VisakhaVidyalaya -Colombo 5

Third Term Test - 2020

Mathematics I

Grade 11

Time : 2hours

Name / Index number ....

❖ **Answer all the questions.**

## Part I

1) A vehicle travels with a uniform speed of 75 kmh^{-1} a certain distance in 1h 20 minutes. Find the time taken to travel the same distance with a uniform speed 80kmh^{-1}
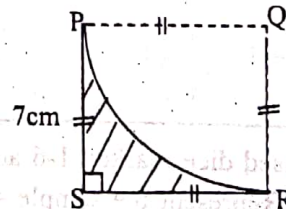
2) Factorize $6 + x - 2x^2$

3) Select the correct statement out of the given and mark "✓" infront of it.

   a) ABC is an acute angled triangle   (........)

   b) AB = BC   (........)

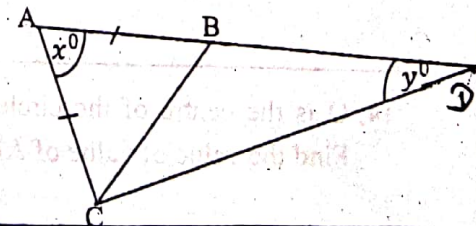   c) The angle bisector of $\hat{B}$ of the triangle ABC is goes through the midpoint of the side AC.   (........)
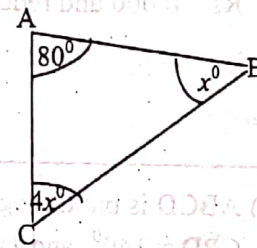
4) PQR is a sector. Find the perimeter of the shaded part.

   7cm

5) (i) L.C.M. of $2m^2n$ and $6m$
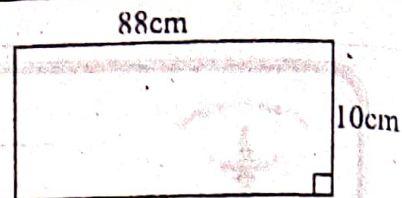
   (ii) Simplify $\dfrac{1}{x} - \dfrac{2}{3x}$

6) In the triangle ABC, AB = AC. The point D is on produced AB such that $A\hat{C}D$ is a right angle. If $A\hat{B}C = 55^0$, find the values of x^0 and y^0.
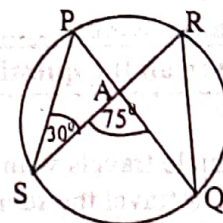

7) Write in index form
   lg 50.5 = 1.7033

1

8) The figure shows a rectangular metal sheet which is used to make a cylinder of height 10 cm by welding it. Find the maximum value that can be taken for the radius of the cylinder.

88cm

10cm

9) The figure shows two chords PQ and RS which intersect at A. If $P\hat{S}R = 30^0$, $S\hat{A}Q = 75^0$. Find the value of $S\hat{R}Q$.

10) Solve $8x^2 - 2 = 0$

11) A pawnshop charged 2% monthly interest when pawing gold. A lady pawned her gold for Rs. 70 000 and redeemed by paying Rs. 75 600. Find the time period the lady pawned.

12) ABCD is parallelogram and CPDQ is a rhombus. If $C\hat{P}D = 140^0$ and $D\hat{A}B = 55^0$, find the value of $B\hat{C}Q$.
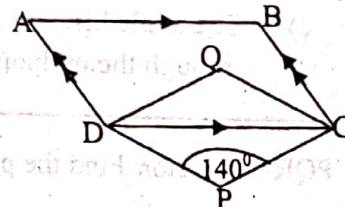
13) An unbaised dice marked 1-6 and a fair coin tossed together. Represent the sample space of the random experiment on the grid and encircle the event of getting tail on the coin and 5 on the dice.

