**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 | TotalGRAND TOTAL |
|  |  |  |  |  |  |  |  |  |

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

|  |  |  |  |
| --- | --- | --- | --- |
|  | **WORK OUT** | **MKS** | **COMMENTS** |
| 1. | 6(2 x ) = ÷ =  6(8 x ) =    | M1M1A1 |  |
|  |  | **03** |  |
| 2.  |  (y2 + x2) (y + x) (y – x) y( y + x) (y – x) y2 + x2 y | M1M1A1  | Simplifying the numerator fullySimplifying the denominator fully |
|  |  | **03** |  |
| 3. |  22x-1 x 2-3 + 3x = 26x +2 2x -1 – 3 + 3x = 6x + 2   x = - 6 | M1M1A1 | All numbers t base twoAll the powers picked correctly |
|  |  | **03** |  |
| 4. | Customers selling price = 90 + 24,000 100  = 21,600100 x 21,600 120 = 18,000 | M1M1A1 |  |
|  |  | **03** |  |
| 5.  |  No. xyx + y = 1210y + x – 15 = 2(10x + y)8(12 – x) -19x = 15x = 3 y = 9Original number 39 | M1M1A1B1 | For the 2 equationsExpressing in one variableFor the two |
|  |  | **04** |  |
| 6. | 9.4522 = 89.34 1 = 0.0157863.37 89.35578 | B1B1B1 | Accept at least 4 sf |
|  |  | **03** |  |

|  |  |  |  |
| --- | --- | --- | --- |
|  | **WORK OUT** | **MKS** | **COMMENTS** |
| 7. | L.S.F =   = 1.5Radius of the large container = (15.5 x 1.5) x = 11.625cm = 11.6cm | M1M1A1 |  |
|  |  | **03** |  |
| 8. | AB =   = 2  -4 = 2i – 4j + k 1 /AB/ = 22 + (-4)2 + 12  = 21 = 4.583 | M1M1A1 |  |
|  |  | **03** |  |
| 9. |  C A300 BBBB15 = 12 Sin 300 sin θ θ = 23.580 n = 180 – 30 – 23.58 = 126.420 Bearing = 180 + 126.42 = 306.420 | M1A1B1 | Accept N 53.580W |
|  |  | **03** |  |
| 10. | 3 – 2x ˂ x3 ˂ 3x1 ˂ x 3x ≤ 2x + 5 x ≤ 5 1 ˂ x ≤ 5 2,3,4,5 | B1B1B1 |  |
|  |  | **03** |  |
| 11. | 4 – x = 12x + 1 728 - 7x = 2x + 1, x = 3y – 3 = -7 x + 1 y = -7x - 4 | M1M1A1 | Give for the equivalent |
|  |  | **03** |  |
|  | **WORK OUT** | **MKS** | **COMMENTS** |
| 12. | L NK NP Q˂ LNK = 300˂ PNK = 700 x = 3600 – (300 +700) = 2600 | B1M1A1 |  |
|  |  | **03** |  |
| 13. |  | B1B1B1 | For correct parallel and equal corresponding linesFor dotted linesFor correct diagram |
|  |  | **03** |  |
| 14. | Volume = 63000 7 = 9000cm3Volume L (15 x 12) - (12 x 10) h = 9000 60h = 9000 h = 1.5m | M1M1A1 |  |
|  |  | **03** |  |
| 15. | (a) Jane Mary 5 : 4Dev. Div Re 4 : 5 : 6 Dev = 4 x 81000 15 = sh. 216001. Div = 5 x 81000

 15 = 27000Mary got 4 x 27000 9 = 12000 | M1A1M1A1 |  |
|  |  | **04** |  |
| 16. | (a) D = ½ x 80 ( 24 + 16) = 1600m1. Decelaration =

  = 20m/s2 | M1A1A1 | 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 = 48,000Therefore the original amount is 48,0001. John received

 (1/4 x 48,000) = 12,000/=1. Business maintenance

 (1/3 x 12,000) = 4,000/= Balance = 8,000Ratios: 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 : 1Peter 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/= | M1M1M1A1M1M1M1A1B1B1 | Any other equivalent method |
|  |  | **10** |  |

|  |  |
| --- | --- |
| **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 = 326.04cm21. r = 81.51
	1. 326.04

r = 2.1cm1. H = 82 – 0.72

 = 7.97cm | M1M1M1M1A1B1B1 | From workingFrom 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  | M1M1A1 |  |
|  |  | **10** |  |
| 20. | (a) (i)Relative speed = (40 + 60) km/h = 100km/h Relative Distance = 80km – 0.5h x 40km/h = 60kmTime = 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 minutesAverage Speed =  = 57.39km/h | B1B1B1M1A1M1A1B1M1A1 |  |
|  |  | **10** |  |
|  |  |  |  |
| 21. | (a) |  |  |

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|  |  |  |  |
| --- | --- | --- | --- |
| 21. | (b) | B1B1M1A1 |  |
|  |  | **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 18001. STR ˂ STR = 180 – (80 + 700)

 = 30 – angles in a straight line add up to 18001. BSU ˂ UBS = 180 – 1150 = 650 – angles in a

 straight line add up to 1800 ˂ BSU = 450 – angles in a straight line add up to 18001. BRS ˂ SBA = 1150 – vertically opposite angles are

 equal˂ BRS = 65 – opposite angles in a cyclic quadrilateral add up to 18001. SBU - 180 – 115 = 650 – angles on a straight line
 | B1B1B1B1B1B1B1B1B1B1 |  |
|  |  | **10** |  |
| 23. |  | B1B1B1B1B1B1B1M1M1A1 |  |
|  |  | **10** |  |

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| --- | --- | --- | --- |
|  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** | B1M1M1A1M1A1B1B1B1B1 | Testing for Max or minFor y – intersectMax, Min pts estimatedCurve |