

UGANDA NATIONAL EXAMINATIONS BOARD
UGANDA CERTIFICATE OF EDUCATION
OCTOBER - NOVEMBER, 2022

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ITEM ONE

TASK	SOLUTIONS	COMPETENCES	WT	COMPE RANGE
1)	Profit Sarah Moses $\text{made} = \text{Shs } 1,500,000$ $\text{Ratio of Sarah: Moses}$ $= 2:3$ I-1 $\text{Total ratio} = 2+3$ I-1 $= 5$ M,-1 Profit Moses re-invested $= 6000000 \times \frac{I-1}{1500,000}$ $= 10,000,000$ $= 900000$ M,-1	Correctly Converts from words to figures Expresses correct values as ratio Identifies correct value & operation to manipulate total ratio Correct output for total ratio Identifies correct values and operation to manipulate Moses' profit Correct output for Moses' profit re-invested.	04	6-7
	Moses re-invested Shs 900,000 in the business AP,-1	Applies correctly manipulated out put to respond about the profit Moses re-invested.	03	3-5
2)	Increase in the no of birds $= 2500 - 2000$ I-1 $= 500$ M,-1 $\% \text{tage } \Delta \text{se} = \frac{500}{2000} \times 100$ $= 25\%$ M,-1 The %tage increase in the number of birds is 25% AP,-1	Identifies values and operation to manipulate %se in the number of birds. Correct output for %se in the no of birds. Identifies correct values & operation to manipulate %tage increase in the number of birds. Correct output for %tage increase in the number of birds.	01	1-2
	$\text{LCM} = 7 \times 15$ I-1 $= 105$ M,-1 $105 - (30+30+31) = 14$ days M,-1	Applies correctly manipulated out put to respond about the %tage increase in the no of birds.	04	3-6
3)	Both events will take place on 14 th June 2024 AP,-1	Identifies correct values & operation to manipulate number of days. Correct output for no of days Manipulation towards actual date Applies correctly manipulated out put to conclude with a correct date.	03	1

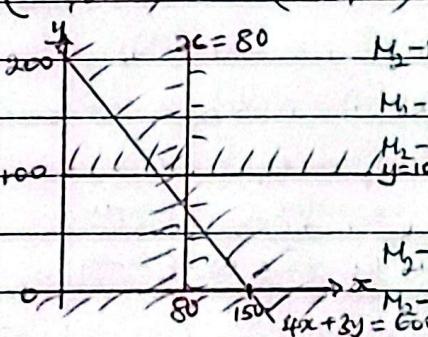
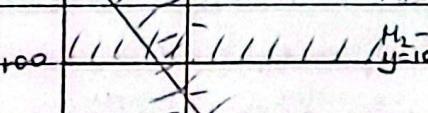
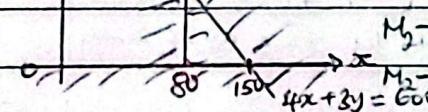
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ITEM TWO

TASK	SOLUTIONS	COMPETENCES	WT	COMPLEXITY
	Let x be no of sets of boys' uniforms and y be the no. of sets of girls' uniform			Formation
	$x \geq 80$ F-1	Forms $x \geq 80$ from word statement	04	4-7
	$y \leq 100$ F-1	Forms $y \leq 100$	03	1-3
	$4x + 3y \leq 600$ F-1	Forms $4x + 3y \leq 600$		
	$\begin{cases} x \geq 0 \\ y \geq 0 \end{cases}$ F-1	} forms boundary inequalities	0	0
	Profit expression (objective function) = $8000x + 6000y$ F-1	Forms correct optimal expression from word statement		M_2
	Eqs $x = 80$ } y = 100 } F-1	Forms eqns from inequalities (Any two correct)	05	6-7
	for $4x + 3y = 600$			
	$(0, 200)$ and $(150, 0)$ M_{h-1}	Determines coordinates to plot and draw lines (Any two points)	04	3-5
Axes		Labeled both axes correctly	03	1-2
Scale		Uses consistent & appropriate scale on any one of the axes.		
Plot & Tn		Plots and joins coordinates to form aline (Any one line seen)	0	0
Names				
Shading		Names lines with respective eqns		AP_3
Feasible region	$P = 8000x + 6000y$ M_{h-1}	Shades the unwanted region to show feasible region correctly (Any one seen)	06	2-4
	$(0, 80) \Rightarrow AP_{-1}$ shs 1,200,000	Reads correct max. coordinates from correct feasible region (Any one)		
	$(120, 40) \Rightarrow AP_{-1}$ shs 1,200,000	Computes correct max. profit (Any one)	05	1
	$(35, 20) \Rightarrow AP_{-1}$ shs 1,200,000			
	$(105, 60) \Rightarrow AP_{-1}$ shs 1,200,000			
	$(150, 0) \Rightarrow AP_{-1}$ shs 1,200,000			
	$(90, 72) \Rightarrow AP_{-1}$ shs 1,200,000			
	He still either make 90 sets of boys' uniforms and 80 sets of girls' uniforms in order to earn a max profit of UGX 1,200,000 AP_{-1} from chosen optimal coordinates.	Makes a decision of the best maximum coordinate Responds on the maximum profit	0	0

