BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-3/T-2   B. Arch Examinations 2019-2020

Sub: **ARCH 335** (Architecture of Bengal)

Full Marks: 140   Time: 3 Hours

USE SEPARATE SCRIPTS FOR EACH SECTION

The figures in the margin indicate full marks

SECTION – A

There are **FOUR** questions in this section. Answer **Q. No. 1** and any **TWO** from the rest.

1.   Write short notes on any two from the followings: **(15 × 2 = 30)**

a. Eklakhi tomb

b. Kantajeer Navaratna Temple

c. Sixty dome Mosque

2.   Why did such a large Muslim population emerge in Bangal and particularly in the Easter part of India so distant from the Middle East, from which. Islam historically expanded? Briefly explain in the light of various theories of islamization in Bengal discussed in class.   **(20)**

3.   Write down the basic differences between a Mughal mosque and a Sultanate mosque of Bengal through examples. Incorporate sketches to complement your answer.   **(20)**

4.   (a) Critically analyse the evolution of temple plan. Starting from its rudimentary form of gupta dynasty and examine how the cruciform arrangement of Paharpur temple was achieved. Use sketches.   **(10)**

(b) Describe the linear layout of Nalanda Maharihara as an ancient center of learning.   **(10)**

SECTION – B

There are **FOUR** questions in this section. Answer **Q. No. 5** and any **TWO** from the rest.

5.   Write short notes on any two of the followings   **(12+12 = 24)**

a. Pari Bibi's Tomb

b. Boro katra

c. Khan Mohammad Mridha Mosque

6.   Write down the basic architectural features of the Adina Mosque. Critically evaluate that mosque as a synthesis of regional style with the idea and concepts of the Arab, Persian and Byzantine.   **(11+12 = 23)**

7.   Critically evaluate Lalbagh Fort as one of the Mughal establishments in Dhaka.   **(23)**

8.   "Zamindars and Nawabs embraced European architectural style and features fro their residences" – explain in the light of Ahsan Manzil.   **(23)**

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-3/T-2   B. Arch. Examinations 2019-2020

Sub : **ARCH 345** (Fundamentals of Urban Design)

Full Marks : 140   Time : 3 Hours

USE SEPARATE SCRIPTS FOR EACH SECTION

The figures in the margin indicate full marks.

SECTION – A

There are **FOUR** questions in this section. *Answer Q. No. 1 and any TWO from the rest.*

1. Answer any Two (2) of the following.   **(10×2=20)**

    (a) Levels of urban design

    (b) Unity in urban design

    (c) City beautiful movement.

2. (a) What are the visionary ideas in designing cities, which were the results of mechanical interventions of 19th century? Describe in details.   **(15+10=25)**

    (b) What were the proposals of 'Conservationist and Park Movement' during the modern era?

3. (a) Define the 'Principles of Urban Design' briefly.   **(5+20=25)**

    (b) What principles are important for urban design and what differences they bear with architectural design principles? Explain with the idea of 'Order' in design.

4. (a) What are the main outcomes of 'International Movement'? Write in short.   **(10+15=25)**

    (b) Describe the main features of Le Corbusier's 'Uni Ville Contemporaine' and its different developments as part of 'International Movement'.

SECTION – B

There are **FOUR** questions in this section. *Answer Q. No. 5 and any TWO from the rest.*

5. Write short notes on any two of the following.   **(10×2=20)**

    (a) Medieval Siena

    (b) Rebuilding Rome

    (c) Roman Forums

6. (a) What Urban design concept Leonardo da Vinci used to overcome the problems of medieval cities.   **(10+15=25)**

    (b) Discuss the urban design ideas developed in the Remodeling Project of Campidoglio, Rome, by Michelangelo during Renaissance period.

ARCH 345

7. (a) Define Urban Space.   (5+10+10=25)

    (b) Classify various types of urban space and describe their characteristics with necessary sketches.

    (c) Explain the principles of height-distance relationship of urban space and mass for its different conditions with necessary sketches.

8. (a) Discuss the urban design principles of Acropolis in Athens.   (10+10+5=25)

    (b) Describe the evolution of Agora in Athens.

    (c) What is the fundamental difference in conceptualizing urban spaces in Acropolis and Agora in Athens?

