**SAMIA SUB – COUNTY JOINT EVALUATION TEST – 2021**

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

MARKING SCHEME

121/1

MATHEMATICS

PAPER 1

MATHEMATICS

|  |  |  |  |
| --- | --- | --- | --- |
|  | 4 of (-4 -3) + 3 – 2  -12 + 3 + 5  4 of (- 7 – 3 – 2)  - 4  48  -4 = - 12 | M1  M1  A1 | For numerator  For denominator |
|  |  | 03 |  |
|  | Nume (3x + 1) (3x - 1)  Den (3x – 1) ( x + 1)  ( 3x +1)(3x – 1)  (3x – 1) (x + 1)  3x + 1  x + 1 | M1  M1  A1 |  |
|  |  | 03 |  |
|  | 4 x 14  11 20  10 ÷ 11  3 10  = 4 x 7 x 33  7 10 100  = 21  250 | M1  A1 | V removal of brackets  Simplified fraction |
|  |  | 02 |  |
|  | No . of hens = 20t, number of ducks = 3t  4  Total No = t + 20t + ¾ t  = 21 ¾ t  ¾ t = 72  t = 96  Hens = 1920  96 + 72 x 100  = 1920  = 8.75% | B1  M1  A1 | Turkey and hens |
|  |  | 03 |  |
|  | 5 + 12  0.1396 0.593  65(7,161) + 12(1.686)  35.805 + 20.232  =56.037 | M1  M1  A1 |  |
|  |  | 03 |  |
|  | M = -2 + 4 , 6 + 2  2 2  =(1,4)  g1= - 2  3  g2 = 3  2  y – 4 = 3  x – 1 2  2y = 3x + 5 | M1  A1  M1  A1 |  |
|  |  | 04 |  |
|  | 12  S.A = πrl  1 = √52 + 1212  =13cm  S.A = 3.142 x 5 - x 13  = 204.23 | B1  M1  A1 | 2x |
|  |  | 03 |  |
|  | Let t and p be the cost of a text book and a pen respectively.  3t + 5p = 970 ………………(i)  2t + 8p = 880 ………………(ii)  Multiply (i) by 8 and (ii) by 5  24t + 40p = 7760  10t + 40p = 4400  104t = 3360  t = 240 | B1  M1  A1 | For both  V attempt to solve  for t |
|  |  | 03 |  |
|  | <BOA = 80 x 2 = 1600  Obtuse < BOA = 2000  Therefore < OAC + 800 + 2000 + 100 = 3600  <OAC = 3600 - 2900  = 700  <CAB = 70 + (180 - 160)  2  = 800 | B1  B1  B1 |  |
|  |  | 03 |  |
| 1. (a)   (b) | |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | Speed | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 | 110 | | Freq | 1 | 4 | 9 | 14 | 38 | 47 | 51 | 32 | 4 | | Fx | 30 | 160 | 450 | 840 | 2660 | 3760 | 4590 | 3200 | 440 |   Σfx = 200  Σfx = 16,130  Σfx = 16130  Σf 200  = 80.65  90km/h | B1  M1  A1  B1 |  |
|  |  | 04 |  |
|  | 33 x+7 = 22 -3x  23 32  3 3(x+7) 3 6x  2 2  3(x + 7) = 6x  3x + 21 = 6x  3x = 21  x = 7 | M1  M1  A1 |  |
|  |  | 03 |  |
|  | 1 + T = - 1  2 2    T = -1 - 1  2 2  = -2  0  x + - 2 = -3  y 0 -3  x = -3 - -2  y -3 0  = -1  -3  R(-1, -3) | B1  M1  A1 |  |
|  |  | 03 |  |
| 1. (a)   (b) | = ½ + 4 x 80 + 80 x 16 + ½ x 4 x 80  = 160 + 1280 + 160  = 1600m  a = - 80  4 = 20m/s2 | M1  A1  M1  A1 |  |
|  |  | 04 |  |
|  | L.C.M of 50 and 80  =400  Number of poles = 400 + 400  50 8  = 13 | B1  M1  A1 |  |
