



Grade

11

SECOND TERM TEST - 2019

SUBJECT - **Mathematics -I**

School : .....

Name of the Student/ Index No : .....

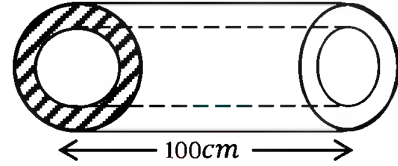
Time : 02 hrs.

Part A

❖ Answer all the questions on the paper itself.

1) It takes 6 men to complete a task within 12 days. How many more men are required if the task is to be completed within 9 days?

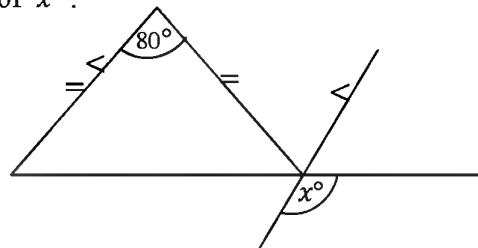
2) If the area of a cross section of a metal tube is  $2\text{cm}^2$  and the height is  $100\text{cm}$ , find the volume of metal contained in the cylinder.



3) If  $\sqrt{3} = 1.73$ , find  $\sqrt{12}$

4) Simplify,  $\frac{12x^2y}{4} \times \frac{5}{3xy}$

5) Using the information given in the figure, find the value of  $x^\circ$ .



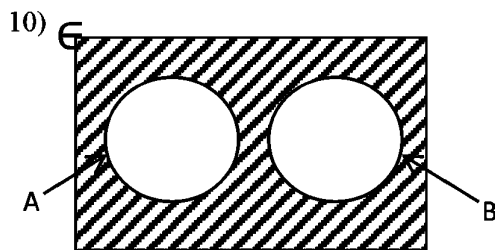
6) Find the common ratio and the value of  $Y$  of the given geometric progression.

7, 21,  $Y$ , 189

7) Solve  $\frac{x-1}{3} = 2$

8) If a car travelled a certain distance at a speed of  $72\text{kmh}^{-1}$  for 4 hours and returned the same distance in 3 hours, find the speed of the car in the return journey.

9) The value of an imported electric appliance is Rs.60 000. If the customs duty is 40% of the value of the item, find the amount paid as duty.

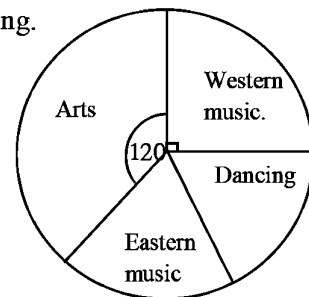


According to the given Venn diagram,

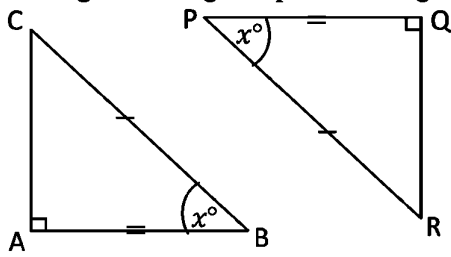
- i. Select and underline the suitable name for the set A and B.
  - a) Compound sets
  - b) Disjoint sets
  - c) Joint sets
- ii. Express the shaded region in set notation.

11) Find the least common multiple of  $6x^2y$  and  $9xy$

12) In the pie chart the number of students who study Eastern music and Dancing are equal. Find the angle at the centre of the sector which denotes the number of students who study Dancing.



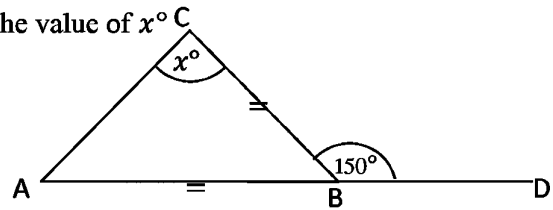
13) According to the given information in the figure select and underline the congruency case which cannot be used to congruent the given pair of triangles.



