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Provincial Department of Education - NWP

දෙවන වාර පරීක්ෂණය - 11 ශ්‍රේණිය - 2023

Second Term Test - Grade 11 - 2023

Mathematics - I

Time: 02 hours

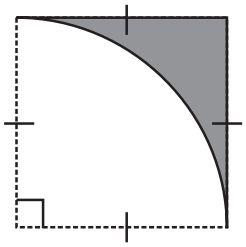
Name / Index No -

Part - A

- **Answer all questions on this paper itself.**
- **Indicate the relevant steps and the correct units when answering the questions.**
- **Marks are awarded as follows. In part A, 02 marks for each question and in part B, 10 marks for each question.**

01. The annual assessed value of a house is Rs. **60 000.** If the provincial council charges annual rate amount of Rs. **4 500**, then find the annual rate percentage.

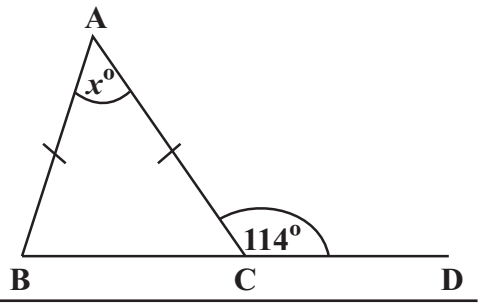
02. The figure represents a square lamina. If the shape of a sector is cut out, Find the perimeter of the remaining figure.



14 cm

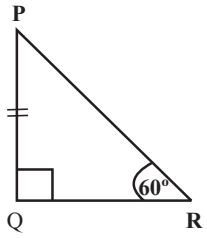
03. Solve . $\frac{2}{3x} - \frac{1}{6x} = \frac{1}{10}$

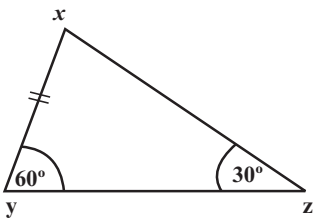
04. Find the value of x^0

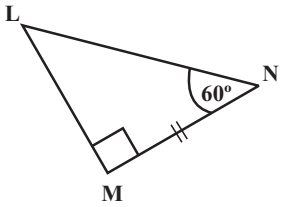


05. Solve $(x+3)(x-8)=0$

06. Select two congruent triangles from the given below and write the relevant case of congruency.



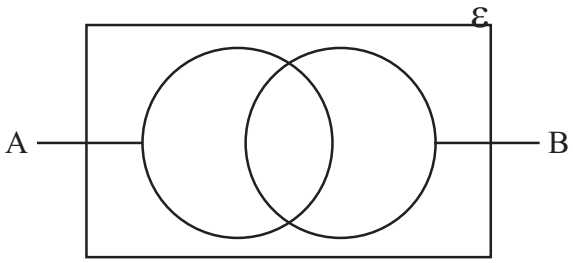




07. Fill in the blanks in the following by using suitable terms

In a rhombus ……. are equal and its diagonals are …….. bisected each other.

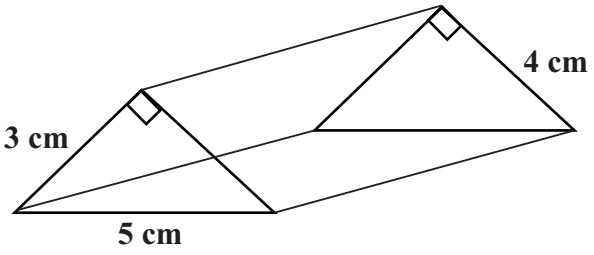
08. Shade the region of $A \cap B'$ in the given Venn diagram.



09. In between which whole numbers does the value of $\sqrt{57}$ lie?

(i) **49** and **64** (ii) **50** and **60** (iii) **7** and **8**

10. Except the triangular faces in the given prism, the area of the remaining faces are **348cm²**. Find the length of this prism



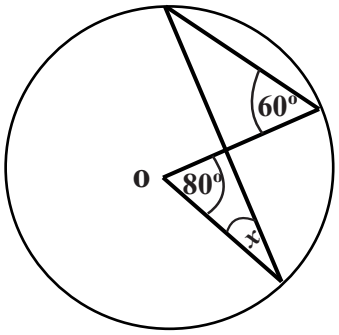
11. If **3x – y = 7** and **5x + 9y = 25** , then find the value of **x + y** without solving the equations.

12. The gradient of a straight line is **3** when passing through the point **(0,4)**. Write the equation of that line as $y = mx + c$

13. First term of a geometric progression is **8** and common ratio is **2**. Write the **15**th term of this progression as a power of two.

14. Write down the least common multiple of the terms $4x^2y$, $2xy$, $3y^2$

15. Find the value of the x according to the data of the circle with center "O".



16. **51-60, 61-70** and **71-80** are few class intervals in a frequency distribution. Write down the lower boundary and the upper boundary of the interval of **61-70**.

