

MCA - I Semester Question Paper

~~R-20~~

Code No: MC2011/R20

~~* 2021 - ACET *~~

MCA I Semester Regular Examinations, July-2021

BUSINESS COMMUNICATION

Max. Marks: 70

Time: 3 Hours

*Answer any FIVE Questions One Question From Each Unit
All Questions Carry Equal Marks*

UNIT-I

1. a Define Communication. Explain the nature and Scope of communication.
b What are the barriers to Communication?

OR

2. a Explain the process of communication.
b Define Listening. What are the objectives of Listening?

UNIT-II

3. a Explain the advantages and disadvantages of organisational Communication.
b What is informal Communication? Explain the Characteristics of informal Communication.

OR

4. a Elaborate the role of emotions in interpersonal Communication.
b Explain briefly about Exchange Theory.

UNIT-III

5. a State the Characteristics of Non-verbal Communication
b Explain briefly about Kinesics.

OR

6. a Define business etiquette. Explain the importance of business etiquette.
b What are the various guidelines for making effective non-verbal Communication.

UNIT-IV

7. a Explain the attributes of written communication.
b What is Report? Explain the characteristics of a good report.

OR

8. a Explain the guidelines for a successful business.
b Describe the functions of business letters.

UNIT-V

9. a What are the factors affecting Presentation?
b Explain the various techniques of group discussion.

OR

10. a Define Interview. What are the objectives of an interview?
b What are the prerequisites of Effective Presentation?

||| ||| ||| |||

*Answer any FIVE Questions One Question from Each Unit
All Questions Carry Equal Marks*

UNIT-I

1. a Define probability and write the axioms of probability for a finite sample space. 4M
- b Given $P(A) = 0.35$, $P(B) = 0.40$ and $P(A \cap B) = 0.20$, Find 5M
(i) $P(A \cup B)$ (ii) $P(\bar{A} \cap B)$ (iii) $P(A \cap \bar{B})$ (iv) $P(\bar{A} \cup \bar{B})$
(v) Are A and B independent?
- c Two cards are drawn at random from an ordinary deck of 52 playing cards. What is the probability of getting two aces if (i) the first card is replaced before the second card is drawn; (ii) the first card is not replaced before the second card is drawn? 5M

OR

2. a Define discrete random variable and discrete probability distribution. 7M
- b Let X be a continuous random variable with distribution : 7M
$$f(x) = \begin{cases} kx^2 & \text{if } 0 \leq x \leq 1 \\ 0 & \text{elsewhere} \end{cases}$$

(i) Evaluate k (ii) Find $p(1/4 \leq X \leq 3/4)$. (iii) Find $p(X > 2/3)$.

UNIT-II

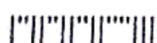
3. a Explain i) Population and Sample, 7M
ii) Sampling With and Without Replacement .
- b Determine a 95% confidence interval for the mean of a normal distribution with variance $\sigma^2 = 0.25$, using a sample of $n = 100$ values with mean $\bar{x} = 212.3$. 7M

OR

4. a Explain Unbiased Estimates and Efficient Estimates . 7M
- b Explain Maximum Likelihood Estimates. 7M

UNIT-III

5. a Explain briefly the following 6M
(i). Type I error (ii). Type II error (iii). Critical region
- b A storekeeper wanted to buy a large quantity of bulbs from two brands A and B respectively. He bought 100 bulbs from each brand A and B and found by testing brand A had mean life time of 1120 hrs and the S.D of 75 hrs and brand B had mean life time 1062 hrs and S.D of 82 hrs. Examine whether the difference of means is significant. Use a 0.01 level of significance. 8M

OR

Code No: MC2012/R20

6. To determine whether there really is a relationship between an employee's performances in the company's training program and his or her ultimate success in the job, the company takes a sample of 400 cases from its very extensive files and obtains the results shown in the following table: 14M

		Performance in training program			Total
Success in job (employer's rating)		Below Average	Average	Above Average	
	Poor	23	60	29	112
	Average	28	79	60	167
	Very good	9	49	63	121
	Total	60	188	152	400

Use the 0.01 level of significance to test the null hypothesis that performance in the training program and success in the job are independent.

