Reg. No.									

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

(A constituent Institution of MAHE, Manipal)

VII SEMESTER B.TECH (ELECTRICAL & ELECTRONICS ENGINEERING)

MAKE UP EXAMINATIONS, MAY 2018

SUBJECT: BUILDING AUTOMATION SYSTEMS [ELE 4016]

REVISED CREDIT SYSTEM

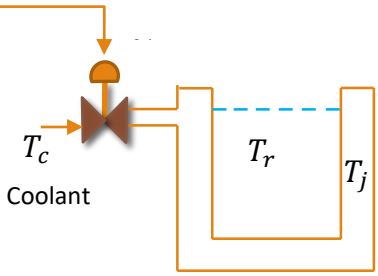
Time: 3 Hours **Date: 10 MAY 2018** **Max. Marks: 50**

Instructions to Candidates:

- Answer **ALL** the questions.
- Missing data may be suitably assumed.

1A. Explain any two implementation issues of derivative term in a PID controller. How are the issues addressed? ***(05)***

1B. What are the drawbacks of feedback control structure? How are they addressed using feedforward control? Configure cascade control structure to control the reactor temperature for the system given in Fig. 1B



$T_C - Coolant\ Temperature$
$T_r - Reactor\ Temperature$
$T_j - Jacket\ Temperature$

Fig. 1B ***(05)***

2A. What is relative humidity? What is its importance? How is dry bulb temperature and wet bulb temperature indicate relative humidity? ***(04)***

2B. With neat diagram, explain the working of Coriolis mass flow meter. Mention any two major advantages of this meter ***(04)***

2C. How does Intrusion Detection System work? Give examples ***(02)***

3A. With neat diagrams/blocks, explain how CAV and VAV systems work ***(04)***

3B. A heating coil raises the temperature of air flowing through it from 15°C to 40°C. If 120 kg per minute of air flow through the heater, how much heat must be supplied to the air per hour? (Specific heat of water = 4.18 kJ/kg. K.) ***(02)***

3C. Solve the following using psychrometric chart

i) The air emerging from a dryer, with an exit temperature of 30°C, passes over a surface which is gradually cooled. It is found that the first traces of moisture appear on this surface when it is at 21°C. Estimate the relative humidity of the air leaving the dryer

ii) An air mixture supplied to a conditioned room consists of 40% by-passed return air withdrawn from the conditioned room, and 60% chilled air at 13°C. The conditioned room is maintained at 25°C. Find the resulting dry bulb temperature of the mixture ***(04)***

4A. Write a short note on daylight matrices ***(04)***

4B. Write a short note on DALI. Mention its advantages ***(04)***

4C. What is a biometric security system? How are they advantageous over other security systems? ***(02)***

5A. What are the factors affecting visual comfort in a building? ***(04)***

5B. Draw the architecture of building management system ***(02)***

5C. What are the factors that affect development of fire? In which regions do the dominant wavelengths of fire exist? ***(04)***

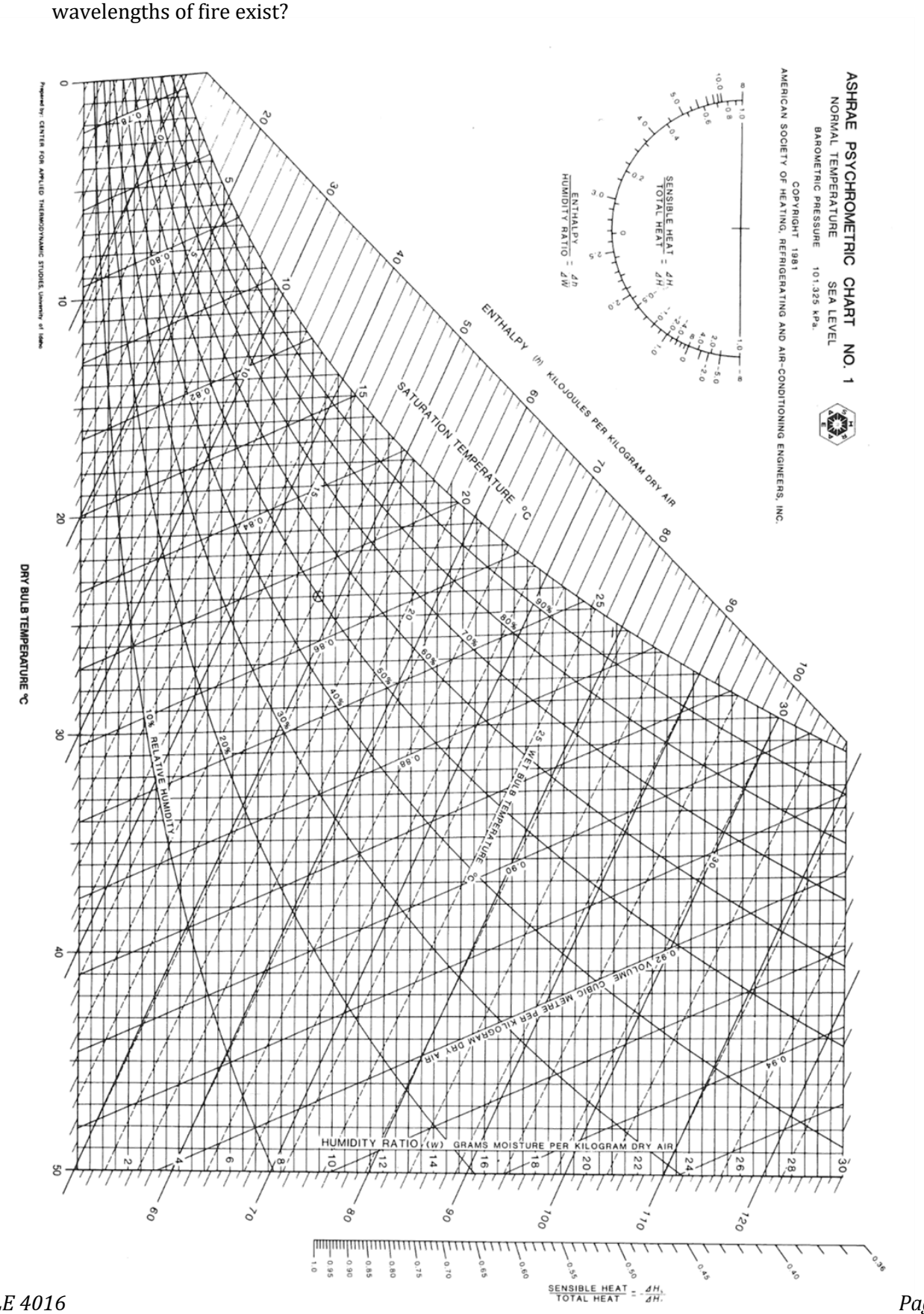


Chart 1b