answer any FIVE Questions**

**All Questions carry equal marks**

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| 1 | a) | Write about various types of industrial loads with load characteristics and examples. | [7M] |
| | b) | A motor has the following duty cycle:<br>Load rising from 200 to 400 h.p. — 4 minutes<br>Uniform load 300 h.p. — 2 minutes<br>Regenerative braking h.p. Returned to supply from 50 to zero —1 minute.<br>Remains idle for 1 minute. Estimate the h.p. of the motor. | [8M] |
| 2 | a) | What are the characteristics of heating element? Explain the design of heating element in resistance heating. | [7M] |
| | b) | Explain the core type Ajax Wyatt furnace with a neat diagram. | [8M] |
| 3 | a) | What is electric welding? Explain various types of electric welding processes. | [7M] |
| | b) | Explain about electric welding process and equipment required. | [8M] |
| 4 | a) | Write about laws of illumination. | [7M] |
| | b) | A lamp of 200W having an M.S.C.P. of 400 is suspended 2 meters above a working surface. Calculate (i) Lamp efficiency (ii) Total luminous flux in a radius of 0.20m just below the lamp. | [8M] |
| 5 | a) | Compare fluorescent lamps with tungsten filament lamps. | [7M] |
| | b) | A room measuring 20m x 15m is to be illuminated by 10 lamps and the average illumination is to be 75 lux. Determine the MSCP of each lamp if the utilization and depreciation factors are 0.5 and 0.8 respectively. | [8M] |
| 6 | a) | Discuss the merits and demerits of the D.C and 1-Φ A.C systems for the line electrification of the railways. | [7M] |
| | b) | A 400 tonne goods train is to be hauled by a locomotive on a gradient of 2% with an acceleration of 1 kmphps. Coefficient of adhesion is 0.2, track resistance is 40N/Ton and effective rotating masses 10% of dead weight. Find the weight of the locomotive and number of axles if the axle load is not to be beyond 22 tonnes. | [8M] |
| 7 | a) | Explain dead weight, accelerating weight and train resistance referred to traction. | [7M] |
| | b) | An electric train has an average speed of 42 kmph on a level track between stops 1,400 m apart. It is accelerated at 1.7 knphps and is braked at 3.3 kmphps. Draw the speed time curve for the run. | [8M] |
| 8 | a) | Write the advantages of DSM. | [7M] |
| | b) | Discuss the significance of energy star rating of equipment. | [8M] |

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