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Er. PERUMAL MANIMEKALAI COLLEGE OF ENGINEERING
DEPARTMENT OF ELECTRICAL AND ELECTRONICS
(Accredited by NAAC with 'B++' Grade)
MODEL EXAM - II
SEMESTER: VIII
### EE6801 – ELECTRIC ENERGY GENERATION, UTILIZATION AND CONSERVATION

Time: 03 Hours.   Maximum: 100 Marks

PART – A (10 x 02 = 20 Marks) Answer ALL Questions

1.	List the requirements of electric traction.	2	CO1, Applying
2.	Define Tractive effort.	2	CO1, Analyzing
3.	Define luminous efficiency	2	CO2, Understanding
4.	Specify any four energy efficient lamps.	2	CO2, Evaluating
5.	Define resistance arc welding?	2	CO3, Analyzing
6.	Differentiate between core type and coreless type induction furnace.	2	CO3, Remembering
7.	What are solar concentrators?	2	CO4, Applying
8.	Define solar constant	2	CO4, Remembering
9.	Compare the relative features of HAWT and VAWT	2	CO5, Analyzing
10.	Define Yaw control and Pitch control.	2	CO5, Evaluating

PART – B (05 x 13 = 65 Marks) Answer ALL Questions

11.a i)What are the factors influencing the choice of electric drive (5) CO1, Evaluating

ii)Analyze the typical speed time curve for main line service and to suburban services in electric traction. Find the equation for distance travelled for main line system. (8) CO1, Analyzing

(or)

11.b i)Illustrate the mechanism of Train movement (5) CO1, Understanding

ii)A train weighing 203 tonnes accelerates uniforms from the rest to a speed of 45kmph up a gradient of 1 in 500, the time taken being 30 seconds. The power is then cut off the coasts down as uniform gradient of 1 in 1000 for a period of 40 seconds when brakes are applied for period of 15 seconds so as to bring the train uniformly to the rest on this gradient. Estimate(i)The maximum power output from the driving axle.(ii)The energy taken from the conductor rails in Kwh. Assume efficiency is 60%, traction effort is 44 Newton/Tonne at all speed, rotational inertia is 10%. (8) CO1, Analyzing

12.a i)Discuss the laws of illumination and its limitation in actual practice. CO2, Understanding

ii)Workshop dimension 30 metre X 30 metre is illuminated by 30 Nos. of 400 Watts Metal Halide lamp. The luminous efficacy of metal Halide lamp is 90 lumens/Watt. The depreciation factor is 1.2 and utilization factor is 0.6. Calculate the illumination level of the working (8) CO2, Analyzing
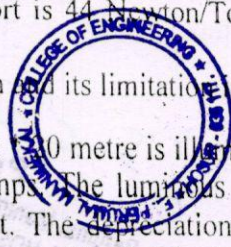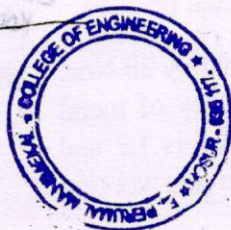
plane

(or)

12. b i) Explain the construction and working of mercury vapour lamp (5) CO2, Understanding

ii) A lamp of 500 c.p. is placed at the centre of a room 20*10*5 m. (8) CO2, Analyzing
Calculate the illumination in each cornoer of the room.

13. a i) Draw a neat sketch of induction furnace and generalize its works (5) CO3, Remembering

ii) An insulating material 2cm thick and 150sq.cm. in area is to be (8) CO3, Analyzing
heated by dielectric heating. The material has permittivity of 4 and p.f.
as 0.04. Power requires is 400watts and frequency of 40MHz. Measure
the voltage and current that will flow through the material. If the
voltage were limited to 700 volts, what will the frequency to get the
same loss?

(or)

13. b i) Explain any three types of resistance welding (5) CO3, Remembering

ii) Calculate the efficiency of a high frequency induction furnace (8) CO3, Analyzing
which takes 12 minutes to melt 1.3Kg of Aluminium. The input to
the furnace being 4.5kW and the initial temperature is 15°C. Take
specific heat of Aluminium is 880J/Kg/°C, melting point of Al
is 660°C and latent heat of fusion of Al is 32KJ/Kg.

14. a i) Define solar constant and collector efficiency. Also explain the (7) CO4, Understanding
solar radiation geometry at earth surface
ii) Estimate the average solar radiation (6) CO4, Remembering

(or)

14. b i) Explain the working principle of various types of concentrating (7) CO4, Understanding
solar collectors with neat sketch.
ii) Explain advantages and disadvantages of non concentrating (6) CO4, Remembering
collectors

15. a With the help of block diagram, discuss the functions of various (13) CO5, Remembering
components of a WECS.

(or)

15. b Explain HAWT and VAWT with neat diagram (13) CO5, Analyzing

PART – C (1 x 15 = 15 Marks)

16. a i) Illustrate the design procedure of heating element. (5) CO3, Remember
ii) A 20kw, 230V, 1-phase resistance oven employs nickel-chrome wire (10) CO3, Understanding
for its heating elements. If the wire temperature is not to exceed 1000 0
C and the temperature of the charge is to be 600 0 C, calculate the
diameter and length of the wire. Assume radiating efficiency to be 0.6
and emissivity as 0.9. For nickel-chrome resistivity is 1.016x10 -6 Ω/m

(OR)

16. b i) Explain the working of a sodium vapor lamp with in a neat sketch (5) CO2, Analyzing
ii) A lamp of 250 c.p is placed 2m below a plane mirror that (10) CO2, Understanding
reflects 60% of light falling on it. The lamp is hung at 6m above
ground. Find the illumination at a point on the ground 8m away
from the point vertically below the lamp.