

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI  
(MID SEMESTER EXAMINATION)**

**CLASS: IMSC  
BRANCH: CHEMISTRY**

**SEMESTER: II  
SESSION: SP/2020**

**SUBJECT: CS270 FUNDAMENTAL OF COMPUTER SCIENCE**

**TIME: 2 HOURS**

**FULL MARKS: 25**

**INSTRUCTIONS:**

1. The total marks of the questions are 25.
  2. Candidates may attempt for all 25 marks.
  3. Before attempting the question paper, be sure that you have got the correct question paper.
  4. The missing data, if any, may be assumed suitably.
  5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
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|----|--|---------|-----------|-------------------|
| Q1 | (a) Answer any <u>five</u> questions:<br>(i). Define ASCII code and write down the ASCII codes for H, T and 7.<br>(ii). Under what circumstances are decimal digits coded using ASCII?<br>(iii). What is the binary equivalent of the octal number 723?<br>(iv). Convert the following binary numbers to decimal: 0.11010.<br>(v). Find the binary equivalent of $(0.5625)_{10}$ .<br>(vi). Convert the following decimal to hexadecimal numbers: 285.48.                                      | [5x1=5] | CO<br>CO1 | BL<br>BT2,<br>BT3 |
| Q2 | (a) Answer any <u>five</u> questions:<br>(i). Add the following binary numbers: 1011011.111 + 1010110.1010.<br>(ii). Subtract the following decimal numbers using 10's complement representation for negative numbers: 684-35.<br>(iii). Using 2's complement representation subtracts (+3) from (-5).<br>(iv). What are the functions of 'Electronic Mail' and 'World Wide Web'?<br>(v). What is zoned decimal numbers and packed decimal numbers in EBCDIC?<br>(vi). How to edit text files? | [5x1=5] | CO1       | BT2,<br>BT3       |
| Q3 | (a) (I) Write a program to check whether the number is even or odd using switch case.<br><p style="text-align: center;">OR</p> (II) Write a program to input three numbers and then find largest of them using conditional (? :) operator.   | [2]     | CO2       | BT3               |
| Q3 | (b) (I) Write a program to print 'GCD of two numbers' using recursion. The recursive function of this problem is given as:<br>GCD (a, b) = b, if b divides a.<br>GCD (b, a mod b), otherwise.<br>(II) And also compare the result of GCD with recursion and GCD with iteration.  | [2+1=3] | CO4       | BT3               |
| Q4 | (a) Write a program/ algorithm to merge two arrays and store them in 3 <sup>rd</sup> array.  | [2]     | CO3       | BT3               |
| Q4 | (b) Write a procedure/ algorithm / function for Insertion sort and analyse its time complexity.  | [3]     | CO4       | BT4               |
| Q5 | (a) Write a procedure/ algorithm / function for Binary search and analyze its time complexity.   | [2]     | CO4       | BT4               |
| Q5 | (b) (I) Write the different operations of Stack. Explain each operation with the help of algorithm/ procedure/ function and examples.<br>(II) Evaluate the following infix expressions to their postfix equivalents with help of stack:<br>$((A-B) + D / ((E+F) * G))$   | [2+1=3] | CO4       | BT5               |