Coin

Dice
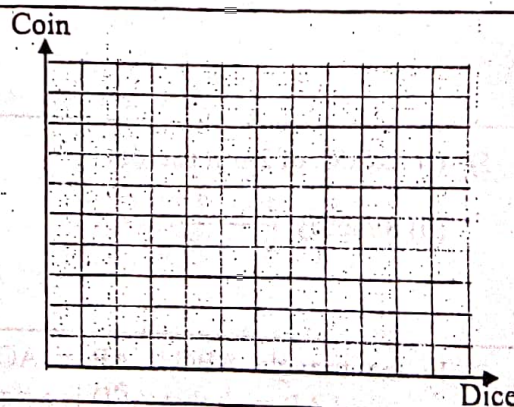
14) O is the centre of the circle. If $B\hat{C}D = 125^0$, $D\hat{A}C = 35^0$. Find the value of value of $A\hat{D}B$.

2
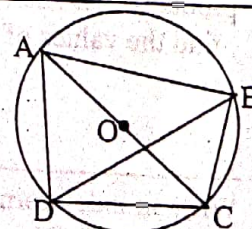
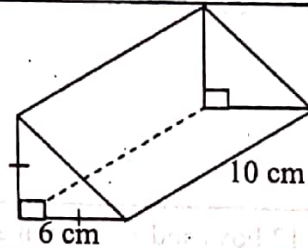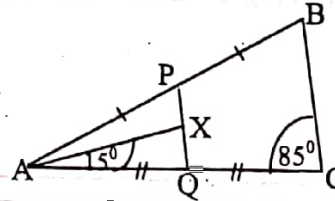15) A person invest Rs. 345 000 to buy shares of price Rs. 25 in a certain company. If the annual divide income received was Rs. 96 600, find the dividend income per share.

16) (i) Find the volume of the prism.
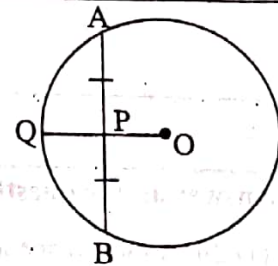(ii) Draw a sketch of a face with its measurements.

10 cm

6 cm

17) Find the value of $A\widehat{X}P$.

B

P

X

15^0

85^0

A   Q   C

18) $\begin{pmatrix} 2 & 3 \\ 1 & 2 \\ \frac{1}{2} & 2 \end{pmatrix} \begin{pmatrix} 4 \\ 1 \end{pmatrix}$

Find the product of the two matrices.

19) The length of the chord AB is 32 cm of the circle with diameter 40cm. If the midpoint of the chord AB is P, find length of PQ.

A

Q   P   O

B

20) Find the seventh term of a geometric progression if the first term $\frac{1}{8}$ and the common ratio is 2.

21) Find the equation of the straight line which passes through the points $\left(\frac{1}{2}, 5\right)$ and $(0, 3)$.

22) (i) Shade the region, which represent the elements belongs to only B.
(ii) Write the region (i) above in set notation

A   B

3
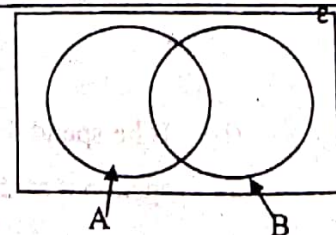
23) The radius of the circle with centre O is 7cm. Show the construction as a rought sketch to identify the location of a point which is 7 cm away from point O and equidistance from PO and QO. Name the point as R.

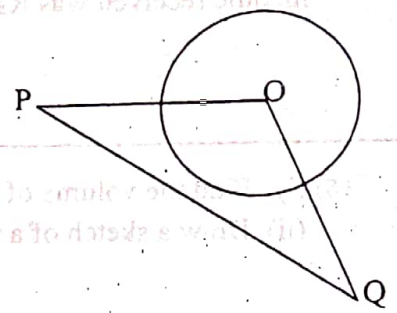24) There are 12 boys and 13 girls in a class. The mean weight of boys is 48 kg and the mean weight of girls is 45kg. Find the mean weight of the class students.

25) Simplify

$$\frac{3y}{5x} \div \frac{9(x+1)}{10xy}$$

Mathematics I - Part B

- **Answer all the questions.**

(1) Mr. Pradeep spend $\frac{1}{4}$ of his salary for food, $\frac{2}{5}$ of his salary for his children's education. $\frac{3}{7}$ of the remainder of his salary spent to pay the installment of a bank loan he got.

