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| **PERIODIC TEST I (2023-24)MATHEMATICS** | | | | | | |
| **Subject: Mathematics**  **Grade: XII** | | | | **Max. Marks:35**  **Time:I Hr 20 min** | | |
| ***General Instructions:***   * ***Questions in Section A carries 1 marks each*** * ***Questions in Section B carries 2 marks each*** * ***Questions in Section C carries 3 marks each*** * ***Questions in Section D carries 4 marks each*** * ***Questions in Section E carries 5 marks each*** | | | | | | |
| **Multiple Choice Questions(1 mark each )** | | | | | | |
|  | A relation R in set A = {1,2,3,4}is defined as R = {(1,1), ( 1,2) ,(2,2),(3,3)}Which of the following ordered pair in R shall be removed to make it an equivalence relation in A | | | | | |
|  | **a.** | | (1,1) | | **b.** | (1,2) |
|  | **c.** | | (2,2) | | **d.** | (3,3) |
| **2.** | Value of k for which A = is a singular matrix | | | | | |
|  | **a.** | | 4 | | **b.** | -4 |
|  | **c.** | |  | | **d.** | 0 |
| **3.** | The value of | | | | | |
|  | **a.** | |  | | **b.** |  |
|  | **c.** | | **-** | | **d.** |  |
| **4.** | Assertion and Reasoning :  Assertion (A):  Reason (R): | | | | | |
|  | **a.** | | Both A and R are true and R is the correct explanation of A | | **b.** | Both A and R are true but R is not the correct reason |
|  | **c.** | | A is true but R is false | | **d.** | A is false and R is true |
| **Section B(2marks)** | | | | | | |
| 5 | | Prove that | | | | |
| 6 | | Show that the function given by f(x) = 2x is one- one but not onto . | | | | |
| 7 | | Write the following function in the simplest form : | | | | |
| **Section C ( 3 marks )** | | | | | | |
| 8 | | Express the following matrix as the sum of symmetric and skew symmetric matrix | | | | |
| 9 | | Show that the relation R defined by ( a,b) R ( c,d) iff a + d= b + c on the set NxN is an equivalence relation | | | | |
| 10 | | Determine whether the relation R defined on the set R of all real numbers as  R = { (a,b) :a,b } | | | | |
| 11 | | If A = and I is the identity matrix of order 2,  show that I + A = ( I-A) | | | | |
| **Section D ( 4 Marks )** | | | | | | |
| 12 | | Three car dealers say A,Band C deals in three types of cars , namely Hatchback cars, Sedan cars ,SUV cars.The sales figure of 2019and 2020 showed that dealer A sold 120 Hatchback ,50 Sedan, 10 SUV cars in 2019 and 300 Hatchback, 150 Sedan , 20 SUV cars cars in 2020;  Dealer B sold 100 hatch back,30 Sedan ,5 SUV cars in 2019 and 200 hatchback,50 Sedan,6 SUV cars in 2020;  Dealer C sold 90 Hatchback,40 sedan ,2 SUV cars in 2019 and 100 Hatchback,60 seadn, 5 SUV cars in 2020    Based on the above information answer the following questions :  (1)The increase in sales from 2019 to 2020 by each dealer is given by the matrix  (2 marks )    (ii)If each dealer receive profit of Rs 50,000 on sale of Hatchback,Rs 1,00,000 on sales of Sedan and Rs 2,00,000 on sale of SUV, then amount of profit received in the year 2020 by each dealer is given by the matrix (2 Marks ) | | | | |
| 13 | | Consider the function f: given by f(x)= .Show that f is bijective. | | | | |
| **SectionE( 5 marks )** | | | | | | |
| 14 | Find the product AB of the matrices where A =  Hence solve the equations by matrix method :  x + y + 2z = 1  3x + 2y + z = 7  2x+ y + 3z = 2 | | | | | |