

# **VARDHMAN MAHAVEER OPEN UNIVERSITY, KOTA**

## **(School of Science and Technology)**

### **MCA Programme Guide**

#### **ABOUT UNIVERSITY**

Vardhman Mahaveer Open University, Kota (earlier Kota Open University, Kota) was established by an Act of the Rajasthan State Legislative Assembly in 1987 with a view to achieve the following objectives:

- Democratizing higher education by taking education to the doorsteps of students.
- Providing access to quality education to all those who seek it, irrespective of age or formal qualification.
- Offering need based academic programmes by giving professional and vocational orientation to the courses.
- Promoting and developing distance education in the State of Rajasthan.

#### **Special Features of the Open and Distance Education System:**

- Relaxed entry requirements.
- Provision of equal opportunities of admission to people from all walks of life.  
Provision of learning at one's own pace, place and time.
- Cost effective educational operations.
- Self instructional printed course material.
- Network of students support services throughout the State of Rajasthan.
- Face to face and distance counseling wherever and whenever needed.
- Continuous evaluation through internal home assignments.
- Provision of term-end examinations.

#### **ACADEMIC PROGRAMMES**

The University offers both short term and long term Programmes leading to Certificate, Diploma or Degree covering conventional as well as innovative programmes. These programmes have been developed by VMOU. They are launched with a view to fulfill the student needs for:

- Improvement of skills.

- Acquisition of professional qualifications.
- Continuing education and professional development at work place.
- Self-enrichment.
- Diversification of knowledge etc.

### **CREDIT SYSTEM**

The University follows the Credit System for its Programmes. Each credit amounts to 30 hours of study containing all learning activities. All MCA courses are six credit courses. Thus, a six credit course involves 180 hours of study. Completion of an academic programme (Degree or Diploma) requires successful clearing of both the home assignments and the term end examinations (Theory and Practical) of each course in a Programme.

### **STUDENTS SUPPORT SERVICES**

VMOU has established a number of Study Centers throughout the state of Rajasthan. Study Centre provides counseling facilities at periodic intervals, acts as information centre and examination centre. Each student will be assigned a Study Centre specially designed for MCA Programmes. Students are advised to get in touch with their Regional/Study Centers for advance/timely/ day to day information. Learners may seek the help of the following functionaries from 10.00 AM to 5.00 PM on working days to sort out the problems as indicated below:

- (i) About non-receipt of Study Materials, Assignments etc.

**Director (MPD), VMOU, Rawatbhata Road, Kota - 324 021**

0744-2797346, 0744-2797349, 0744-2797350

- (ii) About Admission, Fee Receipts, Registration, Change of Regional/Study Centre and postal addresses, etc.

**Concerned Regional Centre of VMOU, Kota**

- (iii) About Examination Centers, Results, Mark Sheets, Revaluation etc.

**Controller of Examinations, VMOU, Rawatbhata Road, Kota - 324 021**

0744-2797314, 0744-2797328, 0744-2797324

- (iv) Important Telephone Numbers –

**Toll Free No. 1800-180-6166**

## **PROGRAMME DELIVERY**

The methodology of instructions in this University is different from that of the conventional Universities. The Open University System is more learners centric and the student is an active participant in the teaching and learning process. Most of the instructions are imparted through distance mode rather than face to face communication. The University follows a multi-media approach for instructions. It comprises of:

- (a) **Self-Instructional Printed Material:** The written printed material for theory components of the programme is supplied to the students for every course. Besides, Videos on selected topics are also available on Website.
- (b) **Counseling Sessions:** Normally counseling sessions are held as per a schedule drawn by the Co-coordinator of the Study Centre. They are generally held on Sundays. The counseling sessions will be held subject to the availability of a minimum number of students at a particular centre and local expertise as per rules.
- (c) **Practical Camp:** 30 days Practical Camp will be organized each for MCA-P-I, and MCA-P-II. Minimum 75% attendance is compulsory in Practical Camp.

## **MCA PROGRAMME STRUCTURE**

Objectives:

- To give the learners knowledge of advanced computer subjects including software and hardware.
- To enable the learners get a better job in computer industry. The jobs may include System Analysts, Programmers, and Technical Facilitators in the industries and teaching posts in colleges and universities.
- To enable the learners to work as system managers and hardware engineers in IT industry.
- To prepare professional in the field of computer science as per the demand of the industry.

