

MURANG'A UNIVERSITY COLLEGE

A constituent college of Jomo Kenyatta University of Agriculture and Technology

University Examination 2014/2015

END OF SEMESTER EXAMINATION FOR DIPLOMA IN BIOLOGY

ASB 1101 MATHEMATICS

DATE: AUGUST 2015

TIME: 2 HOURS

Instructions: Attempt question <u>One</u> and <u>Two</u> other questions

Question 1 Compasory (30 marks)

a)	State	and briefly explain two methods in which statistical data is	collected
			[4marks]
b)	Differ	entiate between the following terms as used in statistics	
	(i)	Primary and Secondary data	[2marks]
	(ii)	Population and a sample	[2marks]
1 \	TT1	sight of distribution of 70 and large of a contain community	

b) The weight of distribution of 70 employees of a certain company is given below.

Weig	ht (Kg)	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	
Frequ	lency	2	10	12	Х	10	8	2	3	
(i)	Calculate t	he value	of X.					[2marks]		
(ii)	State the m	odal clas	s and c	alculate	the mod	e		[3marks]		
(iii)	State the m	edian cla	ass and	calculat	e the me	dian		[3mark	.s]	
Simpli	fy the following	ng surd								
$\frac{4}{5}(\gamma$	$\sqrt{25 - 2\sqrt{5}}$							[3mark	s]	
Ration	alize and simp	olify the d	enomina	tor of the	followin	g surds				
$\frac{2\sqrt{2}}{2\sqrt{3}}$	$\frac{\sqrt{5}}{+\sqrt{2}}$							[4mark	s]	
Simplify the following										
د8)	$(x^2)^{\frac{1}{3}} \div x^{-\frac{1}{3}}$							[3mark	s]	
Solve t	he following of	equations	4 + log	$g_3 x + \log g_3$	1 ₃ 3 — log	$_{3}5 = log$	$g_3^2 + 3$	[4marks	5]	
	Weigh Frequ (i) (ii) (iii) Simplifi $\frac{4}{5}(\sqrt{2\sqrt{3}})$ Simplifi (8x) Solve t	Weight (Kg)Frequency(i)Calculate ti(ii)State the million(iii)State the millionSimplify the following $\frac{4}{5}(\sqrt{25} - 2\sqrt{5})$ Rationalize and simp $\frac{2\sqrt{5}}{2\sqrt{3}+\sqrt{2}}$ Simplify the following $(8x^2)^{\frac{1}{3}} \div x^{-\frac{1}{3}}$ Solve the following of	Weight (Kg)16-20Frequency2(i)Calculate the value(ii)State the modal class(iii)State the median classSimplify the following surd $\frac{4}{5}(\sqrt{25} - 2\sqrt{5})$ Rationalize and simplify the d $\frac{2\sqrt{5}}{2\sqrt{3}+\sqrt{2}}$ Simplify the following $(8x^2)^{\frac{1}{3}} \div x^{-\frac{1}{3}}$ Solve the following equations	Weight (Kg)16-2021-25Frequency210(i)Calculate the value of X.(ii)State the modal class and c(iii)State the median class andSimplify the following surd $\frac{4}{5}(\sqrt{25} - 2\sqrt{5})$ Rationalize and simplify the denomina $\frac{2\sqrt{5}}{2\sqrt{3}+\sqrt{2}}$ Simplify the following $(8x^2)^{\frac{1}{3}} \div x^{-\frac{1}{3}}$ Solve the following equations $4 + log$	Weight (Kg)16-2021-2526-30Frequency21012(i)Calculate the value of X.(ii)State the modal class and calculate(iii)State the median class and calculateSimplify the following surd $\frac{4}{5}(\sqrt{25} - 2\sqrt{5})$ Rationalize and simplify the denominator of the $\frac{2\sqrt{5}}{2\sqrt{3}+\sqrt{2}}$ Simplify the following $(8x^2)^{\frac{1}{3}} \div x^{-\frac{1}{3}}$ Solve the following equations $4 + log_3x + log_3x$	Weight (Kg)16-2021-2526-3031-35Frequency21012X(i)Calculate the value of X.(ii)State the modal class and calculate the mod(iii)State the median class and calculate the median class and calculate the meSimplify the following surd $\frac{4}{5}(\sqrt{25} - 2\sqrt{5})$ Rationalize and simplify the denominator of the following $\frac{2\sqrt{5}}{2\sqrt{3}+\sqrt{2}}$ Simplify the following $(8x^2)^{\frac{1}{3}} \div x^{-\frac{1}{3}}$ Solve the following equations $4 + log_3x + log_33 - log$	Weight (Kg)16-2021-2526-3031-3536-40Frequency21012X10(i)Calculate the value of X.(ii)State the modal class and calculate the mode(iii)State the median class and calculate the medianSimplify the following surd $\frac{4}{5}(\sqrt{25} - 2\sqrt{5})$ Rationalize and simplify the denominator of the following surds $\frac{2\sqrt{5}}{2\sqrt{3}+\sqrt{2}}$ Simplify the following $(8x^2)^{\frac{1}{3}} \div x^{-\frac{1}{3}}$ Solve the following equations $4 + log_3x + log_33 - log_35 = log_35$	Weight (Kg)16-2021-2526-3031-3536-4041-45Frequency21012X108(i)Calculate the value of X.(ii)State the modal class and calculate the mode(iii)State the median class and calculate the medianSimplify the following surd $\frac{4}{5}(\sqrt{25}-2\sqrt{5})$ Rationalize and simplify the denominator of the following surds $\frac{2\sqrt{5}}{2\sqrt{3}+\sqrt{2}}$ Simplify the following $(8x^2)^{\frac{1}{3}} \div x^{-\frac{1}{3}}$ Solve the following equations $4 + log_3x + log_33 - log_35 = log_32 + 3$	Weight (Kg)16-2021-2526-3031-3536-4041-4546-50Frequency21012X1082(i)Calculate the value of X.[2mark(ii)State the modal class and calculate the mode[3mark(iii)State the median class and calculate the median[3markSimplify the following surd $\frac{4}{5}(\sqrt{25}-2\sqrt{5})$ [3markRationalize and simplify the denominator of the following surds $\frac{2\sqrt{5}}{2\sqrt{3}+\sqrt{2}}$ [4markSimplify the following $(8x^2)^{\frac{1}{3}} \div x^{-\frac{1}{3}}$ [3markSolve the following equations $4 + log_3x + log_33 - log_35 = log_32 + 3$ [4mark	

