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M.Sc.I
FBEF610

6th Semester Regular Examination – 2016-17
COMPUTATIONAL METHODS IN PHYSICS
BRANCH(S): M.Sc.I(AP)
Time: 3 Hours
Max Marks: 70
Q.CODE:Z530

Answer Question No.1 which is compulsory and any five from the rest.
The figures in the right hand margin indicate marks.

- Q1 Answer the following questions: (2x10)
- a) What is the difference between source program and object program?
 - b) How are interpreters different from compilers?
 - c) Distinguish between magnetic core memory and semiconductor memory.
 - d) Write down the principal functions of operating system.
 - e) Distinguish between the outcome of the UNIX commands (i) `cd ..` & (ii) `cd /`
 - f) Which symbols are used for decision making and printing in flow chart?
 - g) What is data type in C?
 - h) Differentiate between *signed int* and *unsigned int*.
 - i) How many numbers can be stored in a *double* variable in C?
 - j) Rectify the following C statement(if required)
`printf(“%d%lf”,4.5,6);`
- Q2 a) Explain the difference between the time sharing mode and interactive time sharing mode of operation of computers. (5)
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- b) Write UNIX commands for each of the following jobs (5)
- i) to compile a file named file1 in C-programming
 - ii) to rename the executable file a.out as file1.x
 - iii) to join file1,file2,file3 end to end and rename it as file4
- Q3 a) Define algorithm. State the properties of an algorithm. How does it vary from pseudocode? (5)
- b) Write an algorithm to evaluate the sine series (5)
 $\sin(x) = x - x^3/3! + x^5/5! - x^7/7! + \dots$ (up to n terms)
- Q4 Write an algorithm and draw a flow chart that will calculate the roots of a quadratic equation $ax^2+bx+c=0$ (10)

- Q5 a) State the differences between S RAM and D RAM? (5)
b) i) What does the following UNIX command do? (5)
`cat file1 > file 2`
ii) What does the following UNIX command do?
`sleep 10 ; rm file 1`
iii) A UNIX file named towns contains names of 20 different towns, one name in one line. Explain the outcome of the following UNIX command.
`sort -r towns`

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- Q6 a) Write a C program to check whether a given integer is a prime number. (5)
b) Alice wants to login into the social networking website facebook.com. Write an algorithm and flowchart to login into facebook account. (5)

- Q7 a) a) Write an algorithm and draw a flow chart that counts the number of words formed using the letters a, e, i, o and u (one letter can be used only once). (5)
b) Suppose $j=5$ and $k=3$. Find the final value of j after execution of the following set of statements. (5)

```
while(2*k < 3*j)
{
    j=j+1; k=k+j; }

j=j+2;
```

- Q8 a) Write a C program to calculate the transpose of the following matrix (5)

$$\begin{pmatrix} 9 & 8 & 7 & 16 & 0 \\ 4 & 13 & 2 & -1 & -6 \\ -9 & 4 & 5 & 1 & 8 \end{pmatrix}$$

- b) Draw the flowchart for a program that accepts an unknown number of ages from the keyboard until zero is entered. If the age is greater than or equal to 100 output is "you have lived a century" otherwise if the age is greater than or equal to 55 output is "Here I come" otherwise output is "you are still a spring chicken". List the necessary variables (5)

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