

Mid Year Examination 2015 Mathematics - I

Grade 11

ඉගෙනීම - I

Time: 2 hours

Name/ Index No.

Part - A

- Answer all the questions on paper itself.
- All the questions in part A as well as part B should be answered. 1 mark each for question 01 - 10 and 2 marks each for question 11 - 30.

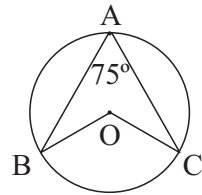
01 The price of a book is Rs. $7x$. Find the price of 8 books.

02 Write $\frac{3}{25}$ as a decimal fraction.

03 Find the value of $\log_2 32$

04 A vehicle travels for $\frac{1}{2}$ hours with a speed of 54kmh^{-1} . Find the distance traveled by it.

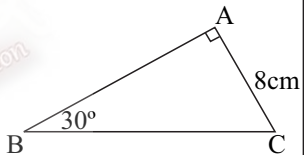
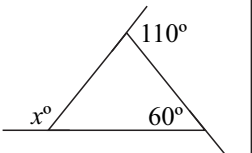
05 The centre of the circle in the figure is O. A, B and C are three points on the circle. If $\hat{BAC} = 75^\circ$, find the value of \hat{BOC} .

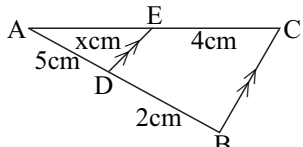
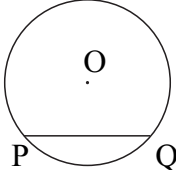
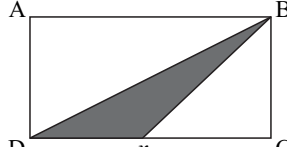


06 Simplify. $8x - 2 - 3x + 7$

07 Evaluate $(2x^0)^3$

08 Write the set of integers belongs to $-3 \leq x < 2$

<p>09 If $3^2 \times 5^2 \times 7^2 = 11025$, find the value of $\sqrt{110.25}$</p>
<p>10 If the number of elements in a set is 3. Write the subsets of that set.</p>
<p>11 Obtain the straight line which passes through the points (-1, 5) and (0, 0).</p>
<p>12 If $\lg 20 = 1.3010$, find the value of $\lg 0.02$</p>
<p>13 What is the quotient you get, when $x^2 - x - 20$ is divided by $(x + 4)$,</p>
<p>14 ABC is a right angled triangle. If $\hat{A}BC = 30^\circ$ and $\sin 30^\circ = 0.5$ find the length of BC.</p>

<p>15 Find the height of a cylinder with a volume of 0.77l and the area of the base 38.5cm^2</p>
<p>16 Find the value $1011_{\text{two}} - 101_{\text{two}}$</p>
<p>17 Find the value of x.</p>

<p>18 Market price of an item is Rs. 40000. On paying ready cash a discount of $12\frac{1}{2}\%$ is allowed. Find the selling price of the item for a customer who pays ready cash.</p>
<p>19 Give the equation in the form $ax^2 + bx + c = 0$ of which the roots are 1 and -2.</p>

<p>20 In the diagram $DE \parallel BC$, find x.</p>	
<p>21 $3x + 4y = 8$ find the value of $(x + y)$ $-x - 2y = 2$</p>	
<p>22 The nth term of an arithmetic progression is $3n - 5$. Find the first term and common difference.</p>	
<p>23 The bearing of B from A is 065°. Find the bearing of A from B.</p>	
<p>24 Simplify. $\frac{y^2 - 4}{y - 2} \div \frac{(y + 2)^2}{3}$</p>	
<p>25 Radius of the circle is 5cm and the centre is O. If the length of the chord PQ is 8cm, find the length of the perpendicular drawn from O to the chord of PQ.</p>	
<p>26 A and B are two points 6cm apart. Point P moves in a way such that it is always equi-distant to A and B both. Draw a rough sketch to show the locus of P.</p>	
<p>27 50 identical cards are numbered from 1 to 50. One card is taken at random. Find the probability of selecting a two digit even number starting with three.</p>	
<p>28 In the diagram ABCD is a rectangle $Dx = xC$, $AB = 10\text{cm}$ and $BC = 4\text{cm}$. Find the area of the triangle DxB.</p>	
<p>29 Simplify. $\sqrt{48} + \sqrt{3}$</p>	
<p>30 When $v = 32$, $p = 4$ and $a = 1$, find the value of b in the formula $v = p(a + \sqrt{b + 1})$</p>	

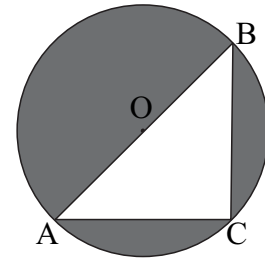
Part - B

● **Answer all questions. 10 marks for each question.**

01 A person gave $\frac{3}{5}$ of his money to his wife, $\frac{1}{4}$ of the remaining to his son and $\frac{1}{4}$ of the remaining to each of his three daughters. One daughter got Rs. 80000.

