Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 20290

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2012.

Eighth Semester

Electrical and Electronics Engineering

EE 2451/EE 81/10133 EE 801 — ELECTRIC ENERGY GENERATION, UTILIZATION AND CONSERVATION

(Regulation 2008)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is Hydrograph?

2. Mention the factors which determines the power in wind.

3. Define load curve and load duration curve.

4. List the disadvantages of low power factor.

5. Define the term MSCP and lamp efficiency.

6. What are the requirements of good lighting?

7. What is meant by resistance arc welding?

8. List a few applications of dielectric heating.

9. What are the features of electric traction?

10. Define Tractive effort.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Describe the general layout of steam power plant with neat diagram. (10)

(ii) Explain the principle and working of a pumped storage hydel plant. (6)

Or

(b) (i) Describe with neat sketch the construction and principle of operation used for tidal power. (8)

(ii) Explain the effect of distributed generation system in power system operation. (8)

12. (a) (i) A generating station has the following load cycle.

Time (Hours)	0 – 6	6 – 10	10 – 12	12 – 16	16 – 20	20 – 24
Load (MW)	40	50	60	50	70	40

Draw the load curve and find maximum demand, units generated per day, Average Load, Load factor and plant capacity factor. (10)

(ii) Explain how power factor improvement is done by using static capacitors. (6)

Or

(b) (i) Explain two part tariff. Also explain how the total cost is reduced in this type. (10)

(ii) Write a note on the importance of energy audit. (6)

13. (a) (i) State and prove laws of illumination. (8)

(ii) A drawing hall 30 × 15 × 5 m is to be provided with a general illumination of 120 Lux. Taking coefficient of utilisation as 0.5, depreciation factor as 1.4, determine the number of fluorescent tubes required, their spacing height, mounting height and total wattage. Take luminous efficacy of fluorescent tubes as 40 Lumen/Watt for 80 watts tube. (8)

Or

(b) (i) With neat diagram explain the construction and working of sodium lamp. (8)

(ii) Two lamp posts are 14 m apart and are fitted with 200 C.P. lamp each at a height of 5 m above the ground. Calculate illumination midway between them and illumination under each lamp. (8)

14. (a) (i) Explain the various types of resistance heating. (8)

(ii) An insulating material 2 cm thick and 150 sq.cm. in area is to be heated by dielectric heating. The material has permittivity of 4 and p.f. as 0.04. Power required is 200 watts and frequency of 30 MHz. Determine the voltage and the current that flows through the material. If the voltage were limited to 600V what will the frequency to get the same loss. (8)

Or

(b) With neat diagram explain the working of the different types of arc welding. (16)

15. (a) (i) Discuss and compare various arrangements of current collection used in traction. (8)

(ii) What are the various types of electric braking used in traction? Discuss in detail. (8)

Or

(b) (i) Explain about multimotor speed control. (8)

(ii) The maximum torque of a 440V, three phase four pole 60c/s IM is 400 N.m at a slip of 0.1. If the motor works at 50c/s, 400V supply, find the maximum torque, slip and the speed at which it occurs. Neglect stator impedance. (8)

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Question Paper Code : 66321

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2011.

Eighth Semester

Electrical and Electronics Engineering

EE 1451 — ELECTRIC ENERGY GENERATION UTILIZATION AND CONSERVATION

(Regulation 2004)

(Common to B.E. (Part-Time) Seventh Semester, Regulation 2005)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Indicate the difficulties in using Geothermal energy.

2. What is a tide?

3. Define the term tariff.

4. List the methods of improve power factor.

5. State any four advantages of electric heating.

6. What is meant by energy efficient lamps?

7. Sketch the speed-time curve for a sub-urban service.

8. List the factors affecting scheduled speed of a train.

9. Define continuous rating of a motor.

10. Suggest suitable drives for lifts and cranes.

PART B — (5 × 16 = 80 marks)

11. (a) With a neat diagram, explain the working of a wind electric power generating system. Also list the advantages and disadvantages of a wind energy conversion system. (16)

Or

(b) Write short note on :

(i) Concept of distributed generation

(ii) Difficulties associated with conventional power generation systems. (16)

12. (a) (i) What is the need for energy conservation? (8)

(ii) What are the various factors that influence the cost of production of electrical energy? (8)

Or

(b) (i) Describe the design for improvement of power factor using power capacitors. (8)

(ii) Discuss about power quality problems. (8)

13. (a) (i) State and explain the laws of illumination. (6)

(ii) Discuss about the various factors that affect the design of lighting system. (10)

Or

(b) (i) A 22 kW, single phase 220 V resistance oven employs circular Nichrome wire for its heating element. The wire temperature is not to exceed 1230°C and the temperature of the charge is 500°C. Calculate the size and the length of the wire required. Take radiating efficiency = 0.6 and specific resistance of the wire is 101×10^{-6} Ω cm. $\varepsilon = 0.9$. (10)

(ii) Write about welding transformer. (6)

14. (a) (i) Write about supply systems used in electric traction. (8)

(ii) A suburban electric train has a maximum speed of 65 km/hr. The scheduled speed including a station of stop of 30 secs is 43.5 km. If acceleration is 1.3 kmphps, find the value of retardation when the distance between the stations is 3 km. (8)

Or

(b) (i) Discuss the suitability of D.C. Motor for traction purpose. (8)

(ii) Write a brief note on recent trends in electric traction. (8)

15. (a) What is load equalization? How is it achieved in practice? Derive an expression for motor torque when load is increasing. (16)

Or

(b) (i) Describe various modern methods of speed control of industrial drives. (10)

(ii) Suggest suitable drives for textile mill. Justify your answer. (6)

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Question Paper Code : D 2211

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2010.

