MCA/PGDCA

	Duration	No. of Question
Section A : Mathematics	90 minutes	50
Section B : Logical Reasoning	60 minutes	50

Note : Each question is of 1 mark, wrong answer carries negative marks (-¼)

Section A : Mathematics

Arithmetic, Geometric and Harmonic progression. Permutation and Combination, Application of Binomial Theorem. Exponential and Logarithmic series. Matrix Algebra and Determinants. Trigonometrical problems on height and distance. Complex numbers and their properties.

Statistics : Measures of central Tendency, frequency distribution and probability concept.

Coordinate Geometry : Straight Line, Circle, Ellipse, Parabola and Hyperbola.

Algebra : Definition and simple properties of groups and subgroups, permutation groups, cyclic groups, Cosets, Lagrange's theorem on the order of subgroup of finite group, Morphisms of groups, Cayley's theorem, Normal subgroups and quotient groups. Fundamental theorem of homomorphism of groups.

Rings : Definiation and examples of ring (integral domain, division rings, fields), Simple properties of rings, subrings and subfields, ring homomorphism and ring isomomorphism.

Vector Space : Definition and simple properties, subspaces, linear dependence and linear independence of vector space, dimension of finitely generated vector space, basic of vector space, dimension of a subspace.

Calculus and Differential Equations : Successive differentiation, Leibnitz Theorem, Polar tangent, normal subtangent and subnormal, derivative of an arc (Cartesian and polar). Expansion of functions by Maclaurin's and Taylor's series, Indeterminate forms. Integration of irrational algebraic and trigonometrical functions, Definite integral. Differential equations of first order and first degree. Linear differential equations with constant coefficients. Linear differential equations of any order, Maxima and Minima of one variables, Partial differentiation with Euler's theorem and it's applications.

Real Analysis : Description of the real number system as a complete ordered field. Bounded and unbounded sets of real numbers Supremum and infimum of a bounded set. Neighbourhood of a point. Real sequences and their convergence, Cauchy sequence, Cauchy's general principle of convergence. Convergence of series: comparison test, root test, ratio test Alternating series, Leibnitz test. Continuous functions and their properties.

Section B : Reasoning Ability

Verbal and Nonverbal reasoning

Sample Questions

Section A : Mathematics

1. $\lim\limits_{n\to\infty}\left(1+\dfrac{1}{n}\right)^2$ lies between

   (a) 0 and 1   (b) 1 and 2   (c) 2 and 3   (d) 3 and 4   (e) none of these

2. A subring of a field is

   (a) integral domain   (b) Skew field

   (c) subring   (d) field   (e) none of these

3. The straight line x/a +y/b = 1 touches the curve y =be$^{x/a}$ at the point

   (a) where it crosses the x-axis   (b) where it crosses the y-axis

   (c) (0,0)   (d) (1,1)   (e) none of these

4. Number of diagonals in a n-side polygon are

   (a) n(n-1)/2   (b) n(n-3)/2   (c) n(n+3)/2   (d) n(n+1)/2   (e) n^2

5. $\begin{vmatrix} m & 1 & 2 \\ -1 & 0 & 3 \\ 5 & -1 & 4 \end{vmatrix}$ = 7 then value of m is

   (a) 21/4   (b) 7/5   (c) -3/14   (d) -14/3   (e) -35/2

Section B : Reasoning Ability

1. 11, 13, 17, 25, 32, 37, ... find the next term in the series

   (a) 40   (b) 41   (c) 43   (d) 47   (e) 51

2. In a certain code 'MASTER' is written as PDVWHU. Using the same code what is the code word for 'WINTER' ?

   (a) ZJQHUW   (b) ZQLWHU   (c) ZLQWUH   (d) ZQLUWH   (e) ZLQWHU

3. Five boys are standing such that they form a circle. Ajay is between Ramesh and Dev, Kant is to the left of Babu, Ramesh is to the left of Kant. Who is to be the right of Ajay?

   (a) Babu   (b)Remesh   (c) Dev

   (d) Kant   (e) Cannot be determined

4. How many 2's are there in the following sequence, which are preceded by but are not followed by 1?

   3231242341432322312312324321 2

   (a) 1   (b) 2   (c) 3   (d) 4   (e) 5

5. In the following question find the odd one out

   (a) Ant   (b) Bee   (c) Moth   (d) Mosquito   (e) Scorpio