- (i) Find the fraction given to son.
- (ii) Find the fraction remaining after given to wife.
- (iii) Find the fraction obtained by a daughter.
- (iv) Find the total amount he had.
- (v) Find the amount he has remained.

02 The diagram shows a circular flower bed of $3\sqrt{2}$ m radius. O is the centre. ABC is a pond in the shape of right angled triangle. AC = BC and AB is the diameter.



- (i) Find the length of AC.
- (ii) Find the perimeter of the pond. $\sqrt{2} = 1.414$
- (iii) Find the area of the pond.
- (iv) Find the area of the part covered with flower plants.

03 A motor car running at a speed of 60kmh^{-1} takes 6 hours to travel from the city A to the city B. Motor car starting from A, after travelling for two hours, had to stop for two hours due to engine failure and made the rest of the journey at a speed of 30kmh^{-1} .

- (i) Find the distance from A to B.
- (ii) Find the distance after travelling for two hours.
- (iii) Find the distance of the rest of the journey.
- (iv) Find the time taken by the motor car to travel from A to B.
- (v) How long had the car been late ?
- (vi) Find the average speed of the car.

04 Out of 35 in a class 11 students do not take part football. 21 do not take part volleyball 5 students do not take part in both foot ball and volley ball.

- (i) Represent these data in a venn diagram.
- (ii) Find the number of students, who took part only football.
- (iii) Find the number of students, who took part only volleyball.
- (iv) Find the number of students, who took part both football and volleyball.
- (v) Find the percentage of the students who took part football.
- (vi) Find the number of students who took part football.
- (vii) Find the number of students who took part volleyball.

05 (i) Fill up the cumulative frequency table given below.

Class interval	Frequency	Cumulative frequency
5 - 10	2	
10 - 15	7	
15 - 20	26	
20 - 25	52	
25 - 30	8	
30 - 35	5	

- (ii) Draw a cumulative frequency curve.
- (iii) Hence find the

(a) Median	(b) First quartile
(c) Second quartile	(d) Inter quartile range

Mid Year Examination 2015

Mathematics - II

Grade 11

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Time: 2.30 hours

Name/ Index No.

- This paper consists of two parts A and B. Answer 5 questions from part A and 5 questions from part B. 10 marks for each question.

Part - A

01 Furniture set of outright price Rs. 27000 can be bought a down payment of Rs. 6000 and remaining amount by 14 monthly instalments of Rs. 1650.

- What is outstanding balance ?
- What portion should be paid monthly ?
- How much is the total amount ?
- Find the total interest that should be paid.
- Find the number of month units.
- What is the interest per month unit.
- Find the rate of interest per annum.

02 To draw the graph of $y = 6 + 3x - x^2$. An incomplete table is given below.

x	-2	-1	0	1	2	3	4	5
y	-4	6	6	2	-4

- Show how do you obtain the answers. Fill in the blanks.
- Draw the graph of the above function by taking 10 small squares as one unit through the x-axis and the y-axis.
- Using your graph
 - Write the equation of the symmetrical axis of the function.
 - Write down the co-ordinates of the vertex of the curve.
 - Obtain the solution of the equation. $6 + 3x - x^2 = 0$

03 (a) Express $\log \left\{ \frac{x^3 y^{\frac{1}{2}}}{z^2} \right\}$ as logarithms of x, y and z.

(b) Find the value of v using the logarithmic table.

$$a = 19.65, b = 3.25, c = 9.65 \text{ and } v^2 = \frac{a^2}{2bc}$$

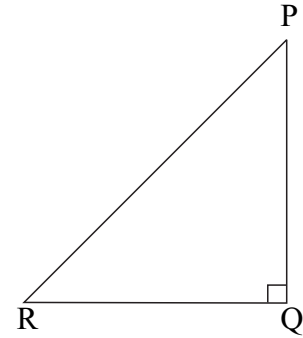
04 (a) In the triangle $\hat{PQR} = 90^\circ$

$$PQ = (a - 1)\text{cm} \quad QR = (a + 2)\text{cm} \quad \text{and} \quad PR = (a + 3)\text{cm}$$

(i) From a quadratic equation in the form $ax^2 + bx + c = 0$ in terms of a.

