**Birla Institute of Technology & Science, Pilani**

**Work Integrated Learning Programmes Division**

**M. Tech. Software Engineering at Wipro Technologies (WASE)**

**Second Semester 2015 - 2016**

**Mid-Semester Exam (Regular)**

Course Number : SEWP ZC142

**No. of Pages : 2  
No. of Questions : 3**

**No. of Questions : 24**

Course Title : Computer Programming

Type of Exam : Closed Book

Weightage : 30%

Duration : 2 hours

Date of Exam : May 08, 2016 Session : AN(12.30 to 2 PM)

**---------------------------------------------------------------------------------------------------------------------Note:** Please read and follow all the instructions given on the cover page of the answer script.

There are 3 questions. Start each answer from a fresh page. All parts of a question should be answered consecutively. Appropriate assumptions can be made and explicitly mentioned.

**Question 1a) Make a single line comment on each of the following [3]**

1. Switch statement cannot have float values in case labels.
2. C program can’t handle octal and hexadecimal constants.
3. User defined function can be called from main function, from macros and from another user defined function.

**Question 1b) Provide the output for each of these code (there is no error) with explanation [3]**

1. #include <stdio.h>

void main() {

static int var = 5;

printf("%d ", var--);

if(var)

main();

}

1. #include <stdio.h>

void main() {

int a =2,b=0,c,d;

c = 16>>2 ;

d = (a++) - (- -b);

printf("a=%d, b=%d, c=%d, d=%d",a,b,c,d);

}

1. #include <stdio.h>

void main() {

int n1 = 10, n2 = 6, res;

res = n1 + (~ n2 + 1) ;

printf ("Result is : %d", res);

}

**Question 1c) What is the correct order of evaluation of operators for the expression: [1]**

“**z = x + y \* z / 4 % 2 – 1”.**

**Question 1d) Convert the following numbers into required form [3]**

1. (11101.110011)2 = (?)16
2. (f2.A)16 = (?)10
3. (29.8)10 = (?)16

**Question 2a) Find the result of given 2’s complement binary Addition/Subtraction. [2]**

The result must be shown in binary as well as decimal form also.

1. (1100 1010)2 – (1001 1010)2
2. (0000 0010)2 – (0000 1000)2

**Question 2b) Develop an algorithm for the following problem. [3]**

**Find total tax to be paid if the input is total income for following problem statement**

Income Tax is charged based on total income of the person from all sources (like Salary, bank interest, house rent etc.). Tax rate varies based on income amount. Assume the currently slabs in place are:

|  |  |
| --- | --- |
| Slab | Tax |
| Slab1: Income between Rs 0 to 1,00,000 | no income tax is charged |
| Slab2: Income between Rs 1,00,001 to 5,00,000 | tax rate of 10% is charged |
| Slab3: Income above Rs 5,00,001 | tax rate of 20% is charged |

Addition to above surcharge of 1.2% is added on calculated tax for all slabs for “education and clean India” campaign.

**Question 2c) Develop a Flowchart for the following problem. [3]**

Depict the logic for computing the value of xy (x to the power y) taking x and y as inputs.

**Question 3a) Write a program for the following problem. [4]**

Write a program to check if a given Integer is Power of 2 using Bitwise Operators

(Your program must have a main function, at least one user function and at least one macro statement. You can take input from user for as many parameters you think are required for this program. Readability of code with proper names, comments will be considered while evaluating answer.)

**Question 3b) Write a program for the following problem. [4]**

**An electricity board charges the following rates for the use of electricity:**

For the first 200 units; 80 P per unit

For the next 100 units; 90 P per unit

Beyond 300 units; Rs. 1 per unit

All users are charged a minimum of Rs. 100 as meter charge. If the total amount is more than Rs. 400, then an additional surcharge of 15% of total amount is charged.

Write a program to read the names of users and number of units consumed and printout the charges with names.

**Question 3c) Write a program for the following problem. [4]**

Write a C program to convert binary number to decimal number with comments on appropriate statements. Input – 4 bit binary number, Output – Equivalent decimal number.

XXXXXX