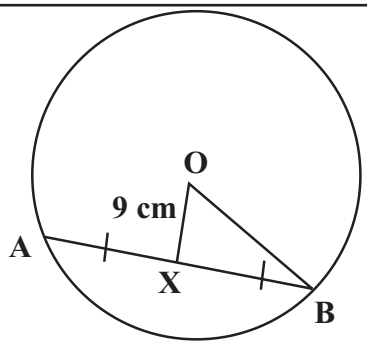
(i) Lower boundary ..... (ii) Upper boundary .....

17. Find the probability of a male get down in the next bus halt from a bus with **7** males and **6** females.

18. If $\log_2 a = 5$, find the value of a.

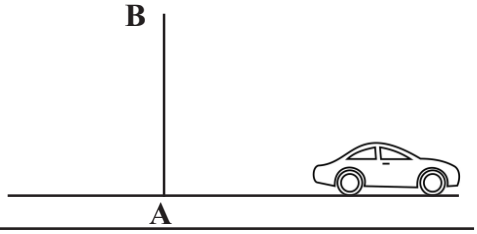
19. The curved surface area of a cylinder is **336cm**^{2} and the base circumference is **42cm**. Find the height of the cylinder.

20. Length of the chord **AB** is **24cm** in the given circle with centre **O**.
If **OX= 9cm**, find the radius of the circle.

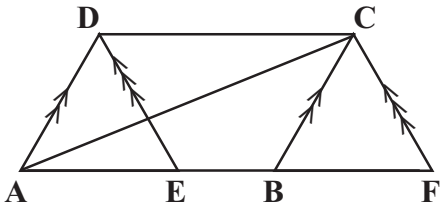


21. Mr.Sampath travelled **14km** within **15 minutes** by his motorcycle. Find his speed in kilometers per hour.

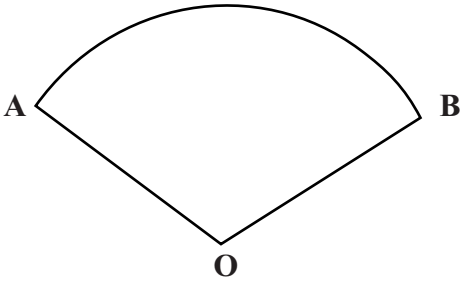
22. AB is a vertical building of **25m** height. An observer observed a car on the horizontal ground from the roof top of the building (B) with a depression angle of 42^0. Represent this information in the given figure.



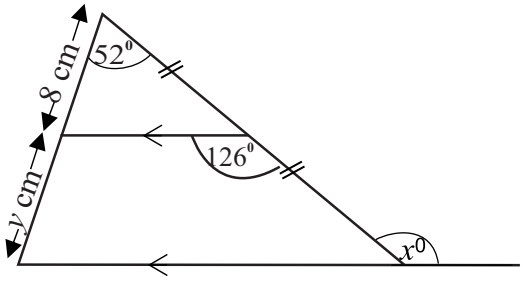
23. **ABCD** and **CDEF** are two parallelograms. If the area of the triangle **ABC** is **12.5cm^2**, find the area of **CDEF**.



24. **AB** is a locus, which is equidistant from the point **O**.
By using the knowledge of loci and constructions,
sketch the point **P** on **AB** as equidistant from **AO** and **BO**.



25. Find the value of ***x*** and ***y***.



Part - B

(01) (a) There are $\frac{2}{7}$ of m.c.q type questions in a certain model papers book. From the remaining questions $\frac{3}{4}$ are structured type questions. And all the remaining questions are essay type questions.

(i) Find what fraction of the whole questions are not belong to m.c.q type questions.

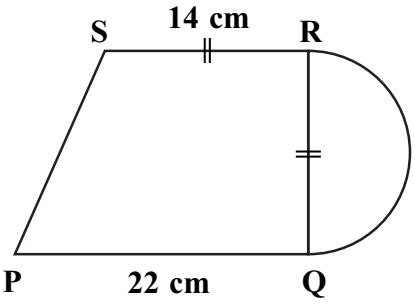
(ii) Find what fraction of the whole questions are structured type questions.

(iii) Write down the ratio between the essay type questions and the structured type questions in the simplest form.

(b) It has been estimated that **6** men will require **8** days to trim a land. If two men left due to sick after they had worked for two days, in how many more days can this task to be completed by the remaining men.

(02) The figure shows a metal sheet consisting of a **PQRS** trapezium and a semicircle with **QR** as it's diameter.

(i) If the perimeter of **PQRS** trapezium is **66cm**,then find the the length of **PS**.



(ii) Find the perimeter of whole figure with the semicircle.

(iii) Find the area of the semicircular portion.

(iv) If another trapezium shape metal sheet is used as its area equal to four times of the area of the semicircular portion and the length of **QR** and **SR** are not changed. Then find its **PQ** length.

(03) (a) Mr. Jayakodi imported an electrical item with the value of Rs. **40 000** and Rs. **16 000** he has to pay as its duty.

(i) Find the duty percentage that Mr. Jayakodi has to pay.

(ii) Mr.Jayakodi decided to mark the price of that item as get a profit of **20%** from the value of the item after paying its duty. Find out the selling price of that electrical item.