**Duration** : Minimum 2 Year, Maximum 4 Year

**Credits** : 72

<b>Medium of Instruction</b>	: English
<b>Examination</b>	: English or Hindi
<b>Fees</b>	: Rs. 19400/- First Year (300/- charge extra for students appearing in the additional bridge course - QCA Course)
	: Rs. 18800/- Second Year

There will be 6 courses for MCA 1<sup>st</sup> Year and 6 courses for MCA 2<sup>nd</sup> Year.

#### MCA 1<sup>st</sup> Year

S.No.	Name of Course	Course Code	Credits
1.	Elementary Computer Application ( <b>Only for B.Sc./ B.Com./ B.A passed students</b> )	QCA	Non-credit
2.	Application Software and Web Designing	MCA-102	6
3.	OOPS Programming with C++ and Java	MCA-103	6
4.	Programming in VB and Dot Net	MCA-104	6
5.	Computer Networking & Network & Internet	MCA-105	6
6.	Elective – I	MCA-E-I	6
7.	Practical-I	MCA-P-I	6

#### *Elective – I*

1.	Computer Graphics	MCA-301	6
2.	Advanced Web Technology	MCA-304	6
3.	Linux System Administration	MCA-305	6

#### MCA 2<sup>nd</sup> Year

S.No.	Name of Course	Course Code	Credits
1.	Data Structure and Algorithm	MCA-201	6
2.	Computer Architecture & Microprocessor	MCA-202	6
3.	Software Engineering	MCA-203	6
4.	Data Communication and Networks	MCA-205	6
5.	Elective - II	MCA-E-II	6
6.	Practical-II	MCA-P-II	6

#### *Elective – II*

1.	Formal Language and Automata	MCA-302	6
2.	E-Commerce	MCA-303	6

- B.Sc./ B.Com./ B.A passed students has to complete additional bridge course which is existing Elementary Computer Application (QCA) course of university. The examination pattern and marking scheme are equivalent of the QCA course.

- Courses MCA-E-I and MCA-E-II are the Elective courses. Student has to choose one of the course from the elective courses each from MCA-E-I and MCA-E-II.
- Course MCA-P-I and MCA-P-II will have practical examination and rest of all will have theory examination.
- 30 days practical camp will be organized each for MCA-P-I and MCA-P-II. Minimum 75% attendance is compulsory in Practical Camps to appear in Practical Examination.
- MCA-P-I is composition of MCA-102, MCA-103, MCA-104, and MCA-E-I
- MCA-P-II is composition of MCA-201, and MCA-203
- The project shall be an integral part of MCA-P-II.

### **ELIGIBILITY FOR MCA PROGRAMME**

The admission eligibility of MCA programme will be-

*“Passed BCA/ Bachelor Degree in Computer Science Engineering or equivalent Degree.*

*OR*

*Passed B.Sc./ B.Com./ B.A. with Mathematics at 10+2 level or at Graduation Level (with additional bridge Courses as per the norms of the concerned University).*

*Obtained at least 50% marks (45% marks in case of candidates belonging to reserved category) in the qualifying Examination.”*

### **ADMISSION CRITERIA**

1. The admission shall be made on merit decided on the basis of marks obtained in MCA Entrance Test organized by VMOU and the test score will remain valid for one year from the date of announcement of MCA Entrance Test result. University reserves the right to exempt the test or decide the cut off pass percentage for the admission. One who qualifies the MCA Entrance test will be required to fulfil the admission eligibility as mentioned above.

The structure of the MCA Entrance Test will be as follows:-

- All the questions will be of multiple choice question, where for each question four options will be given and candidate has to choose one correct option.
- There will be no negative marking

- The medium of MCA Entrance Test will be English only.
- Each question has a weightage of 1 mark.
- The section wise pattern of the exam is given below:

<b>Section</b>	<b>Number of Questions</b>	<b>Total Marks</b>
Elementary Computer Knowledge	30	30
Mathematical Ability	30	30
Reasoning and Aptitude	40	40

- The detailed syllabus of MCA Entrance Test is given in Appendix – A.
- The duration of test will be 120 minutes.
- Entrance Test fee will be 1000/-

**Note:** The Entrance Test will be conducted at selected cities of Regional Centers to be decided by the University. The model question paper and instructions are given in the **Appendix - A**.

### **REGISTRATION**

- (1) Admission Forms will be submitted only at the time of first entry to the Programme. Subsequent continuation in the programme will be through Promotion. Promotee Form or Re-registration form will be made available at the website of VMOU.
- (2) In case the student does not qualify the courses within stipulated examination, he/she will have to apply for Term end Examination for those courses. The marks obtained in the qualifying courses will be carried forward. Examination fee will as per the prevalent Fee Structure at that time.