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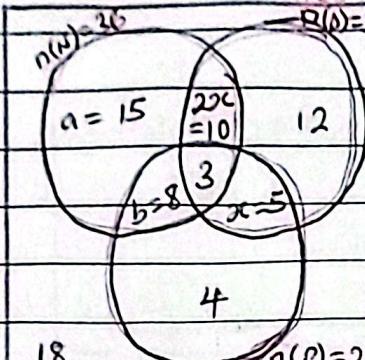
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ITEM THREE

TASK	SOLUTIONS	COMPETENCES	WT	COMPET. RANGE	
	A Venn diagram.	P-1 Writes the title for the presentation $n(E) = 75$ $n(D) = 20$  $a = 15$ $b = 8$ $c = 5$ $d = 3$ $e = 10$ $f = 12$ $g = 4$ $h = 18$ $i = 20$	P-1 Labels sets using letters / words P-1 Inserts correctly all data given in the scenario (3, 4, 12, and 18) P-1 Inserts all data correctly after analysis A2-1 Analyses information provided and defines elements of $n(D \cap P)$ only & $n(N \cap D)$ only i.e. x and $2x$ resp.	04	For P
	$2x + x + 3 + 12 = 30$ $x = 5$	A2-1 Analyses data to determine $n(D \cap P)$ only Correct output for $n(D \cap P)$ only	06	2-4	
	$b + 3 + 5 + 4 = 20$ $b = 8$	A2-1 Analyses data to determine elements of $n(N \cap D)$ only Correct output for $n(N \cap D)$ only	03	1	
	$a + 10 + 3 + 12 + 5 + 8 + 4 + 18 = 75$ $a = 15$	A2-1 Analyses data to determine $n(N)$ only Correct output for $n(N)$ only	0	0	
	$n(N) = 15 + 8 + 3 + 10$ $= 36$	A2-1 Analyses data to determine $n(N)$ Correct output for $n(N)$	0	0	
	The total no of people with national identity Cards = 36	Interprets correctly analysed data & concludes on the total no of people with national identity cards	1	N	
	$n(\text{only one doc}) = 15 + 4 + 12$ $= 31$ people	A2-1 Analyses data to determine no of people with only one document Correct output for $n(\text{only one document})$	05	2-3	
	$P(\text{only one document}) = \frac{31}{75}$ $= 0.41 = 41\%$	A2-1 Analyses data to determine correct value of probability Simplifies prob as decimal or % for easy interpretation	01	1	
	YES there's need for an office This is because the prob of a person having only one document is less than 50%. IN-1	Interprets prob and concludes about the need for a new office Interprets probability and justifies the conclusion made above the need for a new office.	0	0	

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ITEM FOUR

TASK	SOLUTIONS	COMPETENCES	WT	RANGE
		Writes the title for the presentation		For P
Range of Maize freq	P-1	Labels columns of freq and classes	04	2-4
20-29	4	Presents classes with consistent class interval given.	02	01
30-39	5			
40-49	8	Presents correct frequencies for the respective classes	0	0
50-59	12			
60-69	10			
70-79	6	Analyses data & determines correct no. of farmers i.e $\sum f$	06	For A ₃ 5-9
80-89	5			
P-1	$\sum f = 50$	Analyses data and determines c.f.	03	1-4
	$A_3 = 1$	Analyses data ... " correct c. b.	0	0
	$Mdn = \frac{\sum f}{2} = \frac{50}{2} = 25$	Analyses data & determines correct position of median		
	$Mdn = 49.5 + \frac{(25-17) \times 10}{12} = 56.17$	$A_3 = 1$ Subst. Correct values in correct median formulae (25, 17, 12 and 10) - Analyses data and determines correct values to substitute in the median formula Correct QUT PwR for median		
	$56.17 \quad A_3 = 1$			
	\therefore The no. of bags above is half of the farmers harvested was 56 bags (Accept 57 bags)	- Responds to the task about the no. of bags above which $\frac{1}{2}$ of the farmers harvested.	05	for IN 2
(c)	$44.5 = 39.5 + \frac{(x-9)}{8} \times 10 \quad A_3 = 1$	Analyses data to obtain the no. of farmers to be re-trained	01	01
	$8 \times 5 = 10x - 90$	Correct ans for the number of farmers to be re-trained.	0	0
	$x = 13 \quad A_3 = 1$			
	i The number of farmers for re-training is 13 IN-1	- Responds to task about the no. of farmers to be re-trained .		
	$\begin{array}{c} \text{No. of farmer} \\ \text{GRAPHIC METHOD} \\ \hline 25 & A_3 = 1 \\ & A_3 = 1(1) \\ & M_1 = 56 \\ & A_3 = 1 \\ \hline \end{array}$	b) Locates the median point correctly on the graph. - Estimates the median correctly from the graph		
		c) Locates 44.5 bags correctly from the graph - Estimates correct no. of farmers corresponding to 44.5 bags (Accept 13±1)		