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-3/T-2   B. Arch. Examinations 2019-2020

Sub: **ME 363** (Mechanical Equipments)

Full Marks: 140   Time: 3 Hours

The figures in the margin indicate full marks

USE SEPARATE SCRIPTS FOR EACH SECTION

SECTION – A

There are **FOUR** questions in this section. Answer any **THREE** questions.

Students are allowed to use the Refrigeration & A/C data book.

Assume reasonable values for missing data.

1.   (a) With neat sketches distinguish between a "fire triangle" and a "fire tetrahedron".   **(8)**

   (b) What are the 6 classes of fire? With a labelled neat sketch briefly describe the working principle of a CO_2 type fire extinguisher.   **(8)**

   (c) Draw a label various parts of a solder type sprinkler head.   **(7⅓)**

2.   (a) With a "typical arrival rate" versus "time" curve, describe the "5-minute peak" for elevatoring.   **(5)**

   (b) With an example, explain the following formula for an elevator, where symbols have their usual meaning: **(5)**

$$\text{Probable stop} = S - S\left[(S-1)/S\right]^{P}$$

   (c) To transfer 130 persons during "5-minute peak": morning in-rush, for a 17 storied building with a lobby 20 ft and other typical floors 10 ft, determine the following, assuming 2500@700 fpm elevators. Use

   (i)   Total rise (in feet)
   (ii)   Loading capacity (persons per trip)
   (iii)   Number of probable upper floor stops
   (iv)   Round trip time
   (v)   Handling capacity
   (vi)   Required number of elevators

Table 4.6					
Car Size and Loading	2000lb 10	2500lb 12	3000 lb 16	3500 lb 19	4000lb 22
Lobby Time	15	20	23	25	25
Upper Floor Time	8.7	9.5	9.6	9.8	10.0

Table 4.6 and the formula given in Q. No. 2(b) above.

ME 363/ARCH

3.   (a) What is "pre-mature" door opening? What is its limitation? With neat sketches show the difference between 4 types of door opening systems of elevators.   **(8)**

(b) With simple sketches, differentiate between the following "skip-stopping" for elevators: **(8)**

      (i)   odd-even

      (ii)   alternate floor

      (iii)   intermediate landing

(c) Draw and label a typical escalator to show its proportionate space requirements.   **(7⅓)**

4.   Estimate the highest cooling load of an office building room at 5:00 pm on August 12 for the following conditions: **(22⅓)**

Location: Chittagong, Bangladesh

Dimension: 12 m (North-South) × 18 m (East-West); Height = 3m.

Roof: type 4, 100 mm concrete with 50 mm insulation.

Walls: 101 mm face brick + 101 mm common brick (type D).

Lights: 20 w/m^2, fluorescent bulb.

6 people using 4 computers @ 200 w.

Assume negligible heat transfer through floor, north and east walls, Door and windows in south

1 Door: 1.25 m × 2.15 m high × 25 mm thick plywood

2 windows: 1.85 m × 1.25 m high × 3 mm clear glass

Ventilation: 7.5 l/s

Also assume ASHRAE standard in door design conditions and ventilation air supply.

SECTION – B

There are **FOUR** questions in this section. Answer any **THREE** questions.

Assume reasonable values for missing data. All symbols have their usual meaning.

5.   (a) What are the factors that influence the thermal comfort of a human being? Why the outdoor air is required in air conditioning system? Briefly describe the cooling with dehumidification process with example.   **(13⅓)**

(b) Air enters a split type air conditioner at 1 atm., 35°C, and 80 percent relative humidity at a rate of 20 m^3/min. The air leaves the cooling section as saturated air at 12°C. Part of the moisture in the air that condenses during the process is also removed at 12°C. Determine the rate of heat transfer and moisture removal from the air.   **(10)**

6. (a) What are the deviations occur in a real vapor compression cycle from ideal vapor compression cycle? Draw the block diagram of a vapor compression refrigeration system with sub-cooling in condenser and superheating of vapor leaving the evaporator and depict this on a p-h diagram. Why is superheating considered to be good in certain cases? (10⅓)

