

## MCA I SEMESTER EXAMINATION 2010-11

Course Code: MCA101

Paper ID: 0491102

### C-Programming

Time: 3 Hours

Max. Marks: 75

*Note: Attempt six questions in all. Q. No. 1 is compulsory.*

1. Answer any five of the following (limit your answer in 50 words).

(3x5=15)

- a) What is an operating system?
- b) What are the characteristics of algorithm?
- c) What are the arithmetic operators? Explain.
- d) Explain if statement with syntax and example.
- e) Explain the syntax of while and do while loop.
- f) Explain the importance of array.
- g) What is general format of a structure?
- h) Explain C – preprocessor?

2.

- a) Explain the architecture of UNIX operating system. (6)
- b) Differentiate call by value and call by reference. Give an example.
- c) (6)

3.

- a) What are operators? Explain all types of control statement. (6)
- b) Write a program in C to calculate volume of sphere. (6)

4.

- a) Explain scope rules and global. (6)
- b) Write a program in C to print whether the given number is even or odd. (6)

5.

- a) Write a program in C to calculate factorial of a given integer number. (6)
- b) Write a program in C to generate table for a given number? (6)

6.

- a) What is multidimensional array? Explain memory representation of it. (6)
- b) Write a program in C to calculate the sum of even number in given ten elements array? (6)

7.

- a) Explain function calling technique with an example. (6)
- b) Write a program in C to search a number in given n size array. (6)

8.

- a) Explain linear search and sequential search with the help of example. (6)
- b) Write a program in C to sort a given array of integer. (6)

**MCA I SEMESTER EXAMINATION 2010-11**

**Course Code: MCA102**

**Paper ID: 0491102**

**Environmental Science and Ethics**

**Time: 3 Hours**

**Max. Marks: 75**

*Note: Attempt six questions in all. Q. No. 1 is compulsory.*

1. Answer any five of the following (limit your answer in 50 words).  
(3x5=15)
  - a) Define ecosystem with examples.
  - b) What do you mean by fossil fuels? Write with examples.
  - c) What is the distinction between biomass and biogas?
  - d) What do you mean by noise pollution?
  - e) Write major objectives of environmental education.
  - f) What is population growth? Define with examples.
  - g) Give three impacts of ozone layer depletion.
  - h) Differentiate between food chain and food web.
2. What are ecological pyramids? How would you classify the ecological pyramids? What are the main characteristics of each of the ecological pyramids? (12)
3. What is the difference between conventional and non-conventional sources of energy? Which kind of energy sources are environment-friendly and why? (12)
4. Write definition and sources of air pollution. Is air pollution also responsible for global warming? How? (12)
5. What is the impact of burgeoning human population on environment? Give crucial suggestions for population control in India. (12)
6. Discuss the role of IT in environment and human health. Write with examples. (12)

7. Discuss the environmental implications of urbanization. Suggest some measures of environmental pollution control in urban areas. (12)
8. Write short notes on: (6x2=12)
  - a) The Environment (Protection) Act, 1986
  - b) Ocean Thermal Energy

# MCA I SEMESTER EXAMINATION 2010-11

Course Code: MCA103

Paper ID: 0491102

## Discrete Mathematics

Time: 3 Hours

Max. Marks: 75

*Note: Attempt six questions in all. Q. No. 1 is compulsory.*

1. Answer any five of the following (limit your answer in 50 words).

(3x5=15)

- Define logical equivalence. Show that  $\sim(p \vee q)$  and  $(\sim p) \wedge (\sim q)$  are logically equivalent.
- Define tautology. Show that the proposition  $p \rightarrow (p \vee q)$  is a tautology.
- Define Finite, Infinite and Null sets along with one example of each.
- Define composition of relations.
- Define one to one function along with example.
- Show that the function  $f(x) = x^3$  and  $g(x) = x^{1/3}$  for all  $x \in \mathbb{R}$  are inverses of one another.
- Find the generating function for the sequence 1, a,  $a^2$ , ....., where a is a fixed constant.
- Define finite and infinite graphs.

2.

- Explain conditional and Bi-conditional statements along with their truth tables. (6)
- Construct a truth table for the compound proposition  $(p \leftrightarrow q) \vee (\sim q \leftrightarrow r)$ . (6)

3.

- Write a short note on Fallacies of arguments. (6)
- Prove that for sets A, B, C:  $(A \cup (B \cap C)) = (A \cup B) \cap (A \cup C)$  (6)

4.

- Define cartesian product of sets. If  $A = \{1,4\}$ ,  $B = \{4,5\}$ ,  $C = \{5,7\}$ , verify that  $A \times (B \cap C) = (A \times B) \cap (A \times C)$ . (6)
- If A, B, C be any three sets, then using Venn diagram, prove that  $A - (B \cup C) = (A - B) \cap (A - C)$  (6)

5.

