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| **Text  Description automatically generated** | | | | |
| **HY/MAAK/1222/C 22-SEP-2022** | | | | |
| **HALF YEARLY EXAMINATION (2022-23)** | | | | |
| **Subject: Mathematics (Answer Key)**  **Grade: XII** | | | | **Max. Marks:80**  **Time:3hrs** |
|  | | | **SECTION A (10x1=10)** | |
|  | | | **Multiple Choice Questions:** | |
|  | | |  | |
| 2. | | |  | |
| 3. | | |  | |
| 4. | | |  | |
| **5.** | | |  | |
| 6. | |  | | |
| 7. | | 0.28 | | |
| 8. | | -2 cm / min | | |
| 9. | |  | | |
| 10. | |  | | |
| **SECTION B (10 x 2 = 20)** | | | | |
| 11. | | ,  a11A31+ a12A32+a13A33= 2 ( -12) + ( -3) (22)+ 5 ( 18)= 0 | | |
| 12. | | K = 6 | | |
| 13. | | =0 | | |
| 14. | | R is reflexive, not symmetric , transitive | | |
| 15. | | F( ½) = ½ f( 3/2) = ½, x1 .so f is not one-one  F is not onto | | |
| 16. | | cos ( = 0 | | |
| 17 | | = | | |
| 18 | | 20 | | |
| 19 | | 3/7 | | |
| 20 | | P (B/A) =1/3 | | |
| **Section C ( 10x 3 =30 )** | | | | |
| 21 | |  | | |
| 22 | | A = + | | |
| 23 | | A -1= = | | |
| 24 | | Let X = tan t  = =  Put x = tan  Z = = = =  Y = z , differentiating with respect z we get | | |
| 25 | |  | | |
| 26 | |  | | |
| 27 | | Substitute x=tan(t) | | |
| 28 | |  | | |
| 29 | |  | | |
| 30 | |  | | |
| **SECTION D ( 4x 5 = 20 )** | | | | |
| 31 | Let x and y toys of type A and B respectively be manufactured in a day. The given problem can be formulated as follows: Maximise z=7.5x+5y......(1) subject to the constraints 2x+y≤60........(2) x≤20........(3) 2x+3y≤120.........(4) x,y≥0..........(5) The feasible region determined by the constraints is as shown The corner points of the feasible region are A(20,0),B(20,20),C(15,30) and D(0,40) The value of z at these corner points are as follows.   |  |  |  | | --- | --- | --- | | Corner point | **Z=7.5x+5y** |  | | A(20,0) | 150 |  | | B(20,20) | 150 |  | | C(15,30) | 262.5 | → Maximum | | O(0,40) | 200 |  |   The maximum value of z is 262.5 at (15,30) Thus, the manufacturer should manufacture 15 toys of type A and 30 toys of type B to maximize the profit. | | | |
| 32 | F’(x) = | | | |
| 33 |  | | | |
| 34 | 1. 100 2. 300 3. 200 | | | |

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