PROVINCIAL DEPARTMENT OF EDUCATION
NORTHERN PROVINCE

Second Term Examination – 2022

Grade – 10 **Mathematics – II**

Three Hours **Additional Reading Time – 10 Minutes**

Important:

- *Answer **ten** questions selecting **five** questions from **part A** and **five** questions from **part B***
- *Indicate the **relevant steps** and the **correct units** when answering the questions.*
- *Each questions carries **10** marks*

Part *A*

Answer five questions only

01) a)

Income	Tax Percentage
Rs. 100 000	Tax Free
Next Rs. 100 000	10 %
Balance taxable income	15 %

(i) Find the taxable income that a businessman who earns an income of Rs. 240 000.

(ii) Find the taxable income tax of balance taxable income.

(iii) Calculate the total income tax he has to be paid.

b) A man deposits Rs. 200 000 in a bank at annual simple interest rate of 8%. What is the total amount will be received after three years?

02) An incomplete table of values prepared to draw the graph of the function $y = x^2 - 2$ given below.

x	-3	-2	-1	0	1	2	3
y	7	2		-2	-1	2	7

(i) Find the value of y when $x = -1$.

(ii) Using the scale of 10 small divisions representing one unit along the $x-$ axis and along the y – axis draw the graph of the above function on a graph paper.

(iii) Write down the equation of the axis of symmetry.

(iv) Is this function maximum or minimum.

(v) Find the coordinates of the turning point.

(vi) Mark the points of intersection of this graph and the straight-line $y = 2$ on this function.

03) a) A child has certain number of five-rupee coins and certain number of two-rupee coins. The total number of coins he has 46 the total value of this both coins is Rs 158. By taking x as the number of 5 rupees coins and the as y as the number of 2-rupee coins. From a pair of simultaneous equations using the information given above by solving them find the number of five rupee coins and two rupee coins.

b) If a+b=7 and ab=3 find the value of $a^2 + b^2$

04) a) The length of a rectangle is 6 m more than its breadth the area of a rectangle is 720 m^2 by taking the breadth is x build up a quadratic equation find the length of the rectangle by solving the equation.

b) Solve. $\frac{3}{2(y+4)} - \frac{1}{3(y+4)} = \frac{1}{10}$

05) (i) Factorize . $2a^3 - 8a$

(ii) Find the LCM $x^2 + x$ and $x + 1$

(iii) Simplify. $\frac{2}{x^2+x} - \frac{1}{x+1}$

06) Distance time graph of the motion motorcycle Travels from town A To Town B is given below

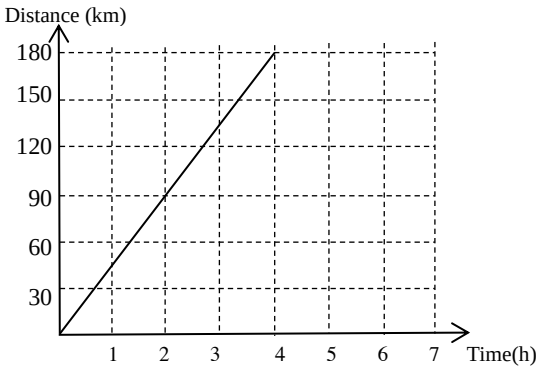
(i) Calculate the average speed of the motorcycle?

(ii) At the same time a bus starts a journey from A to B and takes 3 hours on it. Then It stays 2 hours in the town B

(iii) Draw the motion of bus on the same graph

(iv) Total time taken to travel from A to B and B to A 7 hours. Draw the motion of bus travel from B to A on the same graph

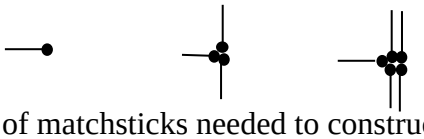
(v) How many time its speed will take to travel from B to A and from A to B.



Part *B*

Answer five questions only

07) The first three instances of pattern constructed by a student pasting matchsticks are shown in the diagram.



i) find the number of matchsticks needed to construct in the three patterns.

ii) find the number of matchsticks need to make the trained instance of this pattern.

iii) 37 matchsticks are created to create which figure of this button

iv) Mayooran states that the total number of matchsticks required to construct this patterns up to the 10^{th} instance can be obtained from 2 matchboxes. Assuming that matchbox to contain 50 matchsticks. Show that mayooran's statements is correct? With reason.

08) i) Draw astraight line $AB = 7$ cm.

ii) Construct 60^0 at A and AB as a side

iii) Construct 45^0 at the B and BA as a side

iv) Complete the triangle ABC

v) Construct the locus of a point equidistant from the point A and B

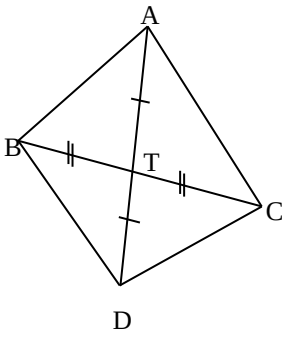
vi) Construct the perpendicular bisector of the sight AC

vii) Name the point where they intersect as *O*.

viii) Taking *O* as the centre, draw a circle with radius *OA*.

09) a) Write two characteristics of a parallelogram

b) In the given figure ABC is a triangle T is a midpoint of BC and AT is extended to D such that AT=TD

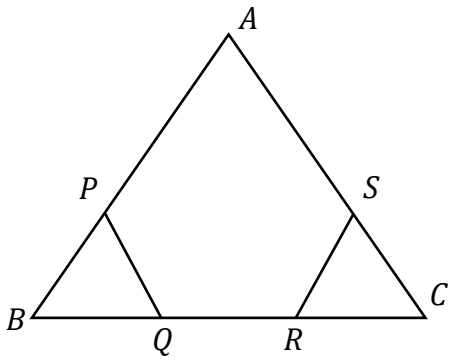


i) What is the special name of quadrilateral

ii) Prove that $\Delta ABT = \Delta DCT$

iii) Write an angle which is equal to ABC

10)



Based on the information in the figure AB//RS, AC//PQ and BQ= CR

i) Mark the information on the figure?

ii) Prove that $\Delta BPQ = \Delta CRS$

iii) Prove that the quadrilateral BRSP is

a parallelogram

11) Out of 60 students in grade 10 class who participated in physical exercise and marching is follows. 40 of them students participated in physical exercise. 35 of them in marching and 22 of them only physical exercise

$\varepsilon = \{\text{Grade 11 students}\}$

$M = \{\text{Students group participated in marching}\}$

$P = \{\text{Students group participated in physical exercise}\}$

i) White value of $n(\varepsilon)$, $n(P)$ and $n(M \cap P)$

ii) Represent the information on Venn diagram

iii) Find $n(M \cup P)$

12

i) Find the value of $\text{Log}_4 64 + \text{Log}_5 25 - 2$

ii) Solve $\text{Lg}\, x - \text{Lg}\, 24 = \text{Lg}\, 16 - \text{Lg}\, 12$

iii) Find the value using the logarithms tables

$$\frac{74.36 \times 9.37}{48.94}$$