Reg. No. :

Question Paper Code: 47304

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2018

Seventh Semester

Electrical and Electronics Engineering

14UEE704 - ELECTRIC POWER UTILIZATION AND ENERGY CONSERVATION

(Regulation 2014)

Duration: Three hours   Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. The voltage used for suburban train in D.C system is usually

    (a) 12V   (b) 24V   (c) 220v   (d) 600V to 750V

2. The unit of luminous flux is

    (a) Steradian   (b) Candela   (c) Lumen   (d) Eddy current

3. Candela is the unit of which of the following quantity

    (a) Wave length   (b) Luminous intensity (c) Luminous flux   (d) Frequency

4. The lighting which is mainly used for indoor light decoration purpose is

    (a) Direct lighting   (b) Indirect lighting

    (c) Semi-direct lighting   (d) Semi-indirect lighting

5. The power factor will be leading in the case of

    (a) Induction heating   (b) Resistance heating

    (c) Dielectric heating   (d) Electric arc heating

6. A filler metal in the form of a wire or rod used in the welding process is known as

    (a) Crater   (b) Clamp   (c) Flux   (d)Electrodes

7. The value of solar constant is

    (a) 1347 W/m^2 (b) 1357 W/m^2 (c) 1367 W/m^2 (d) 1377 W/m^2

8. A concentration type solar collector

    (a) First absorbs the radiation and then increases its concentration

    (b) Increases the density of solar radiation before absorbing it

    (c) Dilutes the density of solar radiation before absorbing it

    (d) Increases the intensity of solar radiation and then reflects it back

9. The range of wind speed suitable for wind power generator is

    (a) 0 to 5 m/s   (b) 5 to 25 m/s   (c) 25 to 50 m/s   (d) 50 to 75 m/s

10. Which of the following is a renewable energy source?

    (a) Bitumen   (b) Wind Energy

    (c) Coal   (d) Natural Gas

PART - B (5 x 2 = 10 Marks)

11. Define Tractive Effort..

12. Define Railway Electrification.

13. Define Lumen.

14. Define solar constant.

15. Distinguish between horizontal axis and vertical axis wind turbines.

PART - C (5 x 16 = 80 Marks)

16. (a) What are the various types of Electric breaking used in traction? Discuss in detail..

                                                                (16)

Or

    (b) Explain in detail about

                        (i) Traction motor control
                        (ii) Track Equipment
                        (iii) Collection.

17. (a) (i) Describe the construction and working of sodium vapour lamp. (8)

(ii) Explain how flood lighting is provided and the design considerations involved.(8)

Or

(b) Explain the various factors to be taken into account for designing street lighting and flood lighting. (16)

18.(a) (i)Explain the working principle of induction heating. Explain the working, advantages and drawbacks of direct core type induction furnaces. (10)

(ii) Discuss the points to be considered while selecting the frequency for dielectric heating. (6)

Or

(b) (i) Explain the method, advantages, disadvantages and applications of carbon arc welding. (8)

(ii) Draw the schematic of laser welding and explain its operation and advantages. (8)

19. (a) (i) Describe with relevant diagram, sun's altitude, zenith and azimuth angles for solar radiation analysis.. (8)

(ii) Obtain the expression for the calculation of transmissivity of cover system of flat plate collectors. (8)

Or

(b) (i) Discuss the various thermal losses occur in solar collector and also obtain the energy balance equation of a solar collector. (8)

(ii) Discuss the advantages and disadvantages of concentrating type collectors over flat-plate type solar collectors. (8)

47304

20. (a) (i) Explain the basic components of wind energy conversion system with relevant block diagram. (10)

(ii) Discuss the factors while selecting the site for wind energy power plants. (6)

Or

(b) With the help of vector diagram of forces, illustrate the principle of aero turbine rotation by making an analysis on aerodynamic forces acting on the blades. (16)

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