### **RESERVATION**

The University follows Govt. policy in respect of reservation or seats in admission.

### **FEE STRUCTURE**

The Fee for MCA Entrance Test is Rs. 1000/- (Rupees One thousand only) to be deposited in the Bank through e-Mitra or Online Banking. For Online Application and other details are available on University Website- [vmou.ac.in](http://vmou.ac.in)

After qualifying the MCA Entrance Test Course Fee of Rs. 19400/- First Year (300/- charge extra for students appearing in the additional bridge course - QCA Course) for MCA First Year is to be deposited. The Course Fee includes Registration Fee, Development Fee, **Study Material**, and Examination Fee. The course fee will be paid through E-Mitra or Online Banking System.

### **VALIDITY OF ADMISSION LISTS**

Candidates who are offered admission have to join on or before the date indicated by the University. In case they seek admission in the next session they have to apply afresh in the next year.

### **INCOMPLETE AND LATE APPLICATIONS**

Incomplete and late application forms will be summarily rejected without referring to the candidate. The students are, therefore, advised to fill in the relevant columns carefully and enclose all the copies of the certificates asked for and submit the filled in form to the concerned Director, Regional Centre before the due date.

### **MEDIUM**

The medium of instructions is English. However, the student can opt to write in English or Hindi in the Examinations.

### **EVALUATION AND EXAMINATIONS**

The evaluation system of the Programme is based on the following components:

- (a) **Internal /Home Assignment:** In each course (paper) Internal Assignment will be of 20 marks. There will be no Internal Assignment in Practical Courses/papers (MCA-P-I, and MCA-P-II). The Internal Assignments shall be submitted to the Concerned Regional/study Centre on or before the date prescribed by the university.
  
- (b) **Term-end Examination (Theory):** On the completion of the prescribed minimum duration for each MCA 1st year as well as for MCA 2nd year; a candidate will be examined by the means of written examination of 3 hours duration in each course (paper). The maximum marks for each course (paper) shall be 80.

**(c) Term End Examination (Practical):**

The maximum marks for term end examination of each practical course shall be 100. Minimum 75% attendance in Practical Counseling Camp is mandatory to appear in Practical Examination

To pass in Examination, a candidate shall be required to score 36% marks in each course (paper) as well as in aggregate. However, it is compulsory to secure 36% marks in each component i.e. Internal /Home Assignment, Term End Examination Theory and Term End Examination Practical separately otherwise he/she may reappear in the next examination after six months to clear the due papers within prescribed maximum duration of that programme. This is also to note that no Division shall be awarded for the MCA 1st year examinations.

The marks obtained in Internal/home assignment and term end examination (Theory and Practical) shall be shown separately in the mark-sheet. The successful candidate shall be classified as per the following table-

First Division	-	60% and above
Second Division	-	48% and above but below 60%
Pass	-	36% and above but below 48%

Examination date sheets (Schedule which indicate the date and time of examination for each course) uploaded on University Website in advance. It is an essential per-requisite for a student to submit the Examination Form for taking examination in any course(s). Copies of the examination forms are available University's Website. Only one form is to be submitted at concerned Regional Centre or Controller of Examination VMOU, Kota. for all the courses in one term-end examination.

The examination fee for the first attempt is included in the admission fee. The last date for submission of examination forms is notified. The examination form received after the date shall be rejected.



Permission letter for the Term End Examination is to be downloaded from the University Website. Your scholar number is generally Roll Number for examinations unless otherwise given separately. Any mistake on writing the Roll No. will result in non-declaration of the result. It is your duty to check whether you are registered for that course and whether you are eligible to appear for the examination or not. If you neglect this and take the examination without being eligible for it, your result will be cancelled.

The student can apply for revaluation of examination as per University rules.

**All Legal cases, if any, are subject to the jurisdiction of Kota City (Rajasthan) only.**

INSTRUCTIONS FOR MCA ENTRANCE TEST (MET)

1. Please fill up the necessary information at the cover of the booklet and specially designed answer sheet before commencement of the test.
2. Please do not open this scaled booklet until you are told to do so.
3. The total time is 120 minutes.
4. The candidate has to complete all the four sections in one single session of 120 minutes.
5. All questions carry equal marks. Each question carries 1 marks.
6. All questions are of MULTIPLE choice type. Each question has four options. The candidate has to select only one of the given options as his/her correct answer and indicate his/her answer on the separate SPECIAL ANSWER SHEET provided by putting cross (X) marks at the appropriate place against the questions number.