UNIT-IV

7. a Define algebraic Systems with Example and General Properties. 7M
b Explain the Semi Groups and Monoids with examples. 7M

OR

8. a Explain i)The Greatest Common Divisor, ii) Euclidean Algorithm. 7M
b Explain The Fundamental Theorem of arithmetic and Modular arithmetic. 7M

UNIT-V

9. a Explain the following with examples 7M
 (i) Representation of graphs
 (ii) Isomorphic graphs
 (iii) planar graphs
 b Explain the following
 (i) Euler graph (ii) Hamiltonian graph 7M

OR

10. a Prove that a tree with n vertices has exactly $n-1$ edges. 7M
b Write the algorithm to Breadth-First Search for a Spanning tree. 7M

Note :- Statistical tables are required

$\Sigma \frac{1}{n} \cdot \frac{1}{E_i}$

2 of 2

||| ||| ||| |||

*Answer any FIVE Questions One Question From Each Unit
All Questions Carry Equal Marks*

UNIT-I

1. a Explain in detail the functions of the main hardware components of a Computer system. 7M
- b What is a Bus in Computer system? With a neat sketch, explain the Bus system connecting the main components of a computer system. 7M

OR

2. a Explain about different types of addressing modes in microprocessor. 7M
- b Describe the basic operations of Stacks and Queues. And also explain the role of Stacks and Queues in computer system. 7M

UNIT-II

3. a Show a possible control sequence for implementing the arithmetic instruction MUL R1, R2. 7M
- b Explain in detail about micro instruction sequencing and execution 7M

OR

4. a Depict the sequence of register transfers involved in the execution of an instruction 7M
- b With a neat sketch, demonstrate the general configuration of a micro programmed control unit. 7M

UNIT-III

5. a Discuss the services provided by operating system for efficient system operation. 7M
- b Explain various fields of Process Control Block. 7M

OR

6. a Explain the various categories of system calls provided by an operating system 7M
- b Consider a set of 5 processes whose arrival and burst times are given below. 7M

Process	Arrival Time	Burst Time
P1	0	3 2 1 0
P2	2	6 5 4 3 2
P3	4	5 4 3 2 1
P4	6	4 3 2 1
P5	8	2 1 0

Draw a Gantt chart illustrating the execution of these jobs using Round Robin CPU scheduling algorithm (Assume time quantum= 1 unit) and also Calculate the average waiting time and average turnaround time.

UNIT-IV

7. a Show that, if the wait and signal operations are not executed atomically, then mutual exclusion may be violated. 7M
b A system is having 3 user processes P1, P2 and P3 where P1 requires 21 units of resource R, P2 requires 31 units of resource R, P3 requires 41 units of resource R. Calculate the minimum number of units of R that ensures no deadlock.

OR

8. a State the Critical Section problem. Illustrate the software based solution to the Critical Section problem. 7M
b Discuss the necessary conditions that cause deadlock situation to occur. 7M

UNIT-V

9. a Consider the following page reference string:
1,2,3,4,2,1,5,6,2,1,2,3,7,6,3,2,1,2,3,6
How many page faults would occur for the optimal page replacement algorithm, assuming three frames and all frames are initially empty. 7M
b Explain and compare the FCFS and SSTF disk scheduling algorithms. 7M
10. a What is meant by Demand Paging? Explain the process of converting logical address to physical address using the page table. 7M
b Given free memory partitions of 100K, 500K, 200K, 300K, and 600K (in order), how would each of the First-fit, Best-fit, and Worst-fit algorithms place processes of 212K, 417K, 112K, and 426K (in order)? 7M



Data Structures

Time: 3 Hours

Max. Marks: 70

*Answer any FIVE Questions One Question From Each Unit
All Questions Carry Equal Marks*

UNIT-I

- Q1. a Write an algorithm and flowchart to compute roots of quadratic equation 7M
 b Define a data type. Mention the different data types supported by C language, giving an example to each. 7M

OR

- OR**

2. a Compare and contrast between if-else and switch -case statements 7M
b Write a program to compute roots of quadratic equation using switch-case statement. 7M

