Devi Balika Vidyalaya - Colombo
Third Term Test – 2018 (October)

Mathematics - I

Grade 11 **Time 2 hours**

Name / Index No. : .....
..... Signature of invigilator

Important :

- This paper consist of 8 pages.
- Write your index number correctly in the appropriate place on page one and page three.
- Answer all questions on this paper itself.
- Use the space provided under each question for working and writing the answer.
- It is necessary to write relevant steps and correct units.
- Marks will be awarded as follows: two marks each for questions 1 – 25 in part A. 10 marks each for questions in part B.

For marking examiner's use only

Question number		Marks
A	1 – 25	
B	1	
	2	
	3	
	4	
	5	
Total		

.....
Marked by

Part - A

- Answer all questions on the given paper itself.

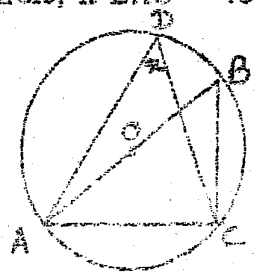
01 Select the value suitable for $\sqrt{13}$ to the first approximation.

3.5 3.6 3.4 3.7

02 Evaluate $\frac{1}{2}\log_4 64$

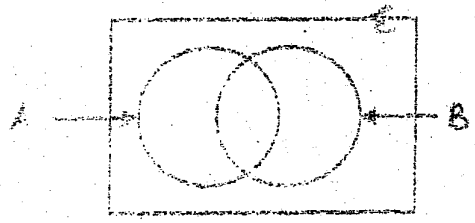
03 The annual assessment tax charged for a shop is 8% and it's annual value is Rs. 60000.00 Find the amount that shop keeper should pay for a quarter as assessment tax.

04 In the given figure, AB is the diameter of the circle, If $B\hat{A}C = 40^0$, Find the value of X.



05 Find the smallest integer which satisfy the inequality $3x + 5 \geq 9$.

06 ε = {students in a class}
A = {students who learn arts}
B = {Male students}
In the given Venn diagram,



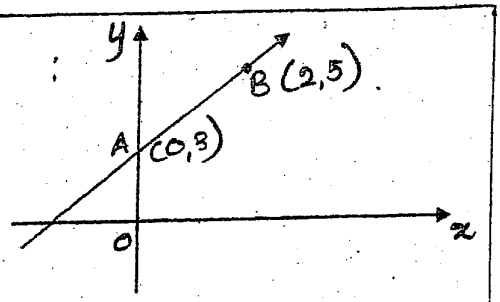
i. Shade the region that includes the students who are not male students and who study arts

ii. Represent the shaded region in set notation.

07 Find the height of a cylinder, which the area of a curved surface is 880cm² and radius of the base is 14cm.

08 If $2x - 3y = 12$ and $x + 6y = -9$, find the value of $x + y$ without solving the equation.

09 By using the information given in the figure, find the equation of the straight line.



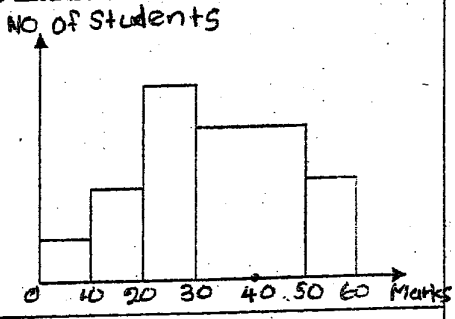
10 Simplify $\sqrt{63} - 2\sqrt{7}$

11 Find the value $\frac{1}{(P-3)} - \frac{1}{2(3-P)}$

12 The following histogram represents the maths marks of several students

i. Find the number of students who scored 30-50 marks.

ii. Find the total number of students who sat for the exam.



