



**CHUMEY HIGHER SECONDARY SCHOOL
BUMTHANG DZONGKHAG
TRIAL EXAMINATION, 2022**



CLASS: X
SUBJECT: Mathematics

TOTAL MARKS: 100
TIME: 3 hrs.

Index code:

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Read the following directions carefully

1. Do not write for the first 15 minutes .This time is to be spent for reading the questions.
2. In this booklet there are two Sections, A and B. Section A is compulsory. From section B, you have to attempt ANY SIX out of Eight questions.
3. All answers should be written in the separate answer sheet provided by the school.
4. Remember to write quickly but neatly
5. Do not leave the examination hall before you made sure that you answered all questions.

SECTION-A [40 MARKS]

ANSWER ALL QUESTIONS

Question 1.

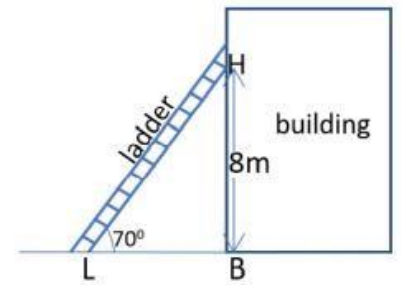
Direction: For each question, there are four alternatives: A, B, C and D. Choose the correct alternative and **circle** it. If there is more than ONE Circle, NO score will be awarded.

- i) HCF of 26 and 91 is
A 15 B 13 C 19 D 11
- ii) If the value of $\sin x$ is $\frac{1}{2}$, the value of $\tan x$ is
A 0.866 B 1.732 C 1.155 D 0.577
- iii) A car is sold for Nu.45000 by a dealer, if the dealer bought it for Nu.15000. Determine the percentage of markup.
A 50% B 200% C 100% D 25%
- iv) What is the order of turn symmetry for regular octagon?
A 7 B 8 C 9 D 10
- v) Which of the following is a linear function?
A $f(x) = 2(x + 1)(x - 2)$ B $f(x) = 4x^2 + x - 1$
C $f(x) = 5(x + 3)$ D $3(x + 4)^2$
- vi) Karma is building a rectangular table with an area of $18,000 \text{ cm}^2$. He wants to put wood trim around the four edges. What is the shortest length of trim he could use (nearest to hundredth)?
A 134.16 cm B 475.60 cm C 536.66 cm D 4500 cm
- vii) If a matrix of order 2×3 is multiplied by another matrix of order 3×4 , the order of the product will be
A 2×3 B 3×3 C 2×4 D 3×4
- viii) The following data shows the weight of eight students in kilogram.
35 37 32 40 37 42 28 30
What is the median of the above data?
A 35 B 36 C 37 D 38.5
- ix) The value of $\sin 37^\circ$ is equivalent to
A $\cos (90^\circ - 53^\circ)$ B $\cos 53^\circ$ C $\sin (90^\circ - 37^\circ)$ D $\sin 53^\circ$

x) The amount received in an investment of Nu.6000 for two years at an interest rate of 5% p.a. Compounded semi-annually is

- A Nu.6500 B Nu.6262 C Nu.6288 D Nu.6623

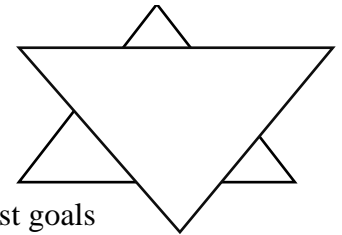
xi) A ladder is used to fix a light bulb that is 8m above the base of the building as shown in the sketch on the right. What is the length of the ladder?



- A 8.5 m B 2.9m C 17.3m D 23.5m

xii) How many lines of symmetry does the figure have?