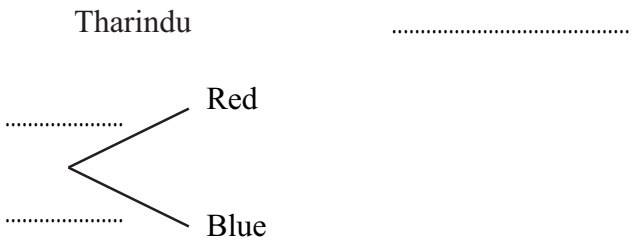
(b) An investor invested Rs. **60 000** in a certain company. Market price of a share is Rs. **25** in that company and dividends of Rs.**4** per share is paid annually

(i) How many shares did he buy?

(ii) How much dividends income does he obtain at the end of a year?

(04) (a) A bag contains identical **3** red balls and **2** blue balls. Tharindu takes out a ball randomly and marks its colour and put it back to the same bag.

(i) A portion of a tree diagram drawn to indicate the probabilities of a ball is taken by Tharindu at random from the bag being a red or blue. Complete the given tree diagram.

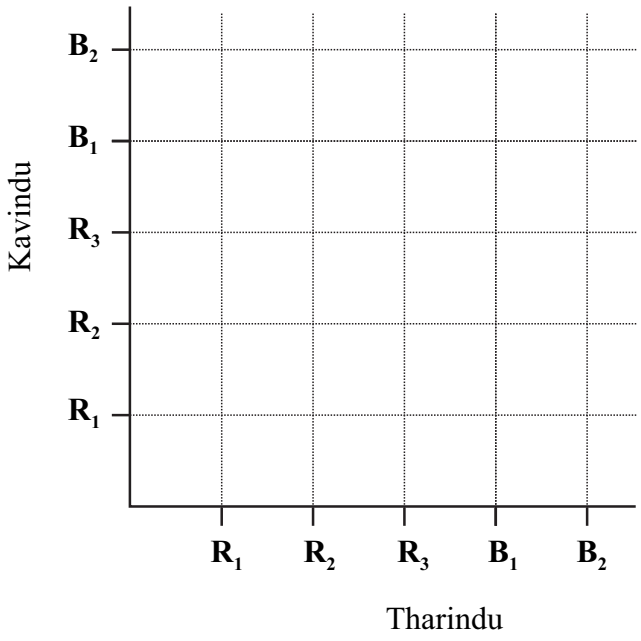


(ii) After Tharindu , Kavindu takes a ball randomly from this bag. Extend the above tree diagram to show the events of getting a red or blue ball by Kavindu.

(iii) Find the probability of getting different colour balls by both of Tarindu and Kavindu.

(b) (i) According to the above event of getting a ball by both of Tarindu and Kavindu, mark the elements of the sample space on the given grid.

(ii) Encircle the event of both getting same colour balls and find its probability.

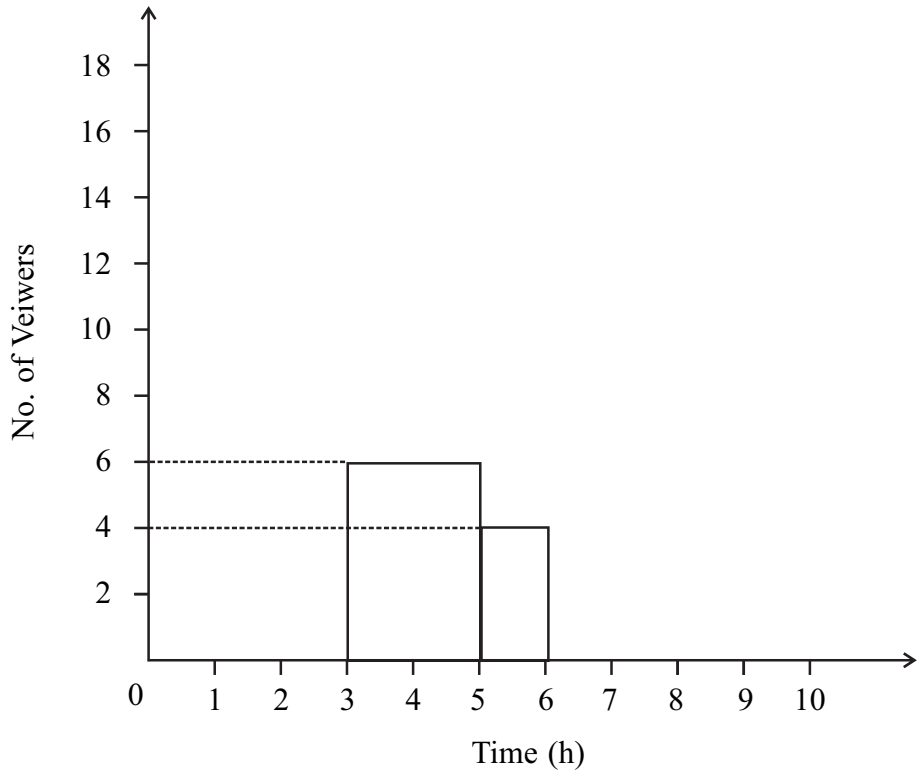


(05) A teacher is uploaded a video of his lesson to his YouTube channel at **3** p.m.The below given incomplete frequency distribution and corresponding incomplete histogram have been represented the number of viewers who watched that video in the same day when at **10** p.m.