 (i)   What fraction of whole salary he spent for food and education.

  (ii)   What fraction of salary he paid as the installment of the loan.

  (iii)   After spending all expenses, if he left Rs. 9 600, find Pradeep's monthly salary.

  (iv)   If he spend 4 000/= more than for food which was earlier spend, find the fraction of food spent out of the whole salary.

4

(2) The figure shows a part of a land. Perimeter of it is 84 m.
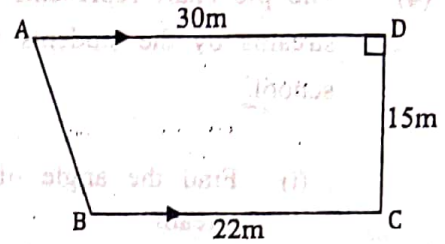
(i) Find the length of the boundary AB.

(ii) Area of the part of the land.

(iii) If a square part CDEF is separated with CD as a boundary from the land, Show it on the diagram given.

(iv) Find the ratio between the area of parts ABFE and CDEF.

(v) A shape of a semicircular pond of diameter 7cm should be construct, placing the center of the semicircle on the midpoint of the boundary AD. Draw the sketch of the part which was separated for the pond in the given diagram and find its area.

(3) Thivanka divided his money Rs. 700 000 in the ratio 4:3 and invest the largest amount of it to buy shares and the remaining part he deposited as a fixed deposit.

(i) How much Thivanka spent to buy shares?

(ii) If the selling price of a share of the company is Rs. 100 and the dividend income per share is Rs. 13, Find the dividend income received by Thivanka at the end of the year.

(iii) If 12.5% annual compound interest is added to the fixed deposit, find the total amount received for the fixed deposit at the end of 2 years.

5

(4) The pie chart represents the selection of A/L subject streams by the students who passed G.C.E O/L in a school.
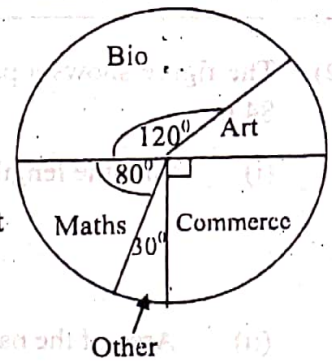
(i) Find the angle of the sector which represent the Art stream?

There are 32 student who select the Maths stream.

(ii) Find the number of students who select the stream Bio?

(iii) Find the total number of students represent in the pie chart.

(iv) After releasing the O/L results, if two students who select the Art stream and two students who select the other stream were failed the O/L exam, find the new angle of sector which represent the stream Art, if the pie chart is drawn again using the students who passed the O/L exam.

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(5) (a) Patients participate a medical clinic in a certain hospital. According to the symptoms, doctors have found that the probability of guessing the disease has infected is $\frac{3}{5}$.

(i) Complete the tree diagram given below using the above information.

guessing the disease has infected
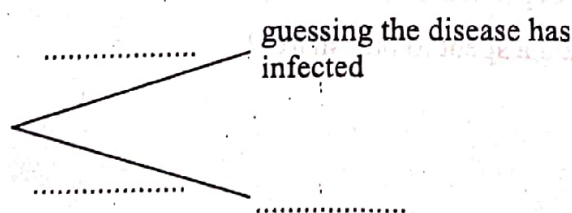
The guessed patients were tested further by taking blood samples. The probability of being a guessed one positive is $\frac{7}{8}$ and for a one who is not guessed one positive is $\frac{1}{12}$.

(ii) Extend the above tree diagram and mark the information in it.

6

(iii) A patient who participates the clinic is forwarded for the blood test. Find the probability making a correct guess by the doctor.

(b) In a group of five patients, three are males and two are females. Two patients have to be select for a special test.

    (i) Represent the sample space for the above selection on a Cartesian plane.

