

Grade ]

10

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Subject

## Mathematics II

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Time

**3 hrs  
10min**

- Write relevant steps and correct units in answering the questions.
- Answer only 10 questions by choosing 5 questions from part A and 5 questions from part B

01.(a) Sunil obtained a loan of Rs. 200 000 from a bank at an annual simple interest rate of 16%. He gave this amount as a loan to another person at monthly interest rate of 2%

(i) Find the total amount Sunil got at the end of 2 years.

(ii) If he settled the loan with the interest from the money received from the bank. Find the profit he makes.

(b) If a person who borrowed Rs. 8000 settled the loan at the end of 3 years by paying back Rs. 11 600, Find the annual interest rate that was charged.

x	-3	-2	-1	0	1	2	3
y	2	-3	-6	.....	.....	-3	2

- (i) Fill in the blanks in the table.
- (ii) Using the scale of 10 small divisions as one unit along the x axis and y axis, draw the graph of the above function on a graph paper.
- Using the graph,
- (iii) Write the coordinate of the turning point.
- (v) Write the interval of x which the function is negative.
- (vi) Find the positive root of the equation  $x^2 - 7 = 0$

03. According to the survey conducted in a shop during 25 days, the quantity of rice sold on each day in Kg is shown below.

15    18    20    19    15  
 17    18    16    15    14  
 20    15    17    18    16  
 17    18    15    14    20  
 15    17    18    19    16

- (i) Complete the table given below using above data

Amount of rice (Kg) (x)	Tally marks	No of days (f)	$f \times x$
14			
15			
16			
17			
18			
19			
20			

- (i) Find the mode  
 (ii) Find the median  
 (iii) Find the mean of the amount of rice sold per day by completing the column  $fx$  to nearest Kilo gramme  
 (iv) Accordingly, Find the expected quantity of rice to be sold in that shop within 3 months.

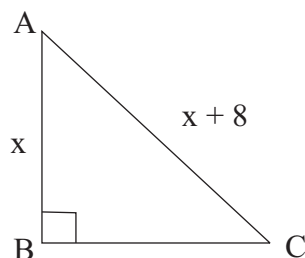
- 04.(a) Solve

(i)  $\frac{3x}{2} - 5 = 4$                       (ii)  $\frac{3}{2x+1} - \frac{2}{3(2x+1)} = \frac{1}{3}$

- (b) A gift of 4 books in same type and 3 pens cost Rs. 1050. another gift parcel of 3 books in same type and 5 pens cost Rs. 925

- (i) Taking the price of a book as Rs. a and the price of a pen as Rs. b, build up a pair of simultaneous equations.  
 (ii) By solving them find the price of a book and a pen separately  
 (iii) Accordingly, find the cost of a gift parcel of 6 books and 8 pens in same type as above (Neglect the cost required for packing the parcels)

05. In the right angled triangle given in the figure  $AB = x$  and  $BC = x + 7$  (all the measurements are in cm)



- (i) Show the quadratic equation  $x^2 - 2x - 15 = 0$  satisfies by  $x$   
 (ii) Find the length of the side AC, by solving the above quadratic equation

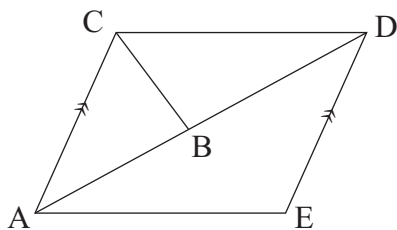
06. The internal length, breadth and height of a cuboidal shaped tank are 4m , 3m and 2m respectively.
- Find the capacity of the tank in  $m^3$
  - When the tank is completely filled with water,  $\frac{2}{3}$  of it used to watering plants. Find the remaining amount of water in the tank in  $l$
- (b) (i)  $\log_2 32 = x$ , find  $x$
- Find the value of  $7.998 \times 30.01$  using logarithmic table.

