**MID- TERM EXAM-2021**

**FORM 4 Marking scheme**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1. |

|  |  |  |
| --- | --- | --- |
| NO. | STD FORM | LOG |
| (0.07284)2(0.06195) 1/30.01341 | (7.284 X 10-2) 2(6.195 X 10‑2)1/31.341 X 10-2 | 2 |

 | M1🗸 all logsM1🗸 multiplication by 28 1/3M1🗸 add & SubA1 |
| 2.  | y = Cx2 + KX  30 = 9C + 3k18 = 3c + 3k30 = 9c + 3k- 12 = -6cC = 2 6 = C + K 6 = 2 + K K = 4 y = 2 x2 + 4xwhen x = -3y = 2 ( -3)2 + 4 x -3 = 18 – 12= 6 | M1🗸 equationsA1🗸 bothB1 |  |
|  |  | 3 |  |
| 3. | OT = ½ AO + ½ OB= 3 **i** + **j** + 2**k** | M1A1B1 |  |
|  |  | 3 |  |
| 4. | a) Co – ordinate of A () A ( A ( 1,2)b) r =  =  =5 units ( x – 1)2 + ( y – 2) 2 = 52 x2 – 2x+ 1 + y2- 4y + 4 = 25 x2 + y2 – 2x - 4y + 5 = 25 x2  y2 – 2x – 4y – 20 = 0  | B1Or equivalentB1B1 |  |
|  |  | 3 |  |
| 5. | Angle on straight line |  B2B1 |  |
|  |  | 3 |  |
| 6. |  4 Sin ( x + 300) = 2Sin ( x + 30) = x + 30 = 30x1 = 30 -30 = 0x+ 30 = 150½ = 150 – 30= 1200 | B1B1B1 |  |
|  |  | 3 |  |
| 7. | Fraction of water emptied per hour.For A=  B= C= All working for 1 hour =  All working for 30 minutesRemaining fractionB & C working for one hour =1h ?= | B1M1A1 |  |
| 7. | 3x2-4xy+y2=3x2-3xy-xy+y2 =3x(x-y)-y(x-y) =(3x-y)(x-y)9x2-y2=(3x-y)(3x+y)= | M1M1A1 |  |
|  |  | 3 |  |
| 8. | Distance =72+78 =150MRelative speed =72+108 =180km/ht==8.333×10-4=2.9993 seconds | B1B1M1A1 |  |
|  |  | 4 |  |
| **9.** |  | **M1****M1****A1** | **✓ Substitution****✓ operation****✓ answer** |
|  |  | **3** |  |
| **10.** | a)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| X | 0 | 0.4 | 0.8 | 1.2 | 1.6 | 2.0 |
| Y | 2.00 | 1.96 | 1.83 | 1.60 | 1.2 | 0.00 |

b) | **B1****M1****A1** | **✓ table values****✓ answers** |
|  |  | **3** |  |
| **11.** |  | **M1****M1****A1** | ✓ operation✓ simplification✓ answer |
|  |  | **3** |  |

|  |  |  |  |
| --- | --- | --- | --- |
| 12. | Width = (3x + 1) - 3= 3x – 2(3x + 1) (3x – 2) → 9x2 – 3x – 2 = 28→ 9x2 – 3x – 30 = 0→ 3x2 – x – 10 = 0x = $\frac{1 \pm \sqrt{121}}{6}$x = $\frac{12}{6} or \frac{-10}{6}$= 2Length = 3x + 1= 3(2) + 1= 7 | M1M1A1 |  |
|  |  | 03 |  |

|  |  |  |  |
| --- | --- | --- | --- |
| 13 | y ≥ 0x + y < 2 or y < -x + 2 y ≤ 2x + 2 | B1B1B1 |  |
|  |  | 03 |  |

|  |  |  |  |
| --- | --- | --- | --- |
| 14 | y ≥ 0x + y < 2 or y < -x + 2 y ≤ 2x + 2 | B1B1B1 |  |
|  |  | 03 |  |

|  |  |  |  |
| --- | --- | --- | --- |
| 15 | Grad AB=grad of AB=coordinates of mid points= =(5,0) | M1B1A1 |  |
|  |  | 3 |  |
| 16. | R2 = PR2 = 3TP – 3T2PR2 – 3TP = -3T2P(R2 – 3T) = -3T2 P =  | M1A1 |  |
|  |  | 4 |  |
| 17. | a) i) x + y  ii) y  x iii) x  200b) on the graph p = 900x + 700y x = 250, y = 250 maximum profit = 250 x 900 + 250(700) = 400,000 | B1B1B1L1L1B1B1M1A1 | For y = x and ✓shadingFor x = 200 and shadingFor x + y = 50 and ✓ shading |
|  |  | 10 |  |

|  |  |  |  |
| --- | --- | --- | --- |
| 18. |  | B1B1B1B1B1B1B1B1B1B110 | Sides of Triangle seenBisecting QRLocating XBisecting < PROLocating MFor PY = 6 cmShading QTTR ” PT  6 cm ” < PRT <QRT |

|  |  |  |  |
| --- | --- | --- | --- |
| 23 | 1. i) ∠ORS = 40o

ii) ∠USP = 80iii) ∠PQR = 130o1. i) 4.57 (to 3 s.f)

ii) R = 2.98(3 s.f) | B1B1B1B1B1B1B1B1B1B1 |  |
|  |  | 10 |  |

|  |  |  |  |
| --- | --- | --- | --- |
| 20.a)b) | ii)  |  |  |
|  |  |  |  |
| 21. |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  | p |  |  |
| 22. |  A: Taxable income = 25,000 + 10,480 M1 = 35,480/= B: First 4350 x 2/20 = 435 Next 4350 x 3/20 = 682.50 B1Next 4555 x 4/20 = 911Next 4550 x 5/20 = 1137.50 B1Remaining 17475 x 6/20 = 5242.50 B1 8408.50 M1 Less relief 800Net tax 7608.50 A1C) 140 x 35480 = 49672 M1(31667 x 6) + 435 + 682.50 + 911 + 1137.50 = 12666.10Less relief 800 11,866.10 M1% increase = 11866.10 – 7608.50 x 100 = 55.96% A1 7608.50 |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| 24.  | a) 32+529+25=$\sqrt{36}$=6cm | M1A1 |  |
| b)tanβ=$^{5}/\_{3}$ β=59.040 | M1A1 |  |
|  | c) 121=64+25-(2X5X8)cosαα=113.580 | M1A1 |  |
| d) $^{1}/\_{2}$bh+ $^{1}/\_{2}$abSinβ=0.5x5x3+ 0.5x5x8Sin113.58=7.5+18.33 =25.83cm2 | M1M1A1 |  |