

Roll No.

TMC-201/TMI-205

M. C. A./M. SC. (IT)
(SECOND SEMESTER)

MID SEMESTER EXAMINATION, 2019

**OBJECT ORIENTED PROGRAMMING
USING C++**

Time : 1 : 30 Hours

Maximum Marks : 50

- Note :** (i) This question paper contains two Sections.
(ii) Both Sections are compulsory.

Section—A

1. Fill in the blanks/True-False : (1×5=5 Marks)
 - (a) A function with no return type value is declared as _____.
 - (b) In function overloading, two functions can have the same _____ in a program.

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- (c) Super classes may also be called as parent class/base class. (True/False)
- (d) A class is a collection of _____ and _____.
- (e) A technique of creating a new class from an existing class is known as _____.
2. Attempt any five parts : (3×5=15 Marks)

- (a) What will be the output of the following program ?

```
#include<iostream.h>
#include<conio.h>
void main( )
{
    short unsigned int = 0;
    cout<<i--;
    getch( );
}
```

- (b) What is scope resolution operator ? Write any two ways where scope resolution operator is used.
- (c) Define Encapsulation.
- (d) What are the advantages of Inheritance ?
- (e) Define static data members.

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- (f) Write any three differences between function overloading and function overriding.

Section—B

3. Attempt any two parts of choice from (a), (b) and (c). (5×2=10 Marks)

- (a) What is Inline Function ? How can we make function inline ? Write one program.

- (b) Differentiate OOP and POP.

- (c) WAP in C++ using friend function to enter the data of any two persons including the details like name, father_name, mother_name and gender. Compare the father_name and mother_name of these 2 persons and find whether they belong to same family or not.

4. Attempt any two parts of choice from (a), (b) and (c). (5×2=10 Marks)

- (a) What is OOP ? Define any five basic concepts of it.

- (b) Define access specifiers with all its types.

- (c) What is constructor and how are they different from a normal member function ?

5. Attempt any *two* parts of choice from (a), (b) and (c). $(5 \times 2 = 10 \text{ Marks})$

(a) WAP in C++ to implement function overloading for the following triangles :

 - (i) Equilateral triangle = 2
 - (ii) Scalene triangle = $(\text{base} * \text{height}) / 2$
 - (iii) Right angled triangle
where $x = (a + b + c) / 2$

(b) How does friend function work in C++ ?
Write one program for it.

(c) In how many ways we can define member function in C++ ? Define with the help of program.

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M. C. A. (SECOND SEMESTER) MID SEMESTER EXAMINATION, 2019

MICROPROCESSOR AND MICROCONTROLLER

Time : 1 : 30 Hours

Maximum Marks : 50

Note : (i) This question paper contains two Sections.

(ii) Both Sections are compulsory.

Section—A

1. Fill in the blanks/True-False : (1×5=5 Marks)

- (a) The memory capacity when there are 40 address lines _____.
- (b) For mostly all arithmetic and logical operation the register important is _____.
- (c) ANI 05H is a _____ byte instruction.

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- (d) Auxiliary carry flag is not used for condition in 8085 microprocessor.
(True/False)
- (e) The highest priority maskable interrupt is _____.
2. Attempt any five parts : (3×5=15 Marks)
- Explain ALE signal of 8085 microprocessor.
 - Draw the flag register of 8085 microprocessor and explain with one example.
 - Explain the two special purpose register of 8085 microprocessor.
 - Write a program to subtract two 8 bit numbers.
 - Draw the external system bus architecture.
 - Draw the architecture of 8085 microprocessor.

Section—B

3. Attempt any two parts of choice from (a), (b) and (c). (5×2=10 Marks)
- Explain the important features of 8085 microprocessor.
 - Mention the data transfer instructions of 8085 microprocessor with examples.

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- (c) Explain the following code and specify the contents of registers and flag status after each instruction executed :

MVI A, FFH

MVI B, 01H

ADI 01H

ADD B

MOV C, A

MOV D, B

H LT

4. Attempt any two parts of choice from (a), (b) and (c). (5×2=10 Marks)

- Explain the control and status signals of 8085 microprocessor.
 - Load the hexadecimal numbers AAH and A7H in register H and L respectively and add the numbers. If the sum is greater than FFH, display 01H at 2500H; otherwise display result.
 - Interface a 8 KB EPROM memory with 8085 microprocessor.
5. Attempt any two parts of choice from (a), (b) and (c). (5×2=10 Marks)
- Explain the addressing modes of 8085 microprocessor.

