Southern Provinoial Department of Education

Year End Test - 2017

Grade - 10

Mathematics I

Name/Index Number ..... Time : 02 hours

- **Answer all questions in part A and B on this paper itself.**
- **Each question in part A carries 02 marks and in part B carries 10 marks.**

Part A

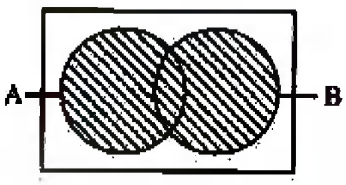
(01) IFRs 2020 had to be paid as annual rates for a house which lies within the limits of a certain urban council, how much has to be paid as rates for a quarter.

(02) $49 = 7^2$ convert into logarithmic from.

(03) A fair cubical die with its sides numbered from 1 to 6 is rolled. Find the probability of getting an even number.

(04) What is the mid value of the class - interval 8 - 16

(05) Write the shaded area in set notation.

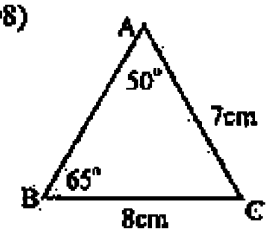


(06) Select and underline the first approximate value of $\sqrt{33}$

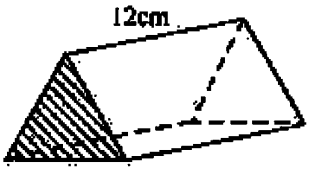
(i) 5.6 (ii) 5. 7 (iii) 5. 8

(07) If the time taken by a train of length 80 m to pass a signal post, is 4 seconds. Find the speed at which the train travels.

(08) Find the length of AB with the help of the information given in the figure.



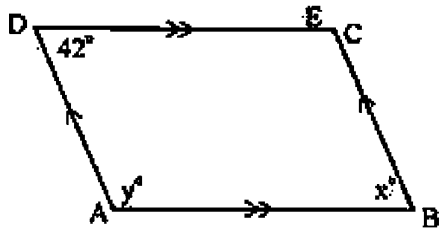
(09) The length of a prism with triangular cross section of area $20cm^2$, is 12 cm. Find the volume of the prism.



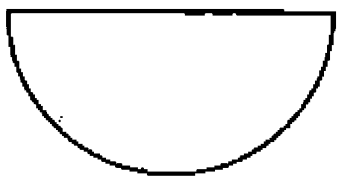
(10) Simplify. $\frac{2}{5x} + \frac{1}{x}$

(11) Find the solutions of the equation $(x-1)(x+2)=0$

(12) Find x^0 and y^0 based on the information given in the figure.

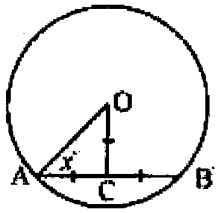


(13) The perimeter of the semicircular sector given in the figure is 36cm. If the arc length is 22cm find the radius.

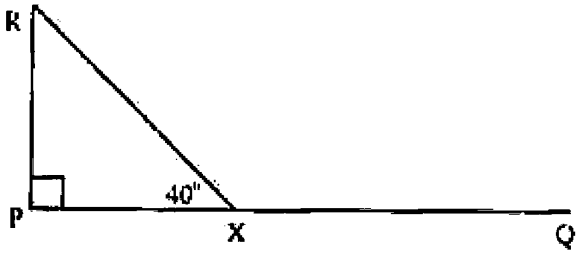


(14) Solve. $\frac{3}{4} - \frac{1}{x} = \frac{1}{2}$

(15) Find x°, based on the information given in the figure.



(16) X and y are two points located on the horizontal path PQ. A vertical post, whose top is R, is at P. The angle of elevation of R from X is 40°, If the angle of elevation of R from y is 20°, Mark y on the path in the given figure.

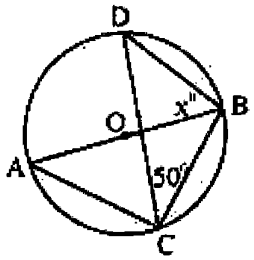


(17) If one of the factors of $x^2 - 2x - 3$ is $(x - 3)$. Find the other factor.

