PRITHWI SECONDARY BOARDING SCHOOL

Basundhara, Kathmandu, Contact: 01-5904816

ANNUAL EXAMINATION - 2077

Grade: IX **Full Marks: 50**

Subject: Optional Mathematics **Pass Marks: 20**

Time: 1 hour 30 minutes

Group A: [2 X 1 = 2]

1.
   a) Write sin A in terms of cosA.
   b) If cos A = ½, find sinA.

Group B: [6 X 2 = 12]

2.
   a) Let A = {1,2,3} and B = $\{a, x, y\}$ be any two non – empty sets. Find A × B and B × A and hence show that A × B ≠ B × A.
   b) Find the sum of the polynomials P (x) and q(x), where p(x) = 9x -15 and q(x) = 10 – 20x.

3.
   a) If f(x) = 2x +5 find f (6) – f (0).
   b) If A = $\begin{bmatrix} 1 & 3 \\ 5 & 7 \end{bmatrix}$ and B = $\begin{bmatrix} 2 & 0 \\ -3 & 4 \end{bmatrix}$, find 2A –B.

4.
   a) Find the distance between the points (4, 8) and (-3,6).
   b) Find the co-ordinates of a point which divide the line joining the points (-2, 3) and (4, 5) internally in the ratio of 3 :5.

5.
   a) Show that the point (1, 2) lies on the locus whose equation is 2x – 4y +6 =0.
   b) Find the equation of straight-line having slope 6 and y - intercept 7 units.

6.
   a) Find the value of $\sin 15^0$.
   b) If tanB = 3/4, find secB.

7.
   a) Find the value of $\cot 15^0$.
   b) The co -ordinates of the mid-point of the line joining the points (a, b) and (3, 5) is (7, 9). Find the value of a and b.

Group C: [9 X 4 = 36]

8. Two functions f(x)= x^2 +2x -1 and g(x) = 5x +3 are given. Find the value of x for which f(x) = g(x). Also find f(4) and g(4).
9. Let P = $\begin{bmatrix} 2 & 5 \\ -4 & 6 \end{bmatrix}$ be a matrix. Find a matrix P^T + 3P.
10. Find the co-ordinates of two points which trisect the line segment joining the points (5, 3) and (8, 6). In what ratio is the line joining the points (1, 2) and (3, -4) is divided by X – axis? Also find the point of intersection.
11. Prove that: $\frac{cosA}{1+sinA} + \frac{1+sinA}{cosA}$ = 2secA.
12. Prove that: $\frac{cos10^0 - sin10^0}{cos10^0 + sin10^0} = tan35^0$.
13. If A + B = $\frac{\pi}{4}$, prove that: (cotA-1) (cotB-1) = 2.
14. If 'I' is an identity matrix of order 2 × 2 and M = $\begin{bmatrix} 4 & 2 \\ -1 & 2 \end{bmatrix}$, prove that (A -2I) (A - 3I) =0.
15. Construct a 3 × 3 matrix whose elements a_{ij} are given as a_{ij} = 3j – 2j.
16. In what ratio is the line joining the points (2.3) and (4, -5) is divided by X – axis. Also find their point of intersection.

Best Wishes!!!