13 If $\tan\theta = \sqrt{3}$, find the value of $\sin\theta$

14 Seperate the factors $2x^2 - 14x + 24$

15 Solve the equation. $\frac{P}{3} + \frac{3P}{2} = 1\frac{5}{6}$

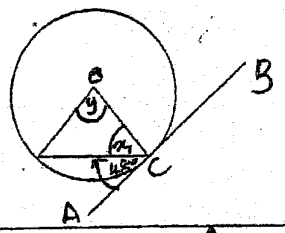
16 If $A = \begin{pmatrix} 0 & 2 \\ 0 & 1 \end{pmatrix}$ and $B = \begin{pmatrix} 2 & 0 \\ 0 & 4 \end{pmatrix}$ find the matrix of AB.

17 It takes 8 hours to complete a task by a robot machine. 12 men require 10 days to complete the same task. Find the amount of task in mandays doing by arobot machine in 1 hour.

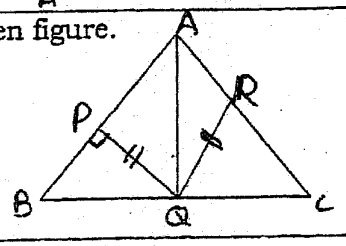
18 An express train which travels $72kmh^{-1}$ stops at a platform for 30 seconds while 18 seconds at a signal post. Find the length of the flat form.

19 ACB is a tangent drawn at the point C in the given circle with centre O.
If $A\hat{C}D = 48^0$

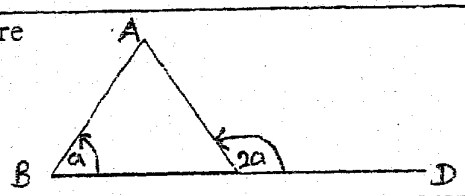
i. Find the value of x
ii. Find the value of y



20 i. Name two congruent triangles in the given figure.
ii. Mention the case of congruency



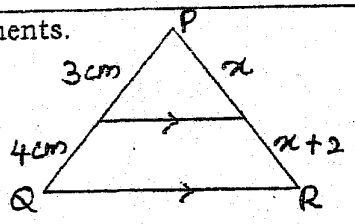
21 Name two equal sides in the given figure



22 Find the probability of being the birthday of two friends in an one day of the week.

23 Make y as the subject of the formula $p + y = \sqrt{r^2 + y^2}$

24 Find the value of x , by using the given measurements.



25 The point P is moving one side of the AB straight line such that angle APB as a constant value. Indicate the locus of point P in a sketch diagram.

A _____ B

Part - B

- **Anser all questions in the given paper itself.**

01) Out of the total croud who came for a medical clinic which was conducted as a community service, $\frac{2}{3}$ of them were less than 40 years while 25% of them were above 75 year old elders. ~~Rest of the 40 were children~~ Rest were 40.

i. Express the number of elders as a fraction of the whole crowd in the simplest from.

ii. Which fraction represents the crowd who were from 40 years till 75 years out of the whole crowd.

iii. Find the total number of people who came for the medical clinic.

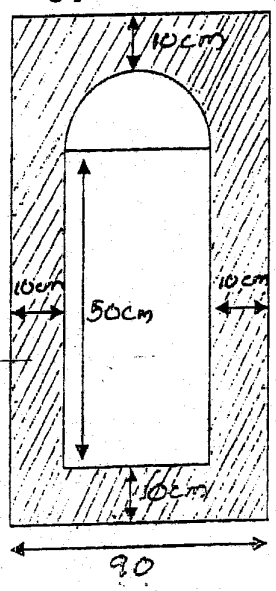
iv. If Rs. 750 worth nutritional bag was given to $\frac{1}{10}$ of the people who have malnutrition out of the whole crowd, find the amout of money spent for that.

02) A window pane of a house is made according to the given diagram. The shaded portion of it is made of wood and the remaining portion is made of glass.

i. Find the height of the window pane.

ii. Find the area of the semi circular part of the glass.

iii. Find the area of the part made of glass



iv. Find the area of the shaded part which is made of wood.

