

SOUTHERN PROVINCIAL DEPARTMENT OF EDUCATION

MID TERM TEST - 2017

GRADE - 10 Mathematics - I

Name / Index No :

Time : 02 hours

Part A

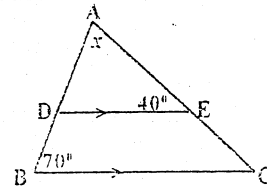
Answer all questions on this paper itself.

- (1) Find the distance that a bus travels at a uniform speed of 100kmh^{-1} covers during 2 hours.

- (2) If $\frac{1}{3}$ of a certain distance is 10km. find the total distance.

- (3) $x = \{\text{factors of six}\}$ write th set x. by listing elements.

- (4) Find x, using the information given with the figure

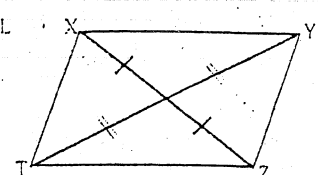
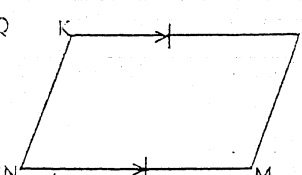
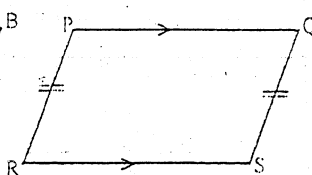
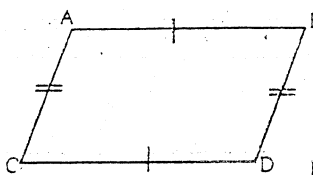


- (5) Select the most suitable value for the first approximation of $\sqrt{33}$

- (i) 5.6 (ii) 5.7 (iii) 5.8 (iv) 5.9

- (6) Simplify $\frac{2}{3x} + \frac{1}{x}$

- (7) Name the quadrilateral which is not a parallelogram by considering the data given with each figure.



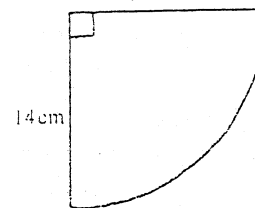
- (8) It takes 30 students 45 minutes to clean their class room on a 'sramadhana' day conducted in the school. If the number of students who come on that day is 25. Find the time required to clean the class room.

- (9) Write the equation given in logarithmic form, in index form and find the value of x .
 $\log_3(x+1) = 2$

- (10) The annual income of a certain individual is Rs. 800 000 and the initial Rs. 600 000 is free of income tax. Calculate the annual income tax that he has to pay if the rest of the money is subject to 4% income tax.

- (11) Factorize $x^2 + 5x - 6$

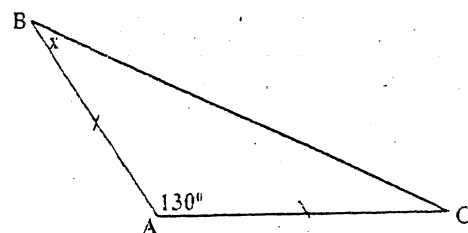
- (12) Find the length of the arc of the sector shown below.



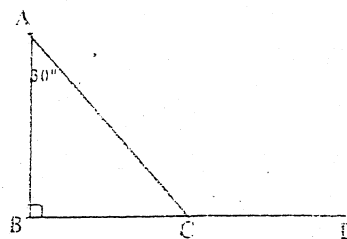
- (13) Find the L. C. M. of the terms $3a^3$ and $2ab$.

- (14) Solve the equation $\frac{5}{2x} - 2 = \frac{1}{2}$

- (15) In the triangle ABC. $AB = AC$
Find x

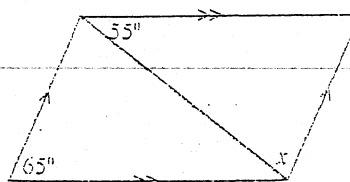


- (16) Find $\angle ACD$ using the information given with the figure.