Question 2 (20 marks)

f)

The table below shows the mathematics examination marks for a class of one hundred students in a certain institution.

Marks out 70	10-19	20-29	30-39	40-49	50-59	60-69
Number of students	4	8	12	22	48	6

Using 34.5 as the assumed mean calculate the

(i)	Mean	[3marks]
(ii)	Variance and Standard deviation	[7marks]
(iii)	Estimate the mode and median	[5marks]
(iv)	Draw an Ogive for the above data and use it to estimate the	quartile deviation [5marks]

Question 3 (20 marks)

a) Simplify the following surds and rationalize the denominator where possible

(i)	$\sqrt{2}\left(\sqrt{7}-3\sqrt{5}\right)$	[2marks]
(ii)	$(2\sqrt{5}-3)(4\sqrt{5}+3)$	[3marks]
(iii)	$3\sqrt{6}(4\sqrt{3}+2\sqrt{8})$	[3marks]
(iv)	$\frac{2\sqrt{2}-\sqrt{3}}{5\sqrt{2}-\sqrt{3}}$	[4marks]
(v)	$\frac{2}{\sqrt{2}-\sqrt{3}} + \frac{3}{\sqrt{2}+\sqrt{3}}$	[4marks]

b) Find the value of the unknown in the equations given below

(i)
$$2^{\frac{1}{2}+x} = 128 \times 2$$
 [4marks]

Question 4 (20 marks)

The following data represents the reported weights (Kg) for 40 students in a class.

45	65	66	67	72	74	79	69	57	58
65	58	65	67	66	70	69	49	50	52
51	70	79	80	84	49	52	55	63	64
85	90	87	69	81	82	68	69	58	60

- a) Using class intervals of five and starting from 45-49,... prepare a frequency distribution table [4marks]
- b) Draw a Cumulative distribution curve (Ogive) for the above given data [4marks]
- c) Use the graph in (b) to estimate

(vi)	Median	[2marks]
(vii)	Lower quartile	[3marks]
(viii)	Upper quartile	[3marks]
(ix)	Interquartile range	[2marks]
(x)	Quartile deviation	[2marks]

Question 5 (20 marks)

(i) Solve the following:

$$x - 2y+5z= 21$$

 $3x + y - 2z= -6$
 $2x + 3y + z = 3$
(10 marks)

(ii) Solve the following using matrix method:

$$4x - 3y = 18$$

 $x + 2y = -1$

(6marks)

(iii) The determinant of the matrix below is 6, find the value of x.

 $\begin{bmatrix} x & x \\ 4 & x \end{bmatrix}$

(4marks)