03) When preparing a Murukku mixture Murukku and cashew are mixed according to the ratio 9 : 1

i. Find the mass of Murukku in 500 g of the Murukku mixture.

ii. If peanuts are mixed to the above mixture such that the ratio between Murukku and peanuts become equal to the ratio 3 : 2, find the ratio of Murukku, cashew and peanuts in the new mixture in the simplest form

iii. When preparing a mixture like this, find the amount of peanuts which should be added to the 500g of the mixture of Murukku and cashew.

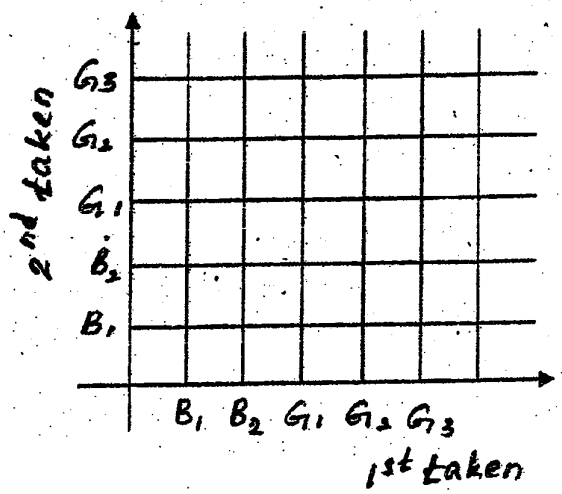
iv. Find the mass of new Murukku mixture.

v. If the price of 100g of Murukku is Rs. 40, 100 g of cashew is Rs. 200 and 100g of peanuts is Rs. 80, find the value of the new mixture.

04) Five eggs in the same size are containing in a box and 3 of them are good in quality and the remaining are rotten. One egg is taken out from the box randomly. If it is a good one, kept it outside and take another one. If it is not a good one put it back and take the 2nd egg.

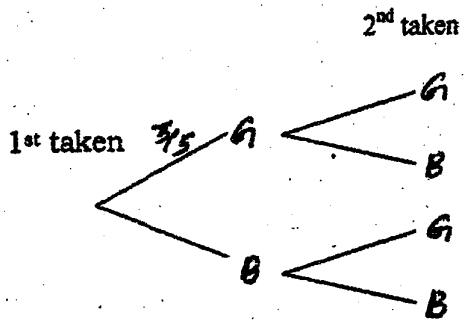
i. Represent the sample space relevant to the event of taking eggs outside the box in the given grid by marking 'X'.

The eggs which are good in quality are given by G1, G2, G3 and rotten eggs are given by B_1 and B_2



ii. Circle the event of getting at least one good quality egg in the grid and find its probability.

iii. An incomplete tree diagram relevant to the above experiment is given below.
Complete the tree diagram by giving relevant probabilities.
G and B represents eggs in good quality and rotten respectively.



iv. Find the probability that only one egg was rotten out of 2 eggs taken out from the box using the tree diagram

05) The following table represents the marks obtained by some applicants who faced to a certain interview.

Class Interval	Tally Marks	No of applicants	Cummulative frequency
0 – 10	//		
10 – 20	////		
20 – 30	///// ///		
30 – 40	///// ///// //		
40 – 50	///// /		

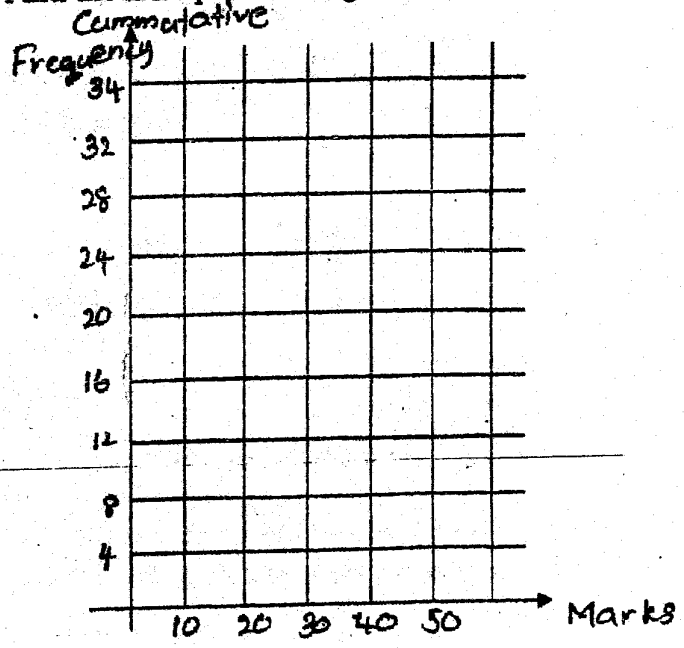
i. Complete the above table.