UNIT-II

3. a Develop a C program to read two number and a function to swap these number using pointers 7M
b How to pass arrays as parameters to functions? Explain with an example. 7M

OR

4. a What is a pointer? Explain dynamic memory management 7M
b Explain various parameter passing mechanisms. 7M

UNIT-III

5. a Write an algorithm to delete an element anywhere from doubly linked list. 7M
 b Show how to reverse a single linked list. 7M

OR

6. a Write an algorithm to delete an element from doubly linked list. 7M
b Compare singly and circular linked list while performing insertion and deletion operations. 7M

UNIT-IV

7. a Discuss Briefly about linear probing, quadratic probing with example. 10M
 b Illustrate the difference between stack and queue. 4M

OR

8. a Write an algorithm for basic operations of stack. 7M
b Write an algorithm to push and pop an element from linked stack. 7M

UNIT-V

9. a Create binary search tree for the following elements (23, 12, 45, 36, 5, 15, 39, 2, 19). Discuss about the height of the above binary search tree. 7M

algori

- in a binary search tree.

OR

10. a A binary tree has seven nodes. The Preorder and Post order traversal of the tree are

given below. Can you

Preorder : GF DABEC

- b Explain the iterative merge sort and recursive merge sort algorithms with an example. 7M

六六六六

三

Code No: MC2015/R20

MCA I Semester Regular Examinations, July-2021
Object Oriented Programming with JAVA

Time: 3 Hours

Max. Marks: 70

*Answer any FIVE Questions One Question from Each Unit
All Questions Carry Equal Marks*

UNIT-I

1. a Describe the structure of a typical Java program with an example. And Write about Java Virtual Machine in detail. 10M
b What are the responsibilities of an agent 4M

OR

2. a What is meant by byte code? Briefly explain how Java is platform independent. 7M
b Explain the significance of public, protected and private access specifies in inheritance. 7M

UNIT-II

3. a Define inheritance. What are the benefits of inheritance? What costs are associated with inheritance? How to prevent a class from inheritance. 10M
b What is a package? Write the syntax to define a "package" in detail. 4M

OR

4. a Give an example where interface can be used to support multiple inheritances. 7M
b Explain the polymorphism and overloading with an example. 7M

UNIT-III

5. a What are the different ways that are possible to create multiple threaded programs in java? Discuss the differences between them. 7M
b Write a program that creates two threads. First thread prints the numbers from 1 to 100 and the other thread prints the numbers from 100 to 1. 7M

OR

6. a Write a program to create three threads in your program and context switch among the threads using sleep functions. 10M
b Write a simple java program to create threads. 4M

UNIT-IV

7. a Differentiate between Checked and Unchecked Exceptions with examples. 7M
b Discuss about Adapter Classes in detail. 7M

OR

8. a Illustrate the use of Grid Bag layout. 7M
b Explain about Component Labels in detail. 7M

UNIT-V

9. a What are the subclasses of JButton class of swing package. Explain. 7M
b Write the step wise procedure to create and run an applet. Explain 7M

OR

10. a Write an applet code to demonstrate parameter passing to applet. 10M
b What is the difference between init() and start () methods in an Applet? When will each be executed 4M

|||



Scanned with OKEN Scanner

MCA I Semester A.P
(ACET) - 2022

Code No: MC2011/R20

MCA I Semester Regular/Supplementary Examinations, May-2022

BUSINESS COMMUNICATION

Time: 3 Hours

Max. Marks: 70

Answer any FIVE Questions One Question From Each Unit
All Questions Carry Equal Marks

UNIT-I

1. a What is Communication? Explain different types of Communication. 7M
b What is Listening? Explain essentials of good listening. 7M

OR

2. a Write a note on:
i) Noise ii) Listening Skills
b Discuss the objectives of Communication. 8M 6M

UNIT-II

3. a Write a note on Formal and Informal Communication. 7M
b Discuss barriers to interpersonal communication. 7M

OR

4. a Elucidate the different models for Inter-personal Communication. 7M
b Explain Exchange Theory with illustration. 7M

UNIT-III

5. a Explain the etiquettes of effective Business Correspondence. 6M
b Write a note on:
i) Paralanguage ii) Haptics 8M

