PROVINCIAL DEPARTMENT OF EDUCATION
NORTHERN PROVINCE

Second Term Examination – 2022

Grade – 11 **Mathematics – II**

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

Important:

- *Answer **ten** questions selecting **five** questions from **partA** and **five** questions from **partB***
- *Indicate the **relevant steps** and the **correct units** when answering the questions.*
- *Each questions carries **10** marks*
- *The volume of a solid right circular cylinder of radius r and height h is $\pi r^2 h$. The volume of a solid sphere of radius r $\frac{4}{3}\pi r^3$*

Part II (A)

Answer any five Questions

01) A laptop priced at Rs. 134000 for outright purchases can be bought by making a down payment of Rs 14000, and paying the rest in12 equal monthly installment. If a 12% annual interest rate charged, where the interest is calculated on the reducing lone balance. find

i. The balance to be paid in installment
ii. The amount due from the principal lone amount each month.
iii. The interest for a month unit.
iv. The number of month units.
v. the total interest should pay
vi. The amount of a monthly installment.

02) An incomplete table of x and y values suitable to sketch the graph of a quadratic function $y = 1 - (x-2)^2$ for value of x such that $-1 \leq x \leq 5$ is given below.

x	-1	0	1	2	3	4	5
y	-8	-3	... .	1	0	-3	-8

a) i. Find the value of y when $x = 1$
ii. Draw the graph by taking 10 small divisions along thė x axis and y axis to be one unit as scale.

b) using the graph , Write down
i. The equation of the axis of symmetry by drawing it.
ii. The coordinates of the turning point.
iii. Find the value of maximum point.
iv. The range of values of x for which the function is positive.

03) A table with information on the weight of 40 boxes that was loaded in vehicle is given below. Here $20 < x \leq 30$.

Weight of boxes (kg)	$20-30$	$30-40$	$40-50$	$50-60$	$60-70$	$70-80$	$80-90$
Number of boxes(f)	02	04	09	10	08	04	03

i. Find the model class?

ii. By taking mid value of the model class as the assumed mean calculate the mean weight of a box.

iii. If 2400kg of maximum weight can be loaded in this vehicle. Show that, we couldn't load 40 boxes into the vehicle.

04) The length of a rectangle lamina is $2x$ the width of lamina is 4m less than the half of its length.

i. Write the width of lamina in terms of x.

ii. If the area is $16m^2$, Show that $x^2 - 4x - 8 = 0$

iii. Find x by completing square method or another method.($\sqrt{3} = 1.73$)

05) There was a special care for covid -19 patients to purchase things in a particular pharmacy. A person bought 3 face masks and 2 soaps for Rs.186. The price of soap is Rs 3 more than the price of 6 facemasks.

i. Let x be the price of a facemask y be the price of soap. Construct two simultaneous equations to represent the above information.

ii. Solve the simultaneous equations and find the price of a face mask and soap.

iii. Show that Rs. 215 is enough to buy 5 facemasks and 2 soaps.

06) a. A man travels 8 km of distance towards eastern direction from A to B. then reaches C where 6km of distance in southern direction from B.

i. Draw a scale diagram to the scale $1:200000$.

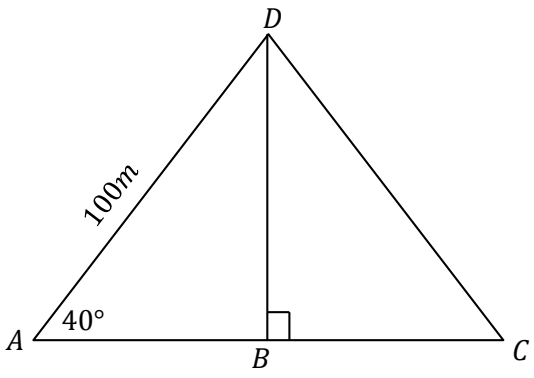
ii. Find the bearing of C from A by measuring the magnitude of $B\hat{A}C$

b. If this figure $AD = 100m, D\hat{A}B = 40°$, BC = 80m and BD $\perp$ AC Using the suitable scale

i) Draw the scale diagram.

ii) The length of BD

iii) The magnitude of $B\hat{C}D$



Part II(B)
Answer any five questions.