### PART B

Answer only **five** questions

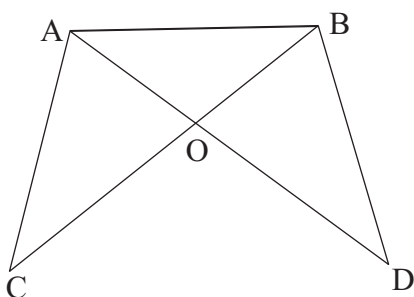
07. A telephone service center charges Rs. 10 for the 1st minute for a phone call from a customer and for each additional minute thereafter, charges Rs. 2 more than the previous minute.
- Write the amount of money to be paid for the first five minutes in order
  - Write the amount of money has to pay for the  $n^{\text{th}}$  minute in terms of  $n$
  - Find the amount of money has to pay for 11<sup>th</sup> minute using the  $n^{\text{th}}$  term obtained in (ii)
  - For which minute is Rs. 40 charged
  - Find the amount charged for the  $(n+1)$  minute.
08. Do the construction given below using a straight edge with a cm/mm scale and a pair of compasses. Show the construction lines clearly.
- Construct the straight line segment AB of length 8cm
  - Draw the locus of points moving equidistant from the points A and B and name the intersecting point of the locus and AB as C
  - Mark the point D on the locus such that  $CD = 6\text{cm}$  and construct the triangle BCD
  - Construct the locus of points moving equidistant from the sides BC and CD and name the intersecting point of this locus and BD as E
  - Measure and write the length of CE

09. In the triangle ABC the side AB is produced up to D



- Name an angle equal to  $\angle BDE$
- Show that,  $\angle CBD = \angle ACB + \angle BDE$
- If  $BC = BD$  show that  $\angle ABC = 2\angle BDC$
- If  $AC = DE$ , Name a pair of congruent triangles and write the case of congruency

10. In the figure given below AD and BC lines intersect at O  $\angle OAC = \angle OBD$ ,  $OA = OB$  and  $\angle CAD = \angle CBD$



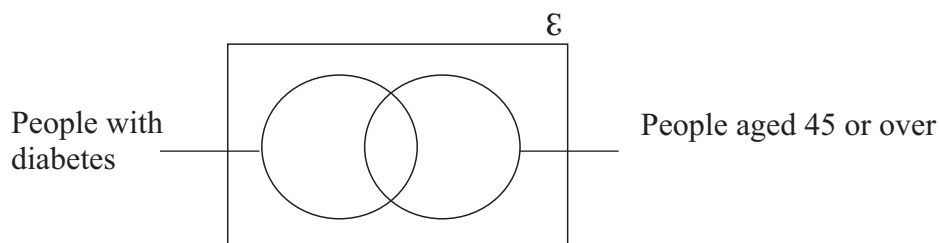
- Write reasons for  $\angle OAB = \angle OBA$
- Prove that,  $\triangle ABC \cong \triangle ABD$
- Show that,  $AD = BC$
- Show that  $OC = OD$  using axioms

11. A well 'W' can be seen at the bearing of  $140^\circ$  from the point A on a road runs from west to east. After travelling 80m towards direction east, at the point B the well can be seen again at the bearing of  $210^\circ$
- Show above information with the measurements on a rough sketch
  - Draw a scale diagram taking the scale 1cm represents 10m for above information
  - Find the shortest distance between the well and road using the scale diagram
  - Mark the point 'C' on the road at the bearing of  $060^\circ$  from the well 'W'

12. The following information is revealed by a survey done using 50 patients in a clinic.

- ★ 34 patients are 45 years or older than 45 years
- ★ 40 patients suffer from diabetes
- ★ 8 person below 45 years do not have diabetes

- Insert above information in the venn diagram given below.  
(Copy the venn diagram onto your answer script)



- Find the number of patients who are aged 45 or over suffering from diabetes.
- Find the number of patients who suffers from diabetes and below 45 years.
- It is revealed that a diabetic patient over 45 years is entered in this venn diagram as a diabetic patient below 45 years. Using this changed information draw a correct venn diagram with correct values