(ii) Solve the equation and give the answer correct to the second decimal place taking $\sqrt{2} = 1.41$

(b) If $x^2 + \frac{1}{x^2} = 51$, find the value of $(x - \frac{1}{x})$

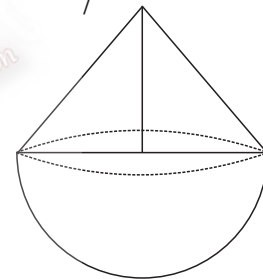


05 The object in the diagram shows a cone and a hemisphere joined. If the height of the cone is $\frac{3r}{2}$ cm and the radius of the hemisphere is 2r cm (take $\pi = \frac{22}{7}$)

(i) find the slant height of the cone.

(ii) find the surface area of the object.

(iii) find the volume of the whole object.



06 The point B is situated 50m away from point A which is in the horizontal ground. A flag pole is in between A and B. An observer at point A observes the top of the flag pole with an angle of elevation 30° and an observer at point B observes the top of the flag pole with an angle of elevation 60° .

(i) Represent the above informations in a sketch diagram.

(ii) Using a suitable scale and draw a scale drawing.

(iii) Using the scale drawing, find the distance.

(a) between A and the foot of the flag pole.

(b) from A to the top of the flag pole.

(c) find the value of $\cos 30^\circ$.

Part - B

- 07 (a) The sum of the first n terms of an arithmetic progression is $(n^2 + 4n)$
- (i) Find the first term.
 - (ii) Find the common difference.
 - (iii) How many terms should be added to the sum to be 192.
- (b) The third term of a geometric progression is -12 and 6th term is 96.
- (i) Find the first term.
 - (ii) Find the common ratio.
- 08 (i) Construct the triangle PQR in which $PQ = 7.5\text{cm}$, $\hat{PQR} = 75^\circ$ and $\hat{QPR} = 45^\circ$.
- (ii) Construct a line through R parallel to PQ.
 - (iii) Construct the perpendicular PT from P to above parallel line.
 - (iv) Find the area of the triangle equal in area of the triangle PQR.
- 09 A frequency distribution prepared for the marks obtained by 100 students at a test is given below.

Marks (class interval)	36 - 40	41 - 45	46 - 50	51 - 55	56 - 60	61 - 65	66 - 70	71 - 75
No. of students (frequency)	7	9	12	20	31	12	6	3

- (i) Write down the modal class of the distribution.
- (ii) What is the median class of the distribution.
- (iii) Taking the mid value of the class interval 56 - 60 as the assumed mean find the mean of the distribution.
- (iv) Find the percentage of students who have scored more than 55 marks.

10 In the triangle PQR, $PQ > PR$. X, Y and Z are the mid points of the sides QR, RP and PQ respectively. The foot of the perpendicular drawn from P to QR is T.

- (i) Draw a diagram to illustrate this data.
- (ii) Give reasons for $ZY \parallel QR$.
- (iii) Show that XRYZ is a parallelogram.
- (iv) Show that the circle with PR as the diameter goes through T
- (v) Show that $\hat{YTR} = \hat{YRT}$

11 In the triangle ABC, $\hat{BAC} = 90^\circ$. The perpendicular AD is drawn from A to BC.

Prove that (i) $DA^2 = DB \cdot DC$ (ii) $BA^2 = BD \cdot BC$

(iii) $AC^2 = BC \cdot CD$

(iv) Hence $AB^2 + AC^2 = BC^2$

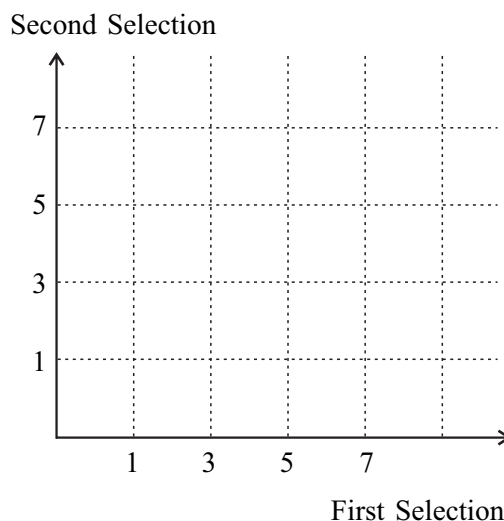
12 (a) (i) In a class of 25 pupils, 20 learn Mathematics and 12 learn Science. Those who learn Science also learn Mathematics. Enter these information on a venn diagram.

(ii) Using the venn diagram, find

- 1. the number of pupils who learn only Mathematics.
- 2. the number who learn none of these subjects.

(b) On cards of same size. 1, 3, 5 and 7 numbers are written and kept in a bag. A card is taken of random from the bag and the digit on of the card is noted down, with out replacing the previous card. Another card is taken out of random from the bag. The digit on the second card also noted down.

- (i) Display all the possible outcomes of numbers formed by two digits on a grid.
- (ii) Find the probability of getting a multiple of 5
- (iii) Find the probability of getting a prime number.



(10 x 10 = 100)