ii. Find the total number of applicants who faced for the interview.

iii. Draw the cummulative frequency curve relevant to the above information in the given grid.

iv. Find the median mark of the applicants using the cummulative frequency curve you have drawn.

v. Find the interquartile range.



Devi Balika Vidyalaya - Colombo
Third Term Test – 2018 (October)

Mathematics - II

Grade 11 **Time 3 hours**

- Answer **ten** questions selecting **five** questions from **part A** and **five** questions from **part B.**
- Each question carries **10** marks.
- The volume of a right circular cone of radius r and height h is $\frac{1}{3}\pi r^2 h$.

Part – A

(01) Mr. Jayantha invested a certain amount of money from Rs. 100 000 he had, to buy shares in company A which pays annual dividends of Rs. 3 per share, at the market price of Rs. 20 per share. He invested the rest of it in company B that pays annual dividends of Rs. 2 per share, and bought shares at the market price of Rs. 30 per share. If his dividends income for a year from these investments was Rs. 10 000, find the amount he invested in each company.

(02) An incomplete table prepared to draw the graph of the function $y = 5 - (x - 1)^2$ is given below.

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

a)

i. Find the value of y when $x = 2$

ii. Using the scale of 10 small divisions as one unit along each of the x – axis and the y – axis, draw the graph of the above function on a graph paper

b) Using the graph

i. Write the coordinates of the turning point

ii. Write down the range of values of x for which $5 - (x - 1)^2 \geq 0$

iii. Show that the positive root of the equation $5 - (x - 1)^2 = 0$ is $\sqrt{5} + 1$ and find the value of $\sqrt{5}$.

iv. Write down the equation of the function corresponding to the graph obtained when the above graph is translated to 2 units in the negative direction of the x – axis.

03) The following chart includes the data collected by a mother based on the time spent by an O/L student to watch the television during 30 days.

Time (minutes)	15-25	25-35	35-45	45-55	55-65	65-75
Number of days	1	3	6	10	8	2

i. What is the maximum number of minutes he spent on watching television per a day?

ii. Find the mean time that he spent on watching television.

iii. Express the number of days he spent on watching the television more than 45 minutes as a fraction of total number of days.

iv. Mother says that, if the time taken to watch the television is being reduced by 20 minutes the child could have attended to his studies for 40 minutes for the past 120 days. Do you agree with her statement ? Give reasons.

04) The ratio between the ages of A and B is 4 : 3. The ratio of the ages of them after 8 years will be 9 : 7. Taking their present ages as x and y, construct a pair of simultaneous equations. Solve the equations and find the present ages of A and B.

05) The top (Q) of a 8m tall coconut tree is observed with an angle of elevation of $46^0\ 23'$ from a point A , a certain distance away from the bottom of the coconut tree. Again it is observed the top of the coconut tree by moving 6m from A to the opposite direction of the coconut tree.

i. Draw a sketch diagram and mark the above data.

ii. Find the length of AP to the first decimal place using trigonometric ratios.

iii. Find the angle of elevation from B to Q.

06) The length and the breadth of a rectangular metal sheet is $(3x + 2)$ cm and $2x$ cm respectively. If the area of the metal sheet is $24cm^2$, build up a quadratic equation for the area of it in term of x. Solve the equation and find the value of x. $\sqrt{37} = 6.08$ Find the breadth of the rectangle.