Time (class intervals)	**3 - 5**	**5 - 6**	**6 - 7**	**7 - 10**
No. of viewers	.....	.....	**16**	**24**

(i) Complete the above frequency table by considering the histogram.

(ii) Complete the below histogram by considering the frequency table.



(iii) Draw the frequency polygon by using the histogram.

(iv) To get a mean number of viewers as 9 who watched this video within one hour, further how many number of viewers have to watch this video?

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දෙවන වාර පරීක්ෂණය - II ශ්‍රේණිය - 2023
Second Term Test - Grade 11 - 2023

Mathematics - II

Time: 3 hours
Additional reading time: 10 minutes

Name / Index No.

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

Part - A

(01) The following leaflet was pasted on a refrigerator at a certain trade center.

The selling price of the refrigerator - Rs. **120 000**	
When outright purchasing **10%** discount is given.	First make a down payment of Rs. **20 000** and the remaining amount can be paid in **20** equal monthly installments at **24%** annual interest rate. The interest is calculated in the method of reducing balance.

Show that, if this refrigerator is purchased on an installment plan rather than an outright purchase, an additional amount of Rs. **33 000** will be payable.

(02) An incomplete table of the x values and the y values prepared to draw the graph of the function $y = 4x - x^2$ is given below.

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

(a) (i) Find the value of y when $x = 2$

(ii) Draw the graph of the function using a suitable scale.

(b) Using the graph,

(i) Write the equation of the axis of symmetry

(ii) Find the roots of the equation $4x - x^2 = 0$

(iii) When the above graph moves downward along the y - axis by 1 unit, the function can be expressed in the form $y = b - (x - a)^2$. Write the values of a and b.

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

(b) The price of **2** watches of the same type and a pair of sunglasses is Rs. **2 700** and the price of a pair of sunglasses is the same after a **30%** discount is given on the marked price of the watch.

(i) By taking the price of a watch as x rupees and the price of a pair of sunglasses as y rupees, construct a pair of simultaneous equations.

(ii) By solving them, find separately the price of a watch the price of a pair of sunglasses.

---

(04) (i) Candidates who have applied for recruitment in a particular vocational training institute can either visit the institute or attend the interview through zoom technology. From the morning of the interview day within "**t**" period of time, the number of people who joined the interview through zoom technology is indicated by $\mathbf{2t^2 + 3t + 10}$ and the number of people who came to the institute and participated for the interview is indicated by $\mathbf{t^2 + 2t + 3}$. If there are 10 people who joined the interview through zoom technology more than the number of candidates who came to the institute and participated for the interview, show that $\mathbf{t^2 + t - 3 = 0}$.

(ii) By taking the value of $\sqrt{\mathbf{13}}$ as **3.6**, solve the above equation using the formula or by some other method. Then, show that the duration of the interview is **1** hour and **18** minutes.

---

(05) An observer in a boat moored at a point **P** in the sea, sees the top **B** of a lighthouse **AB** with the height of **100 m**, at an angle of elevation of $\mathbf{30^0}$. The boat travels at a speed of **20 m** per minute along a rectilinear path towards the lighthouse in **4 minutes** and stops at the point **Q**.

(i) Find the distance of **PQ**.

(ii) Draw a scale diagram including the above informations, using the scale **1 : 2000**

(iii) Using the scale diagram, find the angle of depression of the boat at **Q** when observed from the top **B** of the lighthouse.

---

(06) The following table shows the information about the number of customers who visited the cash deposit and withdrawal machine placed infront of a certain financial institution and withdrew money during a period of one hour. (**5 - 10** means greater than or equal **5** and less than **10**. All the class intervals are in multiples of Rs. **1 000**)

The amount withdrawn (in multiple of 1000)	5 - 10	10 - 15	15 - 20	20 - 25	25 - 30	30 - 35	35 - 40
Number of customers	2	3	8	12	7	5	3

(i) Write the modal class.

(ii) By taking the mid value of the modal class as the assumed mean, find the mean amount of money withdrawn by a customer in an hour.

(iii) Express the number of customers who withdrew more than Rs. 25 000, as a percentage of the total number of customers.

Part - B

(07) (a) A machine that automatically accelerates and operates produces rubber balls. This machine automatically stops every fifteen minutes and restarts after five minutes. The machine produces **4** rubber balls in the first minute and every minute there after produces **3** rubber balls more than the previous minute.

(i) Write the number of rubber balls produced in the first **4** minutes respectively and state which type of progression is it.

(ii) Find the number of rubber balls produced in the **15^{th}** minute.

(iii) Show that the number of rubber balls produced by this machine in **15** minutes exceeds **370**.

(b) In the geometric progression **3, 6, 12, 24,** ..... find the sum of the first 8th terms, using the formula.

---

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

(i) Construct the triangle **ABC**, such that **AB = 7 cm**, $\hat{BAC} = 90^0$ and **AC** = **6** cm

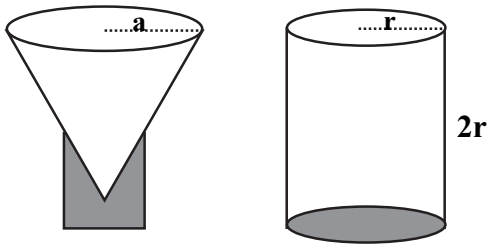
(ii) Construct the locus of points equidistance from **A** and **C,** and name the intersection point of that locus and the side **BC** as **O**. Then construct the circle taking **O** as the center and **OA** as the radius.