(b) Calculate the power required by the three compressors in a R134a system which serves a 60 TR evaporator at –40°C, 50 TR evaporator at –20°C and 40 TR evaporator at –10°C. The system uses three stage compression with inter-cooling and removal of flash gas. The condensing temperature is 30°C and the intercooler temperature is –20°C and –10°C. Draw the schematic diagram and P-h diagram of the system. Also calculate the COP of the system. (13)

7. A packaged air conditioner serves four rooms in an apartment. The schematic layout of the duct system, together with the volume flow rate to each room, is shown in Fig. for Q. No. 7. (i) Size the duct system using the equal-friction method. The duct shall be of standard round sections with diameters in increments of 25 mm. The air velocity in the first section is not to exceed 8 m/s. (ii) Estimate the static pressure in the index run of the duct network. There is a pressure drop of 25 Pa at each of the outlet grilles at E, F, G and H. In the calculation, consider the resistance due to the elbow and Tee as 10 Pa and 15 Pa respectively. (23⅓)
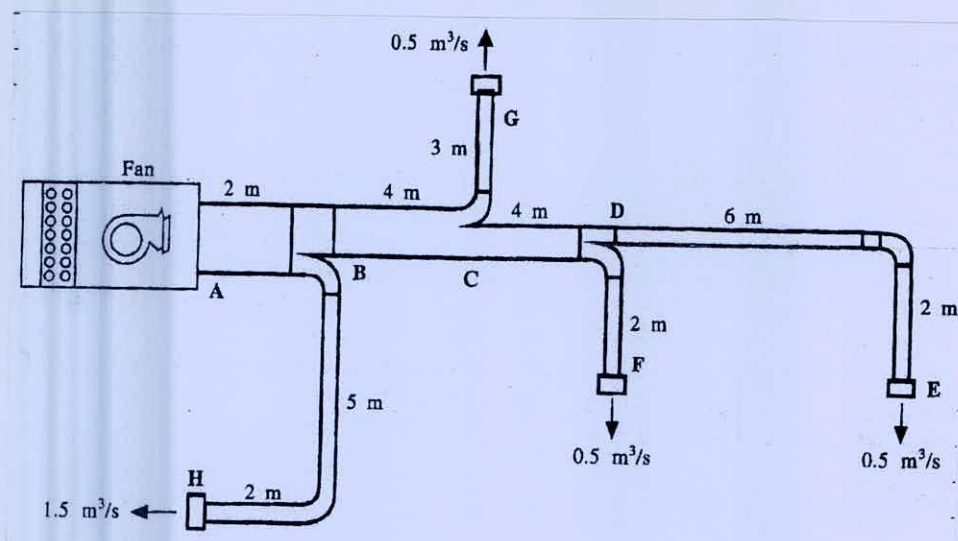
Fig. for Q. No. 7.

ME 363/ARCH

8. (a) What are the basic characteristics of quick freezing process? Classify quick freezing process. Make comparison between Immersion Freezing and Plate Freezing process with respective schematic diagram. $(8\frac{1}{3})$

    (b) Make comparison between ducted split type, multi-split type and VRF type air conditioning system with respective schematic diagram. Briefly describe the working principle of central air conditioning system with schematic diagram. Make comparison between all air type and all water type central air conditioning system with respective schematic diagram.   (15)

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-3/T-2   B. ARCH Examinations 2019-2020

Sub: **ARCH 801**   (Interior Design)

Full Marks: 140   Time: 3 Hours

USE SEPARATE SCRIPTS FOR EACH SECTION

The figures in the margin indicate full marks

SECTION – A

There are **FOUR** questions in this section. Answer Q. 1 and any **TWO** from the rest.

1. Write short notes on any TWO of the following: **(15×2 = 30)**
    (a) The intrusive corner
    (b) Realisation sequence
    (c) Places at zero point.

2. (a) Explain concrete and phenomenal modalities for crafting interior spaces.   **(10+10=20)**
    (b) "Like the Vitruvian Man inscribed within a circle, the BOX Man's perception of geometric boundaries is a projection of his measurements." Explain

3. Define spatial form. Discuss Linear structural system, Planar structural system and Volumetric structural system with neat sketches.   **(5+15=20)**

4. Define Materiality and Tectonics in Interior Design. Explain the co-relation between Technology, Tectonics, Production and Construction in Interior Design.   **(5+15=20)**

SECTION – B

There are **FOUR** questions in this section. Answer Q. 5 and any **TWO** from the rest (Use sketch where necessary).