(18) The L. C. M of the two terms $6xy^2$ and $\square\square$ y is, $6x^2y^2$. Insert a suitable number and an algebraic term for the blank cages given above.

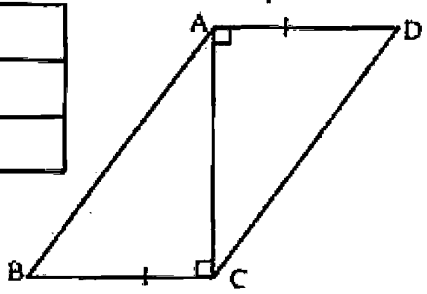
(19) Find the curved surface area of a cylinder of radius 7cm and height 10 cm.

(20) The centre of the circle is "O", Find x° based on the information given in the figure.

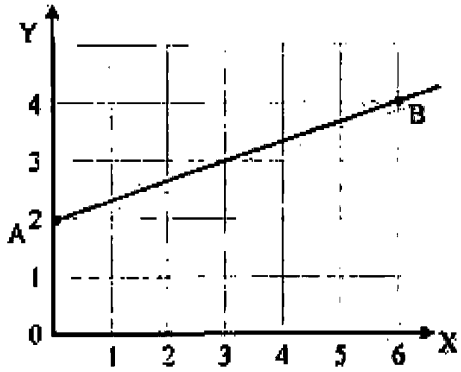


(21) ABC and ADC are congruent triangles. Regarding the triangles three expressions are given below. Put a "✓" mark in the box in front of each correct expression and put a "✗" mark in the box in front of each incorrect expression.

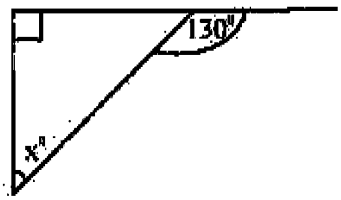
ABC and ADC triangles are congruent under the R.H.S case	
ABC and ADC triangles are congruent under the S.A.S case	
AB and DC are parallel.	



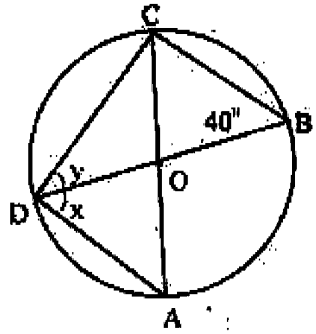
(22) Write the equation of the straight line graph given in the figure..



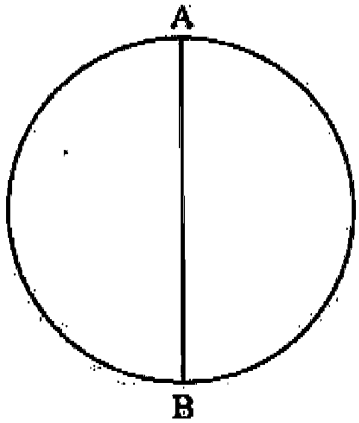
(23) Find x^0 based on the information given in the figure.



(24) "O" is the centre of the circle. Find x^0 and y^0 using the information given.



(25) The centre of the circle, "P" lies on the line AB. Using the knowledge of loci show the construction lines that have to be used to find "P"



Part B

(01) A laborer was able to dig $\frac{2}{5}$ of the total depth of a well in the first day. $\frac{2}{3}$ of the remaining depth in the second day. The task was completed in the third day.

(i) Find what fraction of the total depth that had to be dug after finishing the work in the first day.
(02 marks)

(ii) Find what fraction of the total depth was dug in the seeond day. (02 marks)

(iii) If the remaining 2 meters were dug in the third day, find the total depth of the well. (03 marks)

(iv) If the labourer had charged Rs 1000 per metre for the first five mertes and Rs. 2000 per metre for the rest of the depth, Fiod the total amount of money paid for digging the well.
(03 marks)

(02) When a motorcycle is imported, 25% of its value has to be paid as eustoms daty.

