**MARKING SCHEME MATHEMATICS PAPER 121/1**

**ARISE AND SHINE TRIAL 1 EXAM**

**AUGUST 2022**

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | -2 (3) – 3-5  = -14  15 – 8= 7  -14/7 = 2 | M1  M1  A1 |  |
| 2 | LCM 3 9 15 21  3 3 5 7  5 1 5 7  7 1 1 7  32 x 5 x 7 = 315  315 min  5 hrs 15 mins  11.00 p.m  5hrs 15mins  5.45 p.m  NB (deny 5:45 p.m) | M1  M1  A1 |  |
| 3 | 272/3 ÷ 24  (25) -3/5  (33)2/3 ÷ 24  (25)-3/5  = 32 ÷24  2 - 3  = 32 ÷ 2  = 4.5 | M1  M1  A1 |  |
| 4 | 4  6  2 B1  3x – 2 < 9 + x  2x < 11  x < 5.5  x: 2,3,4,5, B1 |  |  |
| 5 | 180 (n-1-2) = 4/5 1  180(n-2)  4n – 8 =5n – 15  n = 7  Interior angle  (6-2)180 M1  6  =120o A1 |  |  |
| 6 | Distance covered by bus in 45 mins  63 x 45/60 = 47.25km  Let car’s sped 60 xkm/h  R.speed = (x – 63)km/h  Time taken to catch up  1hr 45 mins  47.25 = 1 ¾ (x – 63)  x– 63 = 4/7 (47.25)  =27  x = 100km/h A1  Accept Aft. method |  |  |
| 7 | r = 2 h = 3(2)-1 = 5  = B1  = M1  =7 A1 | Square root |  |
| 8 | 2y = 4x + 5 y = 2x + 2.5  m2  Grad. Of h line = -1/2  B1  = = ½ M1  -x + 3 = 2y – 2  2y = -x + 5 A1 |  |  |
| 9 | B1 shape  B1 – hidden line dotted  AE/ED and EP  B1 – accurate  Led equal  Ac= 3cm,AB=4cm  Bf=5.5cm  (ii). AF = 9.0cm 0.1 |  |  |
| 10 | OB//CA  KOB = CA  k = -  =  -8k = 6  k = -6/8 = -3/4 M1  2 = a – 6 M1  -1.5 = a – 6 M1  4.5 = a A1 |  |  |
| 11 | (a).1 US pond = 77.24/=  100,000 x 77.24 M1  = ksh. 7,724,000 A1  (b). 1 US pond = 122.27/=  ? 7724,000  .  = 63,172 starling pond (nearest) A1 |  |  |
| 12 | . x M1  = 40o A1 |  |  |
| 13 | (2350 + 07h 15 min + 45 min) + 5 hr 40 min M1M1  = 1.330he-  1200  1.30 p.m Monday A1 |  |  |
| 14 | A.s.f = :  =  L.s.f =  = 5:2  V.s.f = (5/2)3 M1  = 125.8  v = = M1  x = 6250cm3 A1 |  |  |
| 15 | AC =  = 40m  Area ABC = ½ x 40 x 75 M1  =1500m2  S = 60 + 40 + 50 = 75m  2  Area ADC 75 M1  = 992.16m2 M1  = = 0.25ha A1 (2d.p)  2350+7h 15 min  M1M1 3105 – 2400  = 005+  45 min M1  0750 hr  0750hr +  0540  1330 hrs M1  -1200  1.30 p.m, Monday A1 |  |  |
| 16 | Rec of 0.01732  1.732-1 x 102  = 0.5774 x 102  = 57.74 B1  .  .  = 0.2 x 57.74 M1  = 11.548 A1 |  |  |
|  | **SECTION II** |  |  |
| 17 | (a). Area of front & back walls  = 6.3 x 3.2 x 2  = 40.32m2  Area of side walls = 4.5 x 3.2 x 2  = 28.8m2  Area of floor = 6.3 x 4.5  = 28.35m2  Total area = 40.32 + 28.8 + 28.35 M1  = 97.47m2  Area of door = 1.85 x 0.8 = 1.48m2  Are of windows = 1.5 x 0.7 x 4 = 4.2m2 +  Area of windows cemented = 5.68m2  Total area not cemented = 97.47 – 5.68  = 91.79  = 91.8m2  (b). Cost of cementing materials  = 91.8 x 500  = sh 45,900  c). Cost of labour = x 45,900  = sh. 9180  Total cost of cementing  = 45900 + 9180  = sh 55,080  (d). A = P (1 + r/100)n  = 55,080 (1 + 8/100)3  = 55,080 (1.08)3  = Ksh.69,384.93696  = Ksh 69,385 |  | M1Expression for total area  M1 exp. Area to be cemented for subtraction  A1 Area to 1d.p  M1 Exp for cost  A1  M1 for total cost  A1  M1 exp.for amount  A1 to nearest shilling |
