



CHUMEY HIGHER SECONDARY SCHOOL
BUMTHANG
ANNUAL EXAMINATION 2022



Subject: Plumbing

Class: XI

Index Code

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Writing Time: 1 hour

Total Marks: 50

READ THE FOLLOWING INSTRUCTIONS CAREFULLY:

- Do not** write for the first **fifteen minutes**. This time is to be spent on reading the questions.
After having read the questions, you will be given **ONE** hour to answer all the questions.
- In this paper, there are two **SECTIONS: A and B**. Both Sections **A and B** are **COMPULSORY**.
- Do not** remove or tear off any page from the booklet.
- Do not** leave the examination hall before you have made sure that you have answered all the questions.

For Teacher's use only

| Question | Q1. a | Q1. b | Q1. c | Q1. d | Total | Signature |
|--------------|-------|-------|-------|-------|-------|-----------|
| Marks | 10 | 10 | 5 | 5 | 30 | |
| Marks Scored | | | | | | |

| Question | Q2 (a) | Q2 (b) | Q2 (c) | Q2 (d) | Q3 (a) | Q3 (b) | Q3 (c) | Q3 (d) | Q4 (a) | Q4 (b) | Q4 (c) | Q4 (d) | Total | Signature |
|----------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------|-----------|
| Marks | 1 | 1 | 2 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 3 | 20 | |
| Scored | | | | | | | | | | | | | | |

SECTION A [30 MARKS]
ANSWER ALL QUESTION

Question 1

a) **Direction: For multiple choice questions, there are four alternatives: A, B, C, and D. Choose the correct alternative and circle it. Do not circle more than ONE alternative. If there is more than one choice circled, no score will be awarded.** [10]


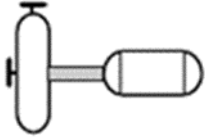
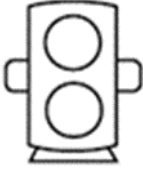

i. The machine that has a motor to deliver the cutting power to cut granite, porcelain, and concrete is:
A cutting machine.
B chipping machine.
C tile cutting machine.
D angle grinding machine.

ii. The purpose of laying the hot and cold-water pipelines in parallel is to
A minimize cost.
B lay pipe in the exposed system.
C maximize the pipes and fittings.
D prevent the crack and loosening of the joints

iii. During the pressure testing entire plumbing system should remain under pressure for at least:
A 1hour.
B 2hours.
C 3hours.
D 4hours.

iv. Daily average rate of the water required per head per day is 135liters, what is the total quantity of water required for 4 heads?
A 350 liters
B 450 liters
C 540 liters
D 600 liters

v. Which of the following is a one-way valve?
A Gate valve.
B Globe valve.
C Ball valve
D Butterfly valve

| | |
|--|--|
| <p>vi. The symbol for the gear pump is</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>A</p> </div> <div style="text-align: center;">  <p>B</p> </div> <div style="text-align: center;">  <p>C</p> </div> <div style="text-align: center;">  <p>D</p> </div> </div> | |
| <p>vii. The pump which does not require electricity to function is</p> <p>A rotary. B lift/shallow. C centrifugal. D reciprocating.</p> | |
| <p>viii. The following formula to find out the water horsepower (WHP) is</p> <p>A $WHP = Q \times H / 3960$. B $WHP = Q \times H / 3960$. C $WHP = BHP / 3960$. D $WHP = 100QH / BHP$</p> | |
| <p>ix. Which view shows the most features or characteristics of an object?</p> <p>A Top view. B Front view. C Rear view. D Back view.</p> | |
| <p>x. The purpose of the scale is to</p> <p>A. Modify drawing structure. B. Reduce or enlarge the drawing C. Indicate the real sizes of components D. Know about the height of the drawing</p> | |
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|---|---|-------------|
| b) Directions: Fill in the blanks with an appropriate word(s). | | [10] |
| i. | The maximum loading unit for a 15mm diameter pipe is | |
| ii. | Channeling is done to lay pipe | |
| iii. | Fractures and cracks in the pipeline are the causes of | |
| iv. | Cold concrete chisel is designed to cut on surface | |
| v. | The distance required between clamps to fix a 1-inch PVC pipe at the temperature of 100°F is ft | |
| vi. | The overflow of the tank is located below point | |
| vii. | Galvanized water storage tank will protect the tank from | |
| viii. | Mix sand, cement, and aggregate thoroughly till the mixture is | |
| ix. | Use piping, hose and fittings rated for maximum system | |
| x. | Shallow foundations are called spread footings or | |
| c) Directions: Write TRUE or FALSE for the following statements in the boxes provided. | | [5] |
| i. | “J” hook is used to support pipe in areas where the pipework has to be removed frequently. | |
| ii. | It is not necessary to remove air from the test line to get the correct pressure | |
| iii. | Polyethylene insulation is resistant to fire with a melting point of approximately 1177°C/2150 F. | |
| iv. | The loading value for the kitchen sink is 2 units. | |
| v. | Hydrostatic test is a procedure that utilizes air pressure to test pipelines for leakage. | |

