SUBJECT: COMPUTER SCIENCE (PAPER-I)

TIME ALLOWED: THREE HOURS **MAXIMUM MARKS: 100**

NOTE:
i. All the parts (if any) of each Question must be attempted at one place instead of at different places.
ii. Write Q. No. in the Answer Book in accordance with Q. No. in the Q. Paper.
iii. No Page/Space be left blank between the answers. All the blank pages of Answer Book must be crossed.
iv. Extra attempt of any question or any part of the question will not be considered.

NOTE: Attempt FIVE Questions in All. Attempt at least ONE question from each Section.

SECTION-A

Q No.1: a) Identify the number of Hexadecimal digits needed to represent each of the following binary values:

(i) A binary value having 16 bits. 4
(ii) A binary value having 25 bits. 7

b) Convert the decimal value "25" into its binary form. You are required to show all steps of conversion. 11001 **(8+12=20 Marks)**

Q No.2: a) Write down the algorithm to convert km into meters.

1Km=1000m

b) Write the phases of three-step development process which incorporates testing in each SDLC phase instead of using testing as a separate phase. **(12+8=20 Marks)**

Q No.3: a) According to which Algorithm discovery approach, the whole task is broken down into simpler parts, and some of those tasks may need further subdivision.

b) Write the definition of a function name Add() which takes two integer type arguments, add these arguments and return the result. **(5+15=20 Marks)**

SECTION-B

Q No.4: a) Write down the names of three main steps that are used in Pulse Code Modulation technique.

b) How many connections/links will be needed to connect 10 computers with each other in a direct point to point network? Also write formula used for calculation.

(6+14=20 Marks)

Q No.5: a) As you knew that Bridges forward frames based on the record in the database in the form of tables. Initially, this table is empty, i.e. No address or information for nodes is given, but gradually as the computer starts transferring data, table gets filled. You are required to mention the names of states of bridge in the following conditions:

(i) When a bridge first boots the address lists are empty.
(ii) When the list gets filled after the bridge has received at least one frame from each computer on the network.

Q No.6: **a)** Write down the Huntington postulates of Boolean algebra. Also give the differences between the Boolean algebra and Arithmetic and ordinary algebra?

b) What is use of Venn's diagram? Explain with figure. **(14+6=20 Marks)**

SECTION-C

Q No.7: **a)** Convert the following infix expression to the equivalent postfix expressions:

4+9/((3-5)+8)-7+2

b) Define Tree and explain basic terminologies related to tree in details. **(10+10=20 Marks)**

Q No.8: **a)** Briefly explain the main functions of an operating system.

b) Explain at least four scheduling algorithms in detail. Also tell which scheduling algorithm is mostly used in single process computer? **(10+10=20 Marks)**

Q No.9: **a)** Define deadlock. Differentiate between deadlock avoidance and deadlock prevention with example.

b) Define operating system. Explain different types of operating systems in detail? **(10+10=20 Marks)**