



ཤེས་རིག་ལྷན་ཁག།
 ལུ་ཏིག་ཐང་འབྲིང་རིམ་སློབ་གྲྭ་གོང་མ།



**MOTITHANG HIGHER SECONDARY SCHOOL
 THIMPHU THROMDE**

“Every child is **inspired** to learn and **empowered** with **wisdom** to excel in life”

ANNUAL EXAMINATIONS 2018

**MATHEMATICS for CL. IX
 NOVEMBER 2018**

Marks: 100

Time: 3.15 Hours

Name:Class & Sec. Roll No.:

Invigilator’s initial

Section	For Teacher’s Use Only												
A	Qn 1	i	ii	iii	iv	v	vi	vii	viii	ix	x	Total	
	Marks	2	2	2	2	2	2	2	2	2	2	20	
	Award												
B	Qns	1	2	3	4	5	6	7	8	9	10	11	TOTAL
	Marks	3	3	2	6	4	4	4	3	3	4	2	38
	Award												
C	Qns	1	2	3	4	5	6	7	TOTAL				
	Marks	6	6	6	6	6	6	6	42				
	Award												
section	A	B	C					Marker’s Initial					
Marks													
Awarded													
Grand Total													

6) The probability of drawing a heart and then spade from a deck of card is

- a) $\frac{1}{2704}$
- b) $\frac{16}{2704}$
- c) $\frac{169}{2704}$
- d) $\frac{32}{2704}$

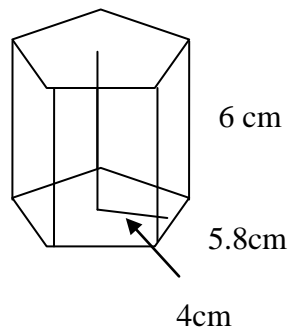
7) The commission of 2% on sales of Nu. 12560 is about :

- a) Nu.400
- b) Nu.251
- c) Nu.351
- d) Nu.165

8) The simple interest on Nu. 13320 at the rate of 3% for one year is about

- a) Nu.300
- b) Nu. 400
- c) Nu.200
- d) Nu.500

9) The volume of the pentagon-based prism is



- a) 406cm^3
- b) 348cm^3
- c) 330cm^3
- d) 334cm^3

10) Dema spends Nu.2100 on food each month. This represents 33% of her income. What is her monthly income?

- a) Nu.6264
- b) Nu.6864
- c) Nu. 6364
- d) Nu.6444

Section : B (38 marks)
ALL QUESTIONS ARE COMPULSORY

1. Solve for n. [3 marks]

a) $8^{4n} = 2^{48}$

b) $2^n = \left(\frac{1}{4}\right)^{-3}$

2. Express each in scientific notation. [3 marks]

a) 0.04584

b) $(1.4 \times 10^{20}) \times (3 \times 10^{-7})$

3. Calculate: $64^{\frac{2}{3}}$ [2 marks]

4. Simplify. [6 marks]

a) $(6x^3 + 16x^2 - 6x) \div (6x - 2)$

b) $2(3x - 4y)$

5. Expand and simplify [4 marks]

a) $3(6 - 2c) + 4(8 + c)$

b) $5(6x^3 + 16x^2 - 6x) - 3y(6x - 2)$

6. Tell whether each relationship between x and y is linear, quadratic or exponential. [4 marks]

a)

x	0	1	2	3	4	5
y	-5	-3	3	13	27	45

x	0	1	2	3	4	5
y	-9	-8	-6	-2	6	22

7. Sketch the graph for each. [4 marks]

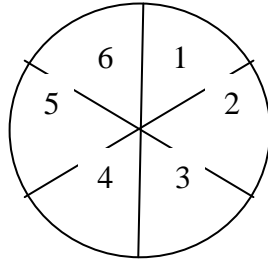
a) $y = 3x - 4$

b) $y = \frac{2}{3}x + 1$

8. Construct a box and whisker plot for the following set of data. [3 marks]

12.8 12.1 13.5 11.8 13.2
 12.6 12.3 13.0 11.9 11.5
 12.5 12.7 13.9 14.0 13.6

9. The spinner below is spun and the coin is tossed. Use an outcome chart to determine each probability. [3 marks]



- a) $P(2 \text{ and Tashi-Tagye})$
- b) $P(\text{even and Khorlo})$
- c) $P(\text{less than 4 and Khorlo})$

10. Graph $\triangle PQR$ with vertices $P(2,1)$ $Q(1,-2)$ and $R(1,4)$. Graph the image of $\triangle PQR$ under the transformation $(x,y) \rightarrow (x,-y)$. Describe the transformation. [4marks]

11. Calculate the monthly and weekly income if the annual income is Nu. 110,000 [2 marks]

Section : C (42 marks)

Attempt either I or II from each question.