d) Directions: Match each item under column A with the most appropriate item in column B. Rewrite the correct pairs by writing the alphabet against the number in the space provided.

[5]

| Column A | Column B |
|--|-------------------|
| i. It is used insulating pipe. | a. Sagging |
| ii. It is to check the pressure reading | b. Wall bracket |
| iii. Fixing the clamp is to prevent | c. Plastic dowel |
| iv. It has internal threads to secure/hold the screw firmly. | d. Measuring tape |
| v. It is used for pipes having sizes more than one inch. | e. Wooden dowel |
| | f. Pressure gauge |
| | g. PVC clamp |

| Column A | Column B |
|--|----------|
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| ii. It is to check the pressure reading | |
| iii. Fixing the clamp is to prevent | |
| iv. It has internal threads to secure/hold the screw firmly. | |
| v. It is used for pipes having sizes more than one inch. | |

SECTION B [20 MARKS]
ATTEMPT ALL QUESTIONS

Question 2. Short Response Question (SRQ)

a) List the importance of trial fittings with **TWO** points.

[1]

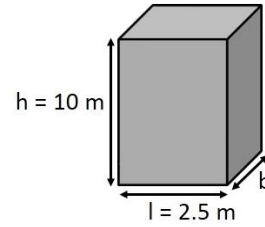
b) Why is it important of laying the hot and cold-water pipelines in parallel?

[1]

c) Draw and label the components of the storage tank.

[2]

d) The capacity of a tank is 50,000 liters of water. Find the breadth of the tank, if its length and depth are 2.5 m and 10 m respectively.



[1]

Question 3

a) What is the purpose of using a check/foot valve?

[1]

b) Explain the working principle of the centrifugal pump.

[1]

c) Write each of the causes and remedies for defective pumps. [2]

| Problem | Causes | Remedies |
|----------------------------|--------|----------|
| Does not deliver any water | | |
| Vibration | | |

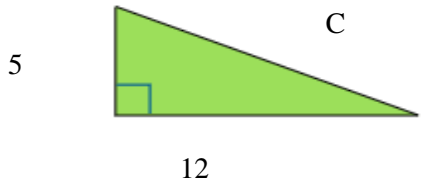
d) List **TWO** advantages and disadvantages of centrifugal pumps. [2]

| Advantages | Disadvantages |
|------------|---------------|
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Extended Response Question

Question 4

a) Find the value of 'C'. All units are in cm [2]



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|--|------------|
| <p>b) The pump is located at ground level and pumps 300 gallons of water per minute from a well. The depth of the well is 85 feet below ground. Find out the water horsepower that the pump needs to deliver.</p> | <p>[2]</p> |
| <p>c) The pump is located at ground level and pumps 460 gallons of water per minute from a well. The depth of the well is 112 feet below ground. Find out the water horsepower that the pump needs to deliver.</p> | <p>[2]</p> |

| | |
|---|------------|
| d) What will be the size of main pipeline for a residential building which has 1 bathtub, 2 urinals, 3 wash basins, 2 kitchen sinks, 1 shower, and 3 water closet pans? | [3] |
|---|------------|