5. Write short notes on any Two of the following: **(15×2=30)**
    (a) Wall Articulation
    (b) Noise Reduction
    (c) Peacak Chair

6. How does shadow have the power to give form to architecture? Explain with relevant examples and sketches.   **(20)**

7. "Interior design helps to achieve better functionality". Explain this statement with the example of the interior design of office space.   **(20)**

8. Describe the different types of floor finish materials used in Bangladesh.   **(20)**

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-3/T-2   B. ARCH Examinations 2019-2020

Sub: **ARCH 807**   (Theories and Practice of Urban Design)

Full Marks: 140   Time: 3 Hours

USE SEPARATE SCRIPTS FOR EACH SECTION

The figures in the margin indicate full marks

SECTION – A

There are **FOUR** questions in this section. Answer Q. 1 and any **TWO** from the rest.

1. Write short notes on any 02 (Two) of the following: (10×2=20)
    (a) Public Realm
    (b) Legibility
    (c) Conservation

2. (a) Define Urbanization. How can we differentiate a city from village?   **(10)**
    (b) Explain evolution of cities in preindustrial and industrial period.   **(15)**

3. (a) What is 'Morphological Dimension' of urban space? Discuss morphological
    elements and the concept of 'Building defining space and building in a space'.   **(15)**
    (b) What is 'Visual Dimension' of urban space? Briefly explain 'Environmental
    Preferences Framework' with sketches.   **(10)**

4. Explain how urban planning principles and architectural trends influenced outdoor
    activities across history.   **(25)**

SECTION – B

There are **FOUR** questions in this section. Answer Q. 5 and any **TWO** from the rest.

5. Discuss the Neo-Rationalist philosophy of Krier Brothers by explaining how different
    types of buildings sections affect urban space. Use any two examples from your own
    experience and understanding that depicts Neo-Rationalist philosophy. Use sketches
    where necessary.   **(20)**

6. Describe the philosophical premise of Empiricism in Urban Design in the light of four
    prominent Empiricists.   **(25)**

7. Elaborate the principles behind the works of Ledoux and Boullee.   **(25)**

8. Discuss the concept of 'Natural city' by Christopher Alexander.   **(25)**

L-3/T-2/ARCH   **Date: 18/04/2022**

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-3/T-2   B. ARCH Examinations 2019-2020

Sub: **PLAN 823** (Rural Planning)

Full Marks: 140   Time: 3 Hours

USE SEPARATE SCRIPTS FOR EACH SECTION

The figures in the margin indicate full marks

SECTION – A

There are **FOUR** questions in this section. Answer any **THREE** questions.

1.   (a) Compare "Absolute Poverty" and "Relative Poverty" with examples.   **(14)**

     (b) Critically discuss the features of "Compact Township".   **(9 $\frac{1}{3}$)**

2.   (a) Critically discuss the strategies and institutional mechanism of "Comilla model" of

     rural development.   **(16)**

     (b) Compare "Social Mapping" and "Resource Mapping" with examples.   **(7 $\frac{1}{3}$)**

3.   (a) The coastal areas of Bangladesh are vulnerable to climate change induced hazards
     such as cyclones, storm surge, salinity intrusion, sea level rise etc. An Integrated Rural
     Development (IRD) Program will be adopted for the people living in these climate
     vulnerable coastal areas for ensuring access to basic services and sustainable livelihood
     opportunities. Explain the suitable IRD model that can be adopted for this purpose with

     examples of activities under the IRD model.   **(13 $\frac{1}{3}$)**

     (b) Briefly discuss any five proposed strategies for "Rural Transport Development &
     Management" in the "8ᵗʰ Five Year Plan".   **(10)**

4.   You are working as an architect in "Low-income housing" project for the rural poor. **(15+8 $\frac{1}{3}$=23 $\frac{1}{3}$)**

     (a) Briefly discuss the "Participatory Rural Appraisal (PRA)" tools you would use in
     this project.
     (b) Discuss the limitations of collecting information using PRA tools from the context
     of this project.

