



අධ්‍යාපන අමාත්‍යාංශය
கல்வி அமைச்சு
Ministry of Education

G. C. E. Ordinary Level | අ. සො. ස. සාමාන්‍ය පෙළ | 2022 (2023)

Student Seminar Series

ශිෂ්‍ය සම්මන්ත්‍රණ මාලාව

Practice Paper | උපකාරක ප්‍රශ්න පත්‍ර

Mathematics

ගණිතය



Answer Sheet - I, II |



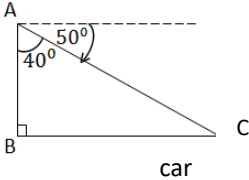
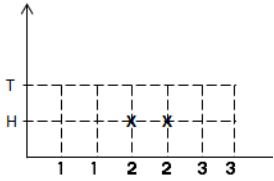
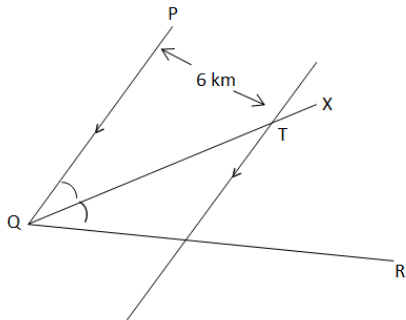
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දුරස්ථ අධ්‍යාපන පුවර්ධන ශාඛාව | ගණිත ශාඛාව

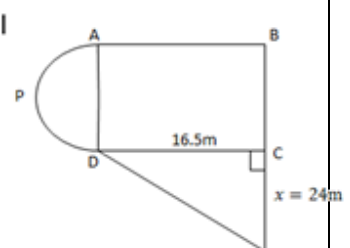
Mathematics - Paper 1 - PART A

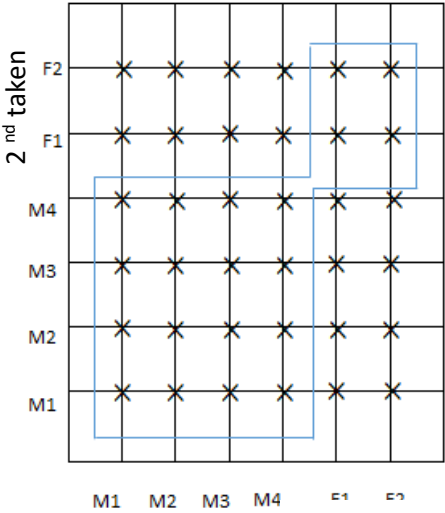
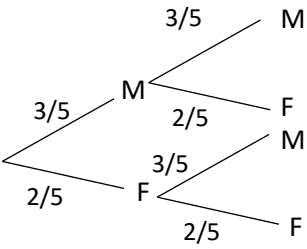
Question Number		Answers	Marks		
(01)		Interest $10\,000 \times \frac{8}{100} \times 3$ or 2400 Total Amount $10\,000 + 2400 = \text{Rs. } 12\,400$	1	02	02
(02)		$750\text{cm}^2 - 150 \times 2\text{cm}^2$ 450cm^2	1	02	02
(03)		$y + 38^0 + 62^0 = 180$ $y + 100 = 180$ $y = 80^0$	1 1	02	02
(04)		$x^2 + 5x - x - 5$ $(x + 5)(x - 1)$	1 1	02	02
(05)	ii	x, x^2, x^3, x^4		02	02
(06)		$18x^2y^2$		02	02
(07)	i ii	$\Delta PTU \equiv \Delta QRS$ [S.A.S.]	1 1	02	02
(08)		$\frac{50 - 22}{2}$ $\frac{28}{2} = 14\text{cm}$	1 1	02	02
(09)		$\frac{2 \times 3}{x \times 3} - \frac{1}{3x} = \frac{5}{3}$ $\frac{5}{3x} = \frac{5}{3}$ $x = 1$	1 1	02	02
(10)		$x + 50^0 + 90^0 = 180^0$ $x = 40^0$	1 1	02	02
(11)		$\log_a b = x$	2	02	02
(12)		$\frac{6 - 2}{2 - 0}$ $\frac{4}{2}$ or 2	1 1	02	02
(13)		$180 - 75 = 105^0$ $x = 105^0$	1 1	02	02
(14)		$\frac{AB}{10} = \frac{7}{10}$ $AB = 7\text{cm}$	1 1	02	02
(15)		$\frac{2x}{3} \times \frac{9a}{4x^2}$ $\frac{3a}{2x}$	1 1	02	02
(16)		$OB^2 = 5^2 + 12^2$ $= 169$ $OB = 13$ $OC = 13\text{cm}$	1 1	02	02
(17)		$A \cap B^1$	2	02	02
(18)		$x < \frac{4}{2}$ $x < 2$ $x = 1$	1 1	02	02