Example:

State the number when squared the then added to 12 becomes seven times of its value:

(A) 2      (B) 3      (C) 5      (D) 6

Out of the above choice 3 being the correct the answer, cross mark (X) is to be placed on (B) as follows:

Q. 1    (A)    (B)    (C)    (D)  
( )    (X)    ( )    ( )

7. Putting a cross at more than one place in the same question will be treated as wrong answer. There is no negative marking for any wrong answer.
8. Wherever you wish to change your answer, completely blacken (or erase completely) the circle already crossed and then put cross at the appropriate place.
9. Rough work, if any is to be done in this booklet. No extra sheet will be provided.
10. CALCULATORS ARE NOT ALLOWED.
11. Please use Ball pen or Ink pen. **Do not use Pencil**

## 12. TEST COMPOSITION

Section	Number of Questions	Total Marks
Elementary Computer Knowledge	30	30
Mathematical Ability	30	30
Reasoning and Aptitude	40	40

### **Detailed Syllabus of MCA Entrance Test**

#### ***Elementary Computer Knowledge***

Computer Basics: Organization of a computer, Central processing Unit (CPU), structure of instructions in CPU, input/output devices, computer memory, back-up devices. Data Representation: Representation of characters, integers and fractions, binary and hexadecimal representations, Binary Arithmetic: Addition, subtraction, multiplication, division, simple arithmetic and two's complement arithmetic, floating point representation of numbers, Boolean algebra, truth table, venn diagrams.

#### ***Mathematical Ability***

Set Theory: Concepts of sets- Union-Intersection-Cardinality-Elementary counting, permutation and combinations Probability and statistics: Basic Concept of Probability theory, Averages, Dependent and independent events, frequency distributions, measure of central tendencies and dispersions, Algebra: Fundamental operations in algebra, Expansions, Factorization, simultaneous linear/Quadratic equations , indices, Logarithms-arithmetic, geometric and harmonic progressions, determinants and metrics . Coordinate Geometry: Rectangular, Cartesian coordinates, distance formulas, equation of line, inter section of line, pair of straight lines, equation of circle, parabola, ellipse and hyperbola. Calculus: Limit of functions, continuous functions, differentiations of functions, tangents and normal's, simple example of maxima and minima. Integration of function by parts, by substitutions, and by partial fraction: definite integrals, application of definite integrals to areas. Vectors: Position vector, addition and subtraction of vectors, scalar and vector products and their applications to simple geometrical problems and mechanics. Trigonometry: simple Identities, trigonometric equations, properties of triangles, solutions of triangles, height and distances, general solution of trigonometric equations.

### ***Reasoning and Aptitude***

The question in this section will cover logical reasoning and quantitative aptitude. Some of the questions will be on comprehension of logical situation and questions based on the facts given in the passage.

### **Model Question Paper of MCA Entrance Test**

#### **SECTION – I**

#### **(Elementary Computer Knowledge)**

1. UNIVAC is
  - a) Universal Automatic Computer
  - b) Universal Array Computer
  - c) Unique Automatic Computer
  - d) Unvalued Automatic Computer
2. The brain of any computer system is
  - a) ALU
  - b) Memory
  - c) CPU
  - d) Control unit
3. Storage capacity of magnetic disk depends on
  - a) tracks per inch of surface
  - b) bits per inch of tracks
  - c) disk pack in disk surface
  - d) All of above
4. Which of the following is not an input device?
  - a) OCR
  - b) Optical scanners
  - c) Voice recognition device
  - d) COM (Computer Output to Microfilm)
5. If in a computer, 16 bits are used to specify address in a RAM, the number of addresses will be
  - a) 216
  - b) 65,536
  - c) 64K
  - d) Any of the above
6. Instructions and memory address are represented by
  - a) Character code
  - b) Binary codes
  - c) Binary word
  - d) Parity bit

7. Mnemonic a memory trick is used in which of the following language?
  - a) Machine language
  - b) Assembly language
  - c) High level language
  - d) None of above
8. BCD is
  - a) Binary Coded Decimal
  - b) Bit Coded Decimal
  - c) Binary Coded Digit
  - d) Bit Coded Digit
9. Properly arranged data is called
  - a) Field
  - b) Words
  - c) Information
  - d) File
10. Algorithm and Flow chart help us to
  - a) Know the memory capacity\
  - b) Identify the base of a number system
  - c) Direct the output to a printer
  - d) Specify the problem completely and clearly

