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(5th Semester)

PHYSICS

EIGHTH (B) PAPER

(C Language and Numerical Methods)

(Pre-Revised)

Full Marks : 55

Time : 2½ hours

(PART : B—DESCRIPTIVE)

(*Marks* : 35)

*The figures in the margin indicate full marks
for the questions*

1. *(a)* What do you mean by keywords and identifiers in C language? How do they differ from each other? Give examples. Also mention the characters that are not allowed within identifiers.   4

   (b) Write the equivalent C expression for the following algebraic expressions :   3

   (i) $\dfrac{2AB + 2BC + 2CA}{2A}$

(**2**)

(ii) $\dfrac{4}{3}x^2$

(iii) $\dfrac{b^2 - 4ac}{2a}$

Or

(c) What are the three basic data types in C? How are they used in variable declaration? Give examples.   3

(d) What are arithmetic, relational and logical operators? Explain with examples. What will be the output value of the following C program segment?   4

```
{
    int a=4;
    int b=1, sum;
    a++;
    b+=5;
    sum=b*3/4+a;
    printf("value of sum is %d\n", sum);
}
```

2. *(a)* What are the formatted and unformatted input and output operators in C? Explain how these commands are used in C programming with examples.   5

   (b) Using a formatted input and output commands, write a simple C program to enter one integer and one real number and then print the integer and the real number entered.   2

(3)

Or

(c) What are standard library functions and user-defined functions? How are these functions declared in C program?   4

(d) Write a C programming code for defining a function to interchange two integers.   3

3. (a) What do you mean by array of pointers? Explain using example.   3

(b) Explain how to perform passing pointers to functions in C with example.   4

Or

(c) Explain how structure can be defined and accessed in C programming.   2+2=4

(d) What is an array within structure? Illustrate with example.   3

4. (a) Explain bisection method and Newton-Raphson method of solving equations. Draw appropriate graphical diagrams for illustration of the two methods.   4

(b) Calculate the first iteration in solving $2x^3 - 2 \cdot 5x - 5 = 0$ by Newton-Raphson method.   3

(4)

Or

Explain Gregory-Newton forward difference interpolation. Given the following data, estimate $f(1 \cdot 83)$ using Newton-Gregory forward difference interpolation polynomial :   4+3=7

i	0	1	2	3	4
x_i	1·0	3·0	5·0	7·0	9·0
f_i	0	1·0986	1·6094	1·9459	2·1972

5. Explain Simpson's rule of numerical integration. Compute the integral $\int_0^1 e^{x^2} dx$ using both Simpson's rules. The values of $y = e^{x^2}$ is given below :   3+4=7

x	0·0	0·1	0·2	0·3	0·4	0·5
y	1·00000	1·01005	1·04081	1·09417	1·17351	1·28402

x	0·6	0·7	0·8	0·9	1·0
y	1·43332	1·63231	1·89648	2·2479	2·71828

Or

Write the logic expressions, logic diagrams and truth tables of the first and second De Morgan's theorems. Using De Morgan's theorem, show that

$$\overline{\overline{A + B\overline{C}} + D(\overline{E + \overline{F}})} = (A + B\overline{C})(\overline{D} + E + \overline{F})$$

4+3=7

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Subject Code : PHY/V/08(b) (PR)

Booklet No. A

To be filled in by the Candidate

DEGREE 5th Semester
(Arts / Science / Commerce /
........................) Exam., **2017**

Subject ....

Paper ....

INSTRUCTIONS TO CANDIDATES

1. **The Booklet No. of this script should be quoted in the answer script meant for descriptive type questions and vice versa.**

2. **This paper should be ANSWERED FIRST and submitted within** *45 minutes* **of the commencement of the Examination.**

3. **While answering the questions of this booklet, any cutting, erasing, over-writing or furnishing more than one answer is prohibited. Any rough work, if required, should be done only on the main Answer Book. Instructions given in each question should be followed for answering that question only.**

To be filled in by the Candidate

DEGREE 5th Semester
(Arts / Science / Commerce /
........................) Exam., **2017**

Roll No. ....

Regn. No. ....

Subject ....

Paper ....

Descriptive Type

Booklet No. B ....

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2 0 1 7

(5th Semester)

PHYSICS

EIGHTH (B) PAPER

(C Language and Numerical Methods)

(Pre-Revised)

(PART : A—OBJECTIVE)

(*Marks* : 20)

The figures in the margin indicate full marks for the questions

SECTION—I

(*Marks* : 5)

Put a Tick (✓) mark against the correct answer in the brackets provided : 1×5=5

1. In C programming, the storage size of character data type is

   (a) 1 byte ( )

   (b) 4 bytes ( )

   (c) 8 bytes ( )

   (d) 10 bytes ( )

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(2)

2. A standard function, which can read from standard input only, is

   (a) getch()   (   )

   (b) getc()   (   )

   (c) getche()   (   )

   (d) getchar()   (   )

3. In C program, a special data type that allows to store different data types in the same memory location is

   (a) array   (   )

   (b) pointer   (   )

   (c) union   (   )

   (d) structure   (   )

4. The number of significant figure in 1.00 is

(a) 1   (   )

(b) 2   (   )

(c) 3   (   )

(d) 4   (   )

5. Octal number 25_8 equivalent in binary system is

(a) 10101_2 (   )

(b) 10111_2 (   )

(c) 10011_2 (   )

(d) 10110_2 (   )

(4)

SECTION—II

(*Marks* : 15)

Give short answers of the following questions :   3×5=15

1. What are the functions of semicolons and comments in C language? Explain with examples.

2. What are arrays? Explain declaration and initialization of arrays in C with examples.

3. What are pointers? Give at least two examples of valid pointer declaration in C.

4. What are absolute and relative errors?

5. What are binary and hexadecimal number systems?

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