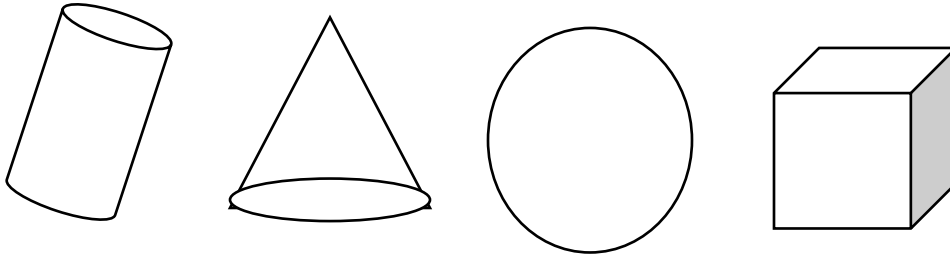
- A 6 B 5 C 4 D 3



xiii) Dana calculated the mean, median and mode from the data of the top ten most goals scored in a season in English premiere league. Which is correct calculation?

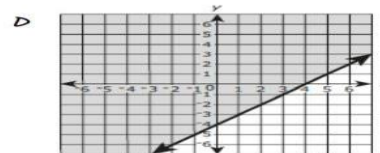
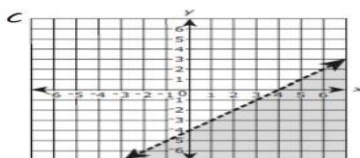
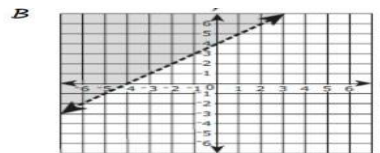
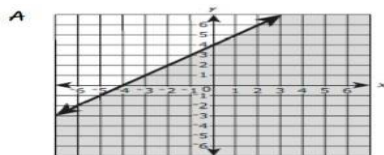
- A mean: 92, median: 92, mode: 87, 86
 B mean: 93, median: 93, mode: 87, 86
 C mean: 94.2, median: 94, mode: 87, 86
 D mean: 95, median: 95, mode: 87, 86

xiv) All shapes given below have the same surface area.



- A Cylinder B Cone C Sphere D Cube

xv) Which of the following graphs represents the solution set for the inequality $y \geq x - 4$



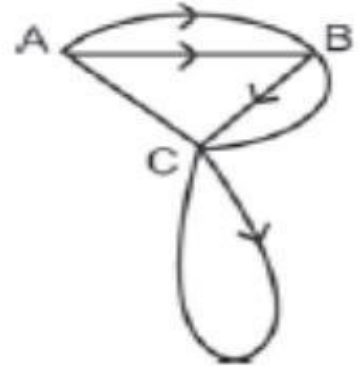
2017-18 Man City	106
2009-10 Chelsea	103
2013-14 Man City	102
1999-2000 Man Utd	97
2018-19 Man City	95
2011-12 Man City	93
2001-02 Man Utd	87
2004-05 Arsenal	87
2001-02 Man Utd	86
2016-17 Tottenham	86

xvi) A discount of 20% is offered on the marked price of Nu 3000 for a summer jacket.
Determine the selling price.

- A Nu.3600 B Nu.3200 C Nu.2700 D Nu.2400

xvii) Match the correct adjacency matrix to the given diagram.

A $\begin{bmatrix} 0 & 2 & 1 \\ 0 & 0 & 2 \\ 1 & 1 & 1 \end{bmatrix}$ B $\begin{bmatrix} 1 & 1 & 1 \\ 0 & 0 & 1 \\ 0 & 2 & 1 \end{bmatrix}$ C $\begin{bmatrix} 0 & 0 & 1 \\ 0 & 2 & 1 \\ 1 & 1 & 1 \end{bmatrix}$ D $\begin{bmatrix} 0 & 1 & 1 \\ 0 & 2 & 1 \\ 1 & 1 & 1 \end{bmatrix}$



xviii) What is the order (dimension) of the matrix given below?

$$X = \begin{bmatrix} 0 & 10 & 6 \\ 4 & 8 & -2 \end{bmatrix}$$

- A 3 x 3 B 3 x 2 C 2 x 3 D 2 x 2

xix) The slope of the line with the equation $3x - 4y = 12$

- A 4 B 3 C $\frac{3}{4}$ D $\frac{4}{3}$

xx) Which of the following is the mode of the data given below?

12, 9, 11, 5, 12, 18, 14, 12, 18, 11, 5, 18

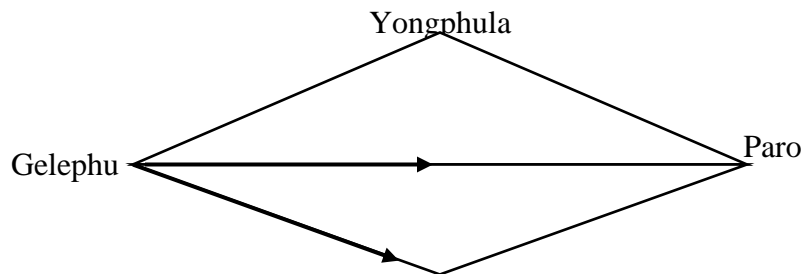
- A 18 B 11 C 5 and 11 D 12 and 18

SECTION B [60 MARKS]

Attempt ANY SIX questions

Question 2(a)

The diagram represents the Druk Air flight network of three airports



(i) Create an adjacency matrix for the above network. [2]

(ii) Square the adjacency matrix and find out the number of One-stopover trips from Gelephu to Paro. [3]

Question 2(b)

If $A = \begin{bmatrix} 2 & 0 \\ 3 & 1 \end{bmatrix}$, $B = \begin{bmatrix} 2 & 1 & 3 \\ 0 & 4 & 1 \end{bmatrix}$ and $C = \begin{bmatrix} 1 & 2 & 3 \\ 2 & 1 & 0 \end{bmatrix}$

i) Find $A \times B$ [3]

ii) Calculate $(A \times B) + C$

[2]

Question 3(a)

Following are the marks obtained by 30 students in a class.

4	20	30	40	45	58
12	20	34	42	52	59
15	21	36	43	55	63
15	25	37	43	58	63
20	30	38	43	58	71

i. Draw a box and whisker plot

[3]

- ii. Mention the 5-number summary. [2]

Question 3(b)

- (i) A restaurant meal usually costs nu. 80. A special rate of Nu 60 is offered for lunch on Thursday only. Calculate the Percent discount. [2]

- (ii) Complete each with an acute angle: [3]

a. $\sin 20^\circ = \cos \dots\dots\dots$

b. $\tan 62^\circ = \cot \dots\dots\dots$

c. $\cos \dots\dots\dots = 1$

Question 4(a)

If $7p - 5q = 15$,

[3]

i) Write down p as a function of q . Hence find $f(4)$

ii) Write down q as a function of p . Hence find $f(5)$

Question 4(b)

Karma wants to pay off a loan of Nu.20, 000. Which is better option for him to pay off the loan? [2]

Option A: Pay off the loan at the end of one year at an interest rate of 14% p.a. compounded monthly.

Option B: Pay off Nu. 23,000 at the end of one year.

Question 4(c)

For the quadratic function, $f(x) = (2x - 5)(3x + 3)$

(i) Find x – intercepts. [2]

(ii) Write the coordinates of the vertex. [3]

Question 5(a)

Sketch the graph of $y > -\frac{2}{3}x - 1$.

[4]

Question 5(b)

Dawa borrowed Nu. 20,000. He repaid the loan at the end of four years with a single payment of Nu. 35,680. What interest rate was charged if the compounding was a semiannual?

[3]

Question 5(c)

A bag contains 3 red balls and 4 black balls. You reach in and draw one ball, return it to the bag, and then draw another ball. Determine each theoretical probability with the help of out-come chart. [3]

- i. Both balls drawn are black.
- ii. ball drawn are different colors

Question 6(a)

i. Complete the table for $f(x) = 25 - 7x$ [2]

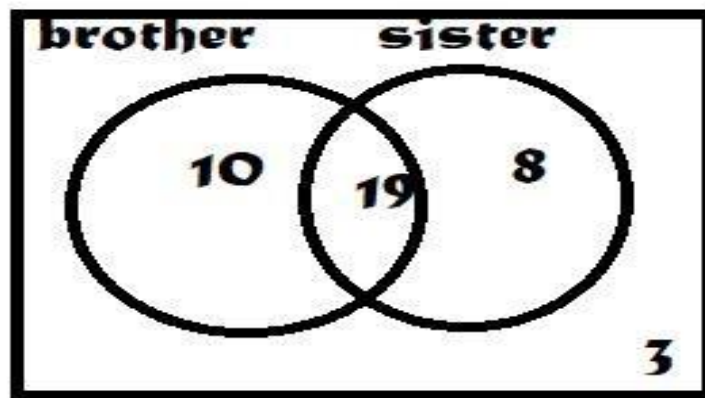
X	$f(x) = 25 - 7x$
2	
1	
0	
-1	
-2	

ii. Does the table of values above represent a function? Explain.

[1]

Question 6(b)

The Venn diagram below shows the number of students in a class of 40, who have only brothers, only sisters, brother and sisters, and no siblings. [3]



A student is randomly selected. What is the probability that the student.

- i. Has brothers?

- ii. Has sisters?

- iii. Has no siblings?

Question 6(c)

The data set below shows the weekly saving of 65 people. Construct a Box and Whisker plot for the data set. [4]

Weekly Saving (Nu)	Number of people	Cf
0 – 200	16	16
200 – 400	12	28
400 – 600	8	36
600 – 800	12	48
800 – 1000	10	58
1000 – 1200	7	65

Question 7(a)

Dechen randomly chooses an integer from 1 to 50. What is the probability of each of the following? [3]

i. Event A: The number is a multiple of 3

ii. Event B: The number is a multiple of 5

iii. Show that Event A and Event B are dependent?

Question 7 (b)

i) Construct the circumcircle $\triangle ABC$ where $AC = 3.6 \text{ cm}$, $BA = 5.1 \text{ cm}$, and $\angle A = 49^\circ$ [2]

ii) The quality control manager at a biscuit factory wants to ensure a consistent product so the number of biscuits in every 100th tin is counted. [3]

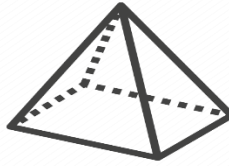
Number of biscuits per Tin

135	154	188	137	123	151	123	119	108	99	132	150
119	143	150	129	144	123	145	127	126	122	128	108
127	132	133	127	142	117	122	137	96	134	107	125

Create a stem and leaf plot.

Question7(c)

Determine the dimension of the most efficient square based pyramid with a capacity of [2]



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Question8 (a)

- i) The equation of a line is given as $3x - 4y = 12$, write this in the form of slope and Y-Intercept form. [3]

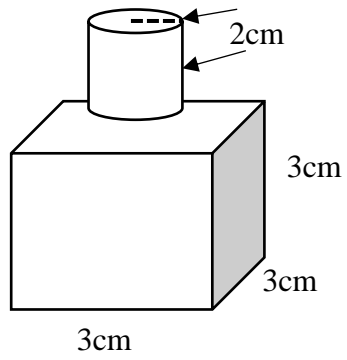
ii) The frequency table below shows the lifespan in hours of 324 light bulbs that were tested at a Light Bulb Manufacturing Company. Create a histogram. [2]

Lifespan(hours)	Frequency(No. of light bulbs)
300 – 400	20
400 – 500	40
500 – 600	56
600 – 700	75
700 – 800	78
800 – 900	55

Question 8(b)

Determine the volume and total surface area of the given shape.

[5]



Question 9 (a)

Construct triangle PQR, where $PQ = 8$ cm, $PR = 6$ cm and angle $Q = 45^\circ$. Locate the Centroid of the triangle with letter C. [3]

Question 9(b)

Construct the in circle of $\triangle ABC$, where $AB=4.7$ cm, $BC=6.6$ cm, $AC=7.5$ cm. [4]

Question 9(c)

A ladder 10 m long leaning against a wall reaches 5 m up the wall. Find the angle the ladder makes with the ground? [3]