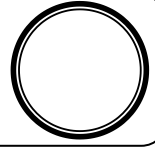




யா/ஹாட்லிக் கல்லூரி,பருத்தித்துறை.  
J/ Hartley College, Point Pedro.



முதலாம் தவணைப் பரீட்சை – 2020 – தரம் 11  
First Term Examination – 2020 – Grade 11

கணிதம் II  
Mathematics I

32

T

II

மூன்று மணித்தியாலம்  
Three Hours

கட்டெண்  
Index No

|  |  |  |  |  |
|--|--|--|--|--|
|  |  |  |  |  |
|--|--|--|--|--|

**Mathematics II**

**Part – II (A)**

**Answer five (5) questions only**

01. A man got Rs.2 300 000 as loan from a bank he lent Rs. 1 100 000 from his loan to a person at the simple interest rate 8% after that he purchased a three wheeler by using the balance.
- What is the interest he earns at the end of the year?
  - He gets Rs. 7 500 as monthly profit from three wheeler. What is the annual profit he gets from three wheeler?
  - Describe that, which investment given above is profitable.
  - He purchased a house worth of 2 000 000 at 10% discount by using the fund, he borrowed lending amount only from the person at the end of the year and collected additional fund. Find the amount of collected additionally.

02. An incomplete table of X and Y values prepared to sketch the graph of the function  $y = 11 - 4x^2$  is given below.

|   |    |    |    |   |               |    |
|---|----|----|----|---|---------------|----|
| x | -2 | -1 | 0  | 1 | $\frac{1}{2}$ | 2  |
| y | -5 | 7  | 11 |   | 10            | -5 |

- Find the value of y when  $x = 1$
- Sketch the graph of the above function by selecting a suitable scale.
- Write down the interval values of x for which  $y \geq 10$ ?

- iv) If the graph moves down words along the y axis by 5 units, write the equation of the graph.
- v) Deduce the solution of the equation  $4x^2 - 11 = 0$  from the graph you obtained.

03. Children and elders participated in a library function the number of children who participated in the library function is 20 more than the number of elders who participated in the library function. It was decided that rental of a chair for children is Rs 60 and rental of a chair for elders is RS 80. In that day RS 2880 was paid as rental for the chairs.

- i) Make a pair of simultaneous equation by taking number of children is  $x$  and the number of elders  $y$ ?
- ii) Find the  $x$  and  $y$  by solving the above equation?
- iii) Simplify

$$\frac{1}{a-b} - \frac{a+b}{(b-a)^2}$$

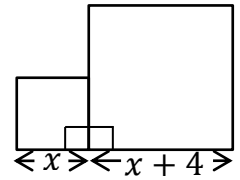
04. In formation on the number of milk powder packets packed by machine in a day by a certain factory is given in the following frequency distribution

i)

| Number of packets  | 36- 40 | 41 - 45 | 46 - 50 | 51 - 55 | 56 - 60 | 61 - 65 | 66 - 70 | 71 - 75 |
|--------------------|--------|---------|---------|---------|---------|---------|---------|---------|
| Number of machines | 04     | 08      | 10      | 12      | 08      | 05      | 02      | 01      |

- ii) Using the above information calculate the mean number of packets which are packed by machines ?
- iii) Calculate the number of packets which are packed by 15 machines?
- iv) RS 40 is to be expected as profit from a packet of milk powder, what is the minimum number of machines needed to get RS 15600 as total profit?

05. A potion has been made by combing two square shape plates whose length of the sides are  $x$  and  $x + 4$  as shown in the figure.



- a) If the perimeter of the given figure is 88 units find the length of side of the small square by making simple equation?
- b) There are two positive integers, large number is 3 less than the twice of small number sum of the squares of large and small numbers is 128  
If small number is  $x$ , show that  $4x^2 - 11x - 119 = 0$  is satisfied by  $x$   
Find the large number by factorizing

06.

- a) Find the value of  $x$  without using the log table  $lgx + lg5 = l + 2lg2$
- b) Calculate the value of  $\frac{0.159^2 \times \sqrt[3]{8.12}}{0.0498}$  using log table.

**Part – II (B)**

**Answer any five questions.**

07. Information of engine fuel using of a vehicle moves in a regular speed are following.

It uses 40ml of fuel in first minute, 45ml of fuel in second minute, 50ml of fuel in third minute.

- i) Measurement of using fuel is in arithmetic progression. Find the measurement of fuel using in 12<sup>th</sup> minute
- ii) Find the measurement of the fuel need for first twelve minutes?
- iii) In a day, due to the irregular path in the movement of this vehicle. Engine uses 4ml of fuel additional after the traveling of 12<sup>th</sup> minute. Driver state “5l of fuel is enough to finish the travelling after the 12<sup>th</sup> minute” show this statement is true with the reasons.

