

7.5. SYLLABUS FOR MCA STREAM

7.5.1 MATHEMATICS (60 Questions)

Logic: Statement, Negation, Implication, Converse, Contrapositive, Conjunction, Disjunction, Truth Table. Different methods of proof, Principle of Mathematical induction.

Algebra of sets: Set operation, Union, Intersection, Difference, Symmetric difference, Complement, Venn diagram, Cartesian product of sets, Relation and functions, Equivalence relation, Kinds of functions and their domain and range, Composite function, Inverse of a function.

Number system: Real numbers (algebraic and order properties, rational and irrational numbers), Absolute value, Triangle inequality, $AM \geq GM$, Inequalities (simple cases), Complex numbers, Algebra of complex numbers, Conjugate and square root of a complex number, Cube roots of unity, De Moivre's theorem with simple application. Permutations and Combinations - simple applications, Binomial theorem for positive integral index, Identities involving binomial coefficients.

Determinants and matrices: Determinants of third order, Minors and cofactors, Properties of determinants, Matrices upto third order, Types of matrices, algebra of matrix, adjoint and inverse of matrix, Application of determinants and matrices to the solution of linear equations (in three unknowns).

Trigonometry: Compound angles, Multiple and Submultiple angles, Solution of trigonometric equations, Properties of triangles, Inverse circular function, Sum and product of sine and cosine functions.

Co-ordinate geometry of two dimensions: Straight lines, Pairs of straight lines, Circles, Equations of tangents and normals to a circle, Equations of parabola, Ellipse and hyperbola in simple forms, their tangents and normals. Condition of tangency. Rectangular and Conjugate hyperbolas.

Coordinate geometry of three dimensions: Distance and Division formulae, Direction cosines and direction ratios, Projection, Angle between two planes, Angle between a line and a plane. Distance of a point from a line and a plane. Equation of a sphere – general equation, Equation of sphere when end points of diameter are given.

Vectors: Fundamentals, Dot and cross product of two vectors, Scalar triple product and vector triple product, Simple application of different products.

Differential calculus: Concept of limit, Continuity of functions, Derivative of standard Algebraic and Transcendental functions, Derivative of composite functions, functions in parametric form, Implicit differentiation, Successive differentiation (simple cases), Leibnitz theorem, Partial differentiation, Application of Euler's theorem, Derivative as a rate measure, Increasing and decreasing functions, Maxima and Minima, Indeterminate forms, Geometrical application of derivatives such as finding tangents and normals to plane curves.

Integral calculus: Standard methods of integration (substitution, by parts, by partial fraction, etc), Integration of rational, irrational functions and trigonometric functions. Definite integrals and properties of definite integrals, Areas under plane curves.

Differential equations: Definition, order, degree of a differential equation, Formation of a differential equation, Solution of a differential equations of the following types.

(i) $dy/dx = f(x)$

(ii) $dy/dx = f(x)g(y)$

(iii) $d^2y/dx^2 = f(x)$

Probability and statistics: Average (mean, median and mode). Dispersion (standard deviation and variance), Definition of probability, Mutually exclusive events, Independent events, Compound events, Conditional probability, Addition theorem.

Number system: Decimal, binary, octal, hexadecimal numbers and their conversion.

7.5.2 COMPUTER AWARENESS (60 Questions)

COMPUTER AWARENESS:

Introduction to Computer: Brief history of Computers, Components of a Computer, Computer

related general knowledge, Application of Computers, Classification of Computers, Windows.

Computer Arithmetic: Number System with general base, Number base conversion, Elementary arithmetic operation.

C Language: Keywords, Constants, Variables, Identifiers, operators, statements. Writing simple C program.

Arithmetic and logical expression, simple if, nested if, if-else-ladder, conditional operators, switch case, for, while and do while loops.

Concept of functions in C.

7.6 SYLLABUS FOR MBA (120 questions)

Questions will be meant to measure a person's general Entrance test in the following aspects:

No. of Questions

Verbal reasoning	40
Analytical reasoning	40
General Knowledge	10
Comprehension	20
Computer and Business fundamentals	10

7.6.1 Sample Questions:

A sample of questions is being provided for making the candidates aware of the style and difficulty level of the questions. The topics covered here in sample are not true indication of the syllabus and the test may contain questions from all related areas under different sections. The samples are given primarily to help the candidates understand the pattern of the test.

