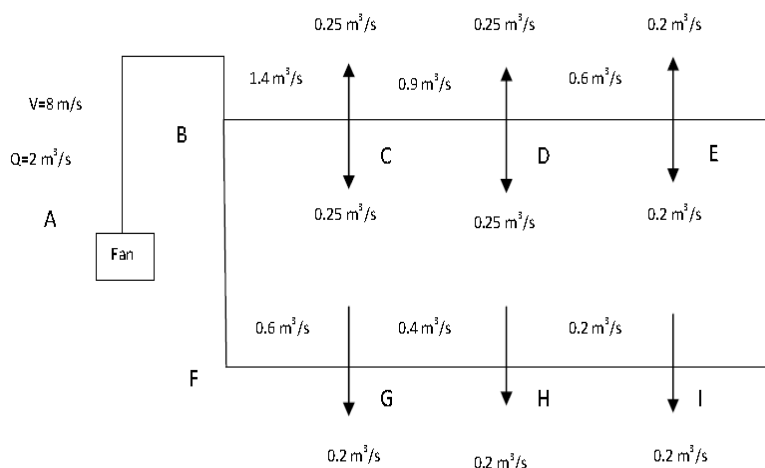


GUJARAT TECHNOLOGICAL UNIVERSITY**M.E –IIst SEMESTER–EXAMINATION – JULY- 2012****Subject code: 1722103****Date: 10/07/2012****Subject Name: Major Elective II - Advanced Air conditioning****Time: 10:30 am – 13:00 pm****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) Describe 'By-Pass Factor' and explain its importance in designing of an air conditioning system. **07**
 (b) Discuss factors which affecting the air conditioning system selection. **07**
- Q.2** (a) An air conditioning system comprising of filter, cooling coil, fan and distribution system uses only fresh air for the purpose of maintaining comfort conditions in summer. The following data is available: RSH=11.63kW, RLH=2.33 kW.
 Outside design condition: 28⁰ C DBT, 20⁰ C WBT, inside design condition: 21⁰ C DBT, 50% RH. Temperature of air entering the room = 11⁰ C.
 Calculate (1) RSHF (2) Coil ADP (3) Room ADP **07**
 (b) Discuss factors affecting the performance of cooling tower **07**
- OR**
- Q.3** (b) Write short note "Central Air Conditioning System". **07**
 (a) Discuss factor for selection of air outlet. **07**
 (b) Given figure shows the duct layout, find the sizes of various duct using equal friction method. **07**

**OR**

- Q.3** (a) Explain equal friction method for duct design. **07**
 (b) Compare the performance of FC, BC, RC fans using characteristic curves. **07**
- Q.4** (a) Discuss the procedure for selection of an outlet using nomograph. **07**
 (b) Explain general rule & procedure in duct design. **07**

OR

- Q.4** (a) Prove that the diameter of circular duct from rectangular duct is given by **07**

$$D_e = 1.265 [a^3 b^3 / (a+b)]^{1/5}$$

- Q.4** (b) A centrifugal fan has a circular inlet duct 450 mm diameter and a rectangular duct of 450 mm × 375 mm. The static pressure at the fan inlet is 125 Pa and the static pressure at the fan outlet is 250 mm when the fan delivers 110 m³/min and absorbs 1 kW power. Assume standard air, calculate (1) total pressure at fan inlet and outlet, (2) fan total pressure and fan static pressure, and (3) fan total efficiency and fan static efficiency. **07**
- Q.5** (a) Explain test methods to measure efficiencies for air filters. **07**
 (b) Explain testing of desert cooler as per BIS. **07**

OR

- Q.5** (a) What is clean room condition? What are its typical applications? **07**
 (b) Explain different methods of noise reduction. **07**