OR

6. a What is Non-Verbal Communication? Explain various forms of Non Verbal Communication. 7M
b Explain appropriate body languages to follow for a Job Interview. 7M

UNIT-IV

7. a Write a short notes on
i) Negative Report ii) Persuasive and Special Reporting
b Explain the factors to be carefully examined in writing a resume. 8M 6M

OR

8. a What is a Report? Explain the structure of a report. 7M
b What is a Meeting? Explain the preparation to be made before a meeting. 7M

UNIT-V

9. a What are formal and informal interviews? Explain the techniques to conduct an interview. 7M
b Explain the importance of communication skills in group discussions. 7M

OR

10. a What is Assertiveness? Explain the strategies of Assertive Behavior. 7M
b Explain the prerequisites of an effective presentation. 7M

|||||

MCA I Semester Regular/Supplementary Examinations, May-2022

Mathematical and Statistical Foundations

Time: 3 Hours

Max. Marks: 70

Answer any FIVE Questions One Question From Each Unit

All Questions Carry Equal Marks

Note :- Statistical tables are required

UNIT-I

1. a Two cards are selected at random from 10 cards numbered 1 to 10. Find the probability that the sum is even if (i) The two cards are drawn together. (ii) The two cards are drawn one after other with replacement. 7M
b From a city, 3 news papers A, B, C are being published. A is read by 20%, B is read by 16%, C is read by 14%, both A and B are read by 8%, both A and C are read by 5%, both C and B are read by 4% and all three A, B, C are read by 2%. What is the % of the population that read at least one paper. 7M

OR

2. A continuous random variable X is defined by 14M

$$f(x) = \begin{cases} \frac{1}{16}(3+x)^2, & \text{if } -3 \leq x < -1 \\ \frac{1}{16}(6-2x^2), & \text{if } -1 \leq x < 1 \\ \frac{1}{16}(3-x)^2, & \text{if } 1 \leq x \leq 3 \\ 0, & \text{elsewhere} \end{cases}$$

Verify that f(x) is a density function and also find the mean and variance of X.

UNIT-II

3. A population consists of six numbers 1, 2, 3, 4, 5, 6. Consider all possible samples of size two which can be drawn (i) with replacement (ii) without replacement. Find
(a) The mean of the population
(b) The standard deviation of the population
(c) The mean of the sampling distribution of means
(d) The standard deviation of the sampling distribution of means 14M

OR

4. a A random sample of size 100 is taken from an infinite population having the mean = 76 and the variance = 256. What is the probability that \bar{x} will be between 75 and 78. 7M
b Explain Point Estimation and Interval Estimation. 7M

UNIT-III

5. a Explain one-tailed and two-tailed tests.
b The average marks scored by 32 boys is 72 with a S.D. of 8. While that for 36 girls is 70 with a S.D. of 6. Does this indicate that the boys perform better than girls at level of significance 0.05? 7M

OR

6. 1000 students at college level were graded according to their I.Q and the economic conditions of their home. Use χ^2 test to find out whether there is any association between condition at home and I.Q ($\alpha = 0.05$) 14M

Economic condition/ I.Q	high	low	total
Rich	460	140	600
Poor	240	160	400
total	700	300	1000

UNIT-IV

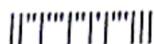
7. a Explain the homomorphism of Semi Groups and Monoids. 7M
 b Prove that $Z_{11}^* = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$ is an abelian group with respect to multiplication modulo 11. 7M

OR

8. a Prove that a non-empty subset H of a group G is a subgroup of G if and only if the following conditions are satisfied: 7M
 (i) $ab \in H, \forall a, b \in H$.
 (ii) $a \in H \Rightarrow a^{-1} \in H$.
 b State and prove Euler's theorem. 7M

UNIT-V

9. a Explain the following with examples 7M
 (i) Adjacency matrix
 (ii) Incidence matrix
 b Explain the following (i) complete graph (ii) Isomorphism of graphs 7M
 OR
 10. a Prove that the number of vertices of odd degree in a graph is always even. 7M
 b Write the algorithm to Depth-First Search for a Spanning tree. 7M