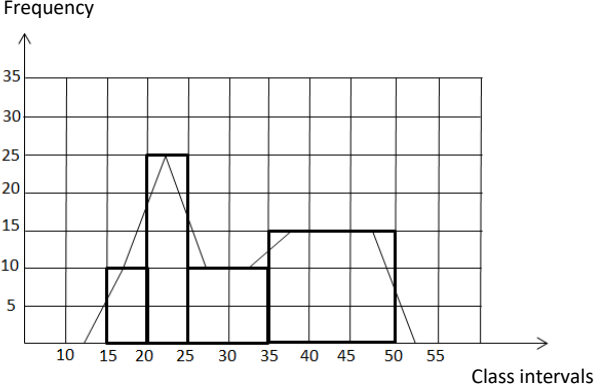
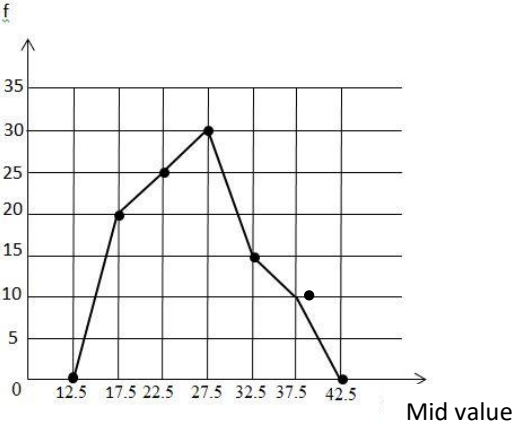
Question Number	Answers		Marks			
(19)			 <p style="text-align: center;">Marking an angle 50°</p>	1 1	②	②
(20)			<p style="text-align: center;">Coin</p>  <p style="text-align: center;">Dice</p> <p style="text-align: center;">$\frac{2}{12}$ or $\frac{1}{6}$</p>	1 1	②	②
(21)			$A\hat{O}B = 60^\circ$ $A\hat{C}B = 30^\circ$	1 1	②	②
(22)			$A\hat{C}B = 90^\circ$ $B\hat{A}C = 90^\circ - 65^\circ = 25^\circ$ $B\hat{D}C = 25^\circ$	1 1	②	②
(23)			$3 \times 12 = 36$ man days $3 \times 5 = 15$ man days $36 - 15 = 21$ man days $\frac{21}{7} = 3$ days $12 - 8 = 4$ days	1 1	②	②
(24)	i. ii.		$60 \div 4 = 15$ $\frac{90}{15} \times 20 = 120^\circ$	1 1	②	②
(25)					②	②

Mathematics - Paper 1 - PART B

Question Number		Answers	Marks		
(01)	i	$\frac{3}{7} + \frac{1}{3}$ $\frac{9+7}{21} = \frac{16}{21}$	1	②	
	ii	$1 - \frac{16}{21}$ $\frac{5}{21}$	1		
	iii	$\frac{1}{3} - \frac{5}{21} = \frac{7-5}{21} = \frac{2}{21}$ $\therefore \frac{2}{21} \Rightarrow 4$	1	③	
	iv	$\therefore \text{Total number of students} = \frac{4}{2} \times 21 = 42$ $14 - \left(42 \times \frac{1}{3} + 42 \times \frac{5}{21}\right) \times \frac{50}{100}$ $14 - (14 + 10) \times \frac{50}{100}$ $14 - 12$ 2	1+1 1 1		
(02)	i	Area of the semi-circle <i>APD</i> $= \frac{22}{7} \times 7 \times 7 \times \frac{1}{2}$ $= 77m^2$	1	②	
	ii	Area of the rectangular part $77 \times 3 = 231m^2$ $\therefore \text{Length of AB} = \frac{231}{14} = 16.5m$	1		
	iii	Arc length = $2 \times \frac{22}{7} \times 7 \times \frac{1}{2}$ $= 22m$ Perimeter of the whole part $= 22 + 16.5 + 16.5 + 14$ $= 69m$	1	②	
					