- (17) Expand the binomial expressions and simplify
 $(x + 1)(x - 5)$

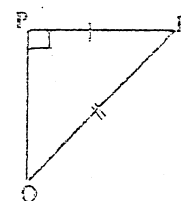
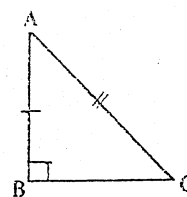
- (18) Find x



- (19) Considering the data given with the figures, insert the suitable sign in the box given in front of each statement.

Correct $\rightarrow \checkmark$

incorrect $\rightarrow \times$

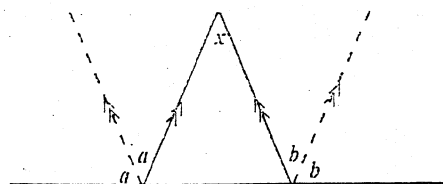


The triangles ABC and PQR are congruent according to the SAS case

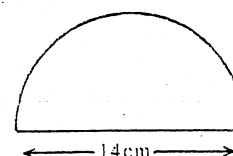
The triangles ABC and PQR are congruent according to the RHS case

$\angle PQR$ is the corresponding angle to $\angle BAC$

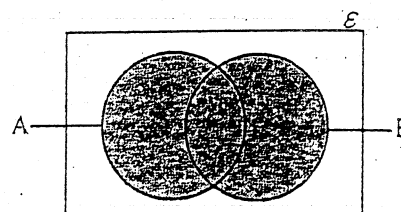
- (20) Find the value of x using the information given with the figure.



- (21) Find the area of the semicircle.

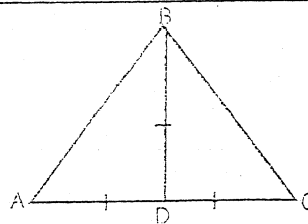


- (22) Write the shaded region in the set notation.



(23) Find the gradient of the straight line which goes through the points (4, 8) and (2, 4)

(24) Find $\angle B\hat{C}A$ using the information given with the figure.



(25) If $x + y = 5$ and $xy = 6$, then find $x^2 + y^2$.

Part B

Answer all the questions.

(1) (a) Simplify $\left(\frac{7}{8} - \frac{1}{4}\right) \div 1\frac{1}{4}$

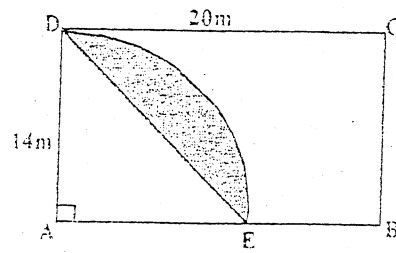
(b) $\frac{4}{5}$ of the capacity of the fuel tank in a vehicle is filled with fuel.

(i) What fraction of the capacity of the tank is remained to be filled completely with fuel.

(ii) $\frac{5}{8}$ of the fuel in the tank was consumed for a certain journey. Find the fuel consumed as a fraction of the capacity of the tank.

(iii) After the journey it is decided to fill the tank completely with fuel. If 35 litres of fuel is needed to completely fill the tank, find the capacity of the fuel tank.

- (2) ABCD is a rectangular land of the length 20m and breadth 14m. The region ADI is a sector of radius 'AD' and the center 'A'. There is a vegetable bed of shape of a triangle (ADE) and the shaded region denotes a pond in the land.

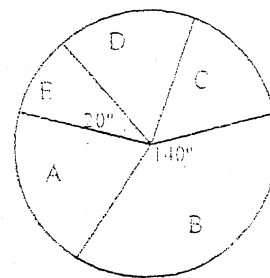


- (i) Find the length of the arc of the sector which is one of the boundaries of the pond.
- (ii) Find the area of the top surface of the pond.
- (iii) The remaining region, except the vegetable bed and the pond is grown with grass. Find the area of the grassy region.
- (iv) It is needed to separate a rectangular portion in the land such that the length of the rectangular part is "BC" and the area is $\frac{1}{3}$ of the area of the grassy region. Show the rectangular part in the land with its measurements.

