Seat No.: _____   Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER–VI(NEW) – EXAMINATION – SUMMER 2019

Subject Code:2164002   **Date:14/05/2019**

Subject Name:Utilities for Civil Infrastructure

Time:10:30 AM TO 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. **Q.1 is compulsory.**

			Marks
Q.1	(a)	Explain following network utility command with an example: Ipconfig, ping, tracert.	03
	(b)	Show the functionality of following network Utilities 1. Ping 2. Ipconfig	04
	(c)	Explain following, 1) Duct, 2) Elements of fire and classes of fire, 3) Building lifts, 4) Graphical representation: Types of heat gain in space.	07
Q.2	(a)	What do you mean by pipe fitting and mention various types of distribution network.	03
	(b)	What do you mean by per capita demand? Explain the factors affecting per capita demand.	04
	(c)	Using the given information find the population of city in 2030 and 2080 using arithmetic increase method, geometric increase method and incremental increase methods.	07

Year	1910	1920	1930	1940	1950	1960	1970
Population	23078	65900	92600	102300	134000	170070	210087

OR

	(c)	The drainage area of one sector of a town is 12 hectares. The classification of the surface of this area is as follows:	07

Percent of total surface area	Type of surface	Coefficient of runoff
20%	Hard Pavement	0.85
20%	Roof surface	0.80
15%	Unpaved street	0.20
30%	Garden and Lawn	0.20
15%	Wooded area	0.15

If the time of concentration for the area is 30 minutes, find the maximum runoff.

Use the formula: $R = \dfrac{900}{t+60}$

Q.3	(a)	You have been asked to design digital classroom. List out the functionalities which can be provided to make it possible.	03
	(b)	What is GPS? What are its applications?	04
	(c)	Briefly explain twisted pair, coaxial cable and fiber optics cables.	07

OR

Q.3	(a)	Briefly explain Hub, switch and Modem.	03
	(b)	Write brief short note on RFID.	04
	(c)	Discuss OSI reference model.	07

Q.4	(a)	What are the types of electrical welding used in industry?	03
	(b)	What are the different methods of laying underground cable?	04
	(c)	Describe different types of UPS system.	07

OR

Q.4	(a)	What is power modulator?	03
	(b)	What are the different types of Electrical heating?	04
	(c)	Describe different types of hydro power plants with diagrams.	07

Q.5	(a)	What is air conditioning? Mention human thermal comfort conditions.	03
	(b)	Enlist the basic types of firefighting systems. Explain any one in detail.	04
	(c)	The atmospheric air at 30°C dry bulb temperature and 75% relative humidity enter a cooling coil at the rate of 200 m^3/min. The coil dew point temperature is 14°C and the bypass factor of the coil is 0.1.	07

Determine:
1. The temperature of air leaving the cooling coil
2. The capacity of the cooling coil in tonnes of refrigeration and in kilowatt
3. The amount of water vapour removed per minute
4. The sensible heat factor for the process.

Note: you need to attach psychrometric chart with marked process.

OR

Q.5	(a)	Differentiate between Building lifts vs. Escalators	03
	(b)	Dry bulb temperature, Wet bulb temperature, Dew point temperature, Relative humidity	04
	(c)	The main air supply duct of an air conditioning system is 800 mm*600 mm in cross section, and carries 300 m^3/min of standard air. It branches into two ducts of cross section 600 mm*500 mm and 600 mm*400mm. If the mean velocity in the larger branch is 480 m/min,	07

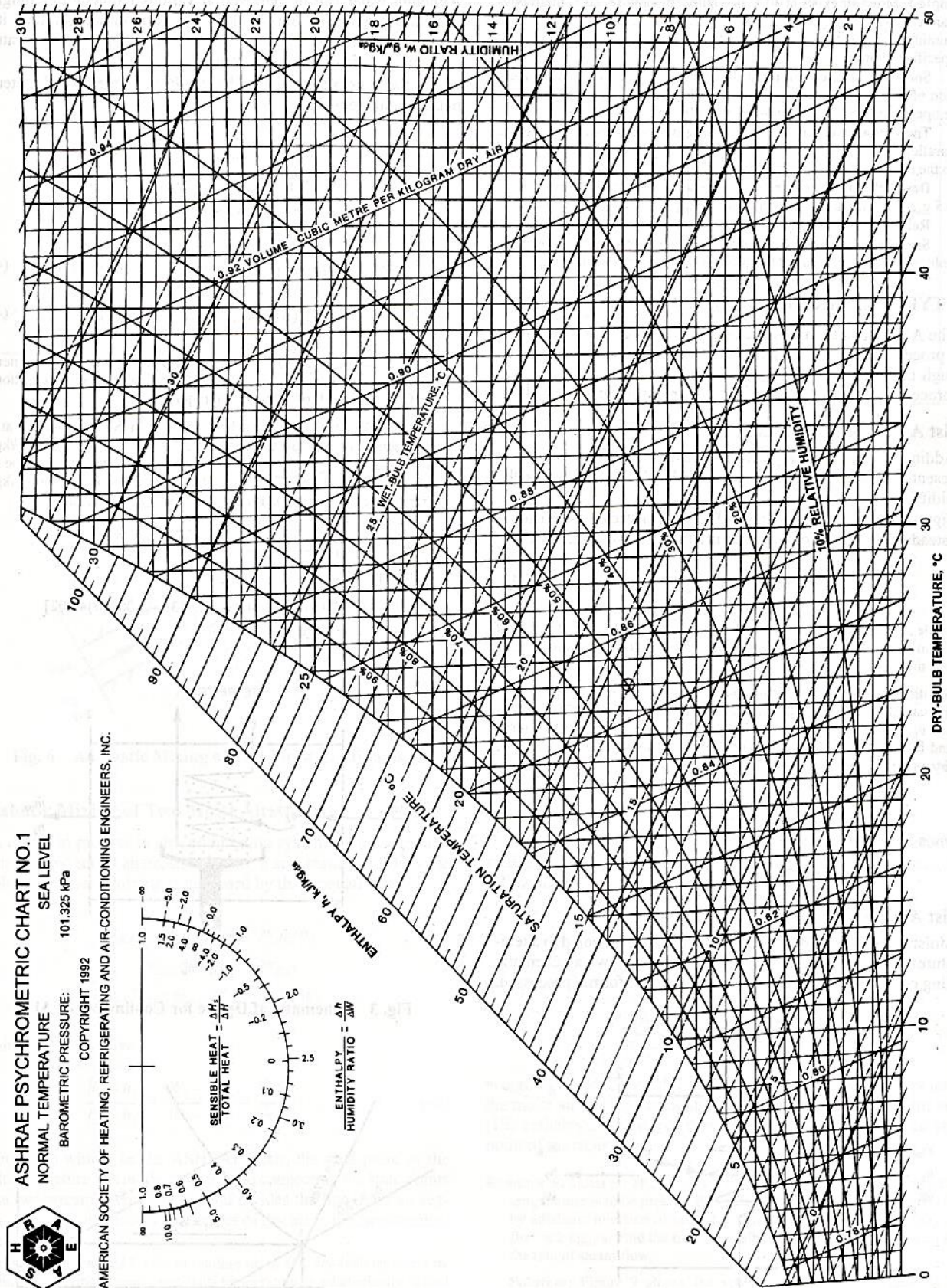Find the, 1) Mean velocity in the main duct and the smaller branch, and 2) mean velocity pressure in each duct.

Fig. 1   ASHRAE Psychrometric Chart No. 1