**TERM 2-2022**

**MATHEMATICS (MARKING SCHEME)**

**FORM 4**

**TIME 2½ HOURS**

**PAPER 1**

**Name………………………………………………………………… Adm No………………………………..**

**School…………………………………………………………………. Class…………………………………….**

**Signature………………………………………………………… Date………………………………………**

**INSTRUCTIONS:**

1. Write your name, Index number in the space provided at the top of the page.
2. Sign and write the date of examination in the spaces provided above.
3. This paper consists of **two** sections 1 and II.
4. Answer all the questions in section **1** and only **five** questions from section II
5. All answers and working must be written on the question paper in the spaces provided below each question.
6. Show all the steps in your calculation, giving your answers at each stage in the space provided.
7. Marks may be given for correct working even if the answer is wrong.
8. Non programmable silent electronic calculator and KNEC Mathematical table may be used, except when stated otherwise.

FOR EXAMINER’S USE ONLY

**SECTION 1**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | Total |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

**SECTION 2**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | Total  GRAND TOTAL |
|  |  |  |  |  |  |  |  |  |

**ZERAKI ACHIEVERS FORM 4 TERM 2 2022 MATHEMATICS PAPER 1 (MARKING SCHEME)**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **WORK OUT** | **MKS** | **COMMENTS** |
| 1. | 6(2 x ) =  ÷ =    6(8 x ) = | M1  M1  A1 |  |
|  |  | **03** |  |
| 2. | (y2 + x2) (y + x) (y – x)  y( y + x) (y – x)  y2 + x2  y | M1  M1  A1 | Simplifying the numerator fully  Simplifying the denominator fully |
|  |  | **03** |  |
| 3. | 22x-1 x 2-3 + 3x = 26x +2  2x -1 – 3 + 3x = 6x + 2    x = - 6 | M1  M1  A1 | All numbers t base two  All the powers picked correctly |
|  |  | **03** |  |
| 4. | Customers selling price  = 90 + 24,000  100  = 21,600  100 x 21,600  120  = 18,000 | M1  M1  A1 |  |
|  |  | **03** |  |
| 5. | No. xy  x + y = 12  10y + x – 15 = 2(10x + y)  8(12 – x) -19x = 15  x = 3 y = 9  Original number 39 | M1  M1  A1  B1 | For the 2 equations  Expressing in one variable  For the two |
|  |  | **04** |  |
| 6. | 9.4522 = 89.34  1 = 0.01578  63.37  89.35578 | B1  B1  B1 | Accept at least 4 sf |
|  |  | **03** |  |

|  |  |  |  |
| --- | --- | --- | --- |
|  | **WORK OUT** | **MKS** | **COMMENTS** |
| 7. | L.S.F =    = 1.5  Radius of the large container = (15.5 x 1.5) x  = 11.625cm  = 11.6cm | M1  M1  A1 |  |
|  |  | **03** |  |
| 8. | AB =    = 2  -4 = 2i – 4j + k  1  /AB/ = 22 + (-4)2 + 12    = 21  = 4.583 | M1  M1  A1 |  |
|  |  | **03** |  |
| 9. | C  A  300  BBBB  15 = 12  Sin 300 sin θ  θ = 23.580  n = 180 – 30 – 23.58  = 126.420  Bearing = 180 + 126.42  = 306.420 | M1  A1  B1 | Accept N 53.580W |
|  |  | **03** |  |
| 10. | 3 – 2x ˂ x  3 ˂ 3x  1 ˂ x  3x ≤ 2x + 5  x ≤ 5 1 ˂ x ≤ 5  2,3,4,5 | B1  B1  B1 |  |
|  |  | **03** |  |
| 11. | 4 – x = 1  2x + 1 7  28 - 7x = 2x + 1, x = 3  y – 3 = -7  x + 1  y = -7x - 4 | M1  M1  A1 | Give for the equivalent |
|  |  | **03** |  |
|  | **WORK OUT** | **MKS** | **COMMENTS** |
| 12. | L N  K N  P Q  ˂ LNK = 300  ˂ PNK = 700  x = 3600 – (300 +700)  = 2600 | B1  M1  A1 |  |
|  |  | **03** |  |
| 13. |  | B1  B1  B1 | For correct parallel and equal corresponding lines  For dotted lines  For correct diagram |
|  |  | **03** |  |
| 14. | Volume = 63000  7  = 9000cm3  Volume L (15 x 12) - (12 x 10) h = 9000  60h = 9000  h = 1.5m | M1  M1  A1 |  |
|  |  | **03** |  |
| 15. | (a) Jane Mary  5 : 4  Dev. Div Re  4 : 5 : 6  Dev = 4 x 81000  15  = sh. 21600   1. Div = 5 x 81000   15  = 27000  Mary got 4 x 27000  9  = 12000 | M1  A1  M1  A1 |  |
|  |  | **04** |  |
| 16. | (a) D = ½ x 80 ( 24 + 16)  = 1600m   1. Decelaration =     = 20m/s2 | M1  A1  A1 | Any other equivalent method |
|  |  | **03** |  |