    (ii) Find the probability of being both patients males.
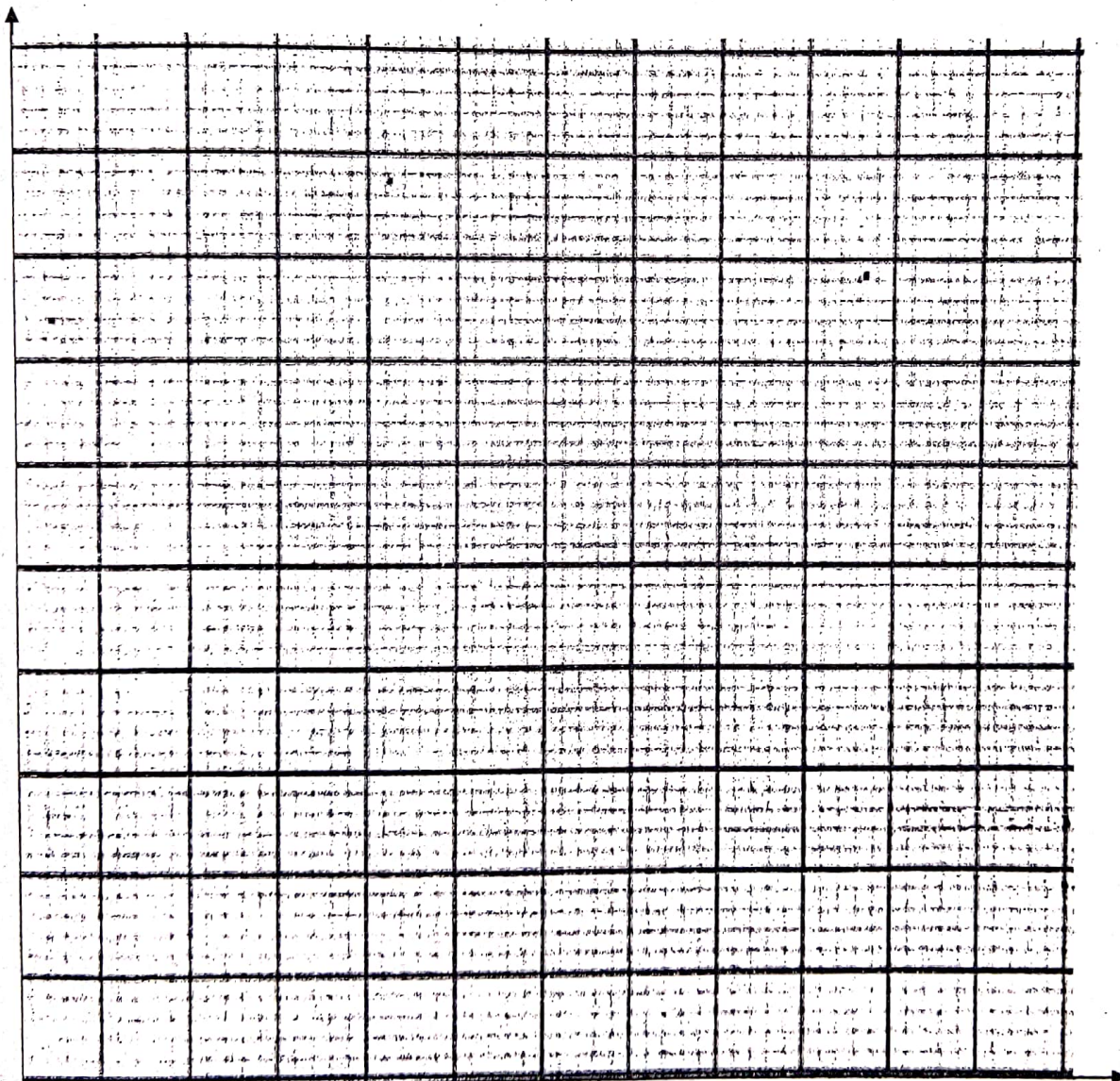
Visakha Vidyalaya -Colombo 5

Third Term Test - 2020

Mathematics II

Grade 11

Time : 3 hours

Name / Index number ....

Important:

❖ Answer ten questions selecting five question from Part A and five questions from part B.

❖ Write the relevant steps and the correct units in answering the questions.

❖ Each question carries 10 marks.

❖ The volume of a right circular cone of base radius r and height h is $\frac{1}{3}\pi r^2 h$.