## SECTION – II

### (Mathematical Ability)

1. A \_\_\_\_\_ is an ordered collection of objects.
  - a) Relation
  - b) Function
  - c) Set
  - d) Proposition
2. The set O of odd positive integers less than 10 can be expressed by \_\_\_\_\_
  - a) {1, 2, 3}
  - b) {1, 3, 5, 7, 9}
  - c) {1, 2, 5, 9}
  - d) {1, 5, 7, 9, 11}
3. What is the Cartesian product of  $A = \{1, 2\}$  and  $B = \{a, b\}$ ?
  - a)  $\{(1, a), (1, b), (2, a), (b, b)\}$
  - b)  $\{(1, 1), (2, 2), (a, a), (b, b)\}$
  - c)  $\{(1, a), (2, a), (1, b), (2, b)\}$
  - d)  $\{(1, 1), (a, a), (2, a), (1, b)\}$

4. If  $a, b, c$  are in AP then relation between  $a, b, c$  can be
  - a)  $2b = 2a + 3c$
  - b)  $2a = b + c$
  - c)  $2b = a + c$
  - d)  $2c = a + c$
5. Which of the following statements regarding sets is false?
  - a)  $A \times B = B \times A$
  - b)  $A \times B \neq B \times A$
  - c)  $n(A \times B) = n(A) * n(B)$
  - d) All of the mentioned
6. Vertex of an angle in standard form is at
  - a)  $(1,0)$
  - b)  $(0,1)$
  - c)  $(1,1)$
  - d)  $(0,0)$
7. 1 radian =
  - a)  $57^{\circ}17'45''$
  - b)  $1^{\circ}$
  - c)  $180^{\circ}$
  - d)  $180'$
8. The equation circle  $x^2 + y^2 - 4x + 2y - 20 = 0$  describes:
  - a) A circle of radius 5 centered at the origin.
  - b) An ellipse centered at  $(2, -1)$ .
  - c) A sphere centered at the origin.
  - d) A circle of radius 5 centered at  $(2, -1)$ .
9. The focus of the parabola  $y^2 = 16x$  is at
  - a)  $(4, 0)$
  - b)  $(0, 4)$
  - c)  $(3, 0)$
  - d)  $(0, 3)$
10. The roots of the equation  $3x^2 - 12x + 10 = 0$  are?
  - a) rational and unequal
  - b) complex
  - c) real and equal
  - d) irrational and unequal

### SECTION – III

#### (Reasoning and Aptitude)

1. In the first 10 overs of a cricket game, the run rate was only 3.2. What should be the run rate in the remaining 40 overs to reach the target of 282 runs?
  - a) 6.25
  - b) 6.5

- c) 6.75  
d) 7
2. It was Sunday on Jan 1, 2006. What was the day of the week Jan 1, 2010?  
a) Sunday  
b) Saturday  
c) Friday  
d) Wednesday
3. Six bells commence tolling together and toll at intervals of 2, 4, 6, 8, 10 and 12 seconds respectively. In 30 minutes, how many times do they toll together?  
a) 4  
b) 10  
c) 15  
d) 16
4. The sum of ages of 5 children born at the intervals of 3 years each is 50 years. What is the age of the youngest child?  
a) 4 years  
b) 8 years  
c) 10 years  
d) None of these
5. Seats for Mathematics, Physics and Biology in a school are in the ratio 5 : 7 : 8. There is a proposal to increase these seats by 40%, 50% and 75% respectively. What will be the ratio of increased seats?  
a) 2 : 3 : 4  
b) 6 : 7 : 8  
c) 6 : 8 : 9  
d) None of these
6. Two pipes A and B can fill a cistern in 37 minutes and 45 minutes respectively. Both pipes are opened. The cistern will be filled in just half an hour, if the B is turned off after:  
a) 5 min.  
b) 9 min.  
c) 10 min.  
d) 15 min.
7. A can do a work in 15 days and B in 20 days. If they work on it together for 4 days, then the fraction of the work that is left is :  
a)  $\frac{1}{4}$   
b)  $\frac{1}{10}$   
c)  $\frac{7}{15}$   
d)  $\frac{8}{15}$
8. A train running at the speed of 60 km/hr crosses a pole in 9 seconds. What is the length of the train?

- a) 120 metres
  - b) 180 metres
  - c) 324 metres
  - d) 150 metres
9. A sum of money at simple interest amounts to Rs. 815 in 3 years and to Rs. 854 in 4 years. The sum is:
- a) Rs. 650
  - b) Rs. 690
  - c) Rs. 698
  - d) Rs. 700
10. The cost price of 20 articles is the same as the selling price of  $x$  articles. If the profit is 25%, then the value of  $x$  is:
- a) 15
  - b) 16
  - c) 18
  - d) 25