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**SINDHI HIGH SCHOOL, BENGALURU**

**UNIT TEST I [2024-25]**

**SUBJECT: APPLIED MATHEMATICS -241**

**Class:XII Max Marks: 25**

**Date: 17 .06.2024 Reading Time:8.25-8.35a.m**

**No of Sides: 2 Writing Time:8.35-9.35a.m**

**General Instructions**:

The question paper consists of 5 sections.

Section A has 4 mcq based questions and 2 assertion-reasoning questions of 1 mark each.

Section B has 2 questions of 2 marks each.

Section C has 2 questions of 3 marks each.

Section D has 1 question of 5marks.

Section E has 1 case study question with two subparts of 2 marks each.

**SECTION A (1x6=6m)**

1.If A is a matrix of order 3x3 ,= 5 then the value of is

a. 25 b.125 c.5 d.15

2. If a matrix A = is a singular matrix then the value of x is

a. 39/27 b.-17/3 c.39/9 d.none of these

3. If x= a and y =2at then =

a. b. c. . d.

4. If A and B are symmetric matrices of same order then AB-BA is a

a. Symmetric matrices b. Skew symmetric matrices c. Zero matrix d. Identity matrix

**ASSERTION-REASON BASED QUESTIONS**

In the following questions, a statement of assertion (A) is followed by a statement of Reason (R). Choose the correct answer out of the following choices.

(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 explanation of A.

(c) A is true but R is false.

(d) A is false but R is true.

5.**ASSERTION (A**):For 2 values of k, area of triangle joining points (0,k) (2,9) (1,3) is 4 square units.

**REASON( R)**: Area is absolute value of the determinant.

6. **ASSERTION(A)** : B= is a skew symmetric matrix then a+b+c =1

**REASON ( R)**: For a skew symmetric matrix , B = -

**SECTION B (2x2=4m)**

7. For A = prove that

8.By using Cramer’s Rule ,check for the consistency of given system of equations

2x+3y =10, x+6y =4 , if consistent find the values of x and y.

**SECTION C (2x3=6m)**

9.Differentiate:

i) y= ii)

10.Using properties of determinants,show that

= xyz(x-y)(y-z)(z-x)

**SECTION D (1x5=5m)**

11.

Solve the system of equations using the matrix method

3x-2y+3z = 8

2x+ y- z = -1

4x-3y+2z = 4

**SECTION E (1x4=4m)**

12.**CASE STUDY**: A manufacturer produces product x,y,z which he sells in two markets.Annual sales are indicated below

|  |  |  |  |
| --- | --- | --- | --- |
| MARKET | PRODUCTS | | |
|  | x | y | z |
| I | 10,000 | 2000 | 18000 |
| II | 6000 | 20000 | 8000 |

Using the above information answer the following

a)If unit sale prices of x,y,z are Rs 2.50,Rs 1.50 and Rs 1.00 respectively,find the total revenue in each market with the help of matrix algebra.

b)If unit cost of the above three commoditities are Rs 2,Rs 1 and 50 paise respectively.Find the gross profit.

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