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- (b) Write an assembly language program using 8085 microprocessor to add two 32 bit numbers.
- (c) Write the difference between Memory-mapped I/O and Peripheral I/O.

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**M. C. A. (SECOND SEMESTER)
MID SEMESTER EXAMINATION, 2019
COMPUTER BASED NUMERICAL AND
STATISTICAL TECHNIQUES**

Time : 1:30 Hours

Maximum Marks : 50

- Note :** (i) This question paper contains two Sections.
(ii) Both Sections are compulsory.

Section—A

1. Fill in the blanks/True-False : ($1 \times 5 = 5$ Marks)
 - (a) The number 0.00023 contains significant figures.
 - (b) If the number 3.1416 is correct to 4 decimal places, then error =
 - (c) Bisection method is always converges. (True/False)
 - (d) Newton-Raphson method is linear convergent. (True/False)
 - (e) Gauss' forward difference formula is applicable when u lies between and

(2)

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2. Attempt any *five* parts : (3×5=15 Marks)
- An approximate value of π is given by 3.1428571 and its true value is 3.1415926. Find the absolute and relative errors.
 - Compute the middle value of numbers $a = 4.568$ and $b = 6.762$ using four digit arithmetic.
 - Find the truncation error for e^x at $x = \frac{1}{5}$ if the first three terms are retained in expansion.
 - Compute the real root of $x^3 - 5x + 3 = 0$ in the interval [1, 2] by the Regula-Falsi method. Perform three iterations only.
 - Prove that :

$$e^x = \left(\frac{\Delta^2}{E} \right) e^x \cdot \frac{Ee^x}{\Delta^2 e^x}$$

- (f) Find the missing value of the following table :

x	$f(x)$
1	7
2
3	13
4	21
5	37

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Section—B

3. Attempt any *two* parts of choice from (a), (b) and (c). (5×2=10 Marks)
- $\sqrt{29} = 5.385$ and $\sqrt{11} = 3.317$ are correct to four significant figures. Find the relative error in their sum and difference.
 - Evaluate $\sqrt{12}$ to four decimal places by using Newton-Raphson method.
 - Find a cubic polynomial in x which takes on the values -3, 3, 11, 27, 57 and 107, when $x = 0, 1, 2, 3, 4$ and 5 respectively.
4. Attempt any *two* parts of choice from (a), (b) and (c). (5×2=10 Marks)
- Using Lagrange's interpolation formula, find $f(2.5)$ from the following table :

x	$f(x)$
1	1
2	8
3	27
4	64

(b) Show that Newton-Raphson method is quadratic convergent.

(c) Using Newton's forward interpolation formula. Estimate the population for the year 1895 from the table of the population of a town in the decimal census :

Year X	Population Y (in thousands)
1891	46
1901	66
1911	81
1921	93
1931	101

5. Attempt any two parts of choice from (a), (b) and (c). $(5 \times 2 = 10 \text{ Marks})$

(a) Using Bessel's formula to find y_{15} , given :

$$y_{10} = 2854, \quad y_{14} = 3162, \quad y_{18} = 3544, \\ y_{22} = 3992.$$

(b) Use Gaussian elimination to solve the system of linear equations :

$$2y + z = -8$$

$$x - 2y - 3z = 0$$

$$-x + y + 2z = 3$$

(c) Using Newton's divided difference formula, find $f(6)$ from the following table :

x	$f(x)$
1	1
2	5
7	5
8	4

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**M. C. A./M. SC. (IT)
(SECOND SEMESTER)**

MID SEMESTER EXAMINATION, 2019

OPERATING SYSTEM

Time : 1 : 30 Hours

Maximum Marks : 50

Note : (i) This question paper contains two Sections.

(ii) Both Sections are compulsory.

Section—A

1. Multiple choice questions : (1×5=5 Marks)

(i) The number of processes completed per unit time is known as _____.

