3 MCA PROGRAMME

3.1 MODES OF PROGRAMME:

- Regular Mode
- Distance Education Mode

3.2 ELIGIBILITY (For both Regular and Distance Education Mode):

Recognised Bachelors degree of minimum 3 years duration in any discipline with Mathematics at least at 10+2 school level and has also qualified in the Entrance Test to be conducted by the University.

OR

Recognised Bachelor's Degree of minimum 3 years duration in any discipline with Mathematics as one of the subjects and has also qualified in the Entrance Test to be conducted by the University.

3.3 REGULAR MODE

3.3.1 Duration of The Programme:

The programme is spread over a period of three years consisting of six semesters. The students study courses for five semesters at the University and do a Software Development Project (SDP) in the sixth semester in some reputed industry.

3.3.2 Number of Seats: 120+60 (for Chandigarh Campus*)

*** These students shall commence their curriculum in Patiala Campus and shall move to Chandigarh Campus when it starts. The geographical location of 'Chandigarh Campus' is at Dera Bassi on the fringe of Chandigarh.**

3.3.3 Distribution of Seats:

General	SC/ST	PH	Total
86	30	4	120(+ 18 FN/NRI seats. Refer section 8 for eligibility & other conditions)

3.4 DISTANCE EDUCATION MODE:

This programme is also spread over a period of three years consisting of six semesters. The programme is approved by the UGC-AICTE-DEC. The students study courses for five semesters and do a software development project in the sixth semester in the Institution/Industry recognized by TU. The objective of the programme is to provide an opportunity to those students who want to upgrade their studies/ knowledge through distance education as well as for those who are working in any organization. The main thrust in the programme will be to polish the professional aptitude of the students through lectures by the experts in their respective fields.

3.4.1 Salient Features of Distance Education Mode:

- Admission would be made once in a year along with regular MCA students through the same Entrance test conducted by Thapar University, Patiala.
- Expert Lecture notes/ Self Instruction Material would be provided to students at the start of each semester for each subject.

- Recorded Lectures for the whole syllabus would be made available online to the students.
- Ten (10) personal contact hours for laboratory work per semester would be made available for all the students for each subject having laboratory component.
- 16 weeks Project semester would be on similar lines as that for regular MCA students.
- Students would be provided one instructor in-charge for each subject in each semester for clearing the problems.
- Evaluation of the students would be made in the form of quizzes/short answer type questions/ laboratory examination/ assignment sheets and end semester examination with different weightage to each component.

3.4.2 Number of Seats: 60

General	SC/ST	PH	Total
43	15	2	60

3.5 **Centres for Examination**: The **entrance test** will be held at TU, **Patiala and Delhi** only. In addition, we may have examination centres at Mumbai, Kolkata, Jammu and Chennai based on sufficient number of options for various centres by the candidates. Highest preferred Entrance Test Centre available shall be allocated.

Syllabus for MCA Entrance Examination

Total Marks : 200

Duration of Test: 3 Hrs

No. of Questions : 200

Section-I: Mathematics (80 marks)

1. **Geometry:** Two-Dimensional; straight lines, circles and conic sections, Three-Dimensional; straight lines and spheres.

2. **Algebra**: Set theory, Relations, Mappings and its applications, Permutations and Combinations.

3. **Calculus**: Limits, Continuity and Differentiability, Rolle's and Mean value theorems, Differentiation, Partial Differentiation, Maxima and Minima of functions of one and two variable. Successive differentiation. Integration by using substitution, partial fraction and by parts, Definite integral and its properties, Applications of definite integral to evaluate length and area of simple plane curves.

4. **Vector Analysis:** Scalar and vector products of two, three and four vectors and their applications.

5. **Statistics, Probability and Linear programming**: Measures of Central tendency, Dispersion, Skewness and Kurtosis. Correlation and Regression. Basic concepts of probability, Conditional probabil ity, Baye's theorem, Discrete and continuous distributions (Binomial, Poisson, and Normal distributions), Fundamentals of linear programming problems, Graphical solution, Simplex method and its variants.

6. **Matrices:** Types of matrices rank of a matrix, solution of system of linear equations, Cayley Hamilton theorem, Inverse of a matrix, Determinant and its properties.

7. **Numerical Analysis:** Solution of non-linear equations using iterative methods, Interpolation (Newton's, Lagrange's and Forward formulae), Numerical Integration (Trapezoidal and Simpson Rule).

Section-II: Computer Awareness (60 marks)

- **Computer Basics** : Organization of a computer, Central Processing Unit (CPU), input/output devices, computer memory, memory organization, back-up devices, Categories of Computers.

- **Data Representation** : Representation of characters, integers, and fractions, binary and hexadecimal representations, Binary Arithmetic: Addition, subtraction, division, multiplication, floating point representation of numbers, normalized floating point representation, Boolean algebra: truth tables, Venn diagrams.
- **Basics of C Programming and Operating Systems :** Computer programming in C : data types, loop and control statements, functions. Fundamentals of operating systems: multiprogramming, multitasking, Multiprocessing and time sharing systems.
- **Networking and Internet :** Categories of Computer Network, Network topologies, Network media, Concepts of LAN, MAN and WAN, Search Engines, Basic internet applications.