- i. SAS
- ii. AAS
- iii. SSS
- iv. RHS

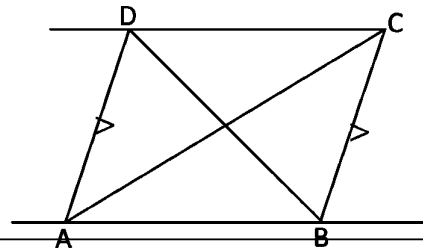
14) Solve  $2x - 1 \leq 5$  and write the maximum value suitable for  $x$ .

15) According to the given information in the figure, find the value of  $x^\circ$

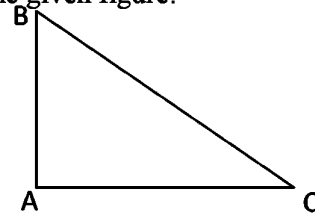


16) When finding the mean of a group of data  $\Sigma fx = 2670$  and  $\Sigma f = 30$ . Find the mean of this group of data.

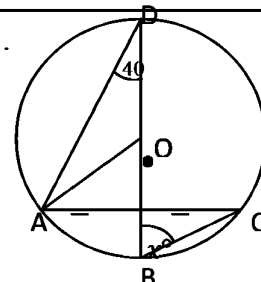
17) According to the given information in the diagram, name a triangle which is equal in area to ABD



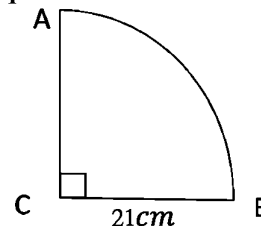
18) An observer who stands on a horizontal ground  $20m$  away from a vertical post AB, observes the top of the post with an angle of elevation of  $48^\circ$ . Represent the measurements in the given figure.



19) According to the information given in the diagram, find the value of  $x^\circ$ .



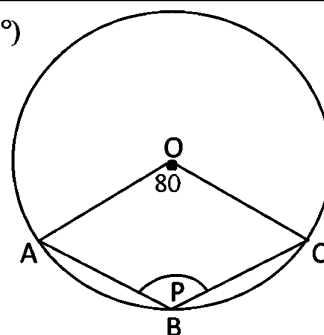
20) The circumference of a circular sheet of radius  $21\text{cm}$  is  $132\text{cm}$ . Find the perimeter of the sector ABC which is cut from it.



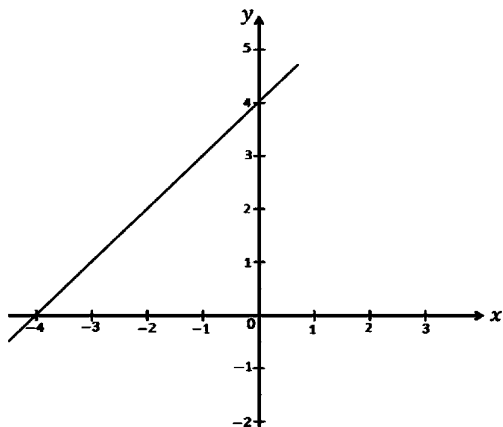
21) If  $10^{2.9809} = 957$ , find the value of  $\lg 957.1$

22) How long will it take to fill a half of a tank with the capacity of  $1000\text{l}$ , using a pipe through which water flows at a uniform rate of  $25$  liters per minute.

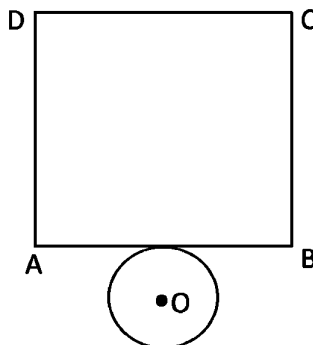
23) According to the information given in the figure, find the value of  $\hat{A}BC$  ( $P^\circ$ )



24) Find the equation of the straight line which is represented in the coordinate plane.