(iii) Construct a line parallel to **AB** through **C** and name the point it meets the circle as **D**.

(iv) Give reasons why **BD // AC**.

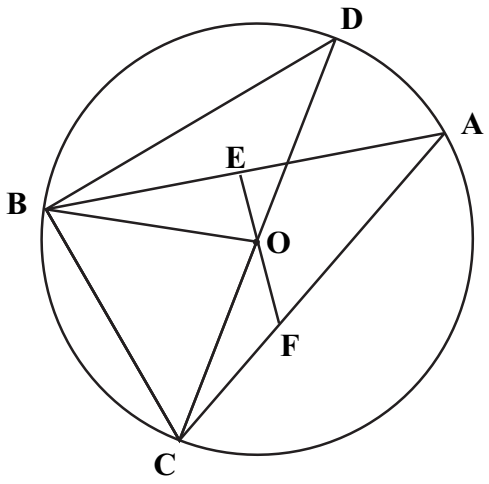
---

(09) The following figure shows a right circular conical shaped vessel rested on a support with the circular opening radius "a" and height of twice of its radius and a solid circular cylinderical vessel with the radius "r" and height 2r. If the conical shaped vessel is completely filled with water and the same volume of water is poured in to the cylinderical vessel, it is filled to half of it's height. Show that $a = \sqrt[3]{\frac{3}{2}}\,\mathbf{r}$ and using the logarithms table, find the value of "a" to the nearest first decimal place when r = 3. 25 cm.



(10) In the triangle **PQR**, **S** is the mid point of the side **PQ**. **T** is a point on the side **PR** such that **RT** $= \frac{1}{3}$ **PR**. The line drawn parallel to **QT** through **S**, meets the side **PR** at **U**. The straight lines **SR** and **QT** meet at **O.** show that **OT** $= \frac{1}{4}$ **QT.**

(11) In the circle with the center **O** shown in the figure, **E** is the mid point of the chord **AB**. The produced line **EO** meets the side **AC** at **F**. Furthermore, produced line **CO** meets the circle at **D**.

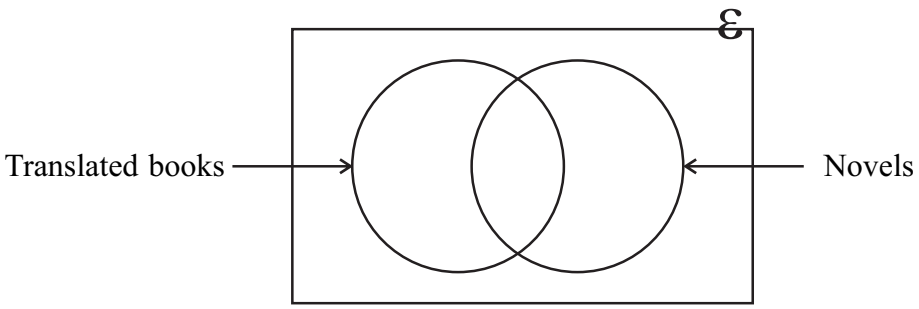


(i) Giving reasons, find the magnitude of $\hat{AEF}$

(ii) Show that $\hat{AFE} = \hat{BCD}$

(iii) Prove that **AB : CO = BD : AF**

(12) Mr. Nirmal who came for a book fair, bought **15** translated books, **13** novels and additionally **7** other books. The total number of books he bought was **30**.



(i) Copy the given diagram and represent the above information in it.

(ii) How many translated novels did Mr. Nirmal buy ?

(iii) Find the number of non - translated novels bought by Mr. Nirmal

(iv) In the venn diagram you copied, shade the region that represents the translated books which are not novels.

(v) Find the probability that the book chosen at random is a novel or a translated book, among the books he bought.

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Department of Provincial Education - NWP
දෙවන වාර පරීක්ෂණය - 10 -11 ශ්‍රේණි - 2023
Second Term Test - Grade 10 -11 - 2023

ගණිතය II

විෂයය Subject	විභාග අංකය Index No.

විභාග ශාලාවෙන් පිටතට ගෙනයාම තහනම්. Not to be removed from the Examination Hall.

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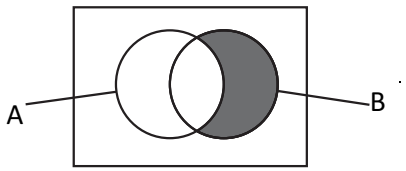
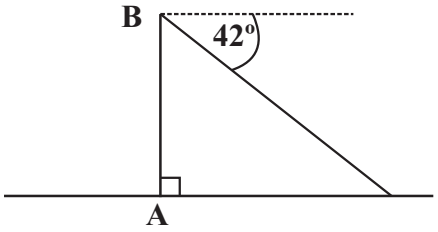
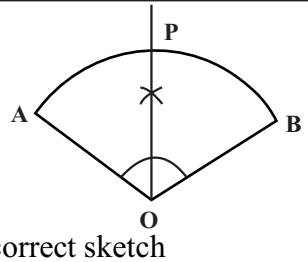
Paper I - Part - A