❖ The volume of a sphere of radius r is $\frac{4}{3}\pi r^3$.

Part A

(Answer only 5 questions)

(1) An incomplete table of values prepared to draw the graph of the function $y = (x-1)^2 - 3$ is given below.

x	−2	−1	0	1	2	3	4
y	6	1		−3	−2	1	6

   (i) Find the value of y when $x = 0$.

   (ii) Using a suitable scale, draw the graph of the given function.

   (iii) Write the interval of values of x on which the function increases within the interval $-3 \leq y \leq 0$

   (iv) Find the roots of the function $(x-1)^2 - 3 = 0$ using the graph, hence find the value of $\sqrt{3}$.

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(2) The price of a set of chairs is Rs. 50 000 when it is purchased outright. It can also be purchased by making a down payment of Rs. 2 000 and paying the remaining amount with interest in 24 equal monthly installments of Rs. 2 240 each. If the interest for this method of payment is calculated according to the reducing balance method, calculate the annual rate of interest that is charged to the nearest first decimal place.

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(3) In the given triangle AP $= x$ cm , BP $= x + 1$ cm

AC $= 3x + 1$ cm. The length of the side AQ is 2cm greater than the length of AP.

   (i) Find the length of QC in terms of x.

   (ii) If $\frac{AP}{PB} = \frac{AQ}{QC}$, build up a quadratic equation in terms of x and by solving it find the length of the side AP by giving reasons. ($\sqrt{6} = 2.45$)

1
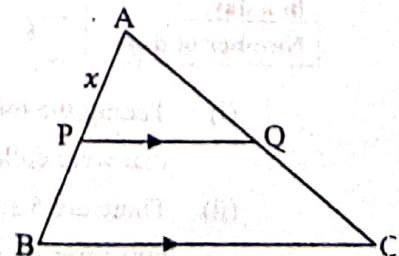
(4) (a) The cost of a boat ride ticket for an adult is Rs. 300 and for a child Rs. 175. If 32 group consisting of adults and children have decided to go the boatride. The total cost of the tickets for this group is Rs. 7 100.

    (i)   Construct a pair of simultaneous equations by taking the number of adults in this group as x and the number of children as y.

    (ii) Solve the pair of simultaneous equations and find separately, the number of adults and children in the group.

(b) Solve the inequality $40x + 35(x + 8) < 1180$ and find the maximum integral value that x can take.

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(5)   The figure represent the sketch of a horizontal ground. The lamp post Q is located 150m away from the place P on a bearing of 070^0. The tree R is located on a bearing 215^0 from Q and 125^0 from P.
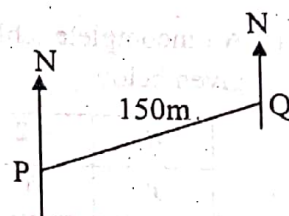
    (i)   Copy the given figure onto your answer script and indicate the above information in it.

    (ii) Show that the triangle PQR is a right angle and using the trigonometric tables, find the distance of QR to the nearest first decimal place.

    (iii) The tree S is situated on the line PR such that SR=30m. Using the trigonometric table find the magnitude of $S\hat{Q}R$ and find the bearing of Q from S.

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(6)   Information collected on the litres of milk that were collected daily in a milk distribution centre, is given in the following frequency table.

Number of liters of milk collected In a day	80-90	90-100	100-110	110-120	120-130	130-140	140-150	150-160
Number of days	8	7	17	25	21	12	5	5

    (i)   Taking the midvalue of the model class as the assumed mean find the mean liters of milk that were collected during a day.

    (ii) There are 5 such milk distribution centres in the village. A factory annoused that it needs 600 litres of milk for a day to make their milk products. Is the factory can fulfill their need? State the answer by giving reasons.

Part B
(Answer only 5 questions)

(7) A special medicine is given to a patient. 300 ml is given at 6.00 am. 280ml is given at 7.00 am. 260ml is given at 8.00 am. This process is done hourly as an arithmetic progression. Using the formula of arithmetic progression.

    (i)   Find the 8th term.

    (ii)   Find the amount of medicine given at 1.00 p.m.