SECTION – B

There are **FOUR** questions in this section. Answer any **THREE**.

5.   (a) Explain your understanding on Sustainable Rural Livelihood.   **(5 $\frac{1}{3}$)**

     (b) Discuss the vulnerability context of the 'Sustainable Rural Livelihood Framework'
     along with livelihood strategies which might help the poor rural people to overcome

     the situation.   **(18)**

6.   (a) Define Growth Centre in the context of Bangladesh. $(5\frac{1}{3})$

      (b) Suppose you are designing a rural infrastructure development project. Discuss different hard measure and soft measures necessary to accomplish the project.   **(18)**

7.   (a) Discuss different road categories in Bangladesh. $(5\frac{1}{3})$

      (b) Discuss the role of NGOs towards the empowerment of rural women.   **(18)**

8.   Write short notes on the following topics:

      (a) Rural-Urban Linkage $(13\frac{1}{3})$

      (b) Role of LGED in rural development   **(10)**

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-3/T-2   B. ARCH Examinations 2019-2020

Sub: **CE 271**   (Building Services I : Plumbing)

Full Marks: 140   Time: 3 Hours

USE SEPARATE SCRIPTS FOR EACH SECTION

The figures in the margin indicate full marks

SECTION – A

There are **FOUR** questions in this section. Answer any **THREE** questions.

1.   (a) What are the purposes of a good 'Plumbing System'? Name the various sources for supplying water to a Building.   **(16)**

With a neat sketch, describe different components of a House Water Connection.

(b) Describe the various factors influencing water demand of a building.   **(7 $\frac{1}{3}$)**

2.   (a) Design the underground Would Reservoir, Roof Top Tank and Riser for a 6 storied Residential Buildings where Ground Floor is used for parking, reception and guard room. Assume any reasonable value of missing data if necessary.   **(16 $\frac{1}{3}$)**

(b) What factors should be considered in designing a Water Storage Tank? Describe.   **(7)**

Draw a Storage Tank Showing its various components

3.   (a) A 6-storied Residential Building has following fixtures at each level from level 2 to level 6.   **(18 $\frac{1}{3}$)**

Bathroom 1	:	1 WB, 1 WC, 1 shower and 1 washing machine
Bathroom 2	:	1 WB, 1 WC & 1 shower
Bathroom 3	:	1 WB, 1 WC & 1 shower
Servant's Toilet	:	1 WC & 1 Tap
Kitchen	:	1 KS & 1 Tap
Dinning Room	:	1 WB

Ground Floor has 1 WC, 1WB & 1 Tap.

Determine the water distribution pipe sizes by Down-food System in the building. Assume any reasonable value o missing data if necessary. (Table chart and Nomograph are attached).

(b) State the minimum and maximum pressure requirements at fixtures of water supply system of a building.   **(5)**

CE 271

4. (a) What are the methods of Water Distribution in a Tall Building? Describe in detail with neat sketches. $(14\frac{1}{3})$

(b) Write short notes on (9)

(i) Air Gap ii) Fixture Unit iii) Upfeed System.

SECTION – B

There are **FOUR** questions in this section. Answer any **THREE** questions.

5. (a) What are the major considerations for designing a drainage system of a building? $(8\frac{1}{3})$

(b) Draw a schematic diagram of one-pipe and two-pipe drainage system of a buildings. What are advantages and disadvantages of each of the system? (10)

(c) What is the function of a manhole? What are the guidelines for location of manhole in a sewer network? (5)

6. (a) What are the causes of loss of trap seal? Describe with sketches. What is anti-siphonage pipe? Why anti-siphonage pipe is required? (10)

(b) What are the basic components of a Rooftop Rainwater Harvesting System? Determine the number of rainwater pipe for a roof area of 4000 sft. The intensity of rainfall is 4 inch/hr. $(5+8\frac{1}{3})$

7. (a) What is septic tank? Draw a schematic diagram of conventional septic tank system. Show different zones of a septic tank in a diagram. (10)

(b) Design a septic tank for a household of 10 family members. The water use is 150 l/p/d. The liquid detention time is 1 day, sludge accumulation rate is 40 l/p/yr and desludging frequency is 4 years. $(13\frac{1}{3})$

