CSED, MNNIT Allahabad, Allahabad, India
PhD & MCA I Semester, Mid Semester Examination, September 2017
Programming and Problem Solving (CA3101)

Time: 1 Hour & 30 Minutes **Total Marks: 20**

Note: paper is printed on both sides. Questions carry equal weight. Feel free to assume any missing data but categorically mention it under the heading.'Assumptions for this question'. Use space of answer sheet judiciously.

1. Write the output of the following program.

```
#include <stdio.h>
void main() {
int x, y, z, t;
x=25; y=35; z=45;
printf("x=%d, y=%d, z=%d\n", x, y, z);
if (x < y) {t=y; y=x; x=t;}
printf("x=%d, y=%d, z=%d\n", x, y, z);
if (x < z) {t=z; z=x; x=t;}
printf("x=%d, y=%d, z=%d\n", x, y, z);
if (y > z) {t=z; z=y; y=t;}
else if (x < z) {t=z; z=x; x=t;}
printf("x=%d, y=%d, z=%d\n", x, y, z);
}
```

Further, Write the output of the program if the line x=25;y=35; z=45; is replaced by x=45; y=35; z=40;

2. Write C programs for the following problems.

(a) A special disaster fund contribution is calculated as 10% of the total salary subject to a minimum of Rs.1000.00 and a maximum of Rs.10000.00. Read the total salary of a person as a positive integer and print the special disaster fund contribution as computed.
Note : While reading the salary you may assume that input will be correctly given as a positive integer. There is no need to check and repeat for correct input.

(b) Read in a positive integer n . Then read in n (> 0) positive integers. Print the largest odd number among the positive numbers you have read. If there is no odd number in the list print that such a number has not been found. DO NOT USE ARRAYs .
Note : While reading the numbers you may assume that inputs will be correctly given as positive integers. There is no need to check and repeat for correct input.

3. **Write the values of the int variables when the following program ends.**

```
#include <stdio.h>
void main() {
int a[] = {0, 1, 4, 9, 16};
int *p, *q;
int i, j, k, l, m, n;
q = &a[4];
p = q - 4;
i = *q;
j = *p++;
k = *--q;
l = p[1];
m = *(q-2);
n = q - p;
}
```

4. Consider the following program:

```
#include <stdio.h>
unsigned int h(unsigned int n) {
if (0 == n)
return 0;
else
return h(n/2) + n % 2;
}
int main() {
unsigned int nMax = 16, sum = 0, n = 0;
for(; n < nMax; ++n) {
sum += h(n);
}
printf("Sum = %u\n", sum);
return 0;
}
```

(a) Compute h(n) for n = 2, 5, and 7 to get an idea for what the function h(n) does. Describe h(n) in words for a given n.
(b) What will be the output of the above program?

5. Write any 20 keywords of C programming language along with a sentence or two sentences to explain the said keyword for each of these 20 keywords.