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**Total No. of Pages: 02**  
**Total No. of Questions: 09****B. Tech. (Sem.-6<sup>th</sup>)**  
**AUTOMOTIVE HEATING, VENTILATION & AIRCONDITIONING****Subject Code: BTAE-602****Paper ID: [A2381]****Time: 3 Hrs.****Max. Marks: 60****INSTRUCTIONS TO CANDIDATE:**

- 1) *Section-A is Compulsory.*
  - 2) *Attempt any Four questions from Section-B.*
  - 3) *Attempt any Two questions from Section-C.*
- Assume any missing data suitably. Steam table is allowed.*

**SECTION-A****(10x2=20)**

Q.1. Write briefly:

- a) Write any two applications of air-conditioning.
- b) What is refrigerant
- c) What is Air Conditioning?
- d) Define Dew point temperature.
- e) What is C.O.P.?
- f) What is sensible heat factor?
- g) What is a comfort chart?
- h) Define Tonne of refrigeration.
- i) What are various types of drying agents and antifreeze solutions commonly employed in refrigeration and air conditioning systems?
- j) Enumerate the alternative refrigerants proposed for the R-12 and R-22 refrigerants.

**SECTION -B****(4x5=20)**

2. Write a short note on human requirements of comfort. Define the term effective temperature and discuss the construction of comfort chart showing the comfort zone human comfort.
3. Describe the effect of traditional chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs) on the environment.
4. Differentiate between working of package and central air conditioning systems.

5. 800 m<sup>3</sup>/min of circulated air at 22<sup>0</sup>C DBT and 10<sup>0</sup>C DPT to be mixed with 300 m<sup>3</sup>/min of fresh air at 30<sup>0</sup>C DBT and 50% RH Determine (i) enthalpy (ii) specific volume (iii) humidity ratio (iv) Dew point temperature.
6. List the components of cooling load estimate.

**SECTION –C**

**(2x10=20)**

7. Explain in brief trouble shooting of air conditioning system.
8. An air conditioned auditorium is to be maintained at 27<sup>0</sup>C DBT of 60% RH. The ambient condition is 40<sup>0</sup>C and 30<sup>0</sup>C WBT. The total sensible heat load is 100,000 KJ/hr and the total latent heat load is 40,000 KJ/hr. 60% as the return air is circulated and mixed with 40% as make up air after cooling coil. The condition as the air leaves the cooling coil is at 18<sup>0</sup>C. Determine (i) room sensible heat factor (ii) condition of air entering auditorium (iii) Amount of makeup air (iv) Apparatus dew point (By bass factor as cooling coil).
9. Give the brief description of the following refrigeration and air conditioning equipment:  
(a) Rotary compressors  
(b) Flooded expansion valve

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