

**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

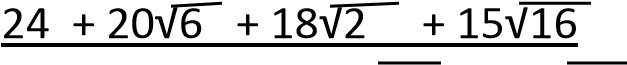
+ 5√

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

= ??