

2017

(5th Semester)

PHYSICS