|  |  | 03 |  |
|  | Ext + Interior = 1800  1x + x = 180  3  4x = 180  3  x = 180 x 3  4  Exterior = 1 x 135 = 4500  3  No. of sides = 360  45  = 8 sides | B1  M1  A1 |  |
|  |  | 03 |  |
|  | 12 – 2x >18x – 8 > 28 – 2x  12 + 8> 18x +2x  x< 1  18x + 2x > - 28 + 8  x > -1  - 1 < x <1  Intergral values are 0 and -1 | B1  B1  A1 |  |
|  |  | 03 |  |
|  | |  |  |  |  |  | | --- | --- | --- | --- | --- | | x | -3 | -4 | 1 | 4 | | -2x2 | -18 | -2 | -2 | -32 | | 2x | -6 | -2 | 2 | 8 | | y | -17 | 3 | 7 | -17 |   (b) (i)  (ii) x = -15 or 2.5  (c) (i) 7+2x – 2x = 9 + 5x – 2x2  y = - 3x – 2  x = - 1.2 or 3.7  (ii) (0.5, 7.5) | B1B1  S1  P1  C1  L1  B1  M1  B1  B1 | Correct line drawn |
|  |  | 10 |  |
|  | 48000-20000  =28000    x = 28000×  = sh. 350, 000  Sales = 350 000+100 000  = 450 000  (i) Sales for feb    =531 000- 100 000  = 431 000 ×  =34, 480  (ii) =  =sh. 398 250  Commission = 298250 ×  = 23, 860  sh 23860 + 20 000  = 43 860 | M1  M1  M1  A1  M1  M1  A1  M1  M1  A1 |  |
|  |  | 10 |  |
|  | V.S.F = 512000: 100000  512: 1000  64: 125  43: 53  L.S.F  Height os small tank = 4x 300  5  = 240cm  A.S.F = 16: 25  S.A of the large tank = 25 x 768  16  = 1200m2  Mass of smaller tank = 125 x 800  64  = 1562 | M1  M1  M1  B1  B1  M1  A1  M1  A1 |  |
|  |  | 10 |  |
| 20 |  |  |  |
|  |  |  |  |
| 21(a)  (b)  (c) | Cos Ө = 2502 + 3202 - 440  2x250 x 320  = 100.330  A = ½ x 250 x 320 sin 100.330  = 39351.65  10000  = 3.9352ha    2R = 440  Sin100.33  R = 223.6  A = 22 x 223.62 - 39351.65  7  =117781.7m2 | M1  A1  M1  M1  A1  M1  B1  M1  M1  A1 | Area of circle diff. |
|  |  | 10 |  |
| 22(a)  (b)  (c)  (d) | Time the arrives in NBI = 400  120  = 3hrs 20 min  Time = 8.20am + 3.20min  = 11.50am  Distance covered by the bus in 30min  = ½ x 80 = 40km  Time taken to meet = Distance  R.S  = 360  200  = 1hr 48min  Distance = 40 + 9 x 80  5  = 40 + 144  = 184km  Distance = 80 x 23  6  = 360 2 km  3 | M1  A1  B1  B1  M1  A1  M1  A1  M1  A1 |  |
|  |  | 10 |  |
| 23(a) | 1. Bearing of B from D = 212 + 11 2. Bearing of A from C = 269 + 10 3. Distance of A from C = 8.4cm + 0.1cm   = 168km + 2   1. B from D = 4.8cm + 0.1cm   = 96km + 2 | B1  B1  B1  B1  B1  B1 |  |
|  |  | 10 |  |
| 24(a)  (b)  (c)  (d) | S = 53 - 5(5)2 + 3(5) + 4  S = 19  V = ds = 3t2 – 10t + 3  dt  = 3(5)2 - 10(5) + 3  = 28m/s  Moment at rest V = 0  3t2 – 10t + 3 = 0  (3t – 1) (t – 3) = 0  t = ⅓ or 3sec  Acceleration when t = 2  a = dv /dt = 6t – 10  = 2m/s2 | M1  A1  M1  M1  A1  M1  M1  A1  M1  A1 |  |
|  |  | 10 |  |