Section A: Verbal Reasoning

1. Identify the odd word
 - A. Sweep
 - B. wipe
 - C. Scrub
 - D. Stain
2. The place where bricks are baked
 - A. Foundry
 - B. Mint
 - C. Cemetery
 - D. Kiln
3. My watch is 6 minutes fast and the train which should have arrived at my station at 11.30 am was 5 minutes late. What time was it by my watch when the train arrived?
 - A. 11.41 am
 - B. 11.40 am
 - C. 11.38 am
 - D. Don't Know

Section B: Analytical Reasoning

1. Which of the following ratio is greatest?
 - A. 7:15
 - B. 15:23
 - C. 17:25
 - D. 21:29
2. If 6 men and 8 boys can do a piece of work in 10 days while 26 men and 48 boys can do the same in 2 days, the time taken by 15 men and 20 boys in doing the same type of work will be:
 - A. 4 days
 - B. 5 days
 - C. 6 days
 - D. 7 days
3. When the integer n is divided by 6, the remainder is 3. Which of the following is not a multiple of 6?

- A. $n-3$ B. $n+3$ C. $2n$ D. $3n$

Section C: General Knowledge

1. The term 'steeplechase' is associated with
A. Horse racing B. Boxing
C. Polo D. Rowing
2. The first indigenously built missile boat is named as:
A. INS Mani B. INS Shilpi
C. INS Bibhuti D. INS Vikrant
3. Central Salt and Marine Chemicals Research Institute is located at
A. Ahmedabad B. Bhavanagar
C. Gandhi Nagar D. Panaji

Section D: Comprehension

Speech is a great blessing but it can also be a great curse, for which it helps us to make our intentions and desires known to our fellows, it can also, if we use it carelessly, make your attitude completely misunderstood. A slip of the tongue, the use of an unusual word, or of an ambiguous word and so on, may create an enemy where we had hope to win a friend. Again different classes of people use different vocabularies, and the ordinary speech of an educated man may strike an uneducated listener as pompous. Unwittingly we may use a word which bears a different meaning to our listener from what it does to men of our own class. Thus speech is not a gift to use lightly without thought, but one which demands careful handling. Only a fool will express himself alike to all kinds and conditions of men.

1. Speech can be a curse, because it can
A. reveal our intentions
B. lead to carelessness
C. hurt others
D. create misunderstanding
2. A 'slip of tongue' means something said
A. unintentionally
B. wrongly by chance
C. without giving proper thought
D. to hurt another person
3. The best way to win a friend is to avoid in speech
A. ambiguity
B. verbosity
C. pomposity
D. irony

Section E: Computer & Business Fundamentals

1. The widely used code in data communication is
A. 8 bit ASCII
B. 7 bit ASCII
C. EBCDIC
D. None of these
2. Point of Sale terminal refers to
A. Terminal associated with MICR
B. Smart Terminal
C. Terminal associated with OCR
D. None of the above
3. How many Stock Exchanges are there in India?

- A. 21
- B. 22
- C. 26
- D. None of the above

7.7 SYLLABUS FOR Integrated MBA(5 years) (60 questions)

Questions will be meant to measure a person's general Entrance test in the following aspects:

Section	No. of Questions
Verbal reasoning	15
Analytical reasoning	15
General Knowledge	15
Comprehension	15

7.8 Syllabus for MCA (Lateral Entry)

7.8.1 MATHEMATICS (60 Questions)

Logic: Statement, Negation, Implication, Converse, Contrapositive, Conjunction, Disjunction, Truth Table. Different methods of proof, Principle of Mathematical induction.

Algebra of sets: Set operation, Union, Intersection, Difference, Symmetric difference, Complement, Venn diagram, Cartesian product of sets, Relation and functions, Equivalence relation, Kinds of functions and their domain and range, Composite function, Inverse of a function.