Section-III : Analytical Ability, Communication Skills and General Knowledge : (60 Marks)

The questions in this section will cover logical reasoning, quantitative reasoning, visual-spatial reasoning and Communication skills. This section shall also contain questions to test the general knowledge about business, finance, industry, transportation, scientific inventions, information technology, governance, healthcare, cultural dimensions etc.

Model Questions

Section –I (Mathematics)

1. The mean and standard deviation of a Binomial distribution are 10 and 2 respectively, then the value of p (the probability of success) is
   (A) 0.3 (B) 0.6 (C) 0.2 (D) 0.4

2. If $\Delta^3(1-ax)(1-3x)(1-4x)=72$ and unity as the interval of differencing, then a is equal to
   (A) -1 (B) 1
   (C) 2 (D) None of these

3. The vectors $2\vec{i}-\vec{j}+\vec{k},\ \vec{i}+2\vec{j}-3\vec{k},$ and $3\vec{i}+\lambda\vec{j}+5\vec{k}$ are coplanar if
   (A) $\lambda = 2$ (B) $\lambda = 4$
   (C) $\lambda = -5$ (D) $\lambda = -4$

4. The area enclosed within the curve $|x|+|y|=1$ is
   (A) $\sqrt{2}$ (B) 2
   (C) $2\sqrt{2}$ (D) None of these

5. **In an LPP, Let k variables out of n variables be unrestricted in sign. The number of non- negative variables in standard form of this LPP, are**
   (A) $2k$ (B) $k+1$
   (C) either k or $k+1$ (D) None of these

Section – II (Computer Awareness)

1. The fastest and most expensive type of storage device is a
   (A) electronic disk (B) register
   (C) cache (D) magnetic tape

2. Which is not a Keyword in C?
   (A) auto (B) else
   (C) for (D) pointer

3. How many main functions can be used in a C program?
   (A) 0 (B) 1
   (C) 2 (D) Any Number

4. A half-adder is also known as
   (A) AND circuit (B) NAND circuit
   (C) NOR circuit (D) EX-OR circuit

5. What is the output of the following?

```
void main()
{
  int a=10,b=20;
  char x=1,y=0;
  if(a,b,x,y)
  {
    printf("EXAM");
  }
}
```

(A) XAM is printed (B) exam is printed

(C) Compiler Error (D) Nothing is printed

Section –III (Analytical Ability, Communication Skills and General Knowledge)

1... A is the father of X. B is the mother of Y. The sister of X and Z is Y. Which of the following statements is definitely not true?

(A) B is the wife of A (B) B has one daughter

(C) Y is the son of A (D) None of these

2... The radius of a circle has been reduced from 9 cm to 7 cm. The approximate percentage decrease in area is

(A) 31.5% (B) 39.5%

(C) 34.5% (D) None of these

3... When we are talking to ourselves we are practicing _____ communication

(A) Interpersonal (B) Intrapersonal

(C) Meditative (D) None of the above

4. India's first surface missile was named

(A) Akash (B) Nag

(C) Prithvi (D) Agni

General Information Regarding MCA Entrance Examination

1. The question paper will contain multiple choice objective type questions, each carrying one mark and will be answered on the question paper itself or on separate Answer sheet.
2. Four options (A), (B), (C), (D) are provided for each question.Out of the four given options, only one option is the correct answer. The candidate will be required to write his/her answer indicating one option out of the four options, in the box provided for that question in the answer sheet.
3. There is a separate sheet for writing answers. Use only **CAPTIAL** letters for writing the answers in the space provided on the answer sheet.
4. If a candidate does not wish to attempt a specific question, the space (box) provided on the answer sheet corresponding to that question should be marked 'X'.A box left blank will be considered as wrong answer.

Example

Q 1 The length of a tangent to the circle with radius 3cm from a point situated at a distance of 5cm from the centre is

(a) 2cm (b) 4cm

(c) 8cm (d) 5cm

(Answer Sheet)

Q.5 For Simple Pendulum the time period of one oscillation is given by

— ——

(A) $2\pi\sqrt{g/l}$ (B) $2\pi\sqrt{2l/g}$
(C) $2\pi\sqrt{l/2g}$ (D) $2\pi\sqrt{l/g}$
(Answer Sheet)

1	2	3	4	5	6	7	8	9	10
A				D					

5. There will be negative marking for wrong answers. Penalty for wrong answers will be adopted as under :
The total marks to be awarded to a candidate in a paper after imposing the penalty will be calculated by the following formula (assuming that each question carries 1 mark).
For each correct answer to a question, one mark will be awarded. However, if the answer is wrong 1/4 mark will be deducted. For examples this will be computed as under.
Let x = No of correct answers
y = No of wrong answers
z = Unattempted questions
Then the total marks obtained is X-1/4 Y. Calculated to the second place of decimal, the examiner will also check that N = X + Y + Z = Total No. of questions = 200.