**KENYA HIGH EXAMINTIONS 2021**

**121/1**

**MATHEMATICS PAPER 1**

**MARKING SCHEME**

|  |  |  |  |
| --- | --- | --- | --- |
| 1. | -2 | M1  A1 | ✔Min &deno |
| 2. | Food =  Trans =  Rem =  Fraction of saving  = 1 – (+ + ) = 1 - =  Salary = 3400 x  = KSh. 17000 | M1  M1  A1 | ✔ Fraction |
| 3. |  | M1  M1  A1 | For den  For number |
| 4. | + 1 = 28  = 27  x =  27 x = 27  =  2x = 0  x = 0 | M1  A1 |  |
| 5. | S = = 8.1  =  = = 11.68  Shaded area = 18.05 – 11.68  = | B1  M1  A1  B1 | For 11.68 |
| 6. | x 100,000 = 2400  x 180,000 = 7020  = 9420 | M1  M1  A1 |  |
| 7. | (a) x(x + 4) = 96  + 4x – 96 = 0  (x-8) (x + 12) = 0  x = 8  Length = 12  Width = 8  (b) Perimeter = 2 (8 + 12) = 40m | M1  A1  B1 | Both |
| 8. | Sin-1 0.5 = (90 – a)  600 = 900 – a  a = 300  Cos 300  Cos a = | M1 for a = 300  B1 for CAO |  |
| 9. | (a) =  =  x = 6  (b) = 4.684  AB = 2 x 4.684 = 9.368  A = x 15 x 9.368 - x 7.5 x 4.684  = 52.698 | M1  A1  M1  A1 |  |
| 10. | x (10 – 6) = 314.29cm3  x = 314.29  r = 4.217 | M1  M1  A1 |  |
| 11. | C:\Users\Nzambia\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.Word\10.jpg  AM = 4.2cm, AC = 5.6cm (± 0.1cm) | B1  B1  B1  B1 | Construction of 450  ΔABC  ⊥ Dropped from A to BC  For AM to AC |
| 12. | 50,48,46,……………  = 50 + 7x (-2)  = 36  = (2 x 50 + (20 – 1) (x – 2)  = 620 | M1  A1  M1  A1 |  |
| 13. | C:\Users\Nzambia\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.Word\11.jpg    Surface area of base = 6cm x 6cm = 36cm2  Area of sides (flaps) = ( ½ x 6cm x 8cm)4 = 96cm2  Total surface area = 36cm2 + 96cm2 = 132cm2 | B1  M1  A1 | Net |
| 14. | C:\Users\Nzambia\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.Word\12.jpg   1. 3240 2. (7.2 x 5) km   = 36km | B1  B1  B1  B1 | Z accurately located wrt Y  X accurately located wrt Y  Bearing of X from Z  Distance of X from Z |
| 15. | - 18 x - 40 = 0  - 18 x -40 = 0  Let be t  t2 – 18t – 40 = 0  t(t – 20) + 2(t – 20) = 0  (t + 2)(t-20) = 0  Either  t – 20 = 0 t = 20  or t + 2 = 0 t = -2  but t = 2x  for 2x = -2 there are no real values  but for 2x = 20  =  x = 4.32 (2 dps) | M1  A1  B1 | eqn in t  both |
| 16. | x = 180,000  x = x 100  = 200000  y = 200000  BP ⇒ x 100 = 166,666.66 | M1  M1  A1 |  |
| 17. | = x 90 = 210km  Remaining distance = 360 – 210 = 150km  As = 90 + 110 = 200km  Time for meeting = = 0.75 hrs  = 45 mins  Meeting time = 10.35  + .45  11.20 a.m  (ii) Distance from A 210 + (0.75 x 90)  = 210 + 67.5  = 277.5 km  (b) Time minibus arrived at B  Time = = = 4 hrs  = 8.15 + 4 hrs = 12.15 p.m  Time taken by the tourist to arrive  B = 12.15 pm – 10.30 a.m = 1 hr 45 min  = 1 x 100  = 175km  ∴ Home to B = 175km  Home to A = 360 – 175  = 185km | B1  B1  M1  A1  M1  A1  M1  M1  A1  B1 | ✔ Distance covered by minibus for  2 hrs  ✔Ans  ✔ CAO |
