**JOINT EXAM TEAM**

**MATHEMATICS PAPER 2**

**APRIL 2020**

**MARKING SCHEME**

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | No Log  58.32 1.7658 = 1.7658  0.98232 1.9922 x2 = 1.9844  1. 7.502  6.935 2. 8410  2. 9092  3  1.6364  4 – 329 x 10 -1  0.4329 | M1  M1  A1 | √ logs  √ operation , x2 , +&  div. by 3 |
| 2. |  | M1  M1  A1 | Accept any other correct method |
| 3 | X3 = 3ht – 3h2  t  tx3 = 3ht – 3h2  3ht – tx3 = 3h2  t (3h – x3) = 3h2  t = 3h2  3h – x3 | M1  M1  A1 |  |
| 4. | (a) ( 1- 2x)6 = 1 (1)6 ( -2x)0 + 6(1)5 (- 2x)1 + 15(1)4 (-2x)2 + 20(1)3 (-2x)3  = 1 – 12x + 60x2 – 160x3  (b) (1 – 2x)6 = ( 1.02)6  x = -0.01  (1.02)6 = 1 – 12(-0.01) +60 ( - 0 .01)2 – 160( - 0.01)3  = 1 + 0.12 + 0.006 + 0.00016  = 1.1262 | M1  M1  A1 |  |
| 5 | ANS:  1/P + 1/T = 1/6  1/15 + 1/T = 1/6 = 1/1 = 1/10  1/6 x 4 = 2/3  1/3 x 10/1 = 31/3 days | M1  M1  M1  A1 |  |
| 6 | P = -5/2 2 + 7/2 - 4 -19  -3 7 = 14.5  4 -2 -17  P = (-19, 14.5, -17) |  |  |
| 7 | 2N = N(1 + 4/1W)n  1.04n = 2  n = wg2/wg 1.04 = 17.67 = 18years |  |  |
| 8 |  |  |  |
| 9 | y = mx + kz  2 = 3m + 4k x 2 4 = 6m +8k  1 = 2m + 3k x 3 3 = 6m + 9k  -1 = + k  k = 1 m = -1  y = -5 + 2 = -3 |  |  |
| 10 | 1(4n – 1) = 25,000  4 – 1  4n = wg75, 001 = 8.097  Wg4  n = 9 |  |  |
| 11 | Cost price = 100/130 x 171.60 = 132  1:n 120 + 150n = 132  1+n  120 – 132 = 132n –150n  2/3 = 12/18 = n  3:2 |  |  |
| 12 |  |  |  |
| 13 |  |  |  |
| 14 | MaxA = 4Л(7.5)2 4 MaxA = 4Л (6.5)2    Absolute error =  % Error = x 100%  = 14.29% | M1  M1  M1  A1 |  |
| 15 | 360 ÷ ½ = 360 x 2 = 720  Amplitude = 6, period = 7200 |  |  |
| 16 | Det = 0-3 = -3 ignore – sign  Area of Δ ABC x Det = Area of A′B′C′  Area of Δ ABC X 3 = 36cm2  Area of Δ ABC = 36cm2 = 12cm2  3 | M1  M1  A1  **03** |  |
| 17 | ANS:   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **x** | **F** | **d** | **fd** | **fd2** | **cf** | | 14.5 | 2 | -30 | -60 | 1800 | 2 | | 24.5 | 6 | -20 | -120 | 2400 | 8 | | 34.5 | 7 | -10 | -70 | 700 | 15 | | 44.5 | 13 | 0 | 0 | 0 | 28 | | 54.5 | 6 | 10 | 60 | 600 | 34 | | 64.5 | 4 | 20 | 80 | 1600 | 38 | | 74.5 | 2 | 30 | 60 | 1800 | 40 | |  |  |  | -50 | 8900 |  |   i) X = 44.5 + -50/40  = 43.25  ii) s.d. = 8900/40 – (50/40)2  =  = 14.86  iii) 49.5 + 30 – 28 x 10 = 52.83  6  B1 – cf, B1 – fd or fx B1 – fd2 or fx2 |  |  |
| 18 | ANS:  =  A1 (3,1) B1 (7,1) C1(10,4)    i) shear with x axis invanant  c(2,4) – c1(10,4)  b) A11 (-1.5,-0.5) B2 (-3.5,0.5) C2(-5,-2)  =  Inverse = ¼ ½ -1 = -1/8 1/4  0 - ½ 0 -1/8 |  |  |
| 19 | ANS:  i) 2/5 x 3/5 x 3/5 x 3 = 54/125  ii) 1 – 3/5 x 3/5 x 3/5 = 98/125  b) i) K + 2K + 3K + 4K + 5K+ 6K = 1  21K = 1  K = 1/21  P(4) = 4K = 4/21  ii) P2 + P3 + P5 = 2/21 +3/21 +5/21 = 10/21 |  |  |
| 20 | ANS:    AC = 52 + 52 = 7.071  Cos 3.536 =  = 44.990  = Cos = 2.5/4.33  = 54.73  Sin = 3.536 = 54.75  4.33  54.75 x 2 = 109.50 |  |  |
| 21 | ANS:  log y = wgk + xwga   |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | x | 0 | 2 | 4 | 5 | 9 | 7 | 12 | | Wgy | 2.41 | 2.46 | 2.50 | 2.53 | 2.64 | 2.59 | 2.72 |   K =  A =  PTS: 1 |  |  |
| 22 |  |  |  |
| 23 |  |  |  |
| 24 |  |  |  |
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