01.	7.5% $\frac{4500}{60000}$ x 100%	1	02
02	50 cm $\frac{1}{4} \times 2 \times \frac{22}{7} \times 14$	1	02
03	$x = 5$ $\frac{3}{6x} = \frac{1}{10}$	1	02
04	$x = 48^0$ $\hat{B} = \hat{C}$ or $C\hat{} = 66^0$	1	02
05	$x = -3$ or $x = 8$ for one answer	1	02
06	XYZ $\triangle \equiv$ LMN $\triangle$ (A.A.S.) Identifying triangles or indicating the case of congruency	1	02
07	sides, perpendicularly for one answer	1	02
08			02
09	49 or 64		02
10	29cm $348 \div 12$	1	02
11	x+y=5 8x+8y=40	1	02
12	$y = 3x + 4$ $y = 3x + c$ or $y = mx + 4$	1	02
13	2^{17} 8×2^{14}	1	02
14	$12x^2y^2$		02
15	20^0 obtaining 100^0 or 80^0	1	02
16	60.5 70.5 for one correct answer.	1	02
17	$\frac{7}{13}$		02
18	32 $2^5 = b$	1	02
19	8cm 336/42	1	02
20	15cm 90º, 12 cm or for pythegorous relation.	1	02
21	56 kmh^{-1} $14 \div \frac{15}{60}$ or 56	1	02
22	 marking 90º, 25 m and 42º for 02 data	1 1	02
23	25 cm^2 (lying between on the same base and in between same parallel lines if no reason.	1	02
24	 correct sketch marking P	1 1	02
25	$x = 126^0$ y = 8 cm	1 1	02

Paper I - Part - B

01

(a) (i) not m.c.q. $= 1\frac{2}{7}$

$= \frac{5}{7}$ 01

(ii) structured $= \frac{5}{7} \times \frac{3}{4}$ 01

$= \frac{15}{28}$ 01

(iii) no. of essay type questions. $= 1-\left(\frac{2}{7}+\frac{15}{28}\right)$ 01

$= 1-\frac{23}{28}$

$= \frac{5}{28}$ 01

ratio $= \frac{5}{28}:\frac{15}{28}$

$= 1:3$ 01 06

(b) estimated man days $= 6 \times 8$

$= 48$ 01

task completed $= 2 \times 6$

$= 12$

remaining task $= 48 - 12$

$= 36$ 01

no. of days for remaining 4 men $= \frac{36}{4}$

$= 9$ 01

additional no. of days $= (9 + 2) - 8$

$= 3$ 01 04

10

02

(i) Length of PS $= 66 - (22 + 14 + 14)$

$= 16$ cm 02 02

(ii) $= 2 \times \frac{22}{7} \times 7 \times \frac{1}{2} + 22 + 16 + 14$ 02

$= 22 + 22 + 16 + 14$

$= 74$ cm 01 03

(iii) area $= \frac{22}{7} \times 7 \times 7 \times \frac{1}{2}$ 01

$= 77\text{cm}^2$ 01 02

(iv) area $= 77 \times 4$ 01

$= 308$

$308 = \frac{1}{2} \times 14\,(14 + Pa)$ 01

$308 = 98 + 7PQ$

$210 = 7PQ$

$30\text{cm} = PQ$ 01 03

10

03

(a) (i) duty percentage $= \frac{16\,000}{40\,000} \times 100\,\%$ 01

$= 40\,\%$ 01 02

(ii) value after paying duty $= 40\,000 - 16\,000 = 56\,000$ 01

selling price $= \frac{120}{100} \times 56\,000$ 02

$=$ Rs. 67 200 01 04

(b) (i) no. of shares bought $= \frac{60\,000}{25}$ 01

$= 2\,400$ 01

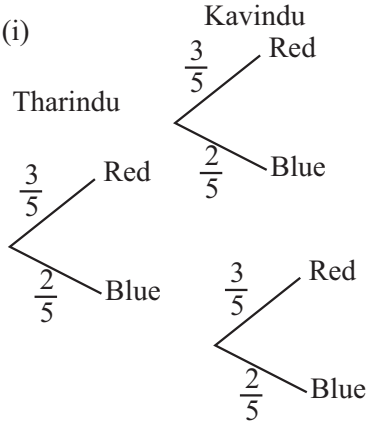
divident income $= 2\,400 \times 4$ 01

$=$ Rs.9 600 01 04

10

04

(i)



01 01 01 01

(ii) $\left(\frac{3}{5} \times \frac{2}{5}\right)+\left(\frac{2}{5} \times \frac{3}{5}\right)$ 01