25) When the circle shown here is rotated around the square ABCD by touching all the sides AB, BC, CD and DA, draw the locus of the centre (O) of it.



## Part B

❖ Answer all the questions on the paper itself.

1) A  $\frac{1}{2}$  of the net profit gained at the end of the year by Malan who is the owner of a certain furniture business, was kept with him and a  $\frac{2}{7}$  from the whole net profit was divided among the employees as bonus.

i. What fraction of the whole net profit was separated for him and for the bonus of the employees? (2 marks)

After separating amounts for him and giving bonus for employee,  $\frac{1}{3}$  of the rest was spent to buy a machine for the business.

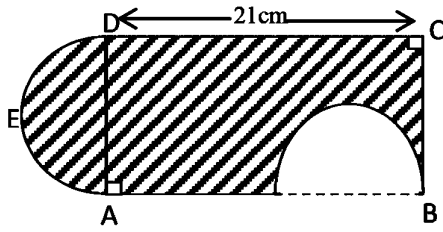
ii. What fraction of the whole net profit was separated to buy the machine? (03 marks)

After buying the machine, the rest was spent for the propaganda of the business.

iii. Find what fraction of the whole net profit was spent for the propaganda of the business.(02 marks)

iv. If the amount spent for the propaganda of the business is Rs. 150 000, find the whole net profit gained from the business at the end of the year. (03 marks)

- 2) A net prepared by cutting a semi circular part of a rectangular piece of cardboard of length  $21\text{ cm}$  and fixing it to the width side of the rectangle is shown in the figure.



- i. If the area of the shaded part is  $294\text{ cm}^2$ , find the width of the rectangular piece of cardboard. (02 marks)
  
- ii. Find the area of the semi circular part (02 marks)
  
- iii. Find the length of AED. (02marks)
  
- iv. Find the perimeter of the shaded part of the net. (02 marks)
  
- v. Calculate the minimum area of the rectangular piece of cardboard which can be used to cut such 4 nets. (02marks)

- 3) The house of Mr. Nayanarathne is within the limits of an Urban Council. He pays Rs. 1750 as the quarterly rate for his house. The Urban Council charges 8% of the assessed value as rates.

- i. How much is to be paid as rates for a year? (02 marks)
  
- ii. Find the assessed annual value of the house. (02 marks)

iii. When it was rented the monthly rent is Rs. 20 000. If 6 months' rent is received as the advance, find the amount he received as the advance. (02 marks)

He spent the advance to buy shares at Rs. 100 per share, in a company that pays annual dividends of Rs. 8 per share.

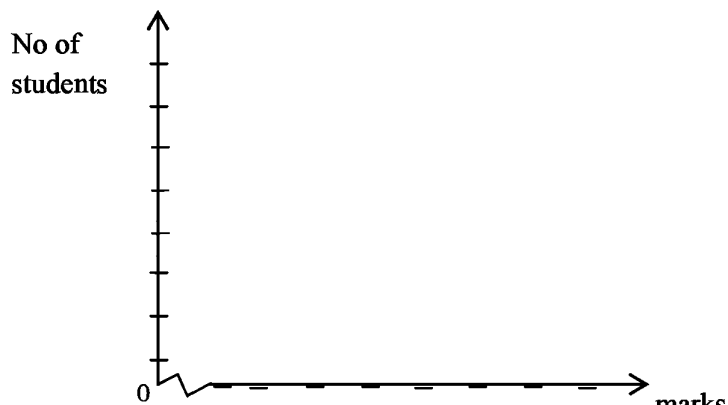
iv. Find the number of shares he bought. (02 marks)

v. Find the dividends income he received from the company at the end of the year. (02 marks)

4) a) The frequency distribution prepared from the marks obtained by students out of 200 marks is given below.