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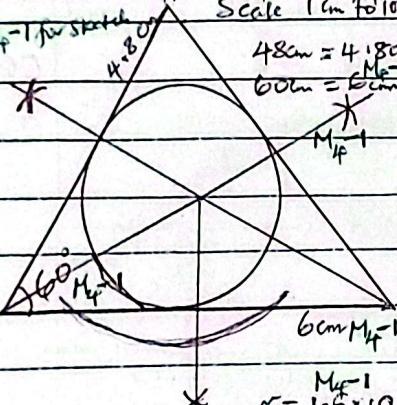
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ITEM 5

TASK	SOLUTIONS	COMPETENCES	WST	COMPETENCE RANGE
				for A ₄
	Cash payment = Shs 400,000 Total Instalment = 2×110000 A_{4f} = Shs 220,000	- Analyses information for values to manipulate total instalment amount. - Correct output for total instalment amount with units.	05	4P-5
	$T.H.P. = 200,000 + 220,000$ = Shs 420,000M ₁	- Analyses information for values to manipulate total amount for hire purchase. - Correct output for total hire purchase amount with units.	04	3
	I recommend that Joseph chooses Cash payment plan since its cheaper A_{4f} Scale 1 cm to 10m	- Makes a decision on w/ payment plan Joseph can take. - Justifies the decision of the payment plan	03	1-2
		- Analyses information & chooses appropriate scale - Analyses information to sketch the board and largest circular tray to cut from it. - Uses scale to reduce bigger values of 4.8cm and 6cm to smaller values	0	0
	$Area of the cake = 22 \times 15 \times 15$ circular tray A_{4f} $= 707.14 \text{ cm}^2$	- Measures / Constructs an angle of 60° - Measures the two given sides of the triangle $\pm 0.1 \text{ cm}$ - Bisects any two angles accurately - Determines radius by either dropping a line from the intersecting point of angle bisectors or completing the circle and measures radius.	05	6-8
		- Analyses correct values and formulae to manipulate area of the circular tray.	04	3-5
	The largest circular tray she plans to cut out of the triangular board will be enough for the base of the cake because the area of the base of the cake is less than that of the tray A_{4f}	- Correct output for area of the circular tray with units	03	1-2
	NOTE: Accept use of radius of the tray and that of the cake to make a conclusion.	NB: Accept a conclusion that the tray is NOT enough if it is derived from a completely accurate sketch/drawing	05	1
			0	0

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ITEM 6	SOLUTIONS	COMPETENCES	WT	COMPET RANGE
TASK	<p>Scale: 1cm rep $10m^{A_4-1}$</p> <p>5cm rep 50m and 7cm rep 70m</p>	<ul style="list-style-type: none"> - Analyses inform and chooses appropriate scale - Uses scale to reduce bigger units to smaller units of cm. - Analyses inform and sketches the design of the play ground. - Measures the line given more accurately 	05	For Ap ₄
		<ul style="list-style-type: none"> - Measures / constructs an angle of 45° - Bisects any two sides of the triangle accurately for circumscribing - Draws the circular fence touching all the three vertices of the triangular garden. 	04	3-4
		<ul style="list-style-type: none"> - Concludes on the type of triangle representing the triangular garden - Justifies the type of triangle 	03	1-2
	<p>M_f-1 triangle base none of the sides or Ls are equal A_4-1</p> <p>- It's an isosceles triangle bcs 2nd sides and Ls are equal</p> <p>Area of $\Delta = \frac{1}{2} \times 70 \times 50 \sin 45^\circ$</p> <p>$= 1237.425 m^2 M_f-1$</p>	<ul style="list-style-type: none"> - Analyses correct values to manipulate area of the triangular garden. - Correct output for area of the triangular garden. 	04	4-6
	<p>Area of Circular fence $= \frac{22}{7} \times 35^2$</p> <p>$= 3850 m^2 M_f-1$</p> <p>Area to be paved $= 3850 - 1237.425$</p> <p>$= 2162.575 m^2 M_f-1$</p>	<ul style="list-style-type: none"> - Analyses correct values to manipulate area of the circular fence - Correct output for area of the circular fence in m^2 - Analyses correct values to manipulate area to be paved. - Correct output for area to be paved. 	03	1-3
	<p>The amount of money needed to buy the pavers $= 2162.575 \times 25000$</p> <p>$= Shs 91,440,125 M_f-1$</p>	<ul style="list-style-type: none"> - Analyses correct values to manipulate amount needed to buy square metres of pavers needed. - Correct output for amount needed. 	0	0
	<p>The amount of money needed to buy pavers in square metres is UGX 91,440,125 A_4-1</p>	<ul style="list-style-type: none"> - Concludes on the amount needed to buy the square metres of pavers needed. 	0	0