**MERU CENTRAL CLUSTER EXAMINATION**

**121/2**

**MATHEMATICS**

**PAPER 2**

**TERM 2, 2020**

**DECEMBER 2020**

**MARKING SCHEME**

|  |  |  |  |
| --- | --- | --- | --- |
| Q |  |  |  |
|  | Log  Log  Log 10,000  4 log 10  =4 | M1  M1  A1 |  |
|  | n=? =  a=3  d=6  =7500  7500=  7500=  7500=(6n)  7500=3n2  n2=2500  n=50 | M1  M1  A1 |  |
|  | =  det = -20 - 9  = 29......................................................................................................  Inverse =  =  = (  = (  =  X = 4, y=5 | M1  M1  A1 |  |
|  | 8.95 9.05  14.5 15.5  Max=  Min =  Actual =  A.E =  =56.57  %error =  =4.445% | M1  M1  A1 | For any 2 correct |
|  | =  Pny + 4p = mwy – 2w  4p+2w = mwy – pny  4p +2w = (mw – pn) y  ,y= | B1  M1  A1 |  |
|  | tan2x – 2 tan x -3=0  Let tan x be P  P2-2p -3=0  P(p-3) + 1(p-3)=0  (p-3)(p+1)=0  P=3 or p=-1  tan x =3  x=71.57o or x = 135o | M1  M1  M1  A1 |  |
|  | 1st tax band = 9680 x 10/100 = 968  2nd tax band = 9120 x 15/100 = 1368  3rd tax band = 9120 x 20/100 = 1824  4th tax band = 9120 x 25/100 = 2280  5th tax band = 5460 x 30/100 = 1638  Gross tax = 8078..............................................  Relief = 1056  Net tax = 7022  Monthly income tax = 7022 | M1  B1  A1 |  |
|  | = 6- | M1  M1  A1 |  |
|  | |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | X5 | 15 | 14 | 13 | 12 | 11 | 10 | | Y | 0 | (-n)1 | (-n)2 | (-x)3 | (-n)4 | (-n)5 | | coeff | 1 | 5 | 10 | 10 | 5 | 1 | |  | 1 | -5n | 10n2 | -10n3 | 5n4 | -n5 |   (1-n)5=1-5n+10n2-10n2+5n4-n5   1. (0.98)5 = (1-0.02)5 = (1-n)5   = 0.02=n  1-5(0.02) + 10(0.02)2 -10(0.02)3  1-0.01+0.004-0.00008 = 0.99392 | B1  B1  M1  A1 |  |
|  | P(fail) = = | M1  A1 |  |
|  | x2+y2-4x+6y+4=0  x2-4x+y2+6y=-4  (x2-4x + (-2)2+(y2+6y+(3)2=-4+(-2)2+(3)2  (x-y)2+(y+3)2=9  Centre =(2,-3)  Radius =3 | A1  B1  A1 |  |
|  | A(50oS, 25oE)  B(50oS, 140oE) = 140-25  long  o  km =  x x 6370  = 12,790.56km | B1  M1  A1 |  |
|  | A (-1,1,0)  AM = -=  =  =  = 3.775 x 2  = 7.550  =7.6 | M1  M1  A1 | For subtraction |
|  |  |  |  |
|  | y(y+9) = 4x9  y2+9y-36=0  y2 + 12y-3y-36=0  y(y+12)-3(y+12)=0  (y-3) (y-12) = 0...................................................  Y=3 or y=-12(ignore)  = BC = 3cm | M1  M1  A1 |  |
|  | Log (3x+8) – lof 8 = 10g (x – 4)  Log () = log (x-4)drop logs  x – 4  3x – 8x = -32 -8  -5x = -40  X=8 | M2  A1 |  |
|  | |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | X | 0 | 0.5 | 1 | 1.5 | 2 | 2.5 | 3 | | Y | 1 | 3 | 6 | 10 | 15 | 21 | 28 |   A= ½ hyo + yn) + 2(y1 +y2+y3+y4+y5)]  = ½ (0.5) [(1+28) + 2(3+6+10+25+21)]  = ¼ x 139  = 34.75   1. 2x2 + 3x+)dx   =[ + + x]  =(2( + (3)2 + (3) – ( + (0)2 + (0) ]  = X 27 + X 9+ 3  + +  =  = 34.5   1. Error = actual estimate   34.5 – 34.75  =-0.25  %error = x 100  = 0.725 decrease | B2  M1  M1  A1  M1  M1  A1  M1  A1 |  |

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | B1  B1  B1  B1  B1  B2  B1  B1  B1  B1  B1 |  |
|  | 1. T.T =   = 1200 p.m   1. 1st 236 x = 23.6   2nd 236 x = 35.4  3rd 236 x = 47.2  4th 236 x = 59 | M1  A1  M1  M1 |  |
|  | b)Constructing bisector of line AC  locating locus P  c)Bisecting angle ABC (locus Q)  constructing a line 2cm away from AC locating locus R  d)Bisecting BAC  drawing an arc (dotted) 5cm away from A.  Shading unwanted side | B1  B1  B1  B1  B1  B1  B1  B1  B1  B1 |  |

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | M1  A1  M1  A1  B1  B1  B1  M1  M1  A1 | Expression  Expression  Time for P  Time for q  Expression  Multiplying |
|  |  | M1  A1  M1  M1  A1  M1  A1  M1  M1  A1 |  |

|  |  |  |  |
| --- | --- | --- | --- |
|  | B1  B1  B1  A1  B1  A2  M1  M1  A1    *For both ans correct* | A2  M1  A1  M1  M1  A1 |  |
|  |  |  |  |