**Section II**

|  |  |  |  |
| --- | --- | --- | --- |
| 17. | (a) let the constant amount be x  Peter - (3/8 x ) / =  John’s - 2/5 (5/8x ) /=  = ¼ x /=  Remaining 3/8x - 18,000  x = 48,000  Therefore the original amount is 48,000   1. John received   (1/4 x 48,000)  = 12,000/=   1. Business maintenance   (1/3 x 12,000)  = 4,000/=  Balance = 8,000  Ratios: Peter - (3/8  x 48,000)  = Ksh. 18,000/=  John - (1/4 x 48,000)  = 12,000/=  Caro - (1/3 x 18,000)  = 6,000/=  Ratio: 18,000 : 12,000 : 6,000  3 : 2 : 1  Peter got 3/6 x 8,000 + 18,000  = Ksh. 22,000/=  John got 2/6 x 8,000  = Ksh. 14,677/=  Caro got 1/6 x 8,000 + 18,000  = Ksh. 7,333/= | M1  M1  M1  A1  M1  M1  M1  A1  B1  B1 | Any other equivalent method |
|  |  | **10** |  |

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| **18.** |  | | |
| 19. | (a) bottom = 22/7 x 4.22  = 55.44cm2  Top = 4 x 22/7 x 3.52 x ½ = 77cm2  Curved = 22/7 x 8 x (4.2 + 3.5) = 193.6cm2  TSA = 77 + 55.44 + 193.6  = 326.04cm2   1. r = 81.51    1. 326.04   r = 2.1cm   1. H = 82 – 0.72   = 7.97cm | M1  M1  M1  M1  A1  B1  B1 | From working  From working |

|  |  |  |  |
| --- | --- | --- | --- |
|  | C (ii) volume = 1/3 x 22/7 x 7.97 (4.22 +3.5 +4.2 x 3.5) +  = 1/3 x 22/7 x 7.97 x 44.59 + 89.83  = 462.13 cm3 | M1  M1  A1 |  |
|  |  | **10** |  |
| 20. | (a) (i)  Relative speed = (40 + 60) km/h  = 100km/h  Relative Distance = 80km – 0.5h x 40km/h  = 60km  Time =  Distance from A = 20km + 0.6 x 40  = 44km  (ii)  10.30am + 36 minutes  = 11.06am  (b)  Time taken by Kamau = 11.06am – 10.20am  = 46 minutes  Average Speed =  = 57.39km/h | B1  B1  B1  M1  A1  M1  A1  B1  M1  A1 |  |
|  |  | **10** |  |
|  |  |  |  |
| 21. | (a) |  |  |

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| --- | --- | --- | --- |
| 21. | (b) | B1  B1  M1  A1 |  |
|  |  | **10** |  |
| 22. | (a) BAR ˂ QAB = 1000 – opposite angles in a  quadrilateral add up to 1800  ˂ BAR = 800 – angles in a straight line add up to 1800   1. STR ˂ STR = 180 – (80 + 700)   = 30 – angles in a straight line add up to 1800   1. BSU ˂ UBS = 180 – 1150 = 650 – angles in a   straight line add up to 1800  ˂ BSU = 450 – angles in a straight line add up to  1800   1. BRS ˂ SBA = 1150 – vertically opposite angles are   equal  ˂ BRS = 65 – opposite angles in a cyclic  quadrilateral add up to 1800   1. SBU - 180 – 115 = 650 – angles on a straight line | B1  B1  B1  B1  B1  B1  B1  B1  B1B1 |  |
|  |  | **10** |  |
| 23. |  | B1  B1  B1  B1  B1  B1  B1  M1  M1  A1 |  |
|  |  | **10** |  |

|  |  |  |  |
| --- | --- | --- | --- |
| 24. | (a)  (b) 3x2 + 2x – 3 = 0  x =  x =  x = - 1.3875 or 0.7208    6(-1.3875) + 2 = -6.325  6(0.7208) + 2 = 6.3248    (-1.3875, 5.416) is maximum turning point  (0.7208, 0.7316) is minimum turning point  (c)  y – intercept = 2  **C:\Users\NOREEN\Desktop\IMG_20211104_180918_380 (2).jpg** | B1  M1  M1  A1  M1  A1  B1  B1  B1  B1 | Testing for Max or min  For y – intersect  Max, Min pts estimated  Curve |