07) a) 153 countries have represented the contestants for the "Miss world competition. Ten contestants will be eliminated from each round. Three contestants will be selected for first, second and third places at the final round.

i. Write the contestants in first five rounds as a number sequence and explain what kind of a progression is that.

ii. Find the number of competitors in last round ?

iii. How many rounds are there in this competition ?

b) The sum of the 2^{nd} and 4^{th} terms of the geometric progression is 30 and the third term is 12. The common ratio of this progression is a positive whole number. If "K" is a constant show that the sum of any terms of "n" can be represented by $K(2^n-1)$

08) In the following constructions, use only a straight edge with a cm/mm scale and a pair of compasses. Show the construction lines clearly.

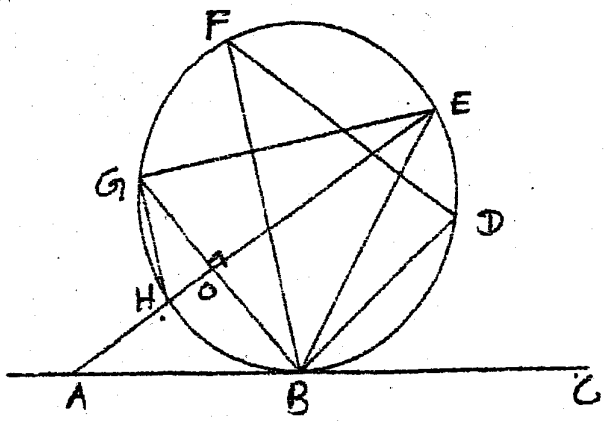
i. Contruct the triangle ABD such that AB = 8cm , BD = 6 cm and $A\hat{B}D = 30^0$

ii. Find the location of the point C when $B\hat{C}D = 90^0$ and AP parallel to DC. Complete the quadrilateral ABCD.

iii. Construct the circle of which the centre is on BD and passes through the points B , D and C. Write the theorem you used above.

iv. Measure and write the radius.

09) B , D , E , F , G , H are the points lie on a circle and ABC is a tangent of it. AB is perpendicular to BG , AB = BE. $B\hat{A}E = 30^0$, $D\hat{B}E = 20^0$. Find the answers for the following by using the above data. State reasons.



i. $C\hat{B}E$

ii. $B\hat{G}E$

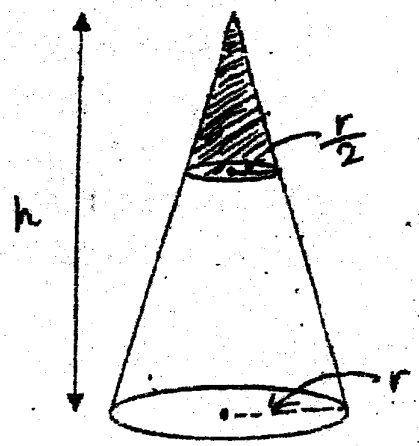
iii. $B\hat{F}D$

iv. Equiangular triangle to ΔOGH

v. Show that $O\hat{A}B = H\hat{G}B$

10) The straight line through B drawn parallel to the diagonal AC of the parallelogram ABCD meets DA produced at E. Prove that the area of the quadrilateral BCDE = 3X the area of ΔACE.

11) a) The figure depicts a conical wooden plank. 1/3 of the portion from the vertex is cut off (shaded portion). If the volume of the rest is V, show that $V = \frac{11\pi r^2 h}{36}$.



b) Find the value to the first decimal place, using logarithmic tables

$$\frac{110 \times 1.75^3}{21}$$

12) Out of 48 persons who visited a certain post office, 20 of them posted the letters and 12 of them sent the telegrams. All those who sent the telegrams bought stamps. 11 persons who bought stamps posted the letters. 4 persons bought stamps and all of them sent the telegrams and posted letters.

i. Depict the above information in a Venn diagram.

ii. Find the persons who visisted only to post the letters.

iii. It 60 persons visited the post office, find the number of persons who visited there for other reasons.