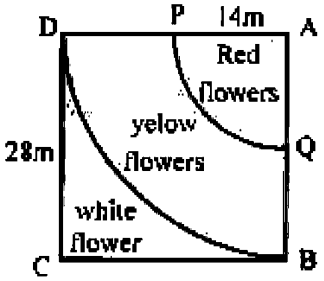
(i) how much duty has to be paid when a motorcycle of this type of value Rs 180 000, is imported.
(02 marks)

(ii) What is the cost of the motorcycle with the customs duty included. (02 marks)

(iii) After paying customs duty and other charges, the cost of the motor cycle is Rs. 250 000. If VAT of 15% is eharged on all these expences, find how much money charged as VAT.
(02 marks)

(iv) Supun intends ro buy the motorcycle. So he takes a loan of Rs 300 000 from a certain financial institute at annual simple interest rate of 4%, promising to settle the loan in five years by paying equal monthly installments with interest. Find the monthly installed that supun has to be paid. (04 marks)

(03) A square shaped flower bed AECD of side length 28m, is shown in the figure. APQ and ADB are two sectors with the centre "0". The flower bed is separated in to three parts by the arc of the sectors. Red, yellow and white flower plants have been grown seperately in these parts as shown in the figure



(i) Find the area of the square shaped flower bed. (02 marks)

(ii) What is the length of the arc of the sector that red flower plants are grown. (02 marks)

(iii) Find the area of the part that white flower plants are grown. (03 marks)

(iv) By constructing a suitable straight line instead of the arc DB, obtain a part of right angled triangular shape with DC as its one boundry and equal in area to the part that white flower plants are grown. (03 marks)

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(04) The following table, the pie chart and the explanations provide the information on the subject streams studied student by the students in A/L classes in a certain higher education institute.

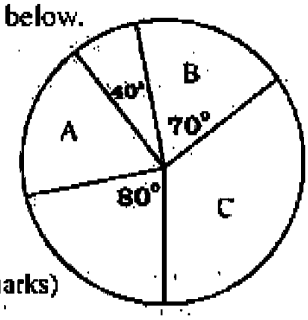
- No of students in arts section is three times the no of students in mathematics - science section. .
- The sum of the number of students in commerce section and language section is equal to the number of students in art section.

stream	maths - science	Commerce	Arts	Tecnical	Languages
no of students	.....	35	60	40	.....

(I) Complete the blanks in the table. (02 marks)

(ii) Find the total number of students studying in A/L classes in this institute. (02 marks)

(iii) Using the pie chart and the information given above answer to the questions below.



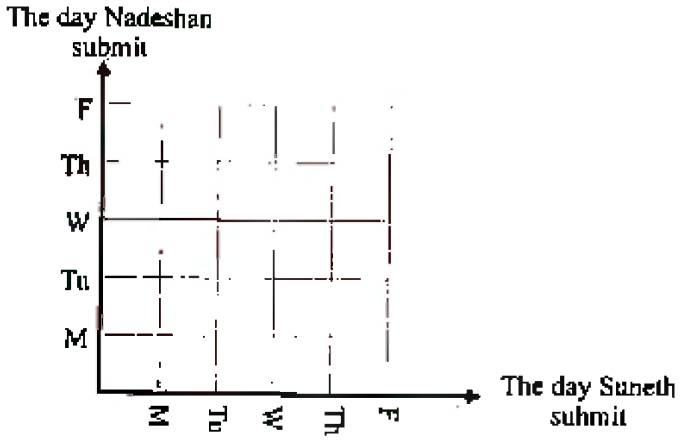
(a) What is the magnitude of the angle at the center that has to be allocated to denote one student. (02 marks)

(b) Which stream of students are denoted by the sector A, and find the magnitude of the angle at the centre in the sector "A" (02 marks)

(c) If five students of commorce section transfer to the technical seetion what would be the engle at the centre of the sector which denotes the new number of students in the tecbnical section. (02 marks)

(05) (a) Students of A/L classes in a certain school have been asked to submit their projects within the five days of the next week.