- (3) (a) The assessed annual value of a house is Rs.32000.00. The relevant provincial council institute charges 6% of the house as rates.
- (i) Find the rates that have to be paid for the year.
- (ii) How much has to be paid as rates for a quarter.
- (iii) If Rs.750.00 is charged by the same provincial council institute as quarterly rates for another house, find the annual assessed value of the house.
- (b) A person who borrowed Rs.100000.00 at 12% simple interest, got released from the loan after 2 years. What was the amount he paid back.

- (4) The following pie chart illustrates the mode of transport of the workers in a certain institute.

A – By motorcycles B – By Public Buses C – By private vehicles
D – By train E – On foot



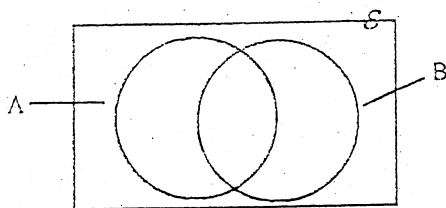
- (i) If the number of workers who come by private vehicles is thrice the number of workers who come on foot, find the angle of the sector which represents the given information.
- (ii) If the number of workers who come by train and the number of workers who come by motor cycles are equal, find the angle of the sector which denotes the workers who come by motorcycles.

- (iii) If the number of workers who come by private vehicles is 24, find the total number of workers in the institute.

- (iv) As there was a common bus strike on a certain day, 10 workers who come by buses come by train. If the pie-chart is drawn again with the new information what will be the angle of the sector which denote the workers who come by train.

- (5) (a) $\mathcal{E} = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$, $A = \{2, 3, 5, 7\}$, $B = \{2, 4, 6, 8, 10\}$

- (i) Complete the venn diagram using the information above.



- (ii) Write the set $A \cap B$, by listing elements.

- (iii) Shade the region denoted by the set $A' \cap B$.

- (b) If $n(A) = 7$, $n(B) = 13$, $n(A \cap B) = 4$. Find $n(A \cup B)$

SOUTHERN PROVINCIAL DEPARTMENT OF EDUCATION

MID TERM TEST - 2017

GRADE - 10 Mathematics - II

Name / Index No :

Time : 03 hours

Answer 5 questions from part A and 5 from part B

Part A

- (1) (a) A person who borrowed Rs. 60 000 from a certain financial institute, agreed to pay back the loan with the interest in 10 equal monthly installments. If the monthly installment was Rs. 6600, find the annual rate of simple interest charged for the loan.
- (b) If he agrees to pay back the loan with the interest in 12 equal monthly installments at the same rate of interest then what will be the amount of a monthly installment.

- (2) An incomplete table prepared to sketch the graph of the function $y = -x^2 + 2$, is given below.

x	-3	-2	-1	0	1	2	3
y	-7	-2	-2	7

- (i) Copy the table and fill in the blanks.
- (ii) Using the scale of 10 small divisions as one unit along both the x-Axis and y-Axis, sketch the graph of the above function.
- (iii) Write the coordinates of the turning point.
- (iv) Hence deduce the coordinate of the turning point of the function $y = x^2 - 2$
- (v) Using the graph find the roots of the equation $x^2 - 2 = 0$

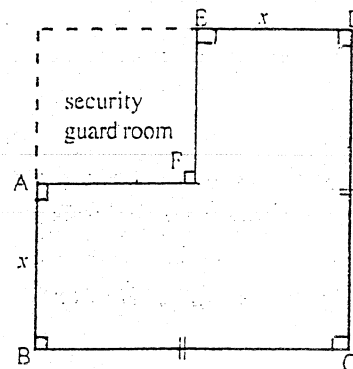
(3) (a) Solve $\frac{3}{2x-1} - \frac{2}{x+1} = 0$

- (b) Supun obtained some money from an automatic teller machine (ATM). There were 26 notes including 1000 rupee notes and 5000 rupee notes in that money. The number of the 1000 rupee notes is 8 more than the twice of the number of the 5000 rupee notes. Taking the number of 1000 rupee notes as x and the 5000 rupee notes as y, build up a pair of simultaneous equations and find the money supun obtained at the ATM.

