

**MURANG’A UNIVERSITY COLLEGE (MRUC)**

**A Constituent College of Jomo Kenyatta University of Agriculture & Technology**

**SMA 2104: MATHEMATICS FOR SCIENCE**

**SUPPLIMENTARY/ SPECIAL EXAM**

 **DIPLOMA IN COMPUTER ENGINEERING**

 **SEMESTER 2 2014/2015**

DATE TIME

**Question one**

1. Members – 1 2 3 4 5 6 7 8 9 10. No. of ways 10 x 9 x 8 x 7 x 6 x 5 x 4 x 3 x 2 x 1

 = 10!

 2 X 1 = 2!

 No. of ways = 10! X 2!

 = 7,257,600

1. 4x2 – 18x + 3 = 0 x2 – 18x + 3 = 0 dividing through by 4

 4 4

 x2 – 9x = -3 taking constant to R.H.S

 2 4

 x2 – 9x 1(-9)2 = -3 + (-9)2 Composing the square in left hand side.

 2 2 7 2

 x -9 2 = -3 + 81

 2 4 4

 x – 9 = 78

 2 √ 4

 x = 4.5 + 4.41 x = 4.5 + 4.41 = 8.91

 or

 x = 4.5 – 4.41 = 0.09

1. B =35, b = 7, c = 5 sine rules

 7 = 5 sin c = 5 sin B = c =24.1

 Sin B Sin c 7

 A +B + C = 180 A = 180 – (B-C)

 = 180 - (35 +24.19)

 = 120.81

 a = b a= b x sin A. Sin A Sin B Sin B

 = 7 x sin 120.81

 Sin 35

 = 10.48 ≈ 10.5.

1. tan x sin x + cos x = 88cx

 = sin x sin x + cos x =Ʒ

 cos n = sin2x + cosx cosn

 = sin2x + cos2x = 1\_\_

 Cos x cos n

 = 50cx

1. 4 + 3√2

=

 + 3 √

4

2

x

 + 5√

6

6

 6 -5 √6

 6 – 5√6 6 + 5√6

 

 36 + 30 √6 - 30 √6 = 25√36

=

 + 20√6 + 18√2 + 30√

24

3

 36 – 150

=

 + 18√2 + 30√3 + 20√

24

6

 -114

**Question Two**

a) x = 6, 9, 12, 13, 14, 16, 17, 18, 19, 22, 23

1. M&ᴥ = A1/2 {A + 1} t Values

 = 13 t Values

 2

 = 7.5t Values

 = 17.5

1. 12R = 23 - 21

 23 = 3 (n + 1)u value 01 = 1(13)t values.

 4 y

 3.25t value

 = 9.75u value = 3rd values + 0.25(4 -13d)

 = 9t value + 0.75(10u -9CR) = 18 + 0.75(19 -18) = 12 + 0.25 (13 -12)

 = 18.75 =12.25.

 1Qn = 18.75 – 12.25

 = 6.5

b. tan2x = sin2x

 tan2  x + 1

 sin x 2 = sin 2 x cos x cos2 x = sin n 2 sin2 n

 cos n + 1 cos n + 1

 = sin2 x cos2 n

 sin2x + cos2n

 cos2 n cos2n

 = sin2n = sin2 x + cos2x cos2 x cos2x 1

 1\_\_ cos2n = sin2n

iii. msin 9nt 

 12

 = 15.8

 x x – ṅ pc – ~~x~~1 6 -9.58 9.58

 9 -6.58 6.58

1. -3.58 3.58
2. -2.58 2.58
3. -1.58 1.58
4. 0.42 0.42 Ʃ(n - ṅ) = 47.84
5. 1.42 1.42
6. 2.42 2.42 M.AD = 47.84
7. 2.42 2.42 12
8. 3.42 3.42

 22 6.42 6.42 =3.99 23 7.42 7.42 ≈ 4.

**Question three**

Using synthetic division/long division.

 5 0 -4 4 -4 7

-3 -15 45 -123 +357 -1083

 5 -15 41 -119 +361 1097

 Ƒ(-3) = 1097

b.

 α2 = b2 + e2 – 2bcosA 82 = 102 + 32 -2(30) cosA

 64 – 100 – 9 = -60 cosA

 60 cosA = 45

 Cos A = ~~45~~ 3 = 41.41

# 4

 sinᵉ mɣ1u a = b sinA sin B

 sinB = b sin A

 α = 10 x sin A

 8

 = 53.77

A + B + C = 180.

 =??

C. ʃ+3x2 + 4x – 7 dx

 = 3x3 + 4x2 – 7x + c 4

 3 2 2

 (64) + 32 – 28 + e – [8 + 8 – 14 + c]

 68 + e - 2 AC

 = 66

**Question four**

(x +5)15 = x15 +15x 145 + 15c2 x1352 + 15c3x1253

 = x15 +75x14 +2625X13 +56875x4

(x +5)15 = (5 +0.2) x = 0.02

 = 0.0215 + 725(0.02)14 + 2625(0.02)13 + 5675(0.02)4- - - -

1. 10C3 X 15c4 = 360,360

 digit 4 digit

1. digit 1 2 3 4 (3)

 2 4 3 3

 Five digit 2 3 4 3 (3)

 4 3 2 3 Six digit

1 2 3 4 5 62 (3)

* + - 1. 3 2 2 1 3

 3( )

* + - 1. - ᵜ.

 Medium = L.C.B. + (n - pcf)

 2

= 360.5 + (50 -42) x 20

 33 = 365.34.

 3(366.9 – 365.34)

 20.17

 = 0.2320

**Question five**

 x f c.f L.C.B

d =

x

-

A

fd

fd

2

c

320.5

-

2

-

30

60

340.5

-

1

-

27

27

0

0

25

25

80

x

60

x

40

x

x

320

 340 360

380

330.5 15 15

 350.5 27 42

 370.5 33 75 360.5 0

390.5 25 100 380.5 1

Cumulative Frequency 100

 20

 l.C.B

Mean = 360.5 + ~~20~~1 (32)

#  108

 5

 = 366.9

 s.d = c ∑ƒd2 - ∑ƒd 2

 √ ∑ƒ ∑ƒ

 = 20√112 - 32

 100 100

 = ??