Class interval ( marks)	80 – 100	100 – 120	120 – 140	140 – 160	160 – 200
Frequency ( number of students)	6	8	10	6	10

i. Illustrate this information in a histogram. (03 marks)



ii. Draw the frequency polygon on the histogram. (3 marks)

iii. Express the number of students those who got 160 as a percentage of the total number of students( 2 marks)

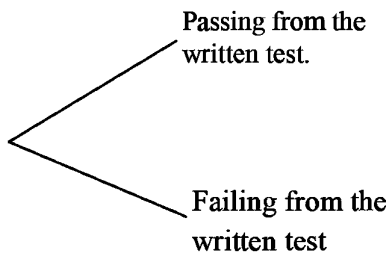
b) 5, 7, 8, 10, 12, 18, 23, 25, 28, 30, 34

i. Find the third quartile (01 marks)

ii. Find the inter quartile range (01mark)

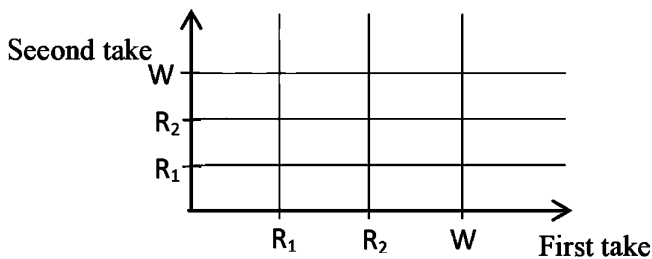
5) One has to pass the written test first and then the interview for a certain government job. The probability of passing the written test is  $\frac{3}{5}$ .

i. Write the probabilities in the branches of the following incomplete tree diagram. (02 marks)



ii. Only the candidates who pass the written test are called for the interview. The probability of failing the interview is  $\frac{1}{3}$ . Extend the above tree diagram to represent the pass/fail from the interview and write the relevant probabilities on the branches. (03 marks)

iii. Find the probability of getting the job for a candidate who sat for the written exam.(02 marks)



b) There are same colour and same shape 2 red bangles ( R1 , R2) and I white bangle (W) in a bag. A bangle is taken randomly and without replacing it, another one is taken randomly.

i. Represent the sample space of the above experiment in the grid. ( I mark)

ii. Find the probability of obtaining different colours in the two occasions. (02 marks)





Grade  
11

SECOND TERM TEST - 2019  
 SUBJECT Mathematics-II

School : .....

Name of the Student/ Index No : .....

Tim 3 hrs.

- ❖ Answer ten questions selecting 5 questions from Part A and 5 questions from Part B.
- ❖ Each question carries 10 marks.
- ❖ The volume of a right circular cylinder of base radius  $r$  and height  $h$  is  $\pi r^2 h$
- ❖ The volume of right circular cone of base radius  $r$  and height  $h$  is  $\frac{1}{3} \pi r^2 h$ .

Part A

1) An advertisement displayed in a showroom is given below.

<ul style="list-style-type: none"> <li>• Bedroom furniture set worth Rs.280 000 can be purchased with a Rs. 40 000 cash down payment and the rest paid in 48 equal monthly installments.</li> </ul>	<ul style="list-style-type: none"> <li>• 20% discount if the Bedroom furniture set worth Rs. 280 000 is purchased at outright payment.</li> </ul>
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Sunil bought a bedroom set by paying Rs. 40 000 and the rest paid in monthly installments. He was charged a 12% annual interest on the reducing loan balance for it.

Sadam bought a bedroom set for outright purchase by taking a loan from a bank for Rs. 280 000 at an annual simple interest rate of 12% for 3 years.

In this transaction who got more profit and find the amount of it?

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

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

- i. Find the value of  $y$  when  $x = 1$
- ii. Using the scale of 10 small divisions as one unit along the  $x$  axis and along the  $y$  axis, draw the graph of the above function on a graph paper.  
Using the graph, answer the following questions.
- iii. Write the interval of values of  $x$  for which the function of  $y$  is increasing and  $-3 < y < 5$
- iv. Express the given function in the form  $y = (x - a)^2 + b$ . (here  $a$  and  $b$  are two numbers)
- v. Write the equation of the graph which is obtained when the above graph is shifted upwards by 4 units along the  $y$  axis.