- (4) A vegetable bed ACDEF is prepared taking two walls (AF, EF) of a security room as its two boundaries. The fence made around the other 4 boundaries is denoted by ABCDE, of length 12m.

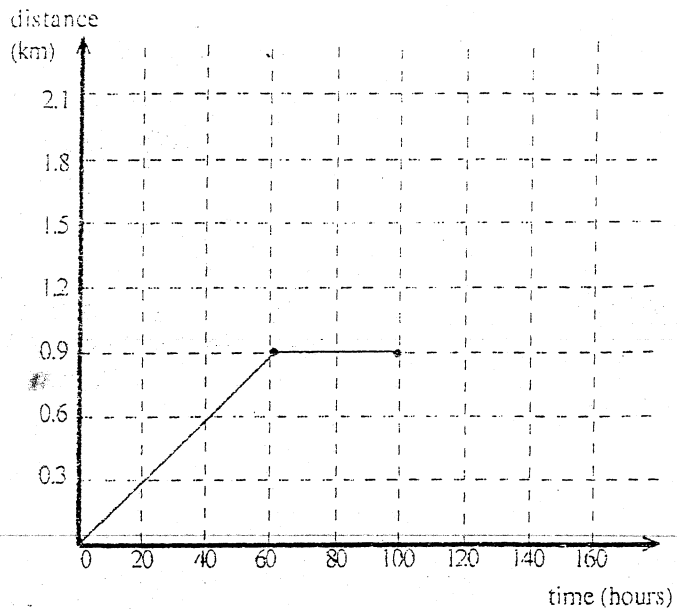
AB = DE = x and BC = DC show that,

- (i) $BC = 6 - x$
- (ii) Area of the vegetable bed is $12x - 3x^2$
- (iii) Area of the floor of the security guard room is $4(9 - 6x + x^2)$
- (iv) If $x = 2m$, find the area of the floor of the security guard room.



- (5) A distance time graph illustrating the motion of Saman who cycled to the city from his home and then returned back home after spending some time at the city.

- According to the graph, find the distance from Saman's home, to the city and time taken to reach the city.
- Calculate the speed at which Saman cycled to the city, in km per hour.
- How long did Saman spend at the city.
- If he returned back home from the city, moving at a uniform speed in 40 seconds, sketch the relevant graph to represent the motion on a copy of the given graph.
- Show that when he returned home he had ignored the preavilling speed limit of 70kmh^{-1}

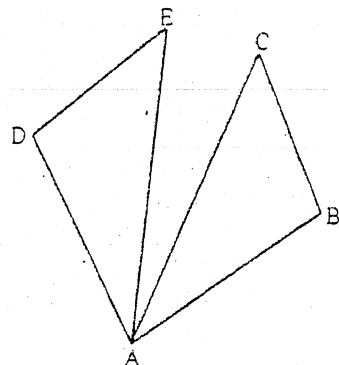


- (6) (a) Factorize
- $x^2 - 49$
 - $x^2 + 5x - 14$
- (b) Find the L. C. M. of the expressions.
 $x^2 - 49$ and $x^2 + 5x - 14$
- (c) Simplify $\frac{2}{x^2 - 49} + \frac{1}{x^2 + 5x - 14}$
- (d) Solve $x^2 + 5x - 14 = 0$

Part B

- (7) (i) Without using the logarithm table, find the value of $\lg 125 + \lg 16 - \lg 2$
- (ii) If $\lg 2.56 = 0.4082$ find $\lg 256$
- (iii) Simplify by using the logarithm tables. $\frac{47.8 \times 2.415}{25.6}$