Number system: Real numbers (algebraic and order properties, rational and irrational numbers), Absolute value, Triangle inequality, AM \geq GM, Inequalities (simple cases), Complex numbers, Algebra of complex numbers, Conjugate and square root of a complex number, Cube roots of unity, De Moivre's theorem with simple application. Permutations and Combinations -simple applications, Binomial theorem for positive integral index, Identities involving binomial coefficients.

Determinants and matrices: Determinants of third order, Minors and cofactors, Properties of determinants, Matrices upto third order, Types of matrices, algebra of matrix, adjoint and inverse of matrix, Application of determinants and matrices to the solution of linear equations (in three unknowns).

Trigonometry: Compound angles, Multiple and Submultiple angles, Solution of trigonometric equations, Properties of triangles, Inverse circular function, Sum and product of sine and cosine functions.

Co-ordinate geometry of two dimensions: Straight lines, Pairs of straight lines, Circles, Equations of tangents and normals to a circle, Equations of parabola, Ellipse and hyperbola in simple forms, their tangents and normals. Condition of tangency. Rectangular and Conjugate hyperbolas.

Coordinate geometry of three dimensions: Distance and Division formulae, Direction cosines and direction ratios, Projection, Angle between two planes, Angle between a line and a plane. Distance of a point from a line and a plane. Equation of a sphere – general equation, Equation of sphere when end points of diameter are given.

Quadratic polynomials: Roots of quadratic polynomial, Factorisation of quadratic polynomials, Maximum and minimum values of quadratic polynomials for all real values of the variable, sign of the quadratic polynomial for all real values of the variable, Solution of quadratic inequations.

Sequence and Series: Definition, Infinite geometric series, Arithmetico-geometric series, Exponential and Logarithmic series.

Vectors: Fundamentals, Dot and cross product of two vectors, Scalar triple product and vector triple product, Simple application of different products.

Differential calculus: Concept of limit, Continuity of functions, Derivative of standard Algebraic and Transcendental functions, Derivative of composite functions, functions in parametric form, Implicit differentiation, Successive differentiation (simple cases), Leibnitz theorem, Partial

differentiation, Application of Euler's theorem, Derivative as a rate measure, Increasing and decreasing functions, Maxima and Minima, Indeterminate forms, Geometrical application of derivatives such as finding tangents and normals to plane curves.

Integral calculus: Standard methods of integration (substitution, by parts, by partial fraction, etc), Integration of rational, irrational functions and trigonometric functions. Definite integrals and properties of definite integrals, Areas under plane curves.

Differential equations: Definition, order, degree of a differential equation, General and particular solution of a differential equation, Formation of a differential equation, Solution of a differential equations by method of separation of variables, Homogeneous differential equations of first order and first degree, Linear differential equations of the form $dy/dx + p(x)y = q(x)$, Solutions of differential equations of the form $d^2y/dx^2 = f(x)$

Probability and statistics: Average (mean, median and mode). Dispersion (standard deviation and variance), Definition of probability, Mutually exclusive events, Independent events, Compound events, Conditional probability, Addition theorem.

Number system: Decimal, binary, octal, hexadecimal numbers and their conversion.

7.8.2. COMPUTER AWARENESS: 60 questions

Introduction to Computer: Brief history of Computers, Components of a Computer, Computer related general knowledge, Application of Computers, Classification of Computers, Windows.

Computer Arithmetic: Number System with general base, Number base conversion, Elementary arithmetic operation.

C Language: Keywords, Constants, Variables, Identifiers, operators, statements. Writing simple C program. Arithmetic and logical expression, simple if, nested if, if-else-ladder, conditional operators, switch case, for, while and do while loops. Concept of functions in C.

C++ and data structure: Object oriented concepts and relationships, control structures, file concepts, Algorithm Analysis, linked list, stack, queue, binary tree, sorting and searching techniques.

Fundamentals of computer Organization and Networking: Sequential combinational circuits, Flip flops, Memory, K-map, Addressing modes, Fetch and execution cycle. OSI model, topologies and protocols, Internet protocols, Ipv4/Ipv6, Introductory concept on Network Security.

Introduction to Operating systems: Resource Management, types of operating systems, DOS and Unix commands,

Logical reasoning and verbal abilities: Data Interpretations, Series brain teasing problem