| 18. | Cosθ =  θ = 100.330  A = x 250 x 320 Sin 100.33  = 3.9352 ha  2R =  R = 223.6  A = x 223.62 – 39351.65  = 117,781.7m2 | M1  A1  M1  M1  A1  M1  A1  M1  M1  A1 | Area of circle  Difference |
| 19. | C:\Users\Nzambia\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.Word\13.jpg  (ii) 4.4 x 50 = 220km± 5  (iii) 8.5 x 50 = 425±5  (iv) 2000 | B1  B1  B1  B1  B1  B1  B1  B1  B1  B1 | Pst of L  Pst of N  Pst of M  Construction of bisector  Measurement  Length  Measurement  Length  Measurement  Angle |
| 20. | (a)  (b) + 10   1. = = 10   = 10  = 10  200x + 6000 = 10x2 – 50x  20x + 600 = x2 – 5x  x2 + 15x – 40x – 600 = 0  x(x + 15) – 40(x + 15) = 0  (x-40)(x+15) = 0  x = 40 people  40 – 5 = 35   1. =   = KSh. 40 |  | B1  B1  B1  M1  M1  M1  A1  B1  M1  A1 |
| 21. | C:\Users\Nzambia\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.Word\14.jpg  (b) (i) Length of ON = 3.9cm±0.1  (ii) Area = 6 x 3.9  = 23.4cm2 | B1  B1  B1  B1  B1  B1  B1 | Both 900& 600 at A  750 at A  900& 600 at B  750 drawn at point B  Both AB = 6cm and BC = 4cm  Parrallegram completed  ⊥ Drawn |
| 22. | C:\Users\Nzambia\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.Word\15.jpg    Areas.  A = x 60 x 60 = 1800m2  B = x 200 = 16000m2  C = x 60 = 6600m2  D = x 120 x 80 = 4800m2  E = x 160 x 220 = 17600m2  F = x 20 = 2600m2  G = x 60 = 6600m2  H = x 120 x 100 = 6000m2  Total area = 62000m2 = = 6.2ha  1ha = 80,000  6.2ha = 8000 x  = KSh. 496,000.00 | B3  M1  M1  M1  M1  M1  A1 | 3 for at least 6, 2 for at least 4, 1 for at least 2 |
| 23. | (a) 6 + 14 + 24 + x + 10 + 6 + 4 = 100  x = 100 – 78  = 22  (b) Modal class 35 – 44  (c) median = 44.4 + x 10  = 48.79  (d)   |  |  |  | | --- | --- | --- | | Midpoint | f | xf | | 19.5 | 6 | 117 | | 29.5 | 14 | 413 | | 39.5 | 24 | 948 | | 49.5 | 14 | 693 | | 59.5 | 22 | 1309 | | 69.5 | 10 | 695 | | 79.5 | 6 | 477 | | 89.5 | 4 | 358 | | M1  A1  B1  M1  A1  B1  B1 | Mid points  x column |
|  | Σf = 100 Σxf = 5010  Mean =  =  = 50.10 | B1  M1  A1 | ✔Σf, Σxf |
| 24. | (a)  C:\Users\Nzambia\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.Word\16.jpg  Triangle ABC  +=  A + B= A  + =  49 + 576 = 625  625 = 625  (b) BAD = 2BAC  Sin θ = θ = 73.740  BAD = 73.74 x 2 = 147.480  (c) Area of kite = x 7 x 24 x 2  Area of sector ABD = x 3.14 x  = 62.87cm2  Area shaded = 168 – 62.87  = 105.13cm2 |  | M1  A1  B1  B1  M1A1  M1  A1  A1  A1 |