Code No: MC2013/R20

MCA I Semester Regular/Supplementary Examinations, May-2022

Computer Organization & Operating Systems

Time: 3 Hours

Max. Marks: 70

**Answer any FIVE Questions One Question From Each Unit
All Questions Carry Equal Marks**

UNIT-I

1. a Explain the Basic structure of computers and their operational concept in detail. 7M
 - b Explain various instruction formats with relevant examples. 7M
- OR**
2. a Explain various Arithmetic Operations with relevant examples. 7M
 - b Consider $C=A+B$, Explain different ways of writing this instruction with respect to number of addresses used. 7M

UNIT-II

3. a Describe the execution style of a fetch-execute cycle with a neat diagram? 7M
 - b Explain the steps of a processor to perform execute instruction 7M
- OR**
4. a How to perform an input transfer using multiple clock cycles in synchronous bus? 7M
 - b Discuss in detail Register Transfers and its operations. 7M

UNIT-III

5. a "Operating System is a Resource Manager". Justify the statement with suitable functionality of the Operating System. 7M
- b What is a System call? Explain in detail the system call sequence to copy the contents of one file to another. 7M

OR

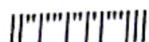
6. a Explain multithreading operating system design with diagram. 6M
- b Assume the following workload in a system: 8M

Process	Arrival Time	Burst Time
P1	5	5
P2	4	6
P3	3	7
P4	1	9
P5	2	2

Draw a Gantt chart illustrating the execution of these jobs using Round robin scheduling algorithm and also Calculate the average waiting time and average turnaround time.

UNIT-IV

7. a How semaphores can be used to deal with n-process critical section problem? Explain. 8M
 - b What are classic problems of Synchronization? Explain. 6M
- OR**
8. a How does deadlock avoidance differ from deadlock prevention? Write about deadlock avoidance algorithm in detail. 8M
 - b Write and explain the solution for Reader-Writer classical synchronization problem using monitors. 6M



UNIT-V

9. a Consider a system where free space is kept in free-space list. And the pointer to the free-space list is lost. Can the system reconstruct the free-space list? Explain with relevant example. 7M
- b What is the need for virtual memory? Describe how the address Translation is done in a page memory system? 7M
10. a Describe in detail about variety of techniques used to improve the efficiency and performance of secondary storage. 6M
- b A disk drive has 100 cylinders, numbered 0 to 99. The drive is currently serving a request at cylinder 53. The queue of pending requests, in FIFO order, is 98, 83, 37, 22, 14, 24, 65, 67. Starting from the current head position, what is the total distance (in cylinders) that the disk arm moves to satisfy all the pending requests for each of the following disk-scheduling algorithms?
i) SSTF ii) LOOK iii) C-SCAN. 8M

21P31F0034

Code No: MC2014/R20

MCA I Semester Regular/Supplementary Examinations, May-2022

Time: 3 Hours

DATA STRUCTURES

Max. Marks: 70

*Answer any FIVE Questions One Question From Each Unit
All Questions Carry Equal Marks*

UNIT-I

1. a How the Precedence and Associativity rules of operators help in executing a 'C' expression? What is the output of the following C code? Give Explanation. 7M

```
#include <stdio.h>
int main()
{
    int h = 7;
    int b = 3 * 5 + 2 * 3 < h*4 ? 3 : 2;
    printf("%d", b);
    return 0;
}
```

- b Give the syntax of various Loop control statements supported by C. Explain their execution behavior with neat flowcharts. 7M

OR

2. a Write a C program to display the sum of the series $1 + 1/2 + 1/3 + 1/4 + 1/5 + \dots 1/N$ on console, where the value of N is taken as input. 7M

- b Explain the memory allocation strategies for various types of arrays supported by C programming with neat diagrams. 7M

UNIT-II

3. a Explain the concept of structures and unions with suitable examples. 7M

- b Distinguish between char *S and char S [] with a sample C program. 7M

OR

4. a Write a C program to add two distances given as input in feet and inches using structures. (*Hint: One feet = 12 inches*) 7M

- b Give the syntax for opening files in C programming. Explain various modes of opening files with an example C program. 7M

UNIT-III

5. a How to measure the complexity of an algorithm? Briefly discuss various notations used for it. 6M

