O.P. JINDAL SCHOOL, SAVITRI NAGAR

Periodic Test-1 (Round 1) - 2026-2027

Class: XII Sci. **MM:20**

Subject: Mathematics **Time :1Hour**

General Instructions:

i) All questions are compulsory.
ii) Question no. 1 to 8 carries 1 mark each, question no. 9 to 11 carries 2 marks each, question no. 12 and 13 carries 3 marks each.
iii) There is no overall choice. However, internal choice has been provided.

SECTION A

1.) Let A = {1, 2, 3} and R = {(1, 2), (2, 3), (1, 3)}be a relation on A. Then R is
a) symmetric and transitive b) symmetric c) transitive d) reflexive and symmetric

2.) Which of the following functions from Z to Z are one-one and onto?
a) $f(x) = x^3$ b) $f(x) = x + 2$ c) $f(x) = 2x + 1$ d) $f(x) = x^2 + 1$

3.) Let R be the relation in the set z of all integers defined by R = {(x, y): x – y is an integer}. Then R is
a) reflexive b) symmetric c) transitive d) equivalence

4.) The number of one-one function on set A containing 4 elements are
a) 24 b) 256 c) 2^{16} d) 512

5.) If matrix A is of order m × n , and for matrix B, AB and BA both are defined, then order of matrix B is
a) m × n b) n × n c) m × m d) n × m

6.) If $\begin{bmatrix} 3 & 4 \\ 2 & x \end{bmatrix}\begin{bmatrix} x \\ 1 \end{bmatrix} = \begin{bmatrix} 19 \\ 15 \end{bmatrix}$ then the value of x is
a) 3 b) 2 c) 5 d) 1

7.) The number of all possible matrices of order 3 × 3 with each entry 0 or 1 is
a) 256 b) 512 c) 81 d) 1024

8.) The matrix $\begin{bmatrix} 0 & 5 & -7 \\ -5 & 0 & 11 \\ 7 & -11 & 0 \end{bmatrix}$ is
a) a skew symmetric matrix b) a symmetric matrix
c) a diagonal matrix d) a scalar matrix

SECTION B

9.) If $A = \begin{bmatrix} 3 & 1 \\ 7 & 5 \end{bmatrix}$, find x and y such that $A^2 + xI = yA$.

10.) Let N be the set of all natural numbers and let R be the relation in N , defined by R = {(a ,b): a is the factor of b}.Then, show that R is reflexive and transitive.

OR

Let A = {1, 2, 3} and R = {(1, 1), (2, 2), (3, 3), (1, 2), (2, 3)}. Show that R is reflexive but neither symmetric nor transitive.

11.) Check whether $f : R - \{3\} \to R$ defined by $f(x) = \dfrac{x-2}{x-3}$ is onto or not .

SECTION C

12.) Express the matrix $A = \begin{bmatrix} 1 & 3 & 5 \\ -6 & 8 & 3 \\ -4 & 6 & 5 \end{bmatrix}$ as the sum of symmetric and skew symmetric matrix.

OR

If $A = \begin{bmatrix} 1 & 2 & 2 \\ 2 & 1 & 2 \\ 2 & 2 & 1 \end{bmatrix}$, then prove that $A^2 - 4A - 5I = \mathbf{O}$.

13.) If $f : R \to R$ be the function defined by $f(x) = 4x^3 + 7$, show that f is a bijection.

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