



JAGAT MANDIR SECONDARY SCHOOL

Lampokhari, Chabahl

**Annual Examination - 2078**

Subject : Opt. Maths

Time: 1 Hour 30 Minutes

Class : 8

Full Marks: 50

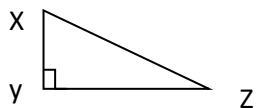
Candidates are required to give their answer according to the given instructions.

Answer all the questions.

**Group 'A' (9×2=18)**

1. If  $P \times Q = \{(a,b), (c,b), (a,d), (c,d), (g,b), (g,d)\}$ , list the elements of the sets P and Q.

2. In the right angled triangle XYZ, find  $\cos X$ .



3. Expand :  $(1 - \sin \beta)^2$

4. Find the median of first five prime numbers.

5. The marks obtained by 20 students are given below. Construct the frequency distribution table taking class size Of 5.

6, 5, 10, 8, 6, 5, 17, 12, 2, 5, 20, 18, 18, 13, 12, 15, 9, 10, 7, 13.

6. Define row matrix with an example.

7. Prove:  $\frac{(1+\cos A)(1-\cos A)}{(1-\sin A)(1+\sin A)} = \tan^2 A$

8. If  $Z = (0, -1)$  then

i. Rotate point Z through  $+90^\circ$

ii. Enlarge Z about origin with scale factor “3”.

9. Construct 3X2 matrix where  $a_{ij} = i-j$ .

**Group 'B' (8×4=32)**

10. Find the image of  $\triangle ABC$  with vertices A(3,-1), B(5,2) and C(2,3) under reflection through X-axis also plot in graph.

11. Find the value of x and y if  $\begin{bmatrix} x-y & 0 \\ 1 & x+y \end{bmatrix} = \begin{bmatrix} 3 & 0 \\ 1 & 5 \end{bmatrix}$

12. If  $A = \begin{bmatrix} 3 & 0 \\ 1 & 5 \end{bmatrix}$  and  $B = \begin{bmatrix} -1 & 3 \\ 1 & 0 \end{bmatrix}$  prove:  $A^T + B^T = (A + B)^T$

13. Solve  $\triangle ABC$  if  $\angle A = 90^\circ$ ,  $\angle C = 60^\circ$ ,  $AB = \sqrt{3}$  and  $AC = 1$ .

14. Prove :  $\frac{\sin(90^\circ - B)}{\cot(90^\circ - B)} \cdot \frac{\sec(90^\circ - B)}{\tan(90^\circ - B)} \cdot \frac{\operatorname{cosec}(90^\circ - B)}{\cos(90^\circ - B)} = \operatorname{cosec}^2 B$

15. The angle of elevation of a tower at a distance of 20 meter from point A is  $30^\circ$ , find the height of the tower.

16.  $M = \{4, 6, 8, 10\}$  and  $N = \{2, 3, 4, 5\}$  are two non empty sets. A relation R is defined as "double of" from the set M to the set N. List R in order pair form. Also represent R in arrow diagram. Find the inverse relation in the order pair form.

17. Calculate mean from the given data :

Marks	0-10	10-20	20-30	30-40	40-50
No. of Students	3	8	12	7	2

\*\*\*