$\frac{6}{25} + \frac{6}{25}$ 01

$\frac{12}{25}$ 06

(b) Marking correct points. 02

encircle the correct points. 01

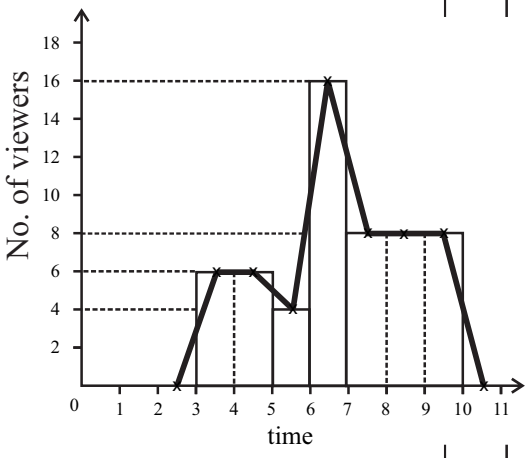
Probability $= \frac{13}{25}$ 01 04

10

05 (i)

3 - 5	5 - 6
12	4

02 02



(ii) drawing the correct coloumns relevant to the class interval **6 - 7** 01
7-10 02 — 03

(iii) correct frequency polygon 03 — 03

(iv) No. of veiwers
= 9 x 7
= 63 01
= 63 - (12 + 4 + 16 + 24)
= 63 - 56
= 7 01 — 02

10

Paper II - Part - A

01. Amount when outright purchasing =

$= \frac{90}{100} \times 120\,000$ 01

= රු. 108 000 01

remaining amount to be payed as installments = 120 000 - 20 000

= 100 000 01

value of one month units $= \frac{100\,000}{20}$ 01

= Rs. 5 000

interest for one month unit =

$\frac{24}{100} \times 5000 \times \frac{1}{12}$ 01

= 100 01

No. of month units $= \frac{20}{2}(20 + 1)$

= 210 01

total interest = 210 x 100

= 21 000 01

total amount = 120 000

+21 000

141 000 01

extra amount payable =

141 000

- 108 000

33 000 01

10

02. (a) (i) 4 01

(ii) drawing correct axis 01
marking correct points 01
smooth curve. 01 — 04

(b) (i) $x = 2$ 01

(ii) $x = 0$ $x = 4$ 02

(iii) $y = 3 - (x - 2)^2$ 01

a = 2 01

b = 3 01 — 06

10

03. (a) $\frac{2x - 1}{3} - \frac{x + 1}{3} = \frac{4}{3}$ 01

$\frac{x - 2}{3} = \frac{4}{3}$ 01

$x = 6$ 01 — 03

(b) price of a watch = Rs. x

price of a pair of sunglasses = Rs. y

$2x + y = 2\,700$ — (1) 01

$0.7x - y = 0$

$7x - 10y = 0$ — (2) 01

(1) × 10

$20x + 10x = 27000$ — (3) 01

(2) + (3)

$27x = 27000$

$x = 1\,000$ 01

$x = 1\,000$ (1) for substitution 01

$2x + y = 2700$

$2000 + y = 2700$

$y = 700$ 01

price of a watch = Rs. 1000

price of a pair of sunglasses = Rs. 700 01 — 07

10

04.

$2t^2 + 3t + 10 - (t^2 + 2t + 3) = 10$ — 01

$2t^2 + 3t + 10 - t^2 - 2t - 3 = 10$

$t^2 + t + 7 - 10 = 0$ — 01

$t^2 + t - 3 = 0$

$t^2 + t = 3$

$t^2 + t + \frac{1}{4} = 3 + \frac{1}{4}$ — 01

$(t + 1)^2 = \frac{13}{4}$

$(t + 1)^2 = \pm\sqrt{\frac{13}{4}}$ — 01

$t = \frac{-1 \pm 3.6}{2}$ — 01

$t = \frac{-1 + 3.6}{2}$ or $t = \frac{-1 - 3.6}{2}$ — 02

$= 1.3$ $= -2.3$ — 01

since $t > 0$

$t = 1.3$ — 01

$1.3 \times 60 = 78$

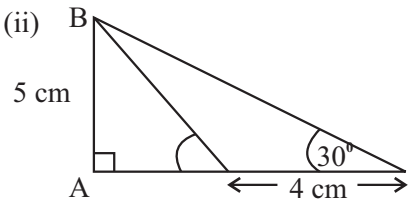
1 hour 18 minutes — 01 — **10**

05

(i) $PQ = 20 \times 40$ — 01

$= 80$ m — 01 — 02

(ii)



drawing AB according to the relevant scale — 02

drawing an angle of elevation 30^0 — 02

marking Q and 4 cm — 02 — 06

completing the scale drawing

(iii) $47^o \pm 1$ — 02 — 02 — **10**

06.

(i) 20 - 25 — 01 — 01

Mid value x	deviation d	frequency	fd	
7.5	-15	2	-30	-100
12.5	-10	3	-30	
17.5	-5	8	-40	
22.5	0	12	0	
27.5	5	7	35	+130
32.5	10	5	50	
37.5	15	3	45	
		$\Sigma f = 40$	$\Sigma fd = (+30)$	

mid value coloumn — 01

deviation — 01

fd — 01

$\Sigma fd = +30$ — 01

mean $= 22.5 + \frac{30}{40}$ — 01

$= 23.25$ — 01

amount $= 23.25 \times 1000$ — 01

Rs. 23 250 — 07

(iii) $\frac{15}{40} \times 100\ \%$ — 01

37. 5 % — 01 — 02 — **10**

Paper II - Part - B

07

(a) (i) 4, 7, 10, 13 ..... — 01

arithmatic progression — 01 — 02

(ii) $Tn = 4 + (15 - 1)\ 3$ — 01

$= 4 + 42$

$= 46$ — 01 — 02

(iii) $Sn = \frac{15}{2}\ \{2 \times 4 + (15 - 1)\ 3$

$= \frac{15}{2}\ (8 + 42)$ — 01

$= \frac{15}{2} \times 50$

$= 375$ — 01

$= 375 > 370$ — 01 — 03

(b) $Sn = a\ (r^h - 1)$

$= \frac{3(2^8 - 1)}{2 - 1}$ — 01

$= 3 \times 255$ — 01

$= 765$ — 01 — 03 — **10**

08.

