**U.S.N** [ ][ ][ ][ ][ ][ ][ ][ ][ ][ ]

# P.E.S. College of Engineering, Mandya - 571 401

*(An Autonomous Institution affiliated to VTU, Belagavi)*

**First Semester, B.E. - Semester End Examination; Dec - 2017/Jan - 2018**

**Computer Concepts and 'C' Programming**

(Common to All Branches)

*Time: 3 hrs*                                                                    *Max. Marks: 100*

*Note*: Answer **FIVE** full questions, selecting **ONE** full question from each unit.

## UNIT - I

| | | |
|---|---|---|
| 1 a. | What is the need for writing an algorithm? Write an algorithm to find largest of three numbers. | 6 |
| b. | Define type conversion. Explain different types of the same. | 5 |
| c. | What is a conditional operator? Explain with an example program. | 5 |
| d. | Write C assignments statements to evaluate the following equations : | |

i) Area = $\pi r^2 + 2\pi rh$            ii) $T = \dfrac{2m_1 . m_2}{m_1 + m_2} . g$

iii) $side = \sqrt{a^2 + b^2 - 2ab \cos(x)}$

iv) $Energy = mass \left[ acceleration \times height + \dfrac{(velocity)^2}{2} \right].$            4

| | | |
|---|---|---|
| 2 a. | Explain briefly the structure of a C program. | 5 |
| b. | Evaluate the expressions, where *a = 8, b = 15, c = 4, d = 10;*<br>i) *2\*(a%5)\*(4+ (b-3)/(c+2))*<br>ii) *d!=b&&!(d<c) !! b>a.* | 6 |
| c. | Briefly write about C tokens with examples. | 4 |
| d. | Write a flowchart to determine whether a given number is prime or not. | 5 |

## UNIT - II

| | | |
|---|---|---|
| 3 a. | Show the exact output that the following output statements will produce if variable<br>s1= "NEW DELHI 110001"<br>i) printf ("%s");          ii) print f ("%20.10s", s1);          iii) printf ("%5s", s1);<br>iv) printf ("%-20.10s",s1);          v) print f ("% .5s", s1); | 5 |
| b. | Differentiate between break and continue statements. | 5 |
| c. | Write a C program using if statement to find all the possible roots of a quadratic equation. | 8 |
| d. | Explain with general format, "SWITCH" statement in C. | 2 |
| 4 a. | Write a program in C to compute area of a circle, area of a rectangle, and area of triangle given radius, length, breadth, and base height respectively. Use choice,<br>1-for area of circle          2- for area of rectangle          3 - for area of triangle. | 10 |
| b. | Explain else-if ladder with its general form. Write a C program using if-else ladder for the following problem. Program should accept taxable income of an individual and should print the income tax slab rates for the year 2017-18 as per the following table: | 10 |

| Income slab | Tax rate slabs |
|---|---|
| Upto 2.5 lakhs | Nil - No tax to be paid |
| 2.5lakhs to 5 lakhs | 10% of the income over 2.5L |
| 5 lakhs to 10 lakhs | 20% of the income over 5L |
| 10 lakhs + | 30% of income over 10L |
| Any other value | Improper income range. |

## UNIT - III

5 a. Differentiate between pre-test and post-test loops. Illustrate your answer with suitable example.    6

   b. Write a program to perform binary search for an unsorted input list.    10

   c. Write a C program to find the transpose of a 2x3 matrix.    4

6 a. Write a C program to read a positive number and reverse the given number.    6

   b. Define an array. Explain the declaration and initialization of both one dimensional and two dimensional arrays.    8

   c. Write a C program to find the sum of the following series:

$$S = x + \frac{x}{2!} + \frac{x}{3!} + \dots \frac{x}{n!}.$$

   6

## UNIT - IV

7 a. Define a function. Explain the need for the same. With the declaration syntax.    5

   b. What are the different ways of passing parameters with examples?    5

   c. Write a C program to check whether a given character is present in a string along with frequency and position of occurrence of it.    10

8 a. Define a pointer. Write a function using pointer to exchange the values stored in two memory locations.    8

   b. Describe the following with respect to a function:
    i) Automatic variables     ii) External variables
    iii) Static variables     iv) Register variables.    12

## UNIT - V

9 a. Define a structure. Write a C program to read and display the information of a person having name, (day, month and year) date of joining and salary details.    8

   b. Describe how structures are different from union and array.    6

   c. Explain the general format of fseek( ) and ftell( ) functions.    6

10 a. Describe the following:
    i) Array of structures     ii) Structure initialization rules     iii) Union concept.    9

   b. Create a structure of students having the following information: sub1, sub2, sub3, total marks. Write a 'C' program to input information for 3 students, calculate and display total marks scored by each students.    7

   c. Differentiate between the following with respect to the file operations:
    i) Append Mode and Write Mode     ii) feof and ferror.    4

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