**DAV PUBLIC SCHOOL CNADRASEKHARPUR, BBSR-21**

**POST SUMMER VACATION TEST – 2022-23**

**CLASS – XII**

**SUB : MATHEMATICS**

**Time : 2Hrs. MaximumMarks:40**

**General Instructions:**

1. This question paper contains two parts A and B. Each part is compulsory. Part A carries 12 marks and part B carries 28 marks.
2. Part A has objective type questions and Part B has descriptive type questions.
3. Both Part A and B have internal choices.

**Part-A**

1. It consists of two sections I and II.
2. Section I comprises of 07 MCQ
3. Section II comprises of one case studies. Case study comprises of 5 case based MCQs.

**Part-B**

1. It consists of three sections III, IV and V.
2. Section –III comprises of 4 questions of 2 marks each.
3. Section –IV comprises of 4 questions of 3 marks each.
4. Section – V comprises of 2 questions of 4 marks each.

**PART-A**

**SECTION-I**

Q1. Let A={1,2,3}. Then, the number of equivalence relations containing (1,2) is

1. 1 (b) 2 (c) 3 (d) 4

Q2. For real numbers x and y, define xRy iff x+ is an irrational number. Then the relation R is

1. reflexive (b) transitive (c) symmetric (d) none of these

Q3. Let f: RR be defined by f(x)= , Then , f is

1. one-one (b) onto (c) bijective (d) not defined

Q4. If the set A contain 5 elements and the set B contains 6 elements, then the number of one-one and onto mappings from A to B is

1. 720 (b) 120 (c) 0 (d) none of these

Q5. The value of is

1. (b) (c) (d)

OR

The value of

1. 10 (b) 10-3 (c) 3-10 (d) 2-10

Q6. The principal value of is :

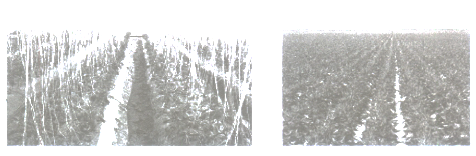
1. (b) (c) (d)

Q7. The principal value branch of is:

1. (b) (c) (d) {0}

**SECTION-II**

The following case study is compulsory. Each question carries 1 mark.

8. Two farmers X and Y cultivate three varieties of pulses namely Urad, Masoor and Mung. The sale (in Rs.) of these varieties of pulses by both the farmers in the month of September and October are given by the following matrices A and B.  


September Sales (in Rs.)

Urad Masor Mung

A =

October Sales (in Rs.)

Urad Masor Mung

B =

Using algebra of matrices, answer the following questions.  
i. The combined sales of Masoor in September and October, for farmer X is

(a) 80000 (b) 90000 (c) 40000 (d) 135000

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ii. The combined sales of Urad in September and October, for farmer Y is

(a) 20000 (b) 30000 (c) 36000 (d) 15000

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iii. Find the decrease in sales of Mung from September to October, for the farmer Y.

(a) 24000 (b) 10000 (c) 30000 (d) No change

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iv. If both farmers receive 2% profit on gross sales, compute the profit for each farmer and for each variety sold in October.

  Urad Masor Mung Urad Masor Mung



Urad Masor Mung Urad Masor Mung

(c)   (d)

v. Which variety of pulse has the highest selling value in the month of September for the farmer Y?

(a) Urad (b) Masor (c) Mung (d) All of these have the same price

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**PART-B**

**SECTION-III**

9. Evaluate:

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10. Show that the function f:NN , given by f(x)= 2x , is one-one but not onto.

11. Construct a 22 matrix A= whose elements aij given by

aij=

12. If = , find the value of x+y

OR

Find the value of a and b if =

**SECTION-IV**

13. Plot the graph of in its principal range and find its domain and range.

14. Find a matrix A such that 2A3B+5C=O , where B= and C=

15. Show that the function f:R-{3}R-{1} given by f(x) = is bijective.

OR

Let f:NN be defined by

f(n)= Show that f is bijection.

16. Let A={1,2,3,…….,9} and R be the relation on AA defined by (a,b) R(c,d) if a+d=b+c for all (a,b), (c,d) AA is an equivalence relation , then find equivalence class [(2,5)], [(3,4)] and [(2,3)]

**SECTION-V**

17. Show that the relation R defined by R= {(a,b): is divisible by 3; a,b z} is an equivalence relation

OR

Let R be a relation on the set A of ordered pairs of non-zero integers defined by (x,y)R(u,v) iff xv=yu . Show that R is an equivalence relation.

18. If A= , show that A25A+7I2=O