8. (a) What are the major differences between Pit latrine and Pour flush latrine? Describe the major design considerations of a Pour Flush latrine. $(13\frac{1}{3})$

(b) Low-Cost Rural Sanitation Technologies in Bangladesh Local Authority in a village is offering pressure-cast concrete rings of 1.0 m diameter and 0.3 m depth and concrete slab to cover it at a subsidized price. Design a pit latrine for a family of 5 with maximum design life. The soil is unconsolidated, loose and the groundwater table is 6.0 m below ground surface. (10)
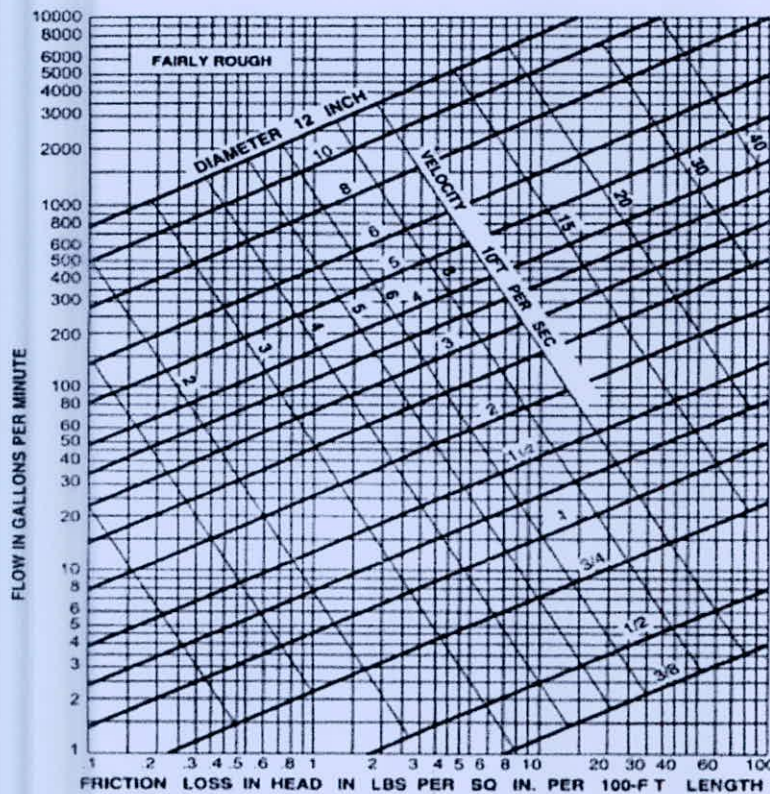

Table

Type of Fixtures	Unit value as Load Factors
Water Closet (Flush Tank System)	3
Water Closet (Flush Valve System)	6
Shower	2
Wash Basin (Domestic)	1
Wash Basin (Public use)	2
Kitchen Sink (Domestic use)	2
Ablution tap	1
Washing Machine	3
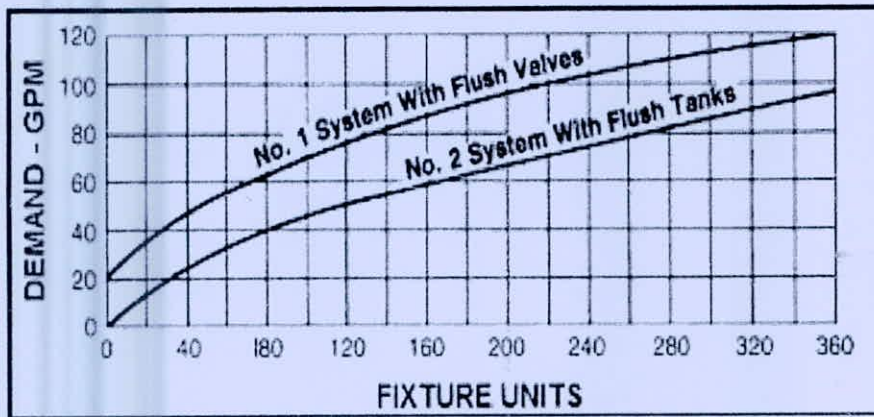
Chart

Nomograph

Table, Chart and Nomograph for Q 3(a)