| 18 | (a). BC2 = 62 + 82 – 2 x 6 x 8 cos 50o M1  BC2 = 100 – 96 cos 50o  BC2 = 100 – 61.71  =  = 6.19cm A1  (b). =  Sin B = 6 sin 50o M1  6.19  Sin B = 0.7425 M1  B = sin-1 0.7425  = 47.95o A1  (c). CAD.  2.822 = 72 + 62 – 2(6x7)cosA M1  7.9524 = 85 – 84 cos A  Cos A = 85 – 7.9524M1  84  = 0.9172  A = cos-1 0.9172  = 23.48oA1 to 2 d.p  (d). Angle ACD  A = ½ ab sin  = ½ x 6 x 7 sin 2348 M1  = 8.488cm2  = 8.49cm2 A1 to 2 d.p |  |  |
| 19 | .M1  14(k+12) – 9(2k+16) = 4M1 for equating det.to4  14k-18k+168-144= 4  -4k=4-24  -4k=-20  K=5  (b). det = (5x9 – 6x7)  45 – 42  = 3  M-1 = 1/3  =  c). (i). =B1  (ii). = 1/3M1  = 1/3 M1  .= 1/3  .= M1  Plate = Ksh 200  Mug = Ksh 240A1 |  | M1 for premulplicaion  M1 multiplication process  M1 simplification  A1For both values |
| 20 | (x+)(x-2) = 24 x 1  x2 – 2x + 3x – 6 = 24  x2 + x - =24  x2 + x – 30 = 0  P = -30 6,5  S = -1  x2 + 6x – 5x – 30 = 0  x(x+6) – 5(x+6) + 0  (x – 5) (x + 6) = 0  x = 5 or -6    (b).  (9+x)(x) = 36  9x + x2 = 36  x2 + 9x – 36 = 0  P = -36 (-3,12)  S = 9  x2 – 3x + 12x – 36 = 0  x(x-3)+12(x-3) =0  (x+12)(x-3) = 0  x = -12 or 3  =x = 3m  Lenth = 9+x  =12m  Width=3  P =2(12+3)  =30m  c).  36 – 2x2 = 28  2x2 = 8  x2 = 4  x = 2m |  | M1  M1  A1 both values  M1 for exp. Of Area  M1  M1  A1  M1 for exp of deference in area  A1 |
| 21 | (a)  (b) (i). GAB =  = -  (ii), Equ. AB  -½ =  2(y) – 3) = -x – 7  2y – 6 = -x – 7  2y = -x – 7 + 6  2y = -x – 1  y = - ½x – ½  c). (i) CD = - ½  GL = 2 B1  2 = M1  2x – 2 = y – 3  y – 2x = -2 + 3  y – 2x = 1 A1  (ii). y = 2x + 1  y intercept = 1 B1 |  | Accept – 0.5x – 0.5 = y |
| 22 | |  |  |  |  |  | | --- | --- | --- | --- | --- | | Mark % | f | Mid points | fx | cf | | 40-44 | 4 | 42 | 168 | 4 | | 45-49 | 7 | 47 | 329 | 11 | | 50-54 | 8 | 52 | 416 | 19 | | 55-59 | 6 | 57 | 342 | 25 | | 60-64 | 7 | 62 | 434 | 32 | | 65-69 | 3 | 67 | 201 | 35 | | 70-74 | 5 | 72 | 360 | 40 | | 75-79 | 0 | 77 | 0 |  | |  | = 40 |  | = 2250 |  | |  |  |  |  |  |   (b). Modal class – 50 – 54 B1  c).(i). x =fx  .  2250 M1  40  = 56.25 marks A1  d). Median mark  m = L + (N/2 – cf)i  f  = 54.5 + (40/2 – 19)5 (B1 for of an table )  6 M1  = 54.5 + 0.8333  = 55.3333  = 55 1/3 A1 Exact value  don’t accept 55.333/55.3 |  | B1-for frequency  B1-for mid point  B1- for cf  B1 – for fx |
| 23 |  |  |  |
| 24 | y = 2x3-9x2+px+1  (i). dy = 62 – 18x + p M1  dx 6(4)2 – 18(4) + P =36 M1  96 – 72 +P = 36  24 + P = 36  P = 36 – 24  P = 12 A1  (ii). dy = 6x2 – 18x + 12  dx  At x = 0.5  6(0.5)2 – 18(0.5)+12  = 4.5  x = 0.5  y =2(0.5)2 – 18(0.5)2 + 12(0.5)+1  = 5  y-5 = 4.5  x–0.5  y – 5 = 4.5x – 2.25  y = 4.5x + 2.75  y = 9/2x + 23/4  6x2 – 18k + 12 = 0  x2-3x+2=0  (x-2) (x-1)=0  x = 2 or 1  When x =1 y=2(1)-9(1)+12(1)+1  = 6  (1,6) and  x = 2  y = 2(2)3-9(2)2+12(2)+1 B1 for both  y = 5 (2,5) |  | M1 for differentiating  M1 for substitution  A1  B1  M1  A1 Accept 4 ½ x + 2 ¾ = y  M1  A1 |