- Write short note on: (3+3)
  - Equivalence relation
  - Hass diagram
- If  $f : A \rightarrow B$  and  $g : B \rightarrow C$  be one to one onto function; then prove that  $(g \circ f)^{-1} = f^{-1} \circ g^{-1}$  (6)

6.

- Explain Injective, Subjective and Bijective functions. (6)
- There are four roads from city X to Y and five roads from city Y to Z, find
  - how many ways is it possible to travel from city X to Z via Y.
  - How different round trips routes are there from city X to Y to Z to Y and back to X.

7.

- Solve the recurrence relation  $f_n = f_{n-1} + f_{n-2}$ ,  $n \geq 2$  with the initial condition  $f_0=1$ ,  $f_1 = 1$ . (6)
- Use generating functions to solve the recurrence relation: (6)
$$a_{n+2} - 2a_{n+1} + a_n = 2^n;$$
$$a_0 = 2, a_1 = 1$$

8. Explain the following:

(3x4=12)

- Directed and undirected graphs
- Connectivity
- Isolated and pendent vertex
- Spanning Tree

## MCA I SEMESTER EXAMINATION 2010-11

Course Code: MCA104

Paper ID: 0491104

### Professional Communication

Time: 3 Hours

Max. Marks: 75

*Note: Attempt six questions in all. Q. No. 1 is compulsory.*

1. Answer any five of the following (limit your answer in 50 words).  
(3x5=15)
  - a) Is “language a tool of Communication”? Justify your answer with a brief explanation.
  - b) Briefly discuss the significance of reports in technical communication.
  - c) Write a summary of the essay, “The Aims of Science and the Humanities” by M.E. Prior.
  - d) Briefly comment on Nuances of Voice Dynamics w.r.t presentation strategies.
  - e) Explain the parts of a technical proposal.
  - f) “Letter writing is an art.” How can this art help you in your career?
  - g) Write a short note on requisites of sentence construction.
  - h) Explain Mass Communication in your own words.
2. Differentiate between: (6x2=12)
  - a) Job Application and Resumes.
  - b) Business letters and Official letters.
3.
  - a) Explain the techniques and methods of paragraph development. (6)
  - b) Explain different types of barriers in communication. (6)
4. Discuss different factors one need to focus for effective and efficient presentation. (12)

5.
  - a) Critically comment on the essay, “Man and Nature”, by J. Bronowski  
OR  
“The effect of scientific temper on man”, by Bertrand Russell. (6)
  - b) Explain the Key rules and skills required for writing a project report. (6)
6. Write notes on (any three): (4x3=12)
  - a) Technical Paper
  - b) Organization Communication
  - c) Flow of Communication
  - d) Verbal and Non-Verbal Communication
  - e) Technical Communication.
7.
  - a) Invite a quotation from a computer hardware dealer, for a list of latest desk-top computers, required in your department lab. (6)
  - b) Write a report on industrial visit conducted recently by your department. (6)
8. Differentiate between (any three): (4x3=12)
  - a) Letter and Technical Proposal.
  - b) Synonyms and Antonyms
  - c) Technical and General Communication
  - d) Dissertation and Thesis.
  - e) Audio and Visual signs in Communication.

## MCA I SEMESTER EXAMINATION 2010-11

Course Code: MCA105

Paper ID: 0491102

### Digital Electronics

Time: 3 Hours

Max. Marks: 75

*Note: Attempt six questions in all. Q. No. 1 is compulsory.*

1. Answer any five of the following (limit your answer in 50 words).

(3x5=15)

- Explain one's complement representation. Find one's complement of  $(0100111001)_2$ .
- Draw logical symbol of NAND gate. Also write its truth table.
- What is standard POS form of Boolean expression?
- Write truth table of S-R Flip-Flop.
- What are multiplexers?
- Draw half adder circuit using basic gates.
- What is synchronous counter?
- Give classification of register depending upon the way in which data is entered and retrieved.

2.

- Convert  $(247.36)_8$  into binary number. (3)
- Convert  $(0.BF85)_{16}$  into octal number. (3)
- Add  $(7F)_{16}$  and  $(BA)_{16}$  (3)
- Represent 396 decimal number into Excess-3 code. (3)

3.

- Explain and prove De Morgan's theorem. (6)
- Simplify the following Boolean expression using K-Map (6)

$$f = ABC + \overline{BCD} + \overline{ABC}$$

4. Draw and explain working of Master slave Flip-Flop. How the problem of race around condition in J-K Flip-Flop is resolved in it. (12)

5. Convert an S-R Flip-Flop to a J-K Flip-Flop using excitation table. (12)

6. Draw truth table and logic diagram for 8 to 1 multiplexer. How 16:1 multiplexer is obtained using two 8:1 multiplexer. (12)

7. Draw logic diagram of 4 bit bidirectional shift register and explain its operation. (12)

8. Draw logic diagram and explain working of 4-bit ring counter. (12)