

**M.Sc. (Part-I) Semester-I (C.B.C.S. Scheme) Examination**  
**COMPUTER SCIENCE**  
**1 MCS4 Computer Networks**

Time : Three Hours]

[Maximum Marks : 80

**Note :—** (1) Assume suitable data wherever necessary.

(2) Illustrate your answers with the help of suitable diagrams.

(3) Use of mobiles or programmable devices are not allowed.

1. (a) Explain the ISO-OSI reference model for networking. State the functions of each of its layers. 8  
 (b) Describe various modes of data transmission. 6

**OR**

2. (a) Describe the following multiplexing techniques :  
 (i) FDM  
 (ii) TDM 8  
 (b) Explain the advantages and disadvantages of digital communication. 6
3. (a) Describe the working of FTP with suitable diagram. 7  
 (b) What is DNS ? Describe its functions. 6

**OR**

4. (a) Describe the authentication procedure in HTTP. 7  
 (b) Explain the various types of HTTP connection. 6
5. (a) Explain the multiplexing and demultiplexing in transport layer. 8  
 (b) Describe various approaches towards congestion. 6

**OR**

6. (a) Explain the working of stop and wait and pipelined protocols for data transfer. 8  
 (b) Describe the services provided by UDP. 6
7. (a) Describe the classification of routing algorithms. 7  
 (b) What is DHCP ? Explain. 6

**OR**

8. (a) What is Router ? Describe the components of a router. 7  
 (b) Describe the IPv4 datagram format. 6
9. (a) What is PPP ? Describe the desirable properties from PPP. 7  
 (b) Explain the working of CSMA/CD protocol. 6

**OR**

10. (a) Explain the 802.11 LAN architecture. 7  
 (b) Explain the CRC method for error detection. 6
11. (a) Explain the private key cryptography technique. 7  
 (b) What is nonce ? State its use. 6

**OR**

12. (a) What is Network Management ? Explain the areas of Network Management. 7  
 (b) What is SMI ? Explain. 6



## M.Sc. (Part—I) Semester—I (C.B.C.S. Scheme) Examination

## COMPUTER SCIENCE

## (Digital System and Microprocessor)

## Paper—1MCS1

Time : Three Hours]

[Maximum Marks : 80

**Note :—** (1) Assume suitable data wherever necessary.

(2) Illustrate your answer with the help of neat sketches.

(3) Use of mobiles or any other programmable devices are not allowed.

1. (a) Describe the possible scheme for representation of positive and negative 8 bit number in memory. 7

(b) Minimise the following logic equation using K-map and implement it by NAND gate only :

$$f(A,B,C,D) = \sum m(0, 1, 2, 3, 5, 7, 8, 9, 11, 14). \quad 7$$

**OR**

2. (a) Verify the following identity :

(i)  $A + BC = (A + B)(A + C)$

(ii)  $(A + B)(A + \overline{B}) = A. \quad 7$

(b) Obtain the following equation in standard SOP and POS form :

(i)  $Y = AB + BC + CD$

(ii)  $Y = (A + B)(B + C)(C + D). \quad 7$

3. (a) Discuss the following parameters of Logic family :

(i) Fan-out

(ii) Propagation delay

(iii) Noise immunity. 6

(b) Explain construction and operation of 1:8 demultiplexer. 7

**OR**

4. (a) Explain construction and operation of gate in TTL family. 7

(b) Explain construction and operation of Decimal to Binary encoder. 6

5. (a) Explain construction and operation of full adder with logic diagram and truth table. 7

(b) Explain 1's and 2's complement method for subtractor of binary number with suitable example. 6

**OR**

6. (a) Explain construction and operation of half adder and half subtractor using logic diagram and truth table. 7
- (b) Explain block diagram and functions of 74181 ALU IC. 6
7. (a) Explain construction and operation of CKRS and DFF with logic diagram and truth table. 7
- (b) Explain the construction and operation of ring counter with logic diagram and truth table. 6

**OR**

8. (a) What is race around condition in JK FF ? How will it be eliminated in JKMS FF ? Explain JKMS FF with its logic diagram and truth table. 7
- (b) Explain construction and operation of PISO and PIPO shift register. 6
9. (a) Draw the pin diagram of 8086 micro-processor and explain the function of following pins :
- (i)  $AD_0-AD_{15}$  (ii) READY
- (iii)  $\overline{MN/MX}$  (iv) HOLD 7
- (b) Explain the register organization of 8086 microprocessor and explain the function of each register. 6

**OR**

10. (a) Explain the evolution of microprocessor. 6
- (b) Explain the memory segmentation in 8086 microprocessor. 7
11. (a) Explain interrupt vector table of 8086 microprocessor. 7
- (b) Explain the interfacing concept of memory with odd and even banks. 7

**OR**

12. (a) Explain the interrupt structure of 8086 microprocessor. 7
- (b) Explain the interfacing of DAC with microprocessor. 7

## M.Sc. (Part—I) Semester—I (C.B.C.S. Scheme) Examination

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## (Digital System and Microprocessor)

## Paper—1MCS1

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**M.Sc. (Part-I) (Semester-I) (C.B.C.S. Scheme) Examination**  
**COMPUTER SCIENCE**  
**1MCS2 (.Net Technologies and C#)**

Time : Three Hours]

[Maximum Marks : 80

**Note** :—(1) Assume suitable data wherever necessary.

(2) Illustrate your answer with the help of neat sketches wherever necessary.

