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**CEKENAS END OF TERM TWO EXAM-2022**

***Kenya Certificate of Secondary Education (K.C.S.E)***

121/2

**MATHEMATICS**

PAPER2

**MARKING SCHEME**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 1. |  | M1  M1  A1 | | For both |
|  |  | 03 | |  |
| 2. |  | M1  M1  A1 | |  |
|  |  | 03 | |  |
| 3. |  | M1  M1  A1 | | for both |
|  |  | 03 | |  |
| 4. |  | M1  M1  A1 | |  |
| 5. |  | B1  M1  A1 | |  |
|  |  | 03 | |  |
|  |  |  | |  |
| 6. | x:y=6:4 | M1  M1  A1 | | For both |
|  |  | 03 | |  |
| 7. | y=x2 – 3x+1 | B1  M1  A1 | |  |
|  |  | 03 | |  |
| 8. | (1-3x)5  (a) =1+5(-3x)1 +10(-3x)2 +10(-3x)3  =1-15x+90x2-270x3  (b) (0.97)5 = (1-3x)5  x= 0.01  1 -15(0.01) +90 (0.01)2 – 270(0.01)3  1-0.15 +0.009 +0.00027 = 0.8587 | M1  A1  M1  A1 | |  |
|  |  | 04 | |  |
| 9. | x+2y=-1  2x+3y=3  y=-5 x=-9  centre (-9, -5)  (x+9)2 + (y+5)2 = 52  x2 + y2 +18x+10y+81=0 | B1  .M1  A1 | |  |
|  |  | 03 | |  |
| 10 |  | B1  M1  A1 | |  |
|  |  | 03 | |  |
| 11. |  | M1  M1  A1 | |  |
|  |  | 03 | |  |
| 12 |  | B1  B1  B1 | | contrast of rectangle  for getting APPB  B1 for getting AP>2.5cm |
|  |  | 03 | |  |
| 13. | 11(6) = (x+4)4  66 = 4x+16  x=12.5  CQ=12.5+4  =16.5 | M1  M1  A1 | |  |
|  |  | 3 | |  |
| 14. | k(2k)-1(k+3)=0  2k2 – k -3 = 0  (k+1)(2k-3)=0  k=-1  k= | M1  M1  A1 | | FOR BOTH |
|  |  | 03 | |  |
| 15. |  | M1  M1  A1 | | for expression  for attempt to solve  for answer |
|  |  | 03 | |  |
| 16. | (a) logV=nLOgP+log a  (b) | B1  M1  A1    B1 | | For gradient  For get 0.6 |
|  |  | 04 | |  |
| 17. (a)  (b)  (c) | Taxable income = 40480  £ 2024  1-435 =435×2=870  436-870 435×3 = 1305  871 -1305 435 ×4 = 1740  1306-1740 435 × 5 = 2175  1741 – 2024 284× 6 = 1704  Payable tax 7794  7794-800 = 6994/= | M1  M1  M1  A1  B1  M1  M1  M1  A1 | | (Addition) |
|  |  | 10 | |  |
| 18. (a)  b  (c) | 576000-528,000=48000  a+(n-1)48000  480,000 +(n-1) 48000  432,000+48000n    % rate of increment = 1.1-1 = 10%  nth term = arn-1  480,000 (1.1)n-1 | M1  A1  M1  M1  A1  M1  A1  M1  M1  A1 | |  |
|  |  | 10 | |  |
| 19. (i)  (ii)  (iii)  (iv)  (v) | |  |  | | --- | --- | |  | 0 3 6 9 | | 0  2  4  6  8 | 0 3 6 9  2 5 8 11  4 7 10 13  6 9 12 15  8 11 14 17 |   =   |  |  | | --- | --- | |  | 0 3 6 9 | | 0  2  4  6  8 | 00 03 06 09  20 23 26 29  40 43 46 49  60 63 66 69  86 83 86 89 |      |  |  | | --- | --- | |  | 0 3 6 9 | | 0  2  4  6  8 | 0 0 0 0  0 6 12 18  0 12 24 36  0 18 36 54  0 24 48 72 |      |  |  | | --- | --- | |  | 0 30 60 90 | | 0  2  4  6  8 | 0 30 60 90  2 32 62 92  4 34 64 94  6 36 66 96  8 38 68 98 | | B1  M1  A1  M1  M1  A1  M1  A1  M1  A1 | |  |
|  |  | 10 | |  |
| 20.  (a)  (b)(i)  (ii)  (c) | longitude difference =120-80 = 400  Time difference = 40×4 = 1600 =2hrs 40 min  Time in A = 12.15 - 2.40 = 9.35am  AB=60× 40 cos 500  =2400× 0.6424  =1542.69nm  r=6370 cos 50  =4094.50  AB=2 rcos 70  = 2× 4094 .56cos 70  =2800.8  AB=2Rcos | M1  A1  M1  M1  A1  M1  M1  A1      M1  A1 | |  |
|  |  | 10 | |  |
| 21.  (a)  (b)  (c)  (d) | 22=x2 +6  x2 =16     |  |  | | --- | --- | | x | -4 -3 -2 -1 0 1 2 3 4 | | y | 22 15 10 7 6 7 10 15 22 | | b1 | 0 7 12 15 16 15 12 7 0 | | M1  A1  B1  M1  A1  M1  M1  A1  M1  A1 | | For both |
|  |  | 10 | |  |
| 22. a(i)  (ii) | Let the number of girls be x boys y  3x+2y24  x+y60  y > x  x 0  y0 | B1  B1  B1 | |  |
|  |  | | B1 for y=x  B1 y+x=60  B1y+x=2  B1x>0  y=0 | |
| (b) | Minimum cost appears at (0,12)  Cost 15000(0) + 10000(12)  =120000 | M1  A1 | |  |
|  |  | 10 | |  |
| 23.a) | |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | x | 0 | 15 | 30 | 45 | 60 | 75 | 90 | 105 | 120 | 135 | 150 | 165 | 180 | | sinx | 0 | 0.26 | 0.50 | 0.71 | 0.87 | 0.97 | 1.00 | 0.97 | 0.87 | 0.71 | 0.50 | 0.26 | 0.00 | | 2cos x | 2 | 1.93 | 1.73 | 1.41 | 1.00 | 0.52 | 0.00 | -0.52 | -1.00 | -1.41 | -1.73 | -1.93 | -2.00 | | y=sinx+2cosx | 2 | 2.19 | 2.23 | 2.12 | 1.87 | 1.49 | 1.00 | 0.45 | -0.13 | -0.70 | -1.23 | -1.67 | -2.00 | | | | |
| b) (i)  (ii)  (iii) | x=1170  x=750 30 sinx=2cos x=1  Tan x + 2 =    sinx+2cosx=1  x=900 | B1  B1  B1  B1  B1 | |  |
|  |  | 10 | |  |
| 24. (a) | |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | mark | 20-29 | 30-39 | 40-49 | 50-59 | 60-69 | 70-79 | 80-89 | | freq | 3 | 13 | 13 | 13 | 14 | 12 | 4 | | cf | 3 | 16 | 29 | 43 | 56 | 68 | 72 |   Median =54.5  Q1 = 41.5  Q2 = 68.5 | B1  B1  B1  B1  B1  B1  B1 | |  |
|  |  | 10 | |  |

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