    (iii)   20ml is given finally. Find the time which it is given.

    (iv)   What is the total volume of medicine given?

(8) Use the compass and a straight edge for the following construction.

    (i)   Construct the triangle PQR which PQ = 8.5cm, $Q\hat{P}R = 45^0$ and PR = 7cm.

    (ii)   Draw a perpendicular to PQ from R and mark the bottom as S.

    (iii)   Construct the circle which the center "O" lies on RS and QR as a chord.

    (iv)   Construct a tangent to the circle at the point R.

    (v)   Draw the angle bisector of $P\hat{Q}R$ and name the point which it meets the above tangent drawn as "T".

(9) PQ is the diameter of the circle which the centre is O. The tangent drawn to the circle at R is ST and the perpendicular drawn to PQ is RA. other tangent is drawn from the point T and the point B is located on it such that PBTR is a cyclic quadrilateral. If $T\hat{R}Q = a$,
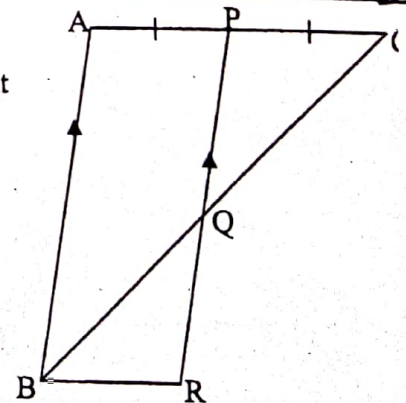
    (i)   Indicate the magnitude of the angle $A\hat{Q}R$ interms of "a". Show that the RQ is the bisector of $T\hat{R}A$.
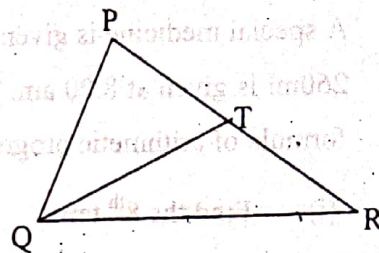
    (ii)   Show that the $T\hat{P}B = 3a$
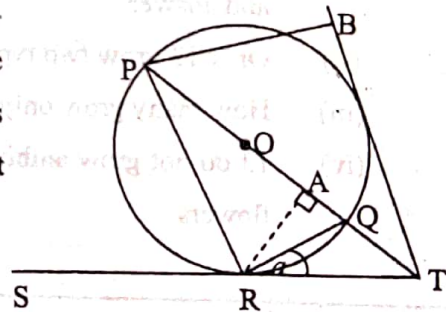
(10) (a) P is the midpoint of AC in the triangle ABC. The line drawn parallel to AB through P meets BC at Q. PQ is extended such that PQ = QR.

    (i)   Show that AC // BR

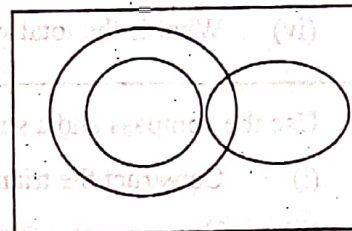   (ii)   Show that the area of $\Delta BRQ = \frac{1}{4}$ the area of APRB.

3

(b) In the triagle PQR, Point T is marked on PR such that $P\hat{R}Q = P\hat{Q}T$. Show that $PQ^2 = PR \cdot PT$

(11) The details of a group of people who grow flowers are given here and write the answer to the followings.

- They grow orchids, anthurium and roses.
- 10 grow orchids.
- 18 grow anthurium
- 9 grow roses.
- All who grow orchids, grow anthurium too.
- No one grows orchids and roses.

(i) Copy the venn diagram given and label the three sets. Complete the venn diagram and answer.

(ii) 13 grow two types of flowers only. How many grow roses and anthurium?

(iii) How many grow only anthurium?

(iv) 13 do not grow anthurium. Find the number of people who do not grow any of these flowers.

(12) A solid metal sphere is melted and 6 solid right circular cones with base diameter r and height 2r were made. Show that the base radius of the sphere is $\sqrt[3]{0.75}\, r$. Find the radius of the sphere taking r = 3.25 cm using the logarithms table.

4