

EXTERNAL PAPER

BOT 2 EXAMS

S.3 MATHATICS

INSTRUCTIONS:

❖ Attempt all questions in section A

❖ Attempt any 5 in section B

- Given that $a \cdot b = \sqrt[n]{b}$. Find the value of
 - $2 \cdot 4$
 - $(2 \cdot 4) \cdot 6$
- Make b the subject of the equation; $t = 20 + \sqrt{a - b^2}$
- Solve $\frac{3}{4}(2a+1) = \frac{5}{6}(a+5)$
- Amina bought ATV set at 5% discount, the market price of the TV set was 320,000/=. How much did she pay for the T.V set?
- Find the equation of the line passing through points S(15,-2) and T(-3,4).
- Factorize $3x^2 - 14x + 3$ hence find the value of $3x^2bx + 3 = 0$.
- Given that A= 47, $\epsilon F_d = -400$ and $\epsilon F = 50$. Calculate the mean using the given quantity.
- A man borrowed 2,000,000/= from a sacco at compound interest rate of 15% p.a for a period of 2 years. Calculate the compound interest on borrowed money.

SECTION B:

- A triangle PQR with vertices P(2,1) Q(u,s) and R(S,-3) mapped onto $\Delta P^1Q^1R^1$ by matrix $A = \begin{pmatrix} 4 & 0 \\ 0 & 4 \end{pmatrix}$. The $\Delta P'Q'R'$ is further transformed to the final image $\Delta P''Q''R''$ by matrix B

$$B = \begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$$

(a) Find the co-ordinates of :-

- $P'Q''R''$
- $P''Q''$ and R''

(b) Find the matrix that maps the object ΔPQR onto final image $\Delta P''Q''R''$

(c) Find the matrix that maps the final image $\Delta P''Q''R''$ back onto the object ΔPQR .

- Copy and complete the following tables for the curve $Y = 2x^2 - 3x - 5$ for the values of x from -3 to 4.

X	-3	-2	-1	0	1	2	3	4
$2x^2$	-	-	-	-	-	8	-	-
$-3x$	-	-	-	-	-	-6	-	-
-5	-5	-	-	-5	-5	-5	-5	-5
Y	-	-	-	-	-	-3	-	-

(b) Use a scale 2cm = 1 unit x-axis .plot the graph $y = 2x^2 - 3x - 5$

(c) use your graph to solve $2x^2 - 3x - 5 = 0$.

14. (a) solve the following simultaneous equations by matrix method (6marks)

$$5x + 3y = 7$$

$$2x - 4y = 3$$

(a) Given that matrix $A = \begin{pmatrix} 2 & 3 \\ 4 & 2 \end{pmatrix}$

(i) Given A^2

(ii) Find A^{-1}

(iii) Find $A^{-1}A$

15. The cost of running a day school varies partly as a constant and partly varies directly as the number of students .The cost of running the school of 500 students is 40,000/=

The cost of running the school of 900 students is 64,000/=.

(a) Write an equation for the cost of running the day school.

(b) Find the cost of running the school which has 700 students

(c) How many students are in the school if the cost is shs 82,000/=

16. The table below shows the ages of 50 people who treated for T.B at a health centre.

86	85	56	59	67	62	63	50	91	62
56	27	50	54	80	61	52	16	52	28
66	46	55	58	56	77	26	40	42	51
35	45	68	51	49	40	93	84	79	63
52	53	25	93	27	71	66	52	30	12

(a) Construct a frequency table starting with class 10-19.

(b) Use the frequency table to calculate

(i) mean

(ii) median

17. The table below shows the income tax rates of a certain country for a government employee;

TAXABLE INCOME	TAX RATES %
1-100,00	5
100001-200,000	13
200001-300,000	20
300001-400,000	30
400001-500,000	40
500001 and above	45

An employee has a growth salary of 753,500 shs is entitled with the following monthly allowance;

- Marriage and child allowance of shs 111,500/=
- Housing and transport allowance of 10% of gross income
- Medical care of shs 81,600/=
- Insurance premium of shs 25,000

Calculate;

- (a) Taxable income
- (b) Income tax
- (c) Net income

****END***