(3) Use of Mobile/Programmable devices is not allowed.

1. (A) What is CLK ? Explain. 7

(B) Explain :

(i) Framework Base Classes

(ii) Managed Code. 6

**OR**

2. (A) Explain .Net Framework with .Net Languages. 7

(B) State and explain the advantages of C# over other traditional languages. 6

3. (A) What are the data types supported by C# ? Explain. 6

(B) Write a program to print numbers from 1 to 100 in tabular manner as given below :

1 11.....91

2 12 92

3 13 93

⋮ ⋮ ⋮

10 20 100 8

**OR**

4. (A) Explain :

(i) Enumeration

(ii) Command line arguments. 6

(B) Write a program in C# to print first N terms of the series given below :

0 1 1 2 3 5 ..... N<sup>th</sup> term. 8

5. (A) How multiple inheritance is achieved in C# ? Explain with example. 6

(B) Explain :

(i) Polymorphism

(ii) Overriding. 8

**OR**

6. (A) How constructor calling is done in an Inheritance ? Explain with example. 7

(B) What are access modifiers ? State and explain different modifiers supported by C#. 7

7. (A) How exceptions are handled in C# ? Explain. 6  
(B) Write a program in C# to overload '+' operator to perform addition of two objects of the class complex. 7

**OR**

8. (A) What are delegates in C# ? Explain with example. 7  
(B) Explain :  
(i) Console class  
(ii) Finally block. 6
9. (A) Write a program to demonstrate the use of thread class. 8  
(B) State and explain basic file handling operations in C#. 5

**OR**

10. (A) Write a program in C# to copy contents of one file into o.her. 7  
(B) Explain :  
(i) File security  
(ii) Thread pooling. 6
11. (A) Write a program to update the records in database table. 7  
(B) Explain :  
(i) Sql Data Reader  
(ii) Data Set Class. 6

**OR**

12. (A) Write a procedure to establish database connection in C#. 6  
(B) Write a program to insert records into database table. 7



**M.Sc. (Part-I) (Semester-I) (C.B.C.S. Scheme) Examination**  
**COMPUTER SCIENCE**  
**1MCS3 (Operating System)**

Time : Three Hours]

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**Note** :— (1) Assume suitable data wherever necessary.

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1. (A) What is meant by system call ? Explain. 5  
 (B) Explain :  
 (a) Process  
 (b) Thread  
 (c) Multiprogramming. 9

**OR**

2. (A) Explain the following terms :  
 (a) Virtual Processor  
 (b) Device Driver. 8  
 (B) Explain :  
 (i) Time Sharing  
 (ii) Real Time Systems. 6
3. (A) What is Round Robin ? Explain. 6  
 (B) Explain operating system for a two processor system in brief. 7

**OR**

4. (A) Explain the following terms :  
 (i) PCB  
 (ii) Types of schedulers. 6  
 (B) Calculate average waiting time for processes given below using SJF and RR with  $q = 3$  :

| Process | CPU Burst Time |
|---------|----------------|
|---------|----------------|

|                |   |
|----------------|---|
| P <sub>1</sub> | 5 |
|----------------|---|

|                |   |
|----------------|---|
| P <sub>2</sub> | 7 |
|----------------|---|

|                |   |
|----------------|---|
| P <sub>3</sub> | 3 |
|----------------|---|

|                |    |
|----------------|----|
| P <sub>4</sub> | 10 |
|----------------|----|

5. (A) What are the necessary conditions for the occurrence of deadlock ? Explain with example. 7  
 (B) Explain the techniques to recover from deadlock by using :  
 (i) Process termination  
 (ii) Resource preemption.  
 Give the advantages/disadvantages of each. 6

**OR**

6. (A) Explain dining-philosophers problem. Also explain the solution to the dining-philosophers problem. 7
- (B) What is critical section ? Explain solutions to solve critical section problem. 6
7. (A) Consider the following page reference :
- 1, 2, 3, 4, 5, 3, 4, 1, 6, 7, 8, 7, 8, 9, 7, 8, 9, 5, 4, 5, 4, 2
- (i) How many page faults will occur using optimal page replacement with 4 frames ?
- (ii) Find the effective access time if the main memory access time is 1 ms and page fault service time is 30 ms with page fault rate obtained from question no. 7(A) (i) 8
- (B) Explain the following terms :
- (i) Page table
- (ii) Internal and external fragmentation. 6
- OR**
8. (A) Differentiate between :
- (i) Swapping and Thrashing
- (ii) Paging and Demand Paging. 6
- (B) Compare and contrast various techniques used for free space management. 8
9. (A) Define the following :
- (i) Seek time
- (ii) Latency time
- (iii) Transfer time. 3
- (B) State and explain different disk scheduling algorithms. 10
- OR**
10. (A) What are flash files ? Explain. 6
- (B) Compare and contrast various techniques used for free space management. 7
11. (A) State and explain the characteristics of embedded system. 6
- (B) Explain the following :
- (i) Remote File Transfer
- (ii) File Replication. 7
- OR**
12. (A) What is process migration ? Explain. 6
- (B) What is meant by “Kernel Synchronization” in Linux ? Describe how it is implemented in Linux. 7

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| P <sub>3</sub> | 3              |
| P <sub>4</sub> | 10             |

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