- (8) In the triangles ABC and ADE, $AB = AD$, $AC = AE$, $BC = DE$
- Copy the figure and feed it with the data given.
 - Prove that $\triangle ABC \cong \triangle ADE$
 - Write the remaining corresponding elements which are equal to each other.
 - Using the congruence of two triangles or otherwise prove that $BE = CD$

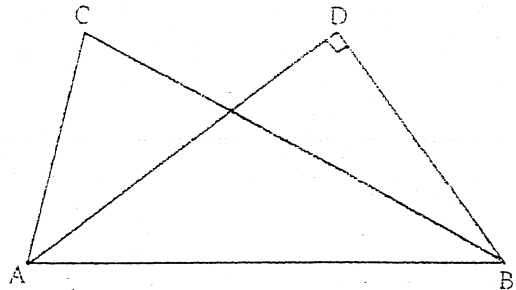


- (9) (a) When the electronic items are imported, customs duty of 30% has to be paid. The value of a LED television set which was imported is Rs. 40000
- Find the customs duty that has to be paid for it.
 - What is the value of the television after the customs duty is paid
 - If VAT of 15% was charged on the value of the television with the customs duty included, find the new value of the television with VAT.
- (b) It takes 4 masons 9 days to make a certain wall. After completing 3 days of work, one gets sick. How many extra days are required to complete the task by the other 3 masons.

- (10) The magnitude of $\angle ACB$ is 3 times of the magnitude of $\angle BAC$. The perpendicular drawn from B to the bisector of $\angle BAC$ is BD. $\angle ABC = x$, $\angle BAD = y$

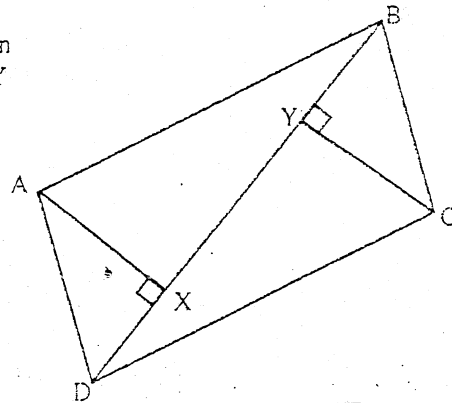
Using the information of the figure shown,

- (a) (i) Find $\angle CAD$ in terms of y
- (ii) Find $\angle ACB$ in terms of x
- (b) (i) Show that $2x + y = 90^\circ$
- (ii) Hence or otherwise prove that BC is the bisector of $\angle ABD$.



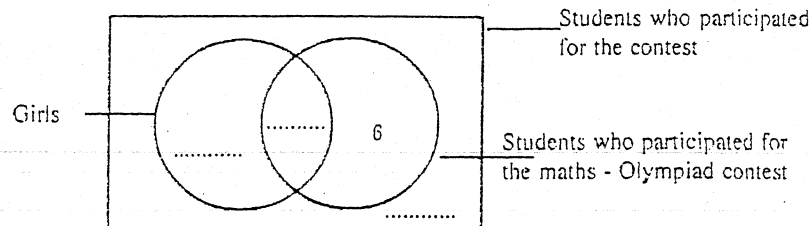
- (11) In the quadrilateral ABCD, $AB \parallel DC$. AX and CY are drawn perpendicularly to DB from A and C respectively. $AX = CY$

- Prove that AXCY is a parallelogram
- Prove that $\triangle AXD \cong \triangle CYB$
- Prove that ABCD is a parallelogram.



- (12) Information about the number of students who participated for two mathematics contests held at a certain school is given in the following table.

	Maths - Do you know contest	Maths - Olympiad contest
Boys	8
Girls	5	11



- Copy the table and the venn diagram fill in the blanks of them.
- Find the total number of students who participated for maths Olympiad contest.
- Shade the region denoted by the students who participated do you know contest.
- Taking the set denoted by the girls as A and the set denoted by the students who participated maths Olympiad contest as B, represent the region denoted by 6 in set notation.