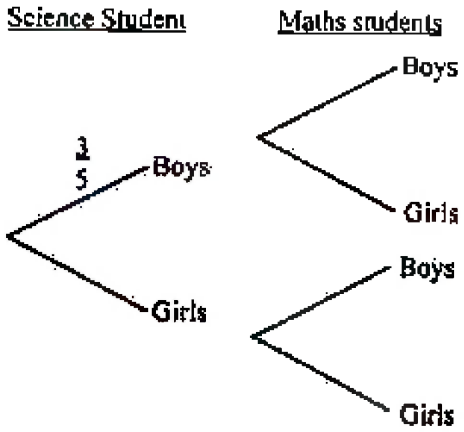
(i) Indicate the relevant sample space which shows the different ways that Suneth and Nadeshan can submit their projects, in the grid given. (02 marks)



(ii) Enclose the event that both will be able to submit their projects on the same day and find the probability of the event. (03 marks)

(b) Among the students who submitted the projects within five days, three are boys out of 5 in science section while three are girls out of 4 in mathematic section. An incomple tree diagram is drawn relevant to the information mentioned above.

(i) Write the relevant probabilities on the branches. (03 marks)



(ii) Hence find the probability of submitting the projects by boys in both sections. (02 marks)

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Year End Test - 2017

Grade - 10

Mathematics II

Name/Index Number ..... Time : 03 hours

- **Answer 10 questions selecting 5 questions from part A and 5 questions from part B.**
- **Each question carries 10 marks**
- **The volume of a cube of side length "a" is a^3**
- **The volume of a right circular cylinder of base radius "r" and height "h" is $\pi r^2 h$**

Part A
Answer 5 questions only.

(01) The assessed annual value of a certain house is Rs 72000. The relevant provincial council institution charges 8% of the value of the house as rates. At the end of the year the owner of the house sold it and received some amount of money. But he had to pay income tax for the money he received at the rate of 4% and the tax free income is Rs 500 000. The income tax that he paid is Rs 28 000.
Show that the amount of money remained after paying income tax and rates is Rs 1166240.

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

x	-3	-2	-1	0	1	2	3
(x + 2)							
(x - 2)							
y							

(i) Copy the table and complete it

(ii) Using the suitable scale draw the graph of the above function.

(iii) Using the graph find the interval values of x on which the function is negative and increasing.

(03) Information about the harvest of salt obtained during the first quarter of the year in a certain saltern at Hambanthota, is given in the table below. (200 - 250 in the table indicates the interval that consists of the values equal or greater than 200 and less than 250)

amount of salt (metric tons)	200-250	250-300	300-350	350-400	400-450	450-500	500-550	550-600	600-650	650-700
No of days	2	3	5	12	22	24	8	6	5	3

(i) What is the model class of the distribution.

(ii) Taking mid value of the model class as the assumed mean, find the mean amount of salt produced a day in the first quarter of the year.

(iii) If the production cost of one metric ton of salt is Rs 10 000 and the selling price of one metric ton of salt is Rs 40 000, find the profit that can be gained a day in this quarter of the year.

(04) (a) Solve. $\frac{3}{x-2} + \frac{1}{3(x-2)} = 1\frac{1}{9}$

(b) The length and the breadth of a rectangular paper are x and y . if it is cut lengthwise to obtain two equal parts as shown, the perimeter of one part is 32cm. If it is cut breadthwise to obtain two equal parts as shown, the perimeter of one part is 28cm.

(i) Construct two simultaneous equations using the information above, containing x and y.

(ii) By solving the equations find the length and the breadth of the initial rectangle.

(05) (a) Solve the inequality $5 - 2x \leq 1$ and represent the solutions on a number line.

(b) Kasun and Ameen select a same number to do some mathematical activity. Kasun adds 3 to the number and squares the answer. Ameen subtracts 2 from the number and also squares the answer.

