Total No. of Questions : 4]

SEAT No. :

PF256

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Apr-26/SE/Insem-315
S.E. (Automobile & Mechanical) (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 and Q.3 or Q.4.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Assume suitable data if necessary.***
5) ***Use of logrithmic tables slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.***

Q1) a) Explain the factors affecting the performance of a Vapour Compression System with p-h diagram. **[8]**

i) Effect of suction pressure

ii) Effect of superheating

iii) Effect of suction temperature and condenser temperature

b) In a summer air conditioner, an atmospheric air enters at 30ºC DBT and 18ºC WBT. The air leaves the air conditioner at 20ºC DBT without changing the moisture content. Find the following; **[7]**

i) Initial enthalpy and specific humidity of air

ii) Final relative humidity of air and its WBT

iii) Sensible heat removed per kg of air.

OR

Q2) a) Explain with the help of psychrometric chart following process; **[8]**

i) Humidification

ii) Dehumidification

iii) Sensible Cooling with humidification

iv) Sensible heating with dehumidification

P.T.O.

b) The temperature limits of an ammonia refrigerating system are 25ºC and –10ºC. If the gas is dry at the end of compression, calculate the coefficient of performance of the cycle, assuming no undercooling of the liquid ammonia. Use the following table for properties of ammonia. Draw (T-S) diagram. **[7]**

Temperature °C	Liquid heat kJ/kg h_f	Latent heat kJ/kg h_{fg}	Liquid Entropy kJ/kg. K S_f	Vapour Entropy kJ/kg. K S_g
25	298.9	1166.94	1.1242	5.038
–10	135.37	1297.68	0.5443	5.475

Q3) a) Explain with neat sketch Valve timing diagram for 4 stroke SI engine and 4 stroke CI engine. **[8]**

b) Give the limitations of air standard cycle. Explain with suitable graphs, the effect of dissociation on maximum temperature and brake power. How does presence of CO affect dissociation? **[7]**

OR

Q4) a) State classification of IC engines on the basis of eight different factors. **[8]**

b) Briefly explain the following Losses in an actual fuel- air cycle; **[7]**

i) Friction Losses

ii) Time Losses

iii) Blow down Losses

iv) Pumping Losses