- b What are the advantages of Circular Linked lists over other types of linked lists? Depict the insert, delete and search operations on Circular Linked lists with neat diagrams. 8M

OR

6. a Why selecting appropriate data structure is so important in computer applications? Elaborate on the classification of data structures. 6M

- b With neat diagrams, explain the Insert and Delete operations in Doubly Linked List data structure. 8M



UNIT-IV

7. a Describe the five basic operations which can be performed on Stack data structure with suitable diagrams where ever necessary. 7M
b Consider a Hash table of size 7 with hash function is $h(k) = k \% m$. Insert the following elements {99,71,18,15,12,81} into a Hash table and use Quadratic probing approach to resolve the collision. 7M

OR

8. a List and explain any four significant applications of Queue data structure in computer system. 6M
b What are the significant advantages of Extendible hashing over Static hashing implementations? Explain the concept of Extendible hashing technique with an example. 8M

UNIT-V

9. a Explain the principle of Quick Sort algorithm with an example. 7M
b Show the resulting Binary Search Tree after inserting the elements 1, 4, 7, 10, 17, 21, 31, 25, 19, 20, 28, 42 in order into an empty tree. 7M
10. a How many passes are required to sort the following list of elements 24, 98, 29, 24, 77, 48, 17, 65, 14, 30 using iterative merge sort. 7M
b Explain in detail various tree traversals techniques. Discuss their applications. 7M



21P31F0034

Code No: MC2015/R20

MCA I Semester Regular/Supplementary Examinations, May-2022

Object Oriented Programming with JAVA

Time: 3 Hours

Max. Marks: 70

*Answer any FIVE Questions One Question From Each Unit
All Questions Carry Equal Marks*

UNIT-I

1. a Explain in detail the four major principles of Object Oriented Programming paradigm. 5M
- b Describe the special characteristics of Constructors and Destructors in JAVA programming. 5M
- c How strings are created using string literals and the new keyword? Give explanation. 4M

OR

2. a What are objects in object oriented programming? How they are created from class? Give the syntax. 7M
- b Write a JAVA program to find whether a triangle can be formed or not (The length of three sides are taken as input.). If the triangle can be formed then check whether the triangle formed is equilateral, isosceles, scalene or a right-angled triangle otherwise display "This Triangle is NOT possible." 7M

UNIT-II

3. a Explain in detail about the Inheritance mechanism in JAVA with suitable example programs. 5M
- b Demonstrate the importance of the CLASSPATH environment variable in creating or using a package with an example JAVA program. 5M
- c What is an Interface in JAVA? How an Interface is different from a Class? Why do we need Interfaces in JAVA? 4M

OR

4. a Explain different types of Polymorphism provided by JAVA programming. 5M
- b What are the benefits of using Packages in JAVA? With an example show how to add classes to packages and how to import packages in classes? 5M
- c Write about 'final' and 'finally' keywords in JAVA. 4M

UNIT-III

5. a What are the advantages of Exception Handling? How to specify and handle Exceptions in JAVA? Explain with a program. 7M
- b What is the necessity and importance of Thread synchronization? How it is achieved in JAVA? Explain with a sample JAVA program. 7M

OR

6. a Explain the differences between 'throw' and 'throws' with an example JAVA program. 7M
- b Write about the members and methods of Thread () class in JAVA. 7M



QUESTION PAPER

Code No: MC2015/R20

UNIT-IV

7. a What are the various sources of Events? Give the respective Event listener interfaces. 7M
b Develop a JAVA program to create a menu bar and menus in a frame. 7M

OR

8. a Why do we use Inner/Nested class in JAVA? Describe the different types of Inner/Nested classes and specify the rules for implementing them. 7M
b Discuss the purpose and types of Layout managers in JAVA. 7M

UNIT-V

9. a How to pass parameters to an Applet? Explain with a JAVA program. 7M
b Differentiate between AWTs and Swings in JAVA. 7M

OR

10. a Write about the MVC architecture and discuss its advantages. 5M
b Why does an Applet not need a main () method? Explain. 2M
c Develop a JAVA program to demonstrate the usage of JTree and JTable classes. 7M

2 of 2