- (a) Output
- (b) Throughput
- (c) Efficiency
- (d) Capacity

(ii) One of the problems with priority scheduling is :

- (a) Ageing

- (b) Starvation
 - (c) Process death
 - (d) Average waiting time
- (iii) UNIX is _____ operating system.
- (a) Single user
 - (b) Real time
 - (c) Time Sharing
 - (d) None of these
- (iv) Multiprogramming systems :
- (a) are easier to develop than single programming systems
 - (b) execute each job faster
 - (c) execute more jobs in the same time period
 - (d) are used only one large mainframe computers.
- (v) _____ runs on computer hardware and serve as platform for other software to run.
- (a) Operating System
 - (b) Application Software
 - (c) System Software
 - (d) All of the above
2. Attempt any five parts : (3×5=15 Marks)
- (a) Define "Turnaround Time" and "Response Time" in the context of process execution.

- (b) Define the term "System Software".
- (c) Define library function and system calls.
- (d) Define Context Switching.
- (e) Define Process Control Block (PCB).
- (f) What is dispatcher ? Explain dispatch latency.

Section—B

3. Attempt any two parts of choice from (a), (b) and (c). (5×2=10 Marks)
- (a) Why shell of an Operating System is called as command interpreter ? Also explain the features provided by the shell.
 - (b) Describe Real Time Operating System (RTOS). In addition, explain the area where RTOS is used.
 - (c) Define Co-operating processes. Also explain mutual exclusion and bounded waiting condition.
4. Attempt any two parts of choice from (a), (b) and (c). (5×2=10 Marks)
- (a) Describe the process of virtualization. Also explain host and guest operating system in Virtual Machine.
 - (b) Describe Round Robin CPU scheduling algorithm.

- (c) Write and explain Rate Monotonic and Earliest Deadline First Algorithms with examples.

5. Attempt any *two* parts of choice from (a), (b) and (c). $(5 \times 2 = 10 \text{ Marks})$

 - Explain long-term, mid-term and short-term schedulers.
 - Explain Multi-level queue and Multi-level feedback queue CPU scheduling algorithms.
 - For the following set of processes, calculate the average turnaround time and average waiting time by using Round Robin (quantum = 2) CPU scheduling algorithm :

Arrival time	Process	CPU Burst	Priority
0	P1	8	3
1	P2	14	1
2	P3	6	1
3	P4	3	2

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M. C. A. (SECOND SEMESTER) MID SEMESTER EXAMINATION, 2019

PYTHON PROGRAMMING

Time : 1 : 30 Hours

Maximum Marks : 50

- Note : (i) This question paper contains two Sections.
(ii) Both Sections are compulsory.

Section—A

1. Fill in the blanks/True-False/MCQs :
 $(1 \times 5 = 5 \text{ Marks})$
 - (a) Which is the correct operator for power (xy) ?
 - (i) x^y
 - (ii) $x**y$
 - (iii) $x^{^y}$
 - (iv) None of the mentioned
 - (b) What data type is the object below ?
 $L = [1, 23, 'hello', 1].$
 - (i) list

- (ii) dictionary
 (iii) array
 (iv) tuple
 (c) Strings are immutable. (True/False)
 (d) Write protect data can be stored using _____ datatype.
 (e) Mathematical operations can be performed on a string. (True/False)
2. Attempt any *five* parts : (3×5=15 Marks)
 Define the following :
- (a) Following set of commands are executed in shell, what will be the output ?
- (i) >>>str="hello"
 >>>str[:2]
 >>>
- (ii) x = ['ab', 'cd']
 for i in x;
 i.upper()
 print(x)
- (b) Discuss some of the applications of python.
- (c) Write a short note on immutable data types in python.
- (d) What are control statements ? Discuss if-else statement in python.
- (e) Enlist some of the features of python.

- (f) Discuss scope of the variables in python with example.

Section—B

3. Attempt any *two* parts of choice from (a), (b) and (c). (5×2=10 Marks)
- (a) What are the functions in python ? Discuss declaration syntax of function with example.
- (b) Discuss different arithmetic operators in python. Also discuss the difference between * and ** operators.
- (c) Write a python script to create a list and insert 10 numbers in it. Numbers should be taken as input. If number is odd the value at the respective index will be 0 otherwise store the number.
4. Attempt any *two* parts of choice from (a), (b) and (c). (5×2=10 Marks)
- (a) Explain python data types with suitable example.
- (b) Write steps to create, save and execute a python script.
- (c) Write a python program to create a function that will check whether a number is palindrome or not.