(03) A frequency distribution prepared using the data on the quantity of rice that was sold in a shop during 30 days is given below.

Amount of rice sold (kg)	40–54	55–69	70–84	85–99	100–114	115–129
Number of days (frequency)	2	4	5	8	7	4

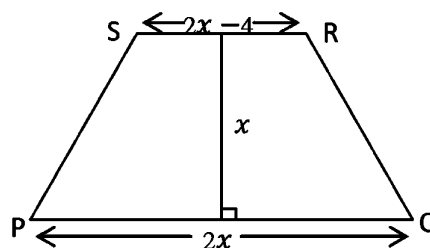
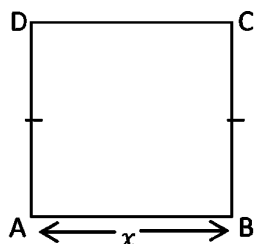
- What is the maximum amount of rice in Kilogram that may have been sold during a day?
- Using the mid value of the class interval 85–99 as the assumed mean or otherwise, find the mean amount of rice in kilogram sold during a day.
- What is the amount of rice in kilogram that the shop can expect to sell in the next seven days?
- It has been found that 90% of the rice sold during a day is white raw rice and the remaining amount is red raw rice. If the price of 1kg of white raw rice is Rs. 80 and red raw rice is Rs. 90, the shopkeeper is expecting to get an income of Rs. 52 000 by selling the rice during a week. According to the given information, prove with reason the shop owner cannot fulfill his expectations.

(04) Factorize,  $x^2 - y^2 - x - y$ .

b) There are 52 students in a class. The number of girls is five less than the twice of number of boys in it.

- Construct a pair of simultaneous equations by taking the number of boys as  $x$  and the number of girls as  $y$ .
- By solving the equation which you have written in part (i), find the number of boys and the number of girls separately.

(05)



The area of the trapezium PQRS is seven units more than the area of the square ABCD. According to the given information, build up a relationship between the areas and using it show that the value of  $x$  is  $1 + 2\sqrt{2}$ . If  $\sqrt{2} = 1.41$ , find the value of  $x$  to the nearest second decimal points.

(06) P and Q are two points on a same horizontal ground and the distance between them is  $18m$ . The top of the vertical building on point P is observed from point Q with the angle of elevation of  $50^\circ$ .

- Draw a scale diagram according to the given information by taking the scale as  $2m$  is represented by  $1cm$  and mark the top of the building as T
- Find the real height of the building PT.
- If the point M, which is in between the points P and Q, and on the same horizontal ground a place is observed from T with the angle of depression of  $70^\circ$ , mark the place where the M is located in the scale

### Part- B

(07) Samith and Manija who were getting ready for an exam, started their studies before 15 weeks of it at the same time. Samith did his studies for 15 hours in the first week and after that for each week he increased 2 hours more than the previous week.

Manuja did his studies for 9 hours per week at the beginning and after that for each week he increased his study time by 3 hours than the previous week.

- i. In a certain week, the time spent on studies of two students was same. Using the formulae, find in which week did it happen.
- ii. The teacher says that they should cover at least 450 hours to pass the exam. Show whether Manuja can achieve that target.
- iii. Find the number of hours he must start with, in the first week, if Samith wanted to achieve the above target.