(i) By taking x as the initial number that Kasun and Ameen selected, write two quadratic expressions separately that Kasun and Ameen obtained as their final answers.

(ii) If the sum of the final answers is 97, show that the sum of the quadratic equations mentioned in (i) is given by the equation $x^2 + x - 42 = 0$

(iii) By solving the quadratic equation in (ii), Find the number selected by Kasun and Ameen.

(06) The top of the telephone exchange tower on the horizontal ground has an angle of elevation of 60° and the bottom has an angle of depression of 40° from the top of the another building of height 20m.

(i) Taking 1cm to represent 4m, Draw a scale diagram.

(ii) find the actual distance between the telephone tower and the building.

(iii) find the height of the telephone exchange tower, in meters.

Part B

(07) 3 , 7, 11, 15.....

(i) What progression do the numbers follow?

(ii) Find the 23rd term of the progression.

(iii) show that the sum of first "n" terms satisfies, $S_n = n(2n+1)$

(iv) Show that the progression obtained by adding 2 to each term of the initial progression, is another arithmetic progression whose common difference is 4.

(08) Use only the straight edge with a cm/mm scale and a pair of compasses for the following constructions show the construction lines clearly.

(i) Construct the triangle ABC such that $AB = AC = 6cm$, and $C\hat{A}B = 60°$

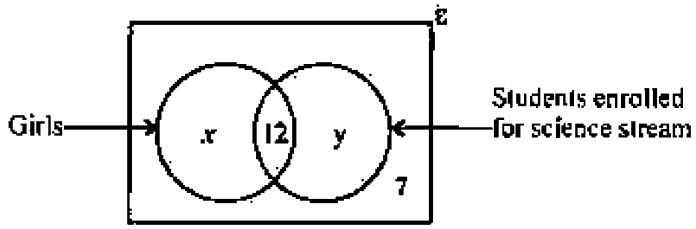
(ii) Construct a line through C, parallel to AB.

(iii) Construct the locus of a point equidistant to AC and AB to meet BC at E and to meet the parallel line constructed in (ii) at D.

(iv) Determine, giving reasons the magnitude of $A\hat{E}B$.

(v) Write the suitable name for the quadrilateral ABCD.

(09) Information on 24 students in a certain mixed school who are qualified to enroll in a National college of Education to follow mathematics stream and science stream Out of 24 students 10 are boys.



(i) What are the values denoted by x and y.

(ii) Find the no of boys who enrolled for mathematics stream.

(iii) Find the total no of students who enrolled for science stream.

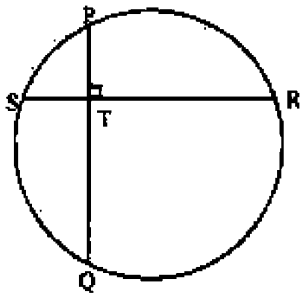
(iv) Copy the Venn diagram above and naming the two sets as "boys" and "student enrolled for mathematics stream", insert the number of students belonging to each region using the information.

(v) Shade the region that represents the girls who enroled for mathematics stream.

(10) (a) An ancient cylindrical coin of radius r and thickness $\frac{45}{r}$ is found through a certain excavation launched by an archaeological department in Sri Lanka. If the volume of the metal made the coin is "V", show that $r = \frac{V}{45\pi}$

(b) If $V = 2120mm^3$ and $\pi = 3.14$ find the radius of the coin using the logarithmic table to the nearest whole number.

(11) The two chords SR and PQ intersect perpendicularly at T such that TP < TQ. Copy the diagram given and produce TP to X such that QT = TX Show that SP produced is perpendicular to RX.



(12) The diagonals of the parallelogram PQRS intersect at "O". A and B are two points lie on PQ and QR respectively at any place on them. AO produced meets SR at C while BO produced meets SP at D.

(i) Copy the figure and indicate the information given above.

(ii) Show that $\Delta AOQ \equiv \Delta SOC$

(iii) Show that OB = OD

(iv) Prove that ABCD is a parallelogram.