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**EE-702**

**B.E. VII Semester**

Examination, December 2016

**Utilization of Electrical Energy**

*Time : Three Hours*

*Maximum Marks : 70*

- Note:** i) Answer five questions. In each question part A, B, C is compulsory and D part has internal choice.  
ii) All parts of each question are to be attempted at one place.  
iii) All questions carry equal marks, out of which part A and B (Max. 50 words) carry 2 marks, part C (Max. 100 words) carry 3 marks, part D (Max. 400 words) carry 7 marks.  
iv) Except numericals, Derivation, Design and Drawing etc.

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**Unit - I**

1. a) State the advantages and applications of sodium vapour lamp.  
b) What do you understand by direct lighting?  
c) What is inverse square law and where it is used?  
d) An office measuring  $30 \times 20\text{m}$ . is to be illuminated with incandescent bulbs. Each bulb has a luminous efficacy of  $14 \text{ lm/w}$ . The average illumination level required is  $300 \text{ lux}$ . Mounting height of lamp is  $4\text{m}$ . Calculate the wattage and number of lamps required is  $\text{UF} = 0.6$  and  $\text{M.F.} = 0.82$ .

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A 60 candle power, 250V filament lamp has a candle power of 71.5 candles at 260V and 50 candles at 240V. Find percent variation of candle power due to the voltage variation of candle power due to voltage variation of 4% from rated value.

### Unit - II

2. a) Compare electric arc and electric resistance welding.
- b) What are the factors affecting the electroplating process?
- c) Write the application of dielectric heating.
- d) Explain the designing of circular heating element for electric heating.

OR

Explain electron beam welding method.  
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### Unit - III

3. a) What are the special requirements of traction motor?
- b) Define average and schedule speed.
- c) What do you understand by tractive effort?
- d) What are the various factors affecting the specific energy consumption?

OR

Explain the importance of adhesive weight and co-efficient of adhesion.

### Unit - IV

4. a) Why d.c. series motor is used for traction purpose?
- b) Why single a.c. traction system preferred over d.c. traction system?  
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- c) Explain starting of Three Phase Induction Motor.
- d) Discuss Electric Braking in electric motors.

OR

Discuss layout of 25 kV a.c. traction system.

### Unit - V

5. a) What is load equalisation? How it is achieved?
- b) What do you understand by intermittent loading?
- c) Draw and explain heating curve.
- d) Suggest with reason the electric drives used for the following applications.
  - i) Rolling Mill
  - ii) Refrigeration
  - iii) Mines  
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  - iv) Lifts and elevators
  - v) Domestic equipment

OR

Give the criteria for the selection of motor for particular application.

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