NAME ……………….........................................................INDEX NO:………………………………

DATE:……………………..……………… SIGNATURE…………………………………

3KNT FRATERNITY2017 TERM 11

FORM IV EVALUATION

MATHEMATICS PAPER 1

121/1

TIME 2 ½ HOURS

INSTRUCTIONS TO CANDIDATES

a ) Write your name and index number in the spaces provided above.

b) Sign and write the date of exam in the spaces provided above.

c) This paper consists of two sections section I and section II.

d) Answer all the questions in section I and ONLY 5 Questions in section II

e) All answers and working must be written on the question papers in the space provided below each question.

f) Non-programmable silent electronic calculators and KNEC Maths tables may be used except where stated otherwise.

|  |  |  |
| --- | --- | --- |
| SECTION 1 | SECTION II | GRAND TOTAL |
|  |  |  |

**SECTION 1- 50 MARKS (ANSWER ALL QUESTIONS IN THIS SECTION)**

1. Without using a calculator evaluate (3mks)

-8 +(4) + 8 ÷ (2)

-6 + (-2) + -1)

1. Simplify (3mks)

4 x2 - 9y2

2x2 - 5xy + 3y2

1. Point M divides line PQ= 7.3cm in the ratio 4: -1 . By constructing determine the position of M (3mks)
2. Two lines AB and PQ are perpendicular to each other. A point A(1,4) and B (5,6) If P(3,2) find the equation of line PQ (3mks)
3. A square brass plate is 2mm thick and has a mass of 1.0512. The density of the brass is 8.4g/cm3 . Calculate the length of the plate in centimeters. (3mks)
4. A Kenyan businessman bought goods from Japan worth 3,850,000 Japanese Yen. On arrival in Kenya custom duty 20% was charged on the value of the goods. If the exchange rates were as follows:

1US £ = 110 Japanese Yen

1US £= 90 Kenyan shillings

Calculate the duty paid in Kenya shillings. 3mks)

1. In the figure below, BC DE is a parallelogram . Angle BCA=76 0 and EDF = 640

A

B E

64°

C D F

at is the value of angle BEA (2mks)

1. The angle of elevation of the top of a storey building from point P is 23.610 . From another point Q six meters nearer to the base of the building, the angle of depression from the top of the building is 35 0 . Calculate to 1 decimal place the height of the building. (3mks)
2. Given that Cos A= . Without using a calculator or logarithm tables find A. (3mks)
3. The interior angles of a hexagon are 2x0 , ½ x 0, x+400 , 1100 , 1300 and 1600 . Find the value of the smallest angle (3mks)
4. The image of point A(1,2) after a translation is A’(-1, 2). What are the co-ordinates of a point P whose image is P’(-3, -3) after this translation? (4mks)
5. Form the three inequalities that satisfy the given region R.

Y

2

X

2

**-2**

1. Using a ruler and compass only construct a parallelogram ABCD having AB=6cm, ABC =600 and AD = 4.5cm. Find the length of BD. (4mks)
2. A container of height 90cm has a capacity of 4.5 litres. What is the height of a similar container of volume 9m 3 . (3mks)
3. Mukami’s clock gains 15 seconds every hour. She set the correct time on the clock at 0545 hours. on Sunday. Determine the time in the 12 hour system the clock will show on Wednesday at 1745 hours. (3mks)
4. (a) Complete the table below for the function y=3x2 – 8x +10 (1mk)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| X | 0 | 2 | 4 | 6 | 8 | 10 |
| y | 10 | 6 |  | 70 |  | 230 |

b) Using trapezoidal rule, estimate the area bounded by the curve y=3x2 -8x + 10 and y = 0, x=0 and the co-ordinate X=10 using 5 strips. (2mks)

**SECTION II (50MKS) Answer any five QUESTIONS FROM THIS SECTION**

17 a) Draw the graph of y= -x2 + x +6 taking integral values of x as -4 ≤ x ≤ 5. (5mks)



b) (i) Using the same axis draw the graph of y=2 – 2x (1mk)

ii) Give the values of point of intersection where the two graphs intersect (1mk)

c) Find the quadratic equation whose roots are the values in part b(ii) above. (3mks)

18.Two boats P and Q leave port A at the same time. P sails on a bearing of 0600. at 750km/h while Q sails on a bearing of 210o at 900km/h.

a) Using a suitable scale draw a diagram to show the positions of the boats after 2 hours.(4mks)

b) Use your diagram to determine

i) The distance between the two boats in kilometers. (2mks)

ii) The baring of Q from P (2mks)

iii) The bearing of P from Q (2mks)

19. Three business partners: Asha, Nangila and Cherop contributed ksh 60,000. ksh 85,000 and ksh 105 000 respectively They agreed to put 25% of the profit back into business each year . They also agreed to put aside 40% of the remaining profit to cater for taxes and insurance. The rest of the profit would then be shared among the partners in the ratio of their contributions. At the end of the first year the business realized a gross profit of 225,000.

a) Calculate the amount of money Cherop received more than Asha at the end of the first year. (5mks)

b) Nangila further invested ksh 25,000 into the business at the beginning of the second year. Given that the gross profit at the end of the second year increased in the ratio 10:P9 calculate Nangila share of the profit at the end of the second year. (5mks)

20. In the triangle PQR shown below PQ =18cm QR=6cm and PS = 11cm

P

11cm

S

T

7cm

6cm

Q R

The triangle PQR is rotated through an angle of 360o about the edge PQ. Calculate

1. The total surface area of the cone formed. (π = 3.142) (3mks)
2. The volume of the cone formed (2mks)
3. The volume of the frustrum of the portion QRTS. (5mks)

21.A triangle ABC has its vertices A(3,4) B(1,3) and C(2,1)

a) On the grid provided draw triangle ABC. Draw A’B’C’ the image of ABC under a rotation of +90 about (0,0) (2mks)



b) Draw A’’B’’ C’’ to the image of A’B’C’ under a reflection in the line y=X. (2mks)

c) Draw A’’’B’’’CC’’’ the image of A’’B’’C’’ under rotation of -900 about (0,0) (2mks)

d) Describe a single transformation that maps ABC onto A’’B’’C’’ (2mks)

e) Write down the equation of the lines of symmetry of the quadrilateral B B’’A’’’A’ (2mks)

22. The diagram below shows the speed time graph of a bread delivery van travelling between Meru town and Embu town. The van starts from rest and accelerates uniformly for 200 seconds. It then travels at a constant speed for 350 seconds and then decelerates uniformly for 300 seconds.

SPEED

(m/s)

TIME (sec)

Given that the distance between the two towns is 15 km. Calculate the

1. Maximum speed in km/h to van attained (3mks)
2. Acceleration for the first 200 seconds (2mks)
3. Distance the van travelled during the last 150 seconds (2mks)
4. Time the van takes to travel the first half of the journey. (3mks)

23.The following are masses of 25 students in form 4 class

49, 51, 50, 60, 55, 46, 56,51,58,59, 44, 59, 42, 50, 62, 46, 43, 57, 56, 52, 43, 41, 40, 54, 44

1. Draw a frequency distribution table with the lower class as 40 – 43 (4mks)
2. Estimate the median mass (2 mks)
3. Draw a histogram for the data. (4mks)

24. In the figure below O1 and O2 are centres of circles. PQ = 8cm and PO1 = QO1=12.5cm, PO2 = QO2 = 10cm.

P

y

X

Q

O1

O2222

Q

Find

1. angle PO1Q (1mk)
2. angle PO2Q (1mk)
3. The area of intersection of the two circles (6mks)
4. The area of section PO2 QYP. (2mks)