**JIYA LAL MITTAL DAV PUBLIC SCHOOL**

**GRADE – XII SA-I (SEPT, 2015)**

**SUBJECT – MATHEMATICS**

**TIME: 3hrs. M.M-100**

**Note: (1) Write clean and clear.**

**(2) All questions are compulsory.**

**(3) Attempt questions serial wise.**

**Section-A (1mark each)**

1. For what value of k the matrix has no inverse.
2. Find the principal value of
3. Let \* be a binary operation on set of natural number N defined by a\*b=l.c.m (a,b) where a,b ϵ N. Find (2\*3)\*6
4. Give an example of two non zero 2X2 matrices A and B such that AB=0
5. Discuss the continuity of the function given by
6. Write the number of possible matrices of order 3X3 with each entry 5 or 7.
7. Differentiate
8. Find the slope of the normal to the curve
9. Find the rate of change of the area of a circle with respect to its radius r when r=4cm.
10. Find

**Section-B (4marks each)**

1. Show that relation R in the set of all book in a library of a college, given by R={(x,y): x and y have same number of pages} is an equivalence relation

Or

Show that relation R in the set A={1,2,3,4,5} given by R={(a,b): |a-b| is even}, is an equivalence relation.

1. Prove that

1. Using elementary transformation finds the inverse of

Or

Without expanding, the determinants prove that is a factor of

1. Discuss the continuity of the function given by
2. Verify Larange Mean Value Theorem for f(x)=(x-3)(x-6)(x-9) in the interval [3, 5]
3. If then show that
4. If

Or

Solve the linear equation, using matrix method

1. Show that of all the rectangle inscribed in a given fixed circle, the square has the maximum area.
2. Find all the points of local maxima and local minima of the function given by
3. Prove that

1. Solve
2. If

**Section-C (6marks each)**

1. Use the product to solve the system of equation
2. A window is in the form of a rectangle surmounted by a semi-circle. If the total perimeter of the window is 30m, find the dimension of the window so that maximum light is admitted.
3. By properties of determinants, prove that

**Or**

By properties of determinants, prove that

1. If **Or**

If

1. Show that the altitude of the right circular cone of maximum volume that can be inscribed in a sphere of radius r is
2. Find the intervals in which the function f given by (i) Increasing (ii) Decreasing
4. Find gof and fog, if
5. If f: R🡪 R be given by