(Please write your Enrollment Number) Enrollment No. 04704092015

MINOR - I EXAMINATION, SEPTEMBER 2015

Subject Code: MCA-101	Subject: Fundamentals of IT
Time : 1 ½ Hours	Maximum Marks : 30

Note: Q. 1 is compulsory. Attempt any two questions from the rest.

Q1 **(2.5*4)**

(a) Evaluate:
(i) $(2BD)_{16} = (?)_{10}$
(ii) $(134)_8 = (?)_2$
(iii) $(10110)_2 = (?)_{10}$

(b) Differentiate between system and application software.

(c) Discuss Signed and unsigned representation, fixed point representation and floating point representation.

(d) Define IT and give its five applications.

Q2 **(5,5)**

(a) Write equivalent codes: (i) BCD for 85_{10} (ii) Gray code for 14_{10}
(iii) Excess- 3 for 52_{10} (iv) ASCII-8 for 'MCA' (v) EBCDIC hexadecimal for 'MCA'

(b) Discuss different types of memory (Primary, Secondary, Cache, Virtual, Auxiliary).

Q3 **(5,5)**

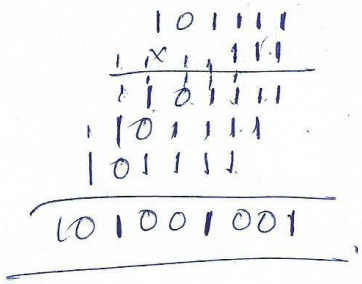
(a) Discuss 1's complement, 2's complement, 9's complement and 10's complement with example

(b) Subtract using complementary method: (i) $1111_2 - 1100_2$
(ii) $234_{10} - 588_{10}$

Q4 **(5,5)**

(a) Discuss different types of character codes with example.

(b) Evaluate: (i) $(4C.2E)_{16} = (?)_{10}$
(ii) Multiply 101111* 111



(Please write your Enrollment Number) Enrollment No. 47

MINOR - I EXAMINATION, SEPTEMBER 2015

Paper Code: MCA 103	**Paper Title:** Problem solving using C programming
Time : 1 ½ Hours	**Maximum Marks :** 30

Note: Q. 1 is compulsory. Attempt any two questions from the rest.

Q1 **(5,3,2)**

(a) Develop your own program in C to perform following operations
1) Copying one string to another.
2) Comparing two strings.

(b) Write a short note on evolution of C language.

(c) Differentiate between
1) while and do-while loop.
2) Break and continue statement.

Q2 **(5,5)**

(a) Write a program using one print statement to print the pattern of asterisks as shown below :

```
*
* *
* * *
* * * *
```

(b) Discuss scope, visibility and lifetime of variables.

Q3 **(4,6)**

(a) The main is a user defined function. How does it differ from other user defined function?

(b) Discuss the variable naming conventions in C with examples.

Q4 **(5,5)**

(a) Write a program in C to sort an array of 10 elements.

(b) Why should we use switch case ? Discuss with example.

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MINOR - I EXAMINATION, SEPTEMBER 2015

Paper Code: MCA 107	Paper Title: Computer Organization
Time : 1 ½ Hours	Maximum Marks : 30

Note: Q. 1 is compulsory. Attempt any two questions from the rest.

Q1 **(2.5x4=10)**

(a) Write the microoperation for ISZ instruction of basic computer.

(b) Differentiate between a sequential circuit and a combinational circuit.

(c) Discuss various applications of a logic microoperation.

(d) What do you mean by instruction set completeness?

Q2 **(5,5)**

(a) Explain the working of JK-flip flop. What is race around condition? How is it overcome?

(b) Register A holds 8 bit binary 11011001. Determine the register B operand and the logic microoperation to be performed in order to change the value:

(i) 01101101

(ii) 11111101

Q3 **(5,5)**

(a) Discuss interrupt cycle with the help of an example.

(b) Define the following:

(i) shift operation

(ii) computer registers

Q4 **(5,5)**

(a) Construct a 5-to-32-line decoder with four 3-to-8-line decoders with enable and one 2- to-4-line decoder.

(b) Construct a 16-to-1 line multiplexer with two 8-to-1 line multiplexer and one 2-to-1 line multiplexer. Use block diagrams for the three multiplexers.

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MID TERM- I EXAMINATION, SEPTEMBER 2015

Paper Code: MCA-105	Paper Title: Discrete Mathematics
Time : 1 ½ Hours	Maximum Marks : 30
Note:Attempt Q1 which is compulsory and any two more questions from the remaining.	

(2x5=10)

Q1

(a) Define a Poset giving an example.

(b) Let A = B = C be set of Real numbers. Let f:A → B, g : B → C be defined as f(a) = a + 1 and g(b) = b^2 + 2. Find:
- (i) gof(-2)
- (ii) fog(-2)
- (iii) fof(x)
- (iv) gog(y)

(c) Let A and B be two finite sets. State and prove the De Morgans Law.