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

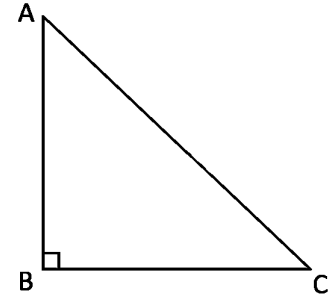
- i. Construct the triangle  $ABC$  such that  $AB = 7\text{cm}$ ,  $\hat{A}BC = 60^\circ$  and  $BC = 6.3\text{cm}$ .
- ii. Construct the locus of a point which is constant distant from points  $A$  and  $C$ , and name the intersected point of it and  $AC$ , as  $E$ .
- iii. Name the point where the above locus and  $CB$  produced meet, as  $D$ .
- iv. Construct the locus of a point which is constant distant from points  $D$  and  $C$  and name the intersected point of it and  $DC$  as  $O$ . Construct a circle of centre  $O$  and radius  $OC$ .
- v. Join  $EO$  and write a relationship between  $\hat{COE}$  and  $\hat{EDC}$ .

(09) a) If a cylinder of radius  $a$  and the height  $27\text{cm}$  is made by melting a solid metal cone of radius  $2h$  and height  $3h$  without wastage, show that  $a = \frac{2(h)^2}{3\sqrt{3}}$

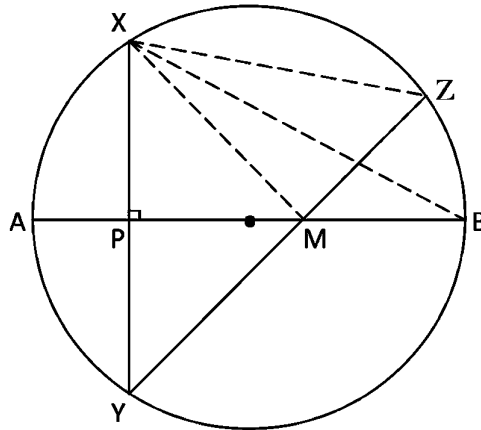
b) Simplify using logarithms table  $200 \times \sqrt{0.426}$

(10) In the right angled triangle  $ABC$ , the midpoint of side  $BC$  is point  $D$ . The line drawn parallel to the side  $AC$  through  $B$  meets  $AD$  produced at  $E$ .

- i. Copy the given diagram to your answer sheet and include the given information.
- ii. Prove that  $ADC\Delta \cong BDE\Delta$
- iii. Prove that  $ABEC$  is a parallelogram.
- iv. Prove that  $AB^2 = AD^2 - \frac{1}{4}BC^2$

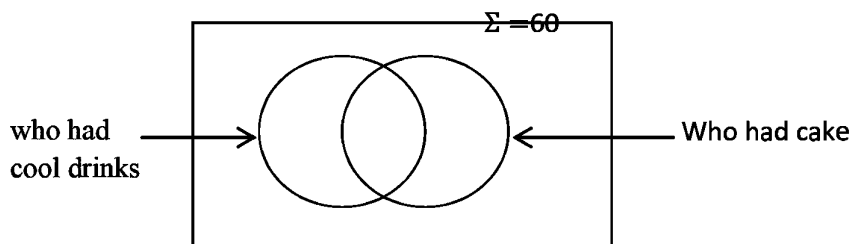


(11)  $XY$  is a chord which is perpendicular to the diameter  $AB$ .  $YMZ$  is another chord which meets  $AB$  at  $M$ . Copy the following diagram to the answer sheet and joining the necessary points, prove that  $PXB\Delta \cong PYB\Delta$  and  $Z\hat{X}B = M\hat{X}B$



(12) Out of the 60 guests at a party, 50% of the guests had cool drinks. But they did not eat cake. While 30% of the guests ate cake 10 of them had cool drinks.

- i. Copy the Venn diagram given below to the answer sheet and find the number of elements belonging to each region using the given information. Write them in the relevant regions.



- ii. How many people neither had cake nor drinks?

b) While  $A$  and  $C$  are mutually exclusive events,  $A$  and  $B$  are independent events.

If  $P(A) = \frac{1}{5}$ ,  $P(C) = \frac{2}{7}$ ,  $P(A \cup B) = \frac{2}{3}$

- i. Find  $P(A \cup C)$
- ii. Find  $P(B)$