**121/1 - MATHEMATICS ALT A - PAPER 1**

**MARKING SCHEME**

**END TERM EXAMINATIONS**

***Kenya Certificate of Secondary Education (KCSE)***

|  |  |  |  |
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|  | **CALCULATIONS** | **MARKS** | **REMARKS** |
| 1. | 133X0.51X1000000  0.19X0.0017X1000000  133X51X100  19X17  2100 | **M1**  **M1**  **A1** | **Multiplying**  **Correct …..**  **CAO** |
|  |  | **03** |  |
| 2. | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | |  |  |  |  | | --- | --- | --- | --- | | 2 | 48 | 72 | 100 | | 2 | 24 | 36 | 50 | | 2 | 12 | 18 | 25 | | 2 | 6 | 9 | 25 | | 3 | 3 | 9 | 25 | | 3 | 1 | 3 | 25 | | 5 | 1 | 1 | 25 | | 5 | 1 | 1 | 5 | |  | 1 | 1 | 1 |   L.C.M = 243252  = 3600  Number =3600 + 3  = 3603 | | |  | | --- | | **M1**  **M1**  **A1** | | **Correct lcm**  **Adding 3**  **CAO** |
|  |  | **03** |  |
| 3. | 20 – x > 5+2x  15 >3x  x <5  5 + 2x ≥ x + 5  2x – x ≥ 0  3x ≥ 0  x ≥0  5> x ≥ 0  Integral values are 0, 1, 2, 3 and 4 | **M1**  **M1**  **A1** |  |
| 4. | 5000 x 84.15  = 420,750  420 750  289 850  130 900  = 1627.50  ≈ 1628 | **M1**  **M1**  **1 CAO** |  |
|  |  | **03** |  |
| 5  3cm  2cm  2cm  3cm  2cm  5cm  5cm  2cm | Surface area =  3 x 5 x 2 = 30  2 x 5 x 2 = 20  2 x 3 x 2 = 12  = 62cm2 | **04** | **B2 Check for other alternatives**  **M1**  **A1** |
| 6. | 2x - 1 - x² = 0  x² - 2x + 1 = 0  (x - 1) (x-1) = 0  x = 1 | **M1**  **M1**  **A1** | **Equating determinant to zero**  **Factorising** |
|  |  | **03** |  |
| 7. | Diagram | **B3** | **Hidden lines visible** |
|  |  | **03** |  |
| 8. | G+c=45  4g+2c= 100  G=45-c  4(45 – c) + 2c=100  180 – 4c +2c=100  C=40  g=5 | **M1**  **M1**  **A1** | **Forming the two equation.**  **Attempt to eliminate one variable.**  **For both** |
|  |  | **03** |  |
| 9. | a) boys = 900 – 600= 300  ratio 3000:600  1:2  b) 300/900 x 100  331/3% | **M1**  **M1**  **A1** | **Getting the number of boys.**  **Should be simplified.** |
|  |  | **03** |  |
| 10. | 4(t-1) – 3(4+t)=0  4t-3t – 4 – 12=0  t- 16 = 0  t= 16 | **M1**  **M1**  **A1** | **Attempting to remove fractions.**  **Removing brackets correctly.** |
|  |  | **03** |  |
| 11. | (3marks)  = 0.2375 x 101  = 2.315    = 0.35 x 2.315  = 0.81025 | **M1**  **M1**  **A1** | **Correct reciprocal**  **Multiplication**  **CAO** |
|  |  | **03** |  |
| 12. | 7y = 3x – 20  y = x -  g =  Gradient of tar =  ∆y/∆x =  =  3y – 6 = -7x + 35  3y = -7x + 41  y = x + | **M1**  **M1**  **A1** | rewriting in y = mx + C  or equivalent  or equivalent  3y + 7x = 41,  7x + 3y – 41 = 0 |
|  |  |  |  |
| 13. | diagram  x =  x = -15  = -15  - = 15  h  h(1-0.7813) = 15 h =  h = 68.58m | **M1**  **M1**  **M1**  **A1** |  |
|  |  | **04** |  |
| 14. | =  =  = | **M1**  **M1**  **A1** |  |
|  |  | **03** |  |
| 15. | Time taken 1600 h – 830 h = 7hrs 30 min  = 7hrs  Av. speed =  = 40km/h | **M1**  **M1**  **A1** |  |
|  |  | **03** |  |
| 16. | 34(x+1) +34x = 246  34x+4 +34x = 246  34x(34+1)=246  34x=246  81  34x=31  4x= 1  X=1/4 | **M1**  **M1**  **M1**  **A1** | **Accept the alternative.**  **Factorizing 34x**  **Equating powers**  **Accept 0.25** |