(i) constructing AB = 7cm — 01

constructing $B\hat{A}C = 90^0$ — 01

AC = 6cm and completing a triangle — 01 — 03

(ii) constructing a perpendicular bisectorAC — 01

marking O and constructing a circle — 01 — 02

(iii) constructing a parallel line through C and marking D — 02 — 02

(iv) $A\hat{C}D = 90^0$ (AB//CD) — 01

$B\hat{D}C = 90^0$ (angle in the semicircle) — 01

$A\hat{C}D + B\hat{D}C = 180^0$

$\therefore AC \parallel BD$ — 01 — 03 — **10**

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09. volume of the cylinder $= \pi r^2 h$

$= \pi r^2 \times 2r$ 01

$= 2\pi r^3$

$\frac{2}{3}\pi a^3 = 2\pi r^3 \times \frac{1}{2}$

$a^3 = \frac{3r^3}{2}$ 01

$a^3 = \sqrt[3]{\frac{3}{2}}\, r$ 01

$a = \sqrt[3]{\frac{3}{2}} \times 3.25$ 01 04

$= \left(\frac{1}{3}\lg 3 - \frac{1}{3}\lg 2\right) + \lg 3.25$ 01

$= \left(\frac{1}{3} \times 0.4771 \frac{1}{3}\, 0.3010\right) + 0.5119$ 03

$= 0.5706$ 01

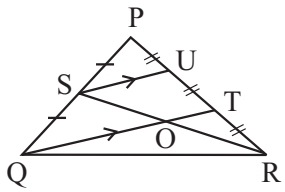
$=$ antilog 0.5706

$= 3.721$

$=3.7$ cm 01 06

10

10.



to correct figure 02

to be proved - $OT = \frac{1}{4}$ OT

proof - PS = SQ (S is the mid point)

SU // QT (data)

$\therefore$ PU = UT (convers of the mid point theorem 02

$\therefore SU = \frac{1}{2}$ QT

$RT = \frac{1}{3}$ PR (data) — (1)

$\therefore PT = \frac{2}{3}$ PR 01

PT = PU + UT 01

PT = 2UT (U is the mid point) 01

$\therefore 2UT = \frac{2}{3}$ PR

$UT = \frac{1}{3}$ PR — (2)

(1) = (2) $\therefore$ UT = RT

SU // OT

SO = OR 01

$\therefore OT = \frac{1}{2}$ SU (convers of the mid point theorem 01

$SU = \frac{1}{2}$ QT

$OT = \frac{1}{2} \times \frac{1}{2}$ QT 01

$\therefore OT = \frac{1}{4}$ QT **10**

11. (i) OE $\perp$ AB (the line joining the centre and the mid point of a chord is perpendicular to the chord.)

$\therefore A\hat{E}F = 90^0$ 01

(ii) to be proved = $A\hat{F}E = B\hat{C}D$

proof = $B\hat{A}C = B\hat{D}C$ (angles in the same segment) 01

$A\hat{E}F = 90^0$ proved in (i)

$\therefore A\hat{F}E = 90 - A\hat{B}C$ (1) 01

$D\hat{B}C = 90^0$ (angles in the semi circle)

$B\hat{C}D = 90^0 - B\hat{D}C$ (2) 01

(1) = (2) $A\hat{E}F = B\hat{C}D$

(iii) to be proved AB : CD = BD : AF

proof BCD Δ and AEF Δ

$D\hat{B}C = A\hat{E}F$ (90º)

$B\hat{D}C = E\hat{A}F$ (angles in the same segment) 03

$B\hat{C}D = A\hat{F}E$ (proved in (ii)

$\therefore$ Δ BCD and Δ AEF are equiangular Δ s

$\frac{AE}{BD} = \frac{AF}{DC}$ 01

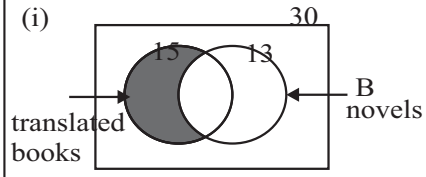
$AE = \frac{1}{2}AB$ (mid point of AB is E) 01

$CD = 2CO$ (DC is the diameter) 01

$\frac{\frac{1}{2}AB}{BD} = \frac{AF}{2CO}$

AB : CO = BD : AF **10**

12. (i)



04

(ii) 15 + 13 = 28

30 - 7 = 23

28 - 23 = 05 03

(iii) 13 - 5 = 8 01

(iv) for shading 01

(v) $\frac{23}{30}$ 01

10

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