08. Draw the following constructions using straight edge and compass.

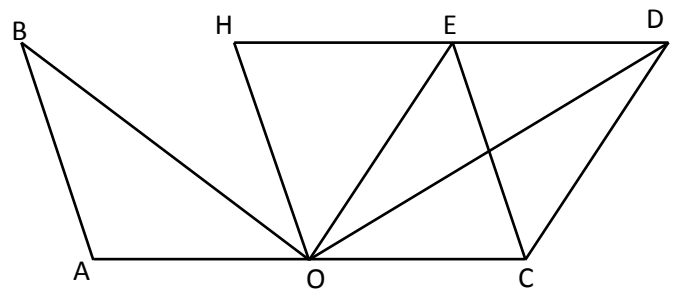
- i) Draw a straight line segment of AB of length 7.2cm, draw an arm AC that  $\widehat{ABC} = 60^\circ$
- ii) Mark the point D on AC such that  $BD=3\text{cm}$
- iii) Draw the perpendicular bisector of BD.
- iv) Draw a circle which goes through B and D and the center of circle lies on AB?
- v) Mark the point E at which cuts AB again and draw a parallel line to OC through it. This straight line meets the circle at F. write the reasons it is to be  $\widehat{BFC} = 90^\circ$ ?

09. In the given figure, AOC is a straight line.

O is the midpoint of AC.

$AB=CD$ ,  $\widehat{OAB}=\widehat{OCD}$  and  $OC \parallel HD$

Copy the given figure in your answer sheet and mark the data.



- i) Show that  $\triangle OAB \equiv \triangle OCD$
- ii) If  $AO = HE$ , show that OCEH is a parallelogram
- iii) Prove that area of  $\triangle OAB = \frac{1}{2}$  area of OCEH?
- iv) If CE produced at F that the HOEF is to be parallelogram prove that area of  $\triangle OAB = \frac{1}{2}$  Area of OCFH?

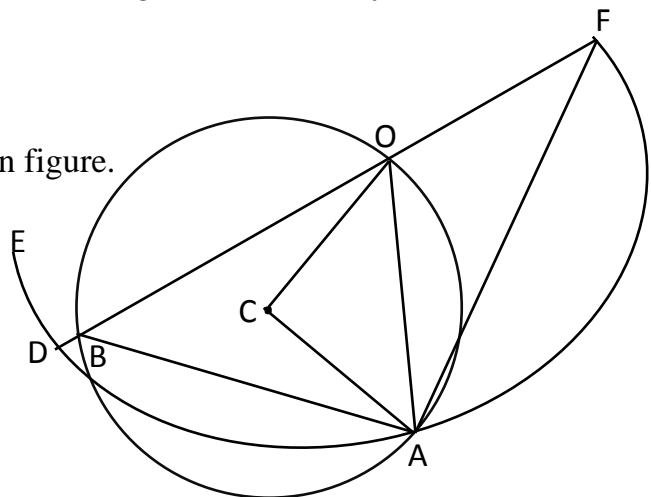
10.

a. Write the theorem the relationship between the angles subtended by an arc at the Centre and on the circumference of a circle.

b. AOB is a circle with radius C, and circular arc EDAF shown in the given figure.

DF is a straight line if  $\widehat{AOP} = x$

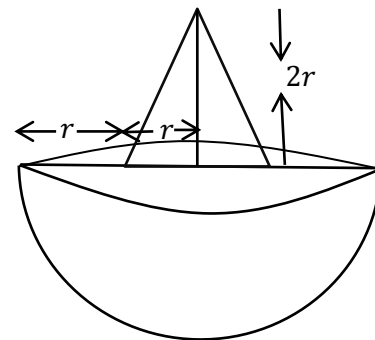
- (i) Express the angles  $\widehat{AOB}$ ,  $\widehat{ACB}$  and  $\widehat{CAB}$  in terms of  $x$ ?



c. Prove that  $\widehat{BAC} + 2\widehat{AFO} = 90^\circ$

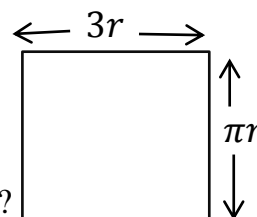
d. If the CO is bisector of angle  $\widehat{AOB}$ , show that the point D coincide with B?

11. In the given figure shows a compound solid and a cone of radius  $r$  cm and height  $2r$  cm on the hemisphere. Which Centres coincide with each other?



a.

- i) Find the total height of the solid in  $r$ ?
- ii) Find the volume of the hemisphere in  $\pi$  and  $r$ ?
- iii) Show that the volume of the compound solid is  $6\pi r^3$ ?



b.

- i) Compound solid is melted and casted in to a cuboid whose cross section dimension are  $\pi r$  cm and  $3r$  cm assuming there was no waste of the metal in the molding process. Calculate the length of the cuboid in terms of  $r$ .
- ii) If maximum length of the compound solid is 18cm show that the maximum length of the cuboid is 9cm.

12. Set P is letters in the word IMMORTALITY

- i) Write the set P as elements.
- ii) If set Q is letters in the word MATHEMATICIAN. Represent the sets P and Q in a Venn diagram
- iii) If  $(P \cup Q)^c = \{B, K\}$  Represent this in Venn diagram
- iv) Find the value of  $n(P \cap Q)$
- v) Set  $Z = \{A, T, I, M\}$  Express the set Z that relate to set P and Q.