(d) What is the Pascal's Triangle? Give its properties.

(e) 13 people show up for a basketball team.
- (i) How many ways are there to choose 10 players team?
- (ii) Of the 13 people, three are women. How many ways are there to choose 10 players such that atleast one of them is a woman?

(3,3,4)

Q2

(a) What are Injective Functions? If A,B,C are sets and f : A → B and g : B→ C are injective functions, show that gof is also injective.

(b) Convert the given formula into PDNF: (P → R) ∧ (Q ↔ R)

(c) State the Pigeonhole Principle and Generalized Pigeonhole Principle. What is the minimum number of students, each of whom comes from one of the 50 states, who must be enrolled in a university to guarantee that there are atleast 100 who are from the same state?

(3,3,4)

Q3

(a) Show that $n^3 - n$ is divisible by 3 using Mathematical Induction.

(b) Using Rules of Inference show that: P ∨ Q , Q → R, P → M, ~M ⊢ R ∧ (P ∨ Q)

(c) Let R and S be relations from set A to B. Show that:
- (i) If R ⊆ S then $R^{-1} \subseteq S^{-1}$
- (ii) $(R \cap S)^{-1} = R^{-1} \cap S^{-1}$

(3,4,3)

Q4

(a) Show that (P → Q) ∧ (P → R) and P → (Q ∧R) are logically equivalent.

(b) There are 79 students in a class. All of them take some combination of Maths, English and History. The number of students who take English is 41; those who take History is 36 and Maths is 30. Those who take Maths and History is 16; English and History is 6. There are 8 who take Maths only and 16 History only. Draw the Venn diagram and find:
- (i) How many students take Maths and English but not History
- (ii) How many take only English
- (iii) How many take all the three.

(c) Let R be a relation on A={ a,b,c,d,e } such that R = { (a,c) ,(b,d) , (c,a) , (d,b) , (e,d)}. Find the Reflexive and Symmetric Closure of R. Also find R^c and R^{-1}.

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MINOR - I EXAMINATION, SEPTEMBER 2015

Paper Code: MCA 109	**Paper Title: Soft Skills**
Time : 1 ½ Hours	**Maximum Marks :** 30
Note: All questions are compulsory.	

Q1 **(2.5x2=5)**

(a) Write short notes on the following:

(i). Importance of knowledge of *Proxemics* for a Professional

(ii). Difference between Formal & Grapevine Communication

(1x5=5)

(b) Explain the meaning of the following Idioms and also make sentences:

(i). Bitter pill to swallow

(ii). Crunch time

(iii). Jump through hoops

(iv). Shape up or ship out

(v). Work out the Kinks

Q2 Read the situation given below carefully and answer the questions thereafter: **(3,3)**

Harish is a 27-yearold who is a food service manager at a casual dining restaurant. He is responsible for supervising and managing all employees at the back end. Employees working at the back endrangeinagefrom18 year's oldto45yearsold. In addition, the employees come from diverse cultural and ethnic backgrounds. For many, Hindi is not their primary language.

Harish tries his best to keep up with food safety issues in the kitchen but he admits it's not easy. Employees receive "on the job training" about food safety basics (for example, appropriate hygiene and hand washing, time/temperature, and cleaning and sanitizing). But with high turnover of employees, training is often rushed and some new employees are put right into the job without training if it is a busy day. Eventually, most employees get some kind of food safety training. The owners of the restaurant are supportive of Harish in his food safety efforts because they know if a food safety outbreak were ever linked to their restaurant; it would likely put them out of business. Still, the owners note there are additional costs for training and making sure food is handled safely.

One day Harish comes to work and is rather upset even before he steps into the restaurant. Things haven't been going well at home and he was lucky to rush through some of the dirty laundry and find a relatively clean outfit to wear for work. He admits he needs a haircut and a good hand scrubbing, especially after working on his car last evening. When he walks into the kitchen he notices several trays of uncooked vegetables and non-vegetarian products spread out in the kitchen area. It appears these have been left at room temperature for quite some time. Harish is frustrated and doesn't know what to do. He feels like he is beating his head against a brick wall when it comes to getting employees to practice food safety.

(a) Comment on the barriers that Harish is facing in the above situation during his communication with his staff members.

(b) Do you think that Harish can also to be blamed for any miscommunication that is happening in the above situation? Explain how can this situation be resolved?

(6)

Q. 3

What is a topic sentence in a paragraph? Keeping in mind the essentials of effective writing technique compose four paragraphs (at-least five lines each) on the following topic:

"Female foeticide in India and its impact on our Society"

(8)

Q. 4

Elaborate any five qualities of a good Business Letter? Assuming that you are the Head of Business Communications department at your college, write a business letter to a leading language lab vendor, asking him to send you a detailed quotation on setting up a digital language lab in the college. Invent the necessary details.