****

**FORM FOUR EXAM**

**CEKENA JOINT EVALUATION TEST-2021**

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

121/2

**MATHEMATICS**

PAPER2

**MARKING SCHEME**

|  |  |  |  |
| --- | --- | --- | --- |
| 1. | Max vol = ×7.05×16=833.1086Min vol = × 6.952 × 16= 809.6419Actual vol =­×7.102 × 16 = 821.333AE= % =  | M1M1A1 | Accept=1.429% |
|  |  | 03 |  |
| 2. | Log3(2x+1)=2Log33 +Log3 (3x-11)üLog3 (2x+1) = Log39 + log3 (3x-11)Log3(2x+1) = Log3 9(3x-11)2x+1=27x-9925x=100x=4 | M1M1A1 | introducing Lo33 |
|  |  | 03 |  |
| 3. | Let the ratio of Brans A : brand B = X:Y | M1M1A1 | Formatting of the eq. with the selling price as 125% of the buying priceAttempt to solve the eq. by correcting the like terms together  |
|  |  | 03 |  |
| 4. |  | M1M1A1 | Denominator eliminated Attempt to collect terms with a |
|  |  | 03 |  |
| 5. | Sin (x+20) = -0.7660(x+20)=500x+20 = 230,710,410x=210,290,390x=2100,2900 |  M1M1A1 |  |
|  |  | 3 |  |
| 6. | 1(x)6 (-y)0 (x)5 (-y)+15(x)4 (-y)2 +20(x)3 (-y)3 +15(x)2 (-y)+6(x)1 (-y)5 +1(x)0 (-y)6= x6 -6x5y+15x4y2 -20x3y3 +15x2y4 -6xy5 +y6(1.98)6 = (x-y)6 = (2-0.02)6=26 -6(2)5(0.02)+15(2)4 (0.02)2 -20(2)3 (0.02)364-3.84+0.096-0.00128=60.25472=60.25 | B1M1A1 |  |
|  |  | 03 |  |
| 7. |  | M1M1A1 |  |
|  |  | 3 |  |
| 8. |  | M1M1A1 |  |
|  |  | 03 |  |
| 9. | 600001.015n >n log 1.015 > log n > Least number of years is 11 years  | M1M1A1 |  |
|  |  | 03 |  |
| 10.(i) | Centre = Radius = (x-2)2 +(y-1)2 =32x2 + 4x+4+y2 -2y+1=9x2 +y2 -4x-2y-4=0 | B1B1B1B1 |  |
|  |  | 04 |  |
| 11.  |  | M1M1M1A1 |  |
|  |  | 04 |  |
| 12. |  | B1B1B1 | Construction of perpendicular bisector. Construction marksLocating the locus of A by drawing circulating circle.  |
|  |  | 03 |  |
| 13. | Average rate of decrease in temperature = 2.625 | M1A1 |  |
|  |  | 02 |  |
| 14. | In 1 hr Tap A =  of the tank Tap B =  of the tank Tap P =  of the tankIn 1 hour tap A and P fillFor 5 hours = ×5 = of the tankThe empty fraction =1-Taps A,B and P in 1 hour fills | M1A1M1A1 |  |
|  |  | 4 |  |
| 15. | Determinant = (k-1)k +2k=k2 +kDeterminant = K(k-1) = 4.5k2 -4.5k=544.5k2 -4.5k -54=045k2 -45k -540=0K2 –K -12=0K2 -4k+3k-12=0K(k-4)+3(k-4)=0(k-4)(k+3)=0K= 4 or k=-3 | M1M1A1 |  |
|  |  | 3 |  |
| 16. | 170000+ (K-1) 15000K=11 | B1M1A1 |  |
|  |  | 03 |  |
| 17.(a)(i) | θ1 = 0.84θ, K1 = 1.44RP1 = G=a+bSA+2b=8a+4b=12-2b = -4 b= 2a= 4G = 4+2 (6) = 16 | B1M1A1B1M1A1B1M1A1B1 |  |
|  |  | 10 |  |
| 18. (a) |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| X0 | 0 | 30 | 60 | 90 | 120 | 150 | 180 | 210 | 240 | 270 |
| y=3cos2x+2 | 5.0 | 3.5 | 0.5 | -1 | 0.5 | 3.5 | 5 | 3.5 | 0.5 | -1 |
| y=sin2x | 0 | 0.87 | 0.87 | 0 | -0.87 | -0.87 | 0 | 0.87 | 0.87 | 0 |

55, 1060, 2350 =  B2Amplitude 3 unitsPeriod 1800 |
|  |  | 10 |  |
| 19. (a)(b)(c)(d)(e)  | 60× θ =600θ = 10C (700N, 170 E)60× 12 cos 60=360 nm = 3.2 hrs or 3hrs 12 minTime difference = 12× 4 = 48min9.20am + 48min + 3hrs 12 min= 1.20Pm or 1320 h | M1A1M1A1M1A1M1A1M1A1 |  |
|  |  | 10 |  |
| 20. |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| mass | f | cf | d | d=x-4.45 | d | fd | fd2 |
| 1.0-1.92.0-2.93.0-3.94.0-4.95.0-5.96.0-6.97.0-7.98.0-8.99.0-9.9 | 2457106321 | 2611182834373940 | 1.452.453.454.455.456.457.458.459.45 | -3--2012345 | -6-8-501012985 | 94101491625 | 1816501024273525 |

B1 for C.fB1 for FdB1 for Fd2Fd2 =157B1 for Q1B1 for Q3M1 A1M1A1 |
|  |  | 10 |  |
| 21.(a) (b) | Area of ABCD = 2 units × 3units  = 6 square units Area of A1B1C1D1 = 4 units × 6 units  =24 square units  | B1B1B1B1M1M1M1A1 |  |
|  |  | 10 |  |
| 22.  |  k=27 | M1A1B1M1M1A1M1M1A1 |  |
|  |  | 10 |  |
| 23. (a)(b)(i)(ii)(iii)(iv) | Volume of the pyramid⅓Base area ×height=(⅓ × (10× 10) 3.744)cm3=124.8cm3 |  |  |
|  |  | 10 |  |
| 24. |  |
|  |  | 10 |  |