[6268]-263

S.E. (Automobile & Mechanical Engineering) (Insem)
APPLIED THERMODYNAMICS
(2019 Pattern) (Semester - IV) (202048)

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

Instructions to the candidates:

1) *Answer Q.1 or Q.2, Q.3 or Q.4.*
2) *Neat diagrams must be drawn wherever necessary.*
3) *Figures to the right side indicate full marks.*
4) *Assume Suitable data if necessary.*
5) *Use of logarithmic tables slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.*

Q1) a) State the difference between Vapour compression Cycle and Vapour absorption cycle? **[7]**

    b) Air is supplied to a conditioned room at 17°C DBT and 50% RH. The air leaves the room at 25°C DBT during which RH increased by 5%. **[8]**

Find the Following Properties of air

    i) DPT of supply air

    ii) Change in enthalpy during the process

    iii) Change in specific humidity during the process.

Show it on psychometric chart.

OR

Q2) a) Define the following terms; **[7]**

    i) Saturated air

    ii) Wet bulb depression

    iii) Relative humidity

    iv) Dew point temperature

    b) In a standard vapor compression refrigeration cycle, operating between an evaporator temperature of –10°C and a condenser temperature of 40°C, the enthalpy of the refrigerant, at the end of the compression is 220 kJ/kg. Show the cycle diagram on T-s plan. **[8]**

P.T.O.

T(°C)	P(bar)	hf(kJ/kg)	hg(kJ/kg)
–10	2.191	26.85	183.1
40	9.607	74.53	203.1

Calculate:

i)   COP of the cycle

ii) The refrigerant capacity

iii) Compressor power

Assuming a refrigerant flow rate of 1kg/min.

Q3) a) Discuss the following engine terminology with a neat sketch **[8]**

　　i)   Top and Bottom Dead centre (T. D. C. and B. D. C.)

　　ii) Clearance Volume (Vc)

　　iii) Swept Volume (Vs)

　　iv) Compression ratio (r)

　b) Draw theoretical and actual P-V diagrams for an Otto cycle and list the assumptions made. **[7]**

OR

Q4) a) Enlist 4 components used in IC engine and state their function, material and manufacturing process. **[8]**

　b) State comparison between Air standard with Fuel and Actual cycle. **[7]**

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