

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. Sem. – IInd - Examination – June/July- 2011

Subject code: 1721003

Subject Name: Advanced Air conditioning

Date: 27/06/2011

Time: 10:30 am – 01:00 pm

Total Marks: 70

Instructions:

- 1. Attempt all questions.**
- 2. Make suitable assumptions wherever necessary.**
- 3. Figures to the right indicate full marks.**
- 4. Use of student's own tables and charts are allowed.**

- Q.1 (a)** Explain (i) Air dew point (ii) Coil apparatus dew point (iii) Dehumidified air quantity (iv) Effective surface temperature (v) GSHF (vi) fogged air (vii) ESHF **07**
- (b)** The following data is available for a conditioned space: **07**
Outside design condition : 35 °C DBT, 28 °C WBT
Inside design condition : 26 °C DBT , 50 % RH
RSH = 46.5 kW, RLH = 9.3 kW, Coil bass pass factor is 0.2.
Calculate coil capacity when all outside air is supplied.
- Q.2 (a)** A window is placed in an air conditioned restaurant at Ahmedabad. The total glass area is 5 m². There are 4 windows. Outside design condition is 40°C DBT and 22 % RH, 24 °C DBT and 55 % RH. Assume suitable overall heat transfer coefficient and shading factor. Calculate ICL at 2 PM. **07**
- (b)** What is the difference between infiltration and ventilation? Explain how you will calculate load due to infiltration and ventilation. **07**
- OR**
- (b)** Write short note on Methods of human body temperature regulation. **07**
- Q.3 (a)** Write classifications of the air conditioning systems based on fluid flow, component location and arrangement? **07**
- (b)** Describe dual duct system with reheat cycle with psychrometric analysis. **07**
- OR**
- Q.3 (a)** Describe with neat sketch all water system. Mention the advantage and disadvantage of all water system **07**
- (b)** Describe with neat sketch construction, working and maintenance of forced draught cooling tower. **07**
- Q.4 (a)** Calculate the size of the rectangular duct system shown in figure-1 by equal friction method. **07**
- (b)** Explain fan characteristics of backward curve centrifugal fan **07**
- OR**
- Q.4 (a)** Enumerate the various dynamic losses which take place and how loss of pressure due to them is accounted? **07**

- (b) Fan delivers $350 \text{ m}^3/\text{min}$ at SP of 30 mm of water pressure consumes 1 kW at 1000 R.P.M. If motor can take 20% of overload, determine safe speed at which fan can be run? What will be SP and discharge of fan at that speed? **07**

- Q.5** (a) Explain RC curve and its use. **07**
 (b) Explain factors affecting grille performance. Also write difference between grille and diffuser. **07**

OR

- Q.5** (a) What is ADPI? Explain design procedure for outlet selection with the help of ADPI. **07**
 (b) Write a short note on “noise reduction for fan.” **07**

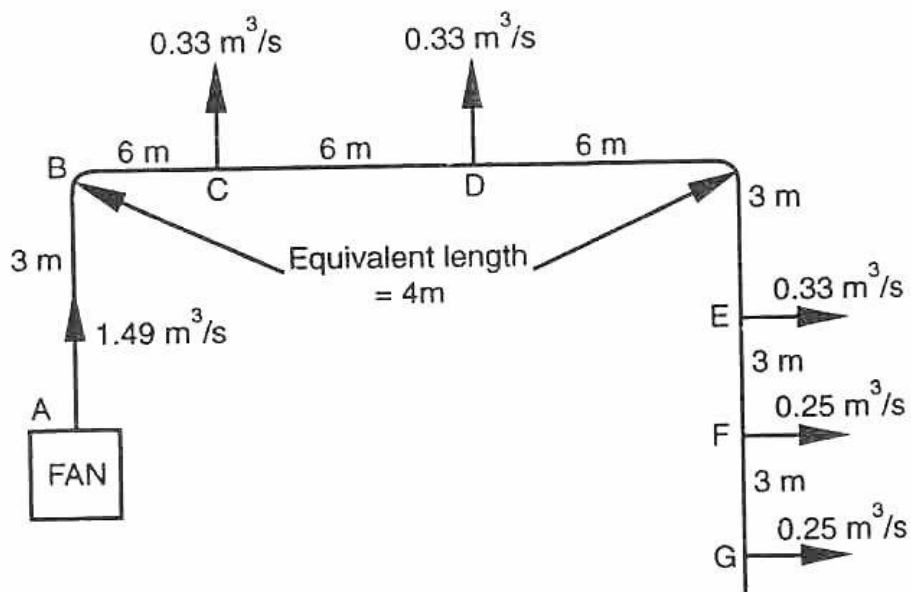


Figure 1