		iv	No of poles = $\frac{22}{2} + 1 = 12$		1+1	02	
		v	 <p>Area of the triangular part = $506 - (77 + 231) = 198m^2$</p> $\frac{1}{2}x \times 16.5 = 198 \therefore x = 24m$		1 1	02	10
Question Number			Answers	Marks			
(03)	(a)	i	$Interest\ for\ a\ year = 600\ 000 \times \frac{15}{100}$ $= Rs. 90\ 000$	1 1	02		
		ii	$Interest\ for\ a\ month = 600\ 000 \times \frac{14}{100} \times \frac{1}{12}$ $= Rs. 7000$	1 1	02		
		iii	$Interest\ for\ a\ year = Rs. \frac{600\ 000}{5}$ $= Rs. 120\ 000$ $\therefore Annual\ interest\ rate = \frac{120\ 000}{600\ 000} \times 100$ $= 20\%$	1 1 1	03		
	(b)	i	$Total\ number\ of\ man\ days = 10 \times 8$ $= 80$	1			
		ii	$Number\ of\ people\ worked\ in\ the\ first\ 2\ days = 12$ $The\ number\ of\ man\ days\ for\ that = 2 \times 12$ $= 24$ $\therefore The\ amount\ paid\ for\ it = 24 \times 2000$ $= Rs. 48\ 000$	1 1 1	03		
							10

Question Number	Answers	Marks
(4)	<p>i</p>  <p>Marking X :</p> <p>Correct notation</p> <p>ii</p> $\frac{20}{36} \text{ or } \frac{5}{9}$ <p>iii</p>  <p>iv</p> $\left(\frac{3}{5} \times \frac{2}{5}\right) + \left(\frac{2}{5} \times \frac{3}{5}\right)$ $\frac{12}{25}$	<p>2</p> <p>1</p> <p>③</p> <p>②</p> <p>1+1+ 1</p> <p>③</p> <p>1</p> <p>1</p> <p>②</p> <p>10</p>

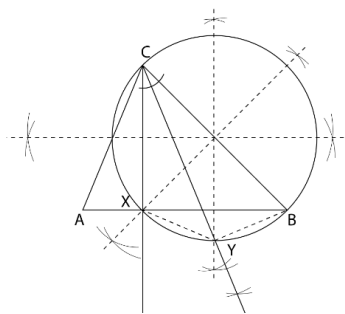
Question Number	Answers	Marks																	
(05)	i. $100 - (10 + 25 + 45)$ 20	1 1 (02)																	
	ii. 	1 1 1 (03)																	
	iii. Marking axes 25-35 and 35-50 Completing histogram To the two end points Completing frequency polygon	1 1 1 1 1																	
	iv. <table border="1" data-bbox="435 1081 1131 1267"> <thead> <tr> <th>Class interval</th> <th>15-20</th> <th>20-25</th> <th>25-30</th> <th>30-35</th> <th>35-40</th> </tr> </thead> <tbody> <tr> <td>Mid value</td> <td>17.5</td> <td>22.5</td> <td>27.5</td> <td>32.5</td> <td>37.5</td> </tr> <tr> <td>Frequency</td> <td>20</td> <td>25</td> <td>30</td> <td>15</td> <td>10</td> </tr> </tbody> </table>	Class interval	15-20	20-25	25-30	30-35	35-40	Mid value	17.5	22.5	27.5	32.5	37.5	Frequency	20	25	30	15	10
Class interval	15-20	20-25	25-30	30-35	35-40														
Mid value	17.5	22.5	27.5	32.5	37.5														
Frequency	20	25	30	15	10														
	To the two end points Completing frequency polygon 	1 1 (02)																	