5. Attempt any *two* parts of choice from (a), (b) and (c). $(5 \times 2 = 10 \text{ Marks})$
- What are modules in python ? How can we import modules in python ?
 - What are operators in python ? Discuss relational and logical operator with example.
 - Write a program to find the sum of all numbers stored in a list.

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M. C. A. (SECOND SEMESTER) MID SEMESTER EXAMINATION, 2019

PROFESSIONAL COMMUNICATION-II

Time : 1 : 30 Hours

Maximum Marks : 50

- Note : (i) This question paper contains two Sections.
(ii) Both Sections are compulsory.

Section—A

1. Fill in the blanks/True-False : ($1 \times 5 = 5$ Marks)
 - (a) Formal Communication is a communication based on parties.
(True/False)
 - (b) Verbal Communication is a type of Formality based Communication.
(True/False)
 - (c) Précis can be written without a caption.
(True/False)
 - (d) A positive feedback is also termed as _____ feedback.
 - (e) Chronomics deals with _____.

2. Attempt any five parts : (3×5=15 Marks)
- Write the Do's in a Précis (any three).
 - List the 7 C's of communication.
 - Write *three* parameters taken into consideration for analyzing the audience.
 - Write the components (in logical sequence) that make communication a process.
 - Draw the different zones of nearness in Proxemics.
 - Write the objectives of delivering a presentation. (any three).

Section—B

3. Attempt any two parts of choice from (a), (b) and (c). (5×2=10 Marks)
- Write a cover letter to apply for the post of 'Software Developer' in HCL Technologies. Treat yourself as a Fresh MCA graduate.
Sender's Name : Mark Shaw Receiver's Name : Paul Edwin
 - Explain the components of Paralanguage in detail.
 - Explain the methods of presentation delivery in detail.

4. Attempt any two parts of choice from (a), (b) and (c). (5×2=10 Marks)
- Explain Gestures in detail.
 - Explain the types of Resume in detail.
 - Write a paragraph on "Autobiography of a Black Board".
5. Attempt any two parts of choice from (a), (b) and (c). (5×2=10 Marks)
- Explain all four approaches to effective listening.
 - Differentiate between Oral and Written Communication.
 - Write a précis of the following :

Trees give shade for the benefit of others, and while they themselves stand in the sun and endure the scorching heat, they produce the fruit of which others profit. The character of good men is like that of trees. What is the use of this perishable body if no use is made of it for the benefit of mankind ? Sandalwood, the more it is rubbed, the more scent does it yield. Sugarcane, the more it is peeled and cut up into pieces, the more juice does it produce. The men who are noble at heart do not lose their qualities even in losing their

lives. What matters whether men praise them or not ? What difference does it make whether they die at this moment or whether lives are prolonged ? Happen what may, those who tread in the right path will not set foot in any other. Life itself is unprofitable to a man who does not live for others. To live for the mere sake of living one's life is to live the life of dog and crows. Those who lay down their lives for the sake of others will assuredly dwell forever in a world of bliss.

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TMI-201

M. SC. (IT) (SECOND SEMESTER) MID SEMESTER EXAMINATION, 2019

PYTHON PROGRAMMING

Time : 1 : 30 Hours

Maximum Marks : 50

Note : (i) This question paper contains two Sections.

(ii) Both Sections are compulsory.

Section—A

1. Fill in the blanks/True-False/Multiple choice questions : (1×5=5 Marks)

(a) Which is the correct operator for floor division ?

- (i) X/y
- (ii) X/y
- (iii) X^^y
- (iv) None of the mentioned

(b) What data type is the object below ?

L =(11, 23, 35, 100)

- (i) list
- (ii) dictionary
- (iii) Set
- (iv) tuple

- (c) elif is similar to elseif. (True/False)
- (d) Write protect data can be stored using _____ datatype.
- (e) _____ is an identity operator.
2. Attempt any five parts : (3×5=15 Marks)
- Define the following :
- (a) Following set of commands are executed in shell, what will be the output ?
- (i) >>>str='this is an example'
>>>str[:-2]
>>>
- (ii) x = [10, 20]
for i in x:
x[i]=x[i]+10
print(x)
- (b) Discuss some of the applications of python.
- (c) Write a short note on mutable data types in python.
- (d) What are control statements ? Discuss if-else statement in python
- (e) Enlist some of the features of python.
- (f) What are identity and membership operators in python ? Discuss with example.