Eighth Semester

Electrical and Electronics Engineering

EE 1451 — ELECTRIC ENERGY GENERATION, UTILISATION AND CONSERVATION

(Regulation 2004)

(Common to B.E. (Part-Time) Seventh Semester Regulation 2005)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Give the principle of working of geothermal power generation.

2. State the advantages of MHD power generation.

3. Give any four objectives of tariff.

4. Define the term power quality.

5. State the laws of illumination.

6. What are the properties of heating element materials?

7. What type of motor is used for electric traction? Why?

8. Give any two advantages of electric traction.

9. Define continuous rating of motor.

10. Why is induction motor commonly preferred drive for industrial application?

PART B — (5 × 16 = 80 marks)

11. (a) With a neat block diagram, explain the main parts and working of a wind electric system. (16)

Or

(b) (i) Write a note on distributed generation. (8)

(ii) Explain the main components and working of Tidal power plant. (8)

12. (a) Write short notes on :

(i) Need for electrical energy conservation (6)

(ii) Energy management (5)

(iii) Energy auditing. (5)

Or

(b) Explain the different methods of power factor improvement. (16)

13. (a) (i) With necessary equations. describe the design of heating element. (10)

(ii) Write about welding transformer and its characteristics. (6)

Or

(b) (i) Discuss the various steps involved in the design of illumination system. (8)

(ii) Discuss the various aspects of residential lighting and street lighting. (8)

14. (a) (i) Discuss the recent trends in electric traction. (8)

(ii) Describe the different types of supply systems used for railway electrification. (8)

Or

(b) (i) Write about mechanics of train movement. (8)

(ii) Discuss the working of D.C. series motor control in detail. (8)

15. (a) Explain steady state and transient characteristics of drives. (16)

Or

(b) What do you understand by the term load equalization? Derive the expression for motor torque in case of motor fitted with the flywheel when load is increasing. (16)

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K 4287

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2009.

Eighth Semester

Electrical and Electronics Engineering

EE 1451 — ELECTRIC ENERGY GENERATION, UTILISATION AND CONSERVATION

(Regulation 2004)

(Common to B.E. (Part Time) Seventh Semester, Regulation 2005)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Give two examples of renewable energy sources.

2. What is the minimum wind velocity required for power generation through wind mill?

3. State a few methods of improving the power factor in the industry.

4. What are the different type of tariffs?

5. Define Illumination.

6. State the advantages of electric heating.

7. List two merits of series-parallel starting of traction motors.

8. What are the factors affecting specific energy consumption?

9. What is load equalisation?

10. Give the merits and demerits of group drive.

PART B — (5 × 16 = 80 marks)

11. (a) Describe briefly the generation of electrical power by conventional methods. (16)

Or

(b) Describe with a neat sketch the working of a wind energy conversion system. (16)

12. (a) (i) Explain briefly about different energy auditing methods in use. (8)

(ii) Bring out the importance of energy conservation measures in electric energy consuming industry. (8)

Or

(b) A generating station has the following daily loads.

0 to 6 hrs	4000 kw
6 to 8 hrs	3000 kw
8 to 12 hrs	8000 kw
12 to 14 hrs	2000 kw
14 to 18 hrs	7500 kw
18 to 20 hrs	3000 kw
20 to 24 hrs	4500 kw

Sketch the load duration curve and determine the load factor assuming the capacity of the plant 11,000 kw. (16)

13. (a) (i) With a neat diagram explain the working of a low pressure mercury vapour lamp. (8)

(ii) A lamp of 500 C.P. is hung at the centre of a room 8×6 m^2 at a height of 3m from the floor. Calculate the maximum and minimum illumination produced and mention the places where it occurs. (8)

Or

(b) A 30 Kw, 3 phase, 440 V resistance oven is to employ nichrome strip 0.025 cm thick for the three star connected heating elements. If the wire temperature is to be 1100°C and that of charge is to be 700°C Estimate a suitable width for the strip. Assume resistivity as 1.016×10^{-6} Ωm, emissivity 0.9 and radiating efficiency 0.5. (16)

14. (a) (i) Draw a typical speed-time curve and explain its salient features. (8)

(ii) An electric train is accelerated at 1.5 kmphps and is braked at 3 kmphps. The train has an average speed of 45 kmph on a level track of 1500 metres between stations. Determine the maximum speed and distance travelled before applying brakes. (8)

Or

(b) A locomotive accelerates a 350 tonne train up a gradient of 1 in 100 at 0.8 kmphps. Assuming coefficient of adhesion to be 0.25 determine the minimum adhesive weight of the locomotive. Assume train resistance 44.5 Newtons/tonne and allow 10% for rotational inertia. (16)

15. (a) Discuss in detail the various factors governing the selection of a motor for a particular application. Explain with an example. (16)

Or

(b) Discuss the modern methods of speed control of industrial drives. (16)