Total No. of Questions : 4]

SEAT No. :

PE-523

[Total No. of Pages : 2

[6577]-4
F.E. (Insem.)
SYSTEMS IN MECHANICAL ENGINEERING
(2019 Pattern) (Semester - I) (102003)

Time : 1 Hour] *[Max. Marks : 30*

Instructions to the candidates :

1) ***Answer Q1 or Q2 and Q3 or Q4.***
2) ***Figures to the right side indicate full marks.***
3) ***Assume suitable data, wherever necessary.***

Q1) a) Explain working of thermal power plant with neat sketch. State its advantages and disadvantages. **[7]**

b) Write a short note on reciprocating compressor. The input power supplied to the compressor is 10 kW and the compressor efficiency is 75%. Find out the work done by compressor. **[8]**

OR

Q2) a) Explain with neat sketch the working of tidal power plant. Give any two advantages and disadvantages of tidal power plant. **[7]**

b) Draw the neat sketch of wind power plant. State any two advantages and disadvantages.

The air at a velocity of 30 km/hr flows over the wind turbine of blade length of 60 m. If the turbine efficiency is 60%, find out; **[8]**

i) Wind power

ii) Power output from the turbine (wind density 1.2kg/m^3)

Q3) a) Classify the steam generators. Differentiate between the fire tube and water tube boiler. **[7]**

b) Explain the three modes of heat transfer. Determine the rate of heat transfer through the wall of thickness 10 cm and surface area 1 m^2 with inner and outer surface temperatures 300 degree Celsius and 50 degree Celsius respectively. Consider the thermal conductivity of the wall as 15 W/m.K. **[8]**

OR

P.T.O.

Q4) a) Explain with neat sketch the working of CI engine. Differentiate between the heat pump and heat engine (any two points). **[8]**

b) State Clausius statement of second law of thermodynamics. Calculate the COP of the refrigerator if the heat absorbed from the refrigerated space is 5 kW and work input of 1.5 kW. What will be the COP if the same refrigerator is used as heat pump. **[7]**

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