Section—B

3. Attempt any two parts of choice from (a), (b) and (c). (5×2=10 Marks)
- (a) What are functions in python ? Discuss declaration syntax of function with example.
- (b) Discuss while and for loop in python. Give suitable example.
- (c) Write a python script to add two matrices.
4. Attempt any two parts of choice from (a), (b) and (c). (5×2=10 Marks)
- (a) What are data types ? Discuss python data types with example.
- (b) Write steps to create, save and execute a python script.
- (c) Write a python program to create a function to print Fibonacci series for n numbers. (n should be taken as input from the user)
5. Attempt any two parts of choice from (a), (b) and (c). (5×2=10 Marks)
- (a) What are modules in python ? How can we import modules in python ?

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- (b) What are operators in python ? Discuss relational and logical operators with example.
- (c) Write a program to find the input a number from the user and check the occurrence of the number in the given list.

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TMI-202

M. SC. (IT) (SECOND SEMESTER) MID SEMESTER EXAMINATION, 2019

DATABASE MANAGEMENT SYSTEM

Time : 1 : 30 Hours

Maximum Marks : 50

- Note :**(i) This question paper contains two Sections.
(ii) Both Sections are compulsory.

Section—A

1. Fill in the blanks/True-False : ($1 \times 5 = 5$ Marks)
 - (a) Collection of related records is a database.
(True/False)
 - (b) DBA stands for database access.
(True/False)
 - (c) The level of data abstraction which describes how the data is actually stored is physical level. (True/False)
 - (d) Between the users and the database itself, a DBMS will act as _____.
 - (e) Data about data is normally termed as _____.

(2)

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2. Attempt any *five* parts : $(3 \times 5 = 15 \text{ Marks})$
(Define/Short Numerical/Short Programming/
Draw)
- (a) Describe query language.
 - (b) Define schema and instances.
 - (c) What is the role of primary key ?
 - (d) Define the term database.
 - (e) Define generalization.
 - (f) Explain the difference between external,
internal and conceptual schemas.

Section—B

3. Attempt any *two* parts of choice from (a), (b)
and (c). $(5 \times 2 = 10 \text{ Marks})$

- (a) Define DBMS, write advantages and
disadvantages.
- (b) Discuss on the role of DBA.
- (c) Explain the concept of various keys in
DBMS.

4. Attempt any *two* parts of choice from (a), (b)
and (c). $(5 \times 2 = 10 \text{ Marks})$

- (a) Explain the concept of ER model.
- (b) Draw and explain three level architecture
of DBMS.
- (c) Define DDL and DML.

(3)

5. Attempt any *two* parts of choice from (a), (b)
and (c). $(5 \times 2 = 10 \text{ Marks})$

- (a) Compare between DBMS and traditional
file processing system.
- (b) Explain the difference between logical and
physical data independence.
- (c) Describe the various database users.

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TMI-204

M. SC. (IT) (SECOND SEMESTER)
MID SEMESTER EXAMINATION, 2019
SOFTWARE ENGINEERING AND PROJECT
MANAGEMENT

Time : 1 : 30 Hours

Maximum Marks : 50

Note :(i) This question paper contains two Sections.

(ii) Both Sections are compulsory.

Section—A

1. Fill in the blanks/True-False : (1×5=5 Marks)
 - (a) SRS stands for _____.
 - (b) In SDLC phase is also known as programming phase.
 - (c) In terms of Software Engineering, Coupling is the degree of interdependence between software modules. (True/False)

(2)

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- (d) The waterfall model is referred to as the Non-linear model. (True/False)
- (e) Which fact finding tool gives us the first hand information ?
- (i) Interview
 - (ii) Questionnaire
 - (iii) Presentation
 - (iv) On site Observation
2. Attempt any *five* parts : (3×5=15 Marks)
- (a) What are the problems associated with Software engineering ? Explain.
 - (b) Write some differences between System software and Application software.
 - (c) Write some characteristics of software.
 - (d) What do you mean by the term "Software Engineering" ?
 - (e) What is SRS ? Define it with the help of example.
 - (f) What are the applications of Software's ? Give examples also.

