

**Code No: K0221****R07****Set No. 1****IV B.Tech. II Semester Supplementary Examinations, July/August, 2012****UTILIZATION OF ELECTRICAL ENERGY****(Electrical and Electronics Engineering)****Time: 3 Hours****Max Marks: 80**

**Answer any FIVE Questions**  
**All Questions carry equal marks**

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1. a) What do you understand by electric heating? What are the various advantages of electrical heating over other methods of heating?  
b) What is dielectric heating? Explain the factors influencing dielectric loss in a dielectric material.
2. a) Discuss the the important features of electric arc welding and resistance welding.  
b) Compare the A.C and D.C systems of metallic arc welding.
3. Explain the construction and working of Mercury vapour lamp with a neat diagram.
4. Discuss the application of rheostatic braking as applied to a series a.c induction motor drive with a neat diagram.
5. a) Discuss the various factors influencing the selection of a drive motor for a particular industrial application.  
b) Discuss the various methods of controlling the speed of 3-Phase induction motors.
6. a) Compare the merits and demerits of filament lamps and fluorescent lamps.  
b) A work shop measures 15m×36m and 20 lamps of 500W each are used for lighting the workshop. The luminous efficiency of lamp is 15 Lumens/Watt. Determine the illumination on the working plane, if the depreciation factor is 0.7 and the coefficient of utilization is 0.5.
7. a) Discuss the advantages of electric traction over other non-electrical systems of traction.  
b) Explain briefly the factors influencing the selection of a particular traction system.
8. The average speed of a train is 50 kmph. Determine its maximum speed assuming trapezoidal Speed-Time curve, if the distance between the stops is 2.5 km, acceleration 1.8 kmphs and retardation 3kmphs.

**Code No: K0221****R07****Set No. 2****IV B.Tech. II Semester Supplementary Examinations, July/August, 2012****UTILIZATION OF ELECTRICAL ENERGY****(Electrical and Electronics Engineering)****Time: 3 Hours****Max Marks: 80**

**Answer any FIVE Questions**  
**All Questions carry equal marks**

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1. Explain with a neat diagram the working and operation of a Sodium vapour lamp. Mention its application.
2. a) Discuss briefly the various methods of welding.  
b) What are the advantages of coated electrodes in welding process?
3. a) What do you understand by electric heating? What are the advantages over other methods of heating?  
b) What are the characteristics of heating elements? Explain the design of heating elements in resistance heating.
4. a) Explain the important factors to be considered for selecting a particular drive motor for industrial application.  
b) Discuss the various methods of controlling the speed of 3-Phase induction motors.
5. Discuss the application of rheostatic braking as applied to series and a.c induction motors with neat diagram.
6. With the help of a complete Speed-Time curve, discuss how different parameters of this curve change with the type of train service.
7. a) A small assembly shop 16x10 m is to be illuminated to a level of 200 lux. The Utilization and maintenance factors are 0.74 and 0.8 respectively. Calculate the number of lamps required to illuminate the whole area if the lumen output of the lamp selected is 3000 lumens.  
b) Explain the various factors influencing the life of a tungsten filament.
8. A train is to run between two stations 2 Km apart at an average speed of 45 kmph. The run is to be made according to a quadrilateral N-T curve. The maximum speed is to be limited to 60 kmph, acceleration to 2 kmphs, coasting retardation to 0.15 kmphs and braking retardation to 3.0 kmphs . Find the duration of acceleration, coasting and braking periods.

**Code No: K0221****R07****Set No. 3****IV B.Tech. II Semester Supplementary Examinations, July/August, 2012****UTILIZATION OF ELECTRICAL ENERGY****(Electrical and Electronics Engineering)****Time: 3 Hours****Max Marks: 80****Answer any FIVE Questions  
All Questions carry equal marks**

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1. a) Compare the important characteristics of tungsten filament lamps and fluorescent lamps.  
b) A room measuring 25m X 12m is to be illuminated by 40W incandescent lamps of lumen output 2700 lumens. The average illumination required in the room is 200 lux. Calculate the number of lamps required to be fitted in the room if utilization and depreciation factors are 0.65 and 1.25 respectively.
2. a) What are the various methods of welding?  
b) Compare the A.C and D.C systems of metallic arc welding.
3. a) Discuss the important features of resistance heating and induction heating.  
b) Explain the merits and application of dielectric heating.
4. With the help of a complete Speed -Time curve discuss how different parameters of this curve change with the type of train service.
5. a) Discuss the various factors influencing the selection of a drive motor for a particular industrial application.  
b) Explain the speed control of a D.C series motor through a suitable diagram.
6. Discuss the application of rheostatic braking as applied to series a.c induction motors with a neat diagram.
7. Explain with a neat diagram the working and operation of a Sodium vapour lamp. Mention its application.
8. The average speed of a train is 36 kmph. Determine its maximum speed assuming trapezoidal Speed-Time curve, if the distance between the stops is 1.8 km, acceleration 1.8 kmphs and retardation 3.6 kmphs.

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**R07**

**Set No. 4**

**IV B.Tech. II Semester Supplementary Examinations, July/August, 2012**

**UTILIZATION OF ELECTRICAL ENERGY**

**(Electrical and Electronics Engineering)**

**Time: 3 Hours**

**Max Marks: 80**

**Answer any FIVE Questions**  
**All Questions carry equal marks**

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1. Explain the different types of lamp fittings and lighting schemes with the help of light distribution graphs.
2. a) Discuss the features of DC arc welding system.  
b) Explain the advantages of AC arc Welding machines.
3. a) Discuss the different methods of electric heating and their relative merits.  
b) What are the characteristics of heating elements? Explain the design of heating elements in resistance heating.
4. a) Discuss the various factors influencing the selection of a drive motor for a particular industrial application.  
b) Compare the characteristics of a D.C series motor and a three phase induction motor.
5. Explain the construction and working of Mercury vapour lamp with a neat diagram.
6. Discuss in detail the various factors on which the final choice of traction system depends.
7. A train is to run between two stations 1.6 km apart at an average speed of 40kmph. The run is to be made according to a quadrilateral N-T curve. The maximum speed is to be limited to 64 kmph, acceleration to 2 kmphps, coasting retardation to 0.16 kmphps and braking retardation to 3.2 kmphps. Find the duration of acceleration, coasting and braking periods.
8. Write short notes on the following:
  - a) Rheostatic braking
  - b) Regenerative braking
  - c) Induction heating
  - d) Flood lighting