Mathematics – Paper 11

Question Number		Answers	Marks		
(1)		<p>Total amount for the 21% simple interest rate</p> $75\,000 \times \frac{21}{100} \times 2 + 75\,000$ $= 750 \times 42 + 75\,000$ $= 31\,500 + 75\,000$ $= \text{Rs. } 106\,500$ <p>Total amount for the 20% compound interest rate</p> $75\,000 \times \frac{120}{100} \times \frac{120}{100}$ $= 750 \times 144$ $= \text{Rs. } 108\,000$ <p>$106500 < 108000$ So compound interest is more profitable.</p> <p>Amount received in both accounts = $106\,500 + 108\,000$</p> $= \text{Rs. } 214\,500$ <p>Total amount = $2\,14\,500 \times \frac{120}{100} \times \frac{120}{100}$</p> $= 2\,145 \times 144$ $= \text{Rs. } 308\,880$	1		
			1	(02)	
			2	(02)	
			1		
			1	(02)	
			1	(01)	
			2		
			1	(03)	
					△ 10
(2)	(a)	<p>i $y = x^2 + 4x - 2$ $x = -1$ $y = (-1)^2 + 4x(-1) - 2$ $= 1 - 4 - 2$ $= -5$</p> <p>ii Correct axes If 5 points are correct Smooth curve</p>	1	(01)	
			1		
			1	(03)	
	(b)	<p>i $x = -2$</p> <p>ii $-5 < x < -2$</p>	1	(01)	
			2	(02)	

Question Number		Answers			Marks																																																
(2)	(c)		$y = (x + 2)^2 - 6$ $y = 0$ when $x = 0.5$ $y = (x + 2)^2 - 6$ $0 = (x + 2)^2 - 6$ $(x + 2)^2 = 6$ $(x + 2) = \sqrt{6}$ Substitute $x = 0.5$ $0.5 + 2 = \sqrt{6}$ $2.5 = \sqrt{6}$			1																																															
					1	(03)	10																																														
(3)	(a)	i	$3a + 5b = 500$ ————— (1) $2a = 5b$ ————— (2) $2a - 5b = 0$ ————— (3) (1)+(3) $5a = 500$ $a = 500$ By substituting $a = 500$ in (2) $2 \times 100 = 5b$ $200 = 5b$ $b = 40$ Price of an orange Rs. 100/- Price of a mandarin Rs. 40/-			1																																															
	(b)		$\frac{5}{x-2} + \frac{1}{x^2-4}$ $= \frac{5}{x-2} + \frac{1}{(x-2)(x+2)}$ $= \frac{5(x+2)+1}{(x-2)(x+2)}$ $= \frac{5x+11}{(x-2)(x+2)}$			1																																															
					1	(07)																																															
					1																																																
					1	(03)	10																																														
(4)		i	700 – 800			1	(01)																																														
		ii	<table border="1"> <thead> <tr> <th>Class interval</th> <th>Mid value</th> <th>Frequency f</th> <th>Deviation d</th> <th>fd</th> </tr> </thead> <tbody> <tr> <td>500-600</td> <td>550</td> <td>2</td> <td>-200</td> <td>-400</td> </tr> <tr> <td>600-700</td> <td>650</td> <td>6</td> <td>-100</td> <td>-600</td> </tr> <tr> <td>700-800</td> <td>750</td> <td>8</td> <td>0</td> <td>0</td> </tr> <tr> <td>800-900</td> <td>850</td> <td>5</td> <td>100</td> <td>500</td> </tr> <tr> <td>900-1000</td> <td>950</td> <td>4</td> <td>200</td> <td>800</td> </tr> <tr> <td>1000-1100</td> <td>1050</td> <td>5</td> <td>300</td> <td>1500</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td>2800-1000</td> </tr> <tr> <td>Amount</td> <td></td> <td>30</td> <td></td> <td>1800</td> </tr> </tbody> </table>			Class interval	Mid value	Frequency f	Deviation d	fd	500-600	550	2	-200	-400	600-700	650	6	-100	-600	700-800	750	8	0	0	800-900	850	5	100	500	900-1000	950	4	200	800	1000-1100	1050	5	300	1500					2800-1000	Amount		30		1800			
Class interval	Mid value	Frequency f	Deviation d	fd																																																	
500-600	550	2	-200	-400																																																	
600-700	650	6	-100	-600																																																	
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				2800-1000																																																	
Amount		30		1800																																																	