| 17. | 1. Original contribution =   New contribution =  Increase =  =  =  =   1. = 24   18000 = 24n2  -120n  n2 – 5n – 750 = 0  n2 – 30n + 25n – 750 = 0  n (n – 30) + (25 (n – 30 ) = 0  (n – 30) (n + 25) = 0  n - 30 = 0  n + 25 = 0  but n cannot be –ve n = 30   1. = 120 original   = 144 new  increase =  = 20 % (10 mks) | **M1**  **M1**  **M1**  **A1**  **M1**  **M1**  **A1**  **M1**  **M1**  **A1** |  |
|  |  | **10mks** |  |
| 18. | F:\my documents\OPENER\MATHS PP1 Q18.jpg | **M1**  **M1**  **M1**  **M1**  **M1**  **M1**  **M1**  **M1** | Mid pts  ∑f  fx  cf  Mean  Expression of median  median |
| . |  | **10mks** |  |
| 19 | F:\my documents\OPENER\maths pp1 q23 a.jpg  **ii) Radius = 3.5 ± 0.1**  **iii) height construction**  **height = 3.4±0.1**  **b) area of circle outside triangle**  **= 22/7 x 3.5 – ½ x 3.4 x 5**  **= 29.98** | **B1**  **B1**  **B1**  **B1**  **B1**  **B1**  **B1**  **M1**  **A1** | **Construction of 300.**  **Construction of 1050**  **Completion of ∆ABC.**  **1 bisectors.**  **circle**  **height constructed** |
|  |  | **10mks** |  |
| 20. | a) i) v=3.142 x 32 x 12+12+2/3 x 3.142 x 33  =339. 336 + 56.556  = 395.892  = 395.9  ii) v= 15 x 6 x6 – 395.892  = 144.108  =144.1  b) i) S.A = 3.142 x 32 +2 x3.142 x 3 x 12 + 2 x 3.14 2 x 32  = 28 .278 +226.224+56.556  311.058  = 311.1  ii) Cost = 311.058 x 900  8x1000  = ksh. 34.99  = 35.0 | **M1**  **M1**  **M1**  **A1**  **A1**  **M1**  **M1**  **A1**  **M1**  **A1** |  |
|  |  | **10mks** |  |
| 21. | 2.80cm  3.5cm  h  5cm  (a) Linear scale factor (L.S.F)  =  Area scale factor (A.S.F) ()2 =  Volume scale factor (V.S.F)  =  From similar triangles  =  5h = 5h + 20  h = 20cm  Length of larger cone  L2 = 252 + 3.52 = 625 + 12.25  =637.25  L =  ∴ l = 25.24  Curved surface area larger cone  = x 3.5 x 25.24  = 277.64cm2  Curved S.A of the small cone  x 277.64 = 99.9cm2  Total surface area of frustrum  + + 99.95 cm2  24.64 + 38.5 + 99.95  = 163.09cm2  (b) Volume of small cone  h = x x 2.8 x 2.8 x 20 = 164.3cm3 ­  Using volume scale factor (V.S.F)  Volume of larger cone  = x 164.3cm3  ∴Volume of frustrum  = x 164.3  x 164.3  = 156.6cm3 | **B1**  **M1**  **M1**  **M1**  **M1**  **A1**  **M1**  **M1**  **M1**  **A1** | **Vsf**  **Height,h**  **Crved SA**    **Big Volm**  **Small volm**  **Volm of frustrum** |
|  |  | **10mks** |  |
| 22. | Dist. AB = 112 × 5/2 = 280km  BC = 75 × 8/3 = 200km  AB = 7cm, BC=5cm, AD=4cm    b) i) CD = 3.5 × 40 = 140KM  ii) Bearing of C from D is 075°   1. i) AM = 6 × 40 = 240km   ii) Speed = 240/2  = 120km/h | **B1**  **B1**  **B1**  **B1**  **B1**  **B1**  **B1**  **B1**  **M1**  **A1** | **Position of B**  **Position of C**  **Position of D**  **Complete route**  **Location of M**  **CD**  **Bearing**  **AM**  **Speed**  **CAO** |
|  |  | **10mks** |  |
| 23. | 1. 64 x 0.5 = 32 km   384 -32 = 352 km  Time =  =  = 2.75 hrs  = 2 hrs 45 min  meeting time = 8.30 + 2.45  = 1075  = 1115 h or 11:15am  (b) D = S x T  = 64 x 2.75  = 176km   1. At 10:30; time difference = 10.30 – 8.30 = 2 hrs   64 x 2 x 64 x 2 = 352  x = 352 – 256 = 96 km apart | **M1**  **M1**  **M1**  **M1**  **A1**  **M1**  **A1**  **M1**  **M1**  **A1** |  |
|  |  | **10mks** |  |
| 24. |  | **M1**  **A1**  **M1**  **A1**  **M1M1**  **A1**  **M1**  **M1**  **A1** |  |
|  |  | **10mks** |  |