07) a. There was a drill competition, student were arranged in such a way that three students were in first row, five student were in second row, seven student were in third row.

i) Which type of progression is this by writing the number of students in pattern?

ii) How many students were in a fifth row?

iii) If the students were arranged in 10 rows, find the total number of students in the above drill competitions.

b. The first term and common ratio of a geometric progression are 8 and 2 respectively. Find its 11^{th} term as a power of 2.

08) In the following construction, use only a pair of compass and a ruler with a $cm/\ mm$ scale. Show the lines of constructions clearly.

i. Construct the triangle ABC in which $AB = 7cm, A\hat{B}c = 60°, BC = 5.5cm.$

ii. Construct the perpendicular bisector of AB.

iii. Construct the locus equidistant from points $A\ and\ C$.

iv. Mark the intersection point as o which intersects the locus (ii) and (iii)

v. Draw a circle with center O and AO as the radius. Measure the radius.

vi. Find the magnitude of $A\hat{O}C$. Give the reason.

09) In a quadrilateral $ABCD, AB > CD,\ AB \not\parallel DC$. E is the midpoint of side BC. The lines which are produced DC and AE meet at F.

i. Mark the above information in a sketch.

ii. Show that $\Delta ABE \equiv \Delta CEF$.

iii. Show that the quadrilateral; $ABFC$ is a parallelogram.

iv. Explain with reason name a pair of triangle which is equal area that have CF as a side.

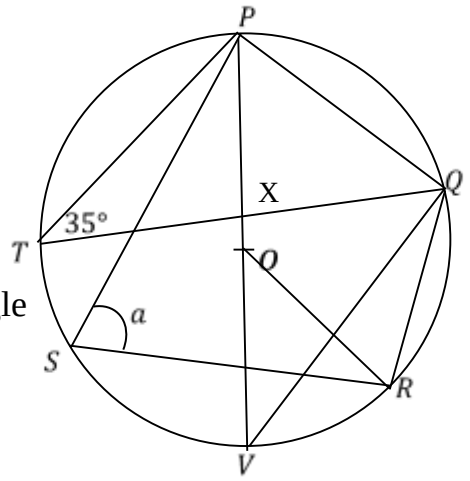
10) Melted a metal solid and made a hemisphere with the radius $3r$ and a cylinder with radius $2r$ and height $5r$ without wastage.

i. Show that the volume of that melted solid is $38\pi r^3$

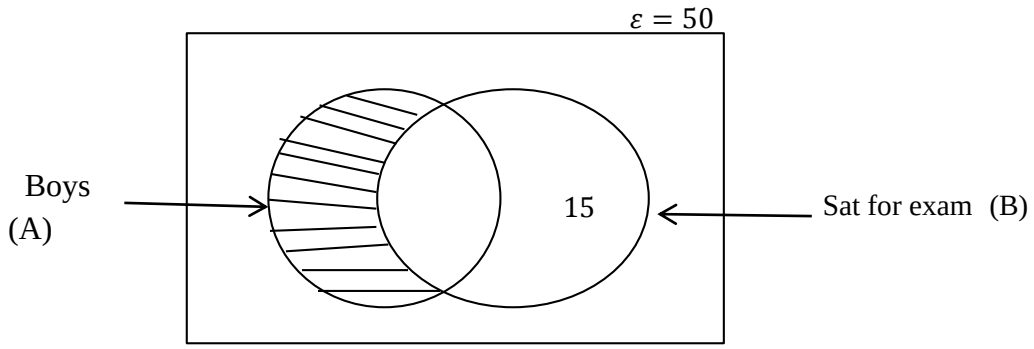
ii. When $\pi = 3.14, r = 0.35cm$ find the volume of metal solid using the logarithms table.

11) Points P, Q, R, V, S, T are on a circle with center O. If $\hat{T}Q = 35°$, $P\hat{S}R = a°$ and Find the magnitude of the following angles with reasons.

i. $P\hat{Q}V$
ii. $P\hat{V}Q$
iii. $V\hat{P}Q$
iv. $V\hat{O}Q$
v. $R\hat{O}P$ (in terms of a)
vi. Show that $\Delta PTX, \Delta VQX$ are equiangular triangle



12) The Venn diagram shows some information about 50 students in grade 10.



- 3 boys did not sit the exam and 35 students sat exam.
  i. Complete the above Venn diagram using the given data.
  ii. Shade the region that representing the girls sat examination.
  iii. Write the shaded region in set notation.
  iv. Find the number of boys who sat exam.
  v. If one of girl selected form them, who did not sit exam then find the probability of it.