MARKING SCHEME

**121/2**

**MATHEMATICS**

**PAPER 2**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **CALCULATIONS** | **MARKS** | **REMARKS** |
|  | 12 + 6  8-6  = 18/2  = 9 | M1M1  A1 | M1 for the max possible value of the numerator m1 for the min.possible value for the denominations. |
|  | 4 - 3 - 3  5 2 3- 2  4( 5 – 2) – 3 (5 – 2)  5 +2 (5 – 2)  4(5 – 4(2 – 3(5 – 3(2)  5-2  5 – 7(2  3 | M1  M1  A1 |  |
|  | nt = L - A  2M 3K  n2T2= L –A  4m2 3K  4M2(L-A) =3K (n2T2)  4LM2 – 4AM2 = 3KN2T2  4= 4LM2 – 3KN2T2  4M2 | M1  M1  A1 | Multiplication by reciprocal n/2m both sides |
|  | a+24d=51  -a + 4d = 11  20d=40  d=2  d=11-8  d=3 | M1  M1  A1 | Both equation .  Attempt to solve for d.  Both values correct. |
|  | Let cos 3x +600 =@  Cos @ = 3/2  @ = 300,3300,3900  X= -10,900,1100  Hence x = 900 ,1100 | B1  B1  B1 | For 3 values of c.  For 3 values os x.  Correct values of x. |
|  | (x+1) (x-2)=22  X2 – x -2=22  X2 – x -24=0  X2 – x=24  x-x+(-1/2)2 = 24 +(-1/2)2  (x-1/2)2 = 24 +1/4  x-1/2 = +- 24.25  x=+-0.5 +- 4.924  x = 5.424 | M1  M1  A1 | Correct equation equated to 0.  Positive value of x. |
|  | 3(2i-3j+k) +2(3i-4j-3k)  6i-9j+3k+6i-8j-6k  12i-17j-3k  ii) (12)2+(-17)2 +(-3)2  442  21.02 |  | M1  A1Accept the column vector.  M1 for r of 442 seen.  A1 |
| 8. | a) AO  b)  F:\photos\EXAM TEMPLT\178.pngOB = 2.828  Cos @ = 2.828  12  @ = cos -1(2.828)  12  @ = 76.370 | B1  M1  A1  03 | Accept OA. |
| 9. | Log (x+5) = log(4  X+2  X+5 = 4  1 x+2  4=x2+5x+2x+10  4=x2 +7x+6=0  X(x+1) +6(x+1)=0  (x+6)(x+1)=0 | M1  M1  A1 | Equation equated to Xero. |
| 10. | 9680 x 10/100=968  (x-9680) x15/100 = 948  0.15x=2400  X=1600 | M1  M1  A1 |  |
| 11. | X+y ≤60  1500x+10,000y = 120000  3x+2y ≤24  x>y  y<,0 | B1  B1  B1  B1 |  |
| 12. | (x3-3x2-4x+12)dx  X4 – x3 – 2x2 + 12) -2  (-2)4 – (-2)3 – 2(-2)2+12(-2) –  -20 - -6.75  -13.25 | M1  M1  A1 | CAO |
| 13. | Locus l1 (correct bisector of line p4)  Locus l2 (angle bisector of  PQ= (measure scale of pq) | B1  B1  B1 |  |
| 14. | X2-8x+16+y2+6y+a=24+16+9  (x-4)2 + (y+3)2=49  Center (4,-3)radius 7 | M1  M1  A1 |  |
| 15. | 25-5(2)4(1/4x)+10(2)3(1/4x)2-10(2)2(1/4x)3  = 32 – 20x +5x2-5x3  -1/4x = -0.25 x = 1  32 – 20 + 5 – 5/8  = 16 3/8 | B1  M1  A1 |  |
| 16. | Let x kg of grade A be mixed of kg of grade b.  75x +50y=70(x+y)  75x+50y=70x+70y.  5x=20y  x/y = 5/20 = ¼  x:y=1:4 | M1  M1  A1 | ACCEPT THE ALTERNATIVE |
| 17. | C=k+td  7000=k+2000t  11000=k+4000t  400=200t  t=20  7000=k+200x20  K=3000  C=3000+20d  C=3000 +20 x500  =3000 +10,000  =13,000  K1=120 x 3000 = 3600  100  T1=110/100 x 20 =22  C= 3600 +22 x 500  = 3600 +11,000  14,600  Increase = 14,600 – 13,000 = 1600  1600 x 1000 = 12.31%  13000 | B1  M1  A1  B1  M1  A1  M1  A1  B1  A1 | Correct equations.  Both values of t and k correct.  For 1600  For 12.31% |
|  |  | 10 |  |
| 18. | F:\my documents\OPENER\MATHS PP2 Q17B.jpg | | |
|  | F:\my documents\OPENER\mathspp2 q 18.jpg | | |
| 19. | i) 180-80=100  100 x 60  =6,000  6000/450  =131/3hrs  b) 13 + 25 = 3800  38/360 x 2 x 3.142 x 6370 cos 400.  3,236.76km.  c)  CD = 60 x 30  1800 mm.  Time taken = 1800/450  = 4hrs .  Arrival time 3:10  4:00  7.10 p.m | M1  A1  M1  A1  B1  M1  A1  A1  B1  B1  B1 | For 380.  For 1800nm.  4hrs.  For 7:10p.m |
| 20. | H.P = (24 X 1250) + 7200  = 3000 +7200  37200.  b) cash price  = 100 X 37200  124  = 30,000  c) A= 30 000(1 +18/100)2  = 30,000(1.18)2  = 41772.  Total interest = 41772 – 30,000  =11772.  d) A= 800,000(1- 20/100)5  = 262, 144. | M1 m1  A1  M1  M1  M1  A1  M1  A1 |  |
|  |  | 10 |  |
| 21. | Class Tally f. c.f    21 = 30 7 7  31 – 40 7 14  41 – 50 10 24  51 – 60 7 31  61 – 70 7 38  71 – 80 6 44  81 – 90 4 48   1. – 100 2 50   F:\my documents\OPENER\maths pp2 q 21.jpg   1. i) 69.5± 1   ii) 39.±1  iii) 69.5 – 39  2  15.25 | B1  B1  B1  B1  B1  M1  A1 | Correct classes  Correct frequency.  Cumulative frequency. |
|  |  | 10 |  |
| 22. | F:\my documents\OPENER\MATHS PP2 Q 22A.jpg   1. i) p(R) = 8/15   ii) p( B or G) = p(b) or p(g)  = 5/15 x 4/15  2/21  (8/15 x 2/14) + (5/15 x 2/14) + (2/15 x 8/14) +(2/15 x 5/14)  +2/15 x 4/15)  = 2/21.  (8/15 x 2/14) + (2/15 x 8/14) + 2/15 x 5/14) + 2/15 x 1/14)  = 16/ 210 + 10/210 +16/210 +10/210+2/210  = 54/210  9/25 | B1  B1  B1  M1  A1  M1  M1  A1  M1  M1  A1 | correct branches .  for correct probabilities seen. |
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| 23. | < AOB=460  Angle subtended at the circumference by the same arc/chord.  <DBO= 170  Angles subtended at the circumference by the same arc/chord are equal sum angles of a triangle add to 1800.  < BDA= 630.  Angles subtended at the circumference by the same arc/ chord are equal.  Reflex < BOC = 3.060  Angle at a point add up to 3600. | B1  B1  B1  B1  B1  B1  B1  B1  B1 | Accept the alternative .  Accept the alternative. |
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| 24 | F:\my documents\OPENER\MATHS PP2 Q 24.jpg | | |