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Section—B

3. Attempt any *two* parts of choice from (a), (b) and (c). (5×2=10 Marks)
- (a) Explain the concept of "Software Project Management Spectrum", explain in your own words ? Also explain the concept of 4 Ps in SPM.
 - (b) What do you mean by Software Project Planning ? What are the various objectives of planning ? Why the planning is called as the primary function of the management ?
 - (c) Define "Coupling" and "Cohesion" in detail.
4. Attempt any *two* parts of choice from (a), (b) and (c). (5×2=10 Marks)
- (a) What is SDLC ? Define all the phases of it.
 - (b) Explain waterfall model with the help of a diagram.
 - (c) Define some processes of "Software Requirement Engineering process".

(4)

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5. Attempt any *two* parts of choice from (a), (b) and (c). $(5 \times 2 = 10 \text{ Marks})$

- (a) What is the need for software project management ?
- (b) What are the various fact finding tools ?
Explain in detail.
- (c) Define the term "Software Designing" in detail.

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TMI-206

**M. SC. (IT) (SECOND SEMESTER)
MID SEMESTER EXAMINATION, 2019
DATA COMMUNICATION AND COMPUTER
NETWORK**

Time : 1 : 30 Hours

Maximum Marks : 50

- Note :** (i) This question paper contains two Sections.
(ii) Both Sections are compulsory.

Section—A

1. Fill in the blanks : (1×5=5 Marks)
 - (a) The layer _____ lies between data link layer and transport layer in ISO-OSI reference model.
 - (b) You have five computers connected by an Ethernet switch at home. Is this a LAN, a MAN or a WAN ?
 - (c) The period of a signal is 100 ms. Its frequency in kilohertz will be _____ .

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- (d) A digital signal has a bit rate of 5 kbps, the duration of each bit will be _____.
- (e) If two *or* more bits in the data unit have changed from 1 to 0 *or* 0 to 1 is known as _____ error.
2. Attempt any *five* parts : (3×5=15 Marks)
- What is the difference between a port address, a logical address, and a physical address ?
 - What are two reasons for using layered protocols ? What is one possible disadvantage of using layered protocols ?
 - How do the layers of the Internet model correlate to the layers of the OSI model ?
 - What is the difference between network layer delivery and transport layer delivery ?
 - Suppose a computer sends a packet at the network layer to another computer somewhere in the Internet. The logical destination address of the packet is corrupted. What happens to the packet ? How can the source computer be informed of the situation ?

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- (f) We need to send 265 kbps over a noiseless channel with a bandwidth of 20 kHz. How many signal levels do we need ?
- (g) How does switch differ from a router ?

Section—B

3. Attempt any *two* parts of choice from (a), (b) and (c). (5×2=10 Marks)
- Match the following to one or more layers of the OSI model :
 - Reliable process-to-process message delivery
 - Route selection
 - Defines frames
 - Provides user services such as e-mail and file transfer
 - Transmission of bit stream across physical medium
 - A path in a digital circuit-switched network has a data rate of 1 Mbps. The exchange of 1000 bits is required for the setup and teardown phases. The distance between two parties is 5000 km. Answer

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the following questions if the propagation speed is 2×10^8 m :

- (i) What is the total delay if 1000 bits of data are exchanged during the data transfer phase ?
 - (ii) What is the total delay if 100,000 bits of data are exchanged during the data transfer phase ?
 - (c) A sine wave is offset $1/6$ cycle with respect to time 0. What is its phase in degrees and radians ?
4. Attempt any *two* parts of choice from (a), (b) and (c). $(5 \times 2 = 10$ Marks)
- (a) Translation, encryption, and compression are some of the duties of the presentation layer in the OSI model. Which layer do you think is responsible for these duties in the Internet model ? Explain your answer. Which layer is responsible for Dialog control and synchronization in OSI model and Internet Model ?

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- (b) Explain the Delta Modulation (PCM) technique used for Analog to Digital conversion.
- (c) Explain the Manchester and differential Manchester encoding also sketch the same encoding for the following bit stream (take necessary assumption) :

10011010000001000001

5. Attempt any *two* parts of choice from (a), (b) and (c). $(5 \times 2 = 10$ Marks)

- (a) Explain the various functions of Transport Layer and Network Layer.
- (b) Explain the various framing methods used in Data Link Layer with proper examples.
- (c) A bit string 01111101111111010101111110, needs to be transmitted at the data link layer what is the string transmitted after bit stuffing using starting and ending flag with bit stuffing.