Question Number		Answers	Marks		
	v.	$S_{12} = \frac{12}{2} (12 + 45)$ $= 6 \times 57$ $= 342$ <p>Number of seats filled = $342 + 8 = 350$ <i>Amount</i> = 350×500 = Rs. .175 000</p>	1		
			1	(02)	△ 10
(8)	i.	Drawing the line AB Drawing 45° Drawing the triangle ABC	1		
	ii.	Constructing the perpendicular CX	1	(03)	
	iii.	Constructing a perpendicular to a side Marking the centre Drawing the circle	1	(01)	
	iv.	Constructing a locus of the points equi- distant from XC and CB	1	(03)	
	v.	$\hat{A}BC = 45^\circ$ (Data) $\hat{C}BX = \hat{C}YX$ (Angles in the same segment) $\therefore \hat{C}YX = 45^\circ$	1	(01)	
			1	(02)	△ 10
(9)	i.	$BC \parallel PQ$ $\therefore BR \parallel PQ$ $AB \parallel QR$ $\therefore PB \parallel QR$ $\therefore PQRB$ is a parallelogram (The opposite sides of a parallelogram are equal) $\hat{A}BC = 90^\circ$ $\hat{PBC} = 90^\circ$ $\therefore PQRB$ is a rectangle (If one of the angles of a parallelogram is a right angle, then it is a rectangle)	1		
			1		
			1		
			1	(04)	



Question Number		Answers	Marks		
(9)	ii.	<p>P is a midpoint of the side AB $BC \parallel PQ$ \therefore Q is a midpoint of the side AC (Converse of the mid point theorem) $AB \parallel QR$ \therefore R is a midpoint of the side BC (Converse of the mid point theorem) $\therefore AC \parallel PR$ (Mid point theorem) $AQ \parallel PR$ $\frac{1}{2}AC = PR$ $AQ = PR$ $\therefore AQRB$ is a parallelogram (A pair of opposite side is equal and parallel)</p>	1		
	iii.	<p>$AQ = PR$ (Proved) $PR = BQ$ (The diagonals of a rectangle are equal) $\therefore \hat{P}AQ = \hat{P}BQ$ (Angles opposite equal sides of an isosceles triangle)</p>	1	04	
			1	02	10
(10)	(a)	<p>Volume of n spheres = Volume of the empty cylinder $\frac{4}{3}\pi a^3 \times n = \pi \times r^2 \times 2r$ $\frac{4a^3 n}{3} = 2r^3$ $n = \frac{3r^3}{2a^3}$ $n = \frac{3}{2} \left(\frac{r}{a}\right)^3$</p>	1		
	(b)	<p>Substituting $n = \frac{3}{2} \left(\frac{r}{a}\right)^3$ $= \frac{3}{2} \times \frac{7}{3.5} \times \frac{7}{3.5} \times \frac{7}{3.5}$ $= 12$</p>	1	03	
		<p>$lgx = lg 4.32 + lg 542 - lg 25.71$ $= 0.6355 + 2.7340 - lg 1.4101$ $= 1.9594$ $x = \text{antilog } 1.9594$ $= 91.08$</p>	1	02	
			1	05	10

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Question Number		Answers	Marks		
(11)	i.		1	(04)	
	ii.	Shading the area	1	(01)	
	iii.	40	1	(01)	
	iv.	40: 15 8 : 3	1 1	(02)	
	v.	7 + 9 16	1 1	(02)	△10
(12)		<p>In the triangle AOB and AOD</p> <p>$AB = AD$ (Data)</p> <p>$BO = DO$ (The radii of the same circle are equal)</p> <p>$AO = AO$ (Common side)</p> <p>$\therefore \triangle AOB \cong \triangle AOD$ (SSS)</p> <p>$\hat{BAX} = \hat{DAX}$ (Corresponding angles of congruent triangle are equal)</p> <p>$\hat{BAD} = \hat{BAX} + \hat{DAX}$</p> <p>$\hat{BAD} = 2\hat{DAX}$</p> <p>$\hat{DOX} = 2\hat{DAX}$ (The angle subtended at the centre by an arc of a circle is twice the angle subtended by the arc on the remaining part of the circle)</p> <p>$\hat{BAD} + \hat{BCD} = 180^\circ$ (Opposite angles of a cyclic quadrilateral are supplementary.)</p> <p>$\therefore 2\hat{DAX} + \hat{BCD} = 180^\circ$</p> <p>$\hat{DOX} + \hat{BCD} = 180^\circ$</p>	1 1 1 1 1 1 1 1 1	(04) (01) (03) (02)	△10