Question 1

I. a) Solve each equation. [3 marks]

- i. $-3x+3=2x-1$
- ii. $2x+6=18$
- iii. $\frac{2}{3}m+6=\frac{4}{5}$

b) $\triangle ABC$ has three vertices: $A(1,3)$, $B(3,-1)$ and $C(7,6)$. [3 marks]

- i. What will be the image of $\triangle ABC$ after the translation $[2,-5]$?
- ii. What will be the image of $\triangle ABC$ after a reflection in the y-axis?

OR

II. a) A photographer charges a base fee of Nu. 250 and then charges Nu. 50 for each photograph ordered. Maya can afford to spend no more

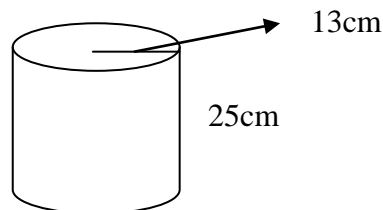
than Nu. 1060. What different quantities of photos can Maya afford?[3marks]

b) Construct a circle graph for this data. [3 marks]

Activity	Time spent (%)
Homework	25
Watching TV	25
Games	10
Other	40

Question 2

I. a) Determine the total surface area of the cylinder.[3 marks]



b) Karma's family earned 12% interest this year on a bank invested of Nu. 15,200. How much did Karma's family earn from interest ? [3 marks]

OR

II. a) Three families each set a goal to save a certain percentage of their monthly income. Calculate the savings goals, in ngultrums ,for each family below: [3marks]

i) Monthly income : Nu.8600

Savings goal : 4%

ii) Monthly income : Nu. 12000

Savings goal : 8%

iii) Monthly income : Nu. 14,500

Savings goal: 10%

b) The equatorial diameter of Earth is about 12,800 km. The equatorial diameter of Jupiter is about 143,000 km. How many times larger in volume is Jupiter than Earth ? [3 marks]

Question 3

I. a) Dorji's family income is Nu. 19,000 a month. How much would they spend in a month in each category of expenditures if these are the percentage? [3 marks]

- i. Rent : 31%
- ii. Food : 25%

b) What is the total surface area of an igloo with diameter 4.5 m? [3 marks]

OR

II. a) Determine the diameter of a sphere with total surface area 212 cm^2 . [3 marks]

b) The vertices of ΔXYZ are $X(7,8)$, $Y(-4,5)$ and $Z(0,9)$. What are the vertices of the final image if ΔXYZ is reflected in the x-axis? [3 marks]

Question 4

I. a) You roll two dice. Determine each theoretical probability. [3 marks]

- i. Sum is greater than 7.
- ii. Difference is less than 2.

b) Add [3 marks]

$$(-3y - 2xy + x^2) + (-12y + 9xy + 5x^2)$$

OR

II. a) Solve the inequality: [3 marks]

$$4x - 5 \leq 7$$

b) Subtract. [3 marks]

$$(3x - 6x^2 + 8x^3) - (-x + x^2 - y^2)$$

Question 5

I. a) The oranges in the basket on Dema's back weigh about 18 kg. On average there are 11 oranges per kilogram. Estimate the number of oranges Dema is carrying. [3 marks]

b) Find the value of b in the relation : $-\frac{4}{5}b + 1 = -15$ [3 marks]

OR

II. a) Draw the graph of the relation $y = x^2$. [3 marks]

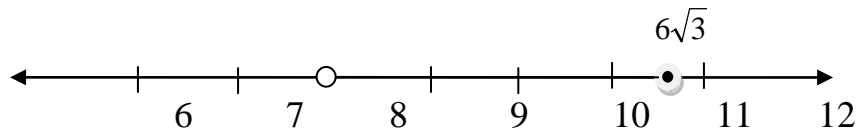
b) Create a graph and solve the linear equations:

$$y = 2x - 7 \quad \text{and} \quad y = 5x - 4 \quad [3 \text{ marks}]$$

Question 6

I. a) What is the radius of the cylinder with height 54cm and a capacity of 18L? [3 marks]

b) Write an inequality statement for the graph below. [3 marks]



OR

II. a) Solve. [3 marks]

$$40.5 - 3 \times (-2)^5 \div [10 + 3 \times (-2.4)]$$

b) $\triangle ABC$ has vertices A(3,-1), B(5,0) and C(4,7). (i). What are the vertices of the images after the translation of $[-3,5]$? [2 marks]

(ii). Use mapping notation to represent the translation. [1 mark]

Question 7

I. a) A line has equation $3x + 2y = 6$. [3 marks]

- Determine the coordinates of the y-intercept.
- Determine the coordinates of the x-intercept.
- Write the slope and y-intercept form of the equation.

b) Determine the scale factor for each dilatation centered at the origin. [3 marks]

i) $J(2,-7) \rightarrow J'(4,-14)$

ii) $K(-12,6) \rightarrow K'(-4,2)$

iii) $L(3,6) \rightarrow L'(2,4)$

OR

II. A cone shaped paper cup has a diameter of 7cm and a depth of 12 cm.

a) What is the area of paper needed to make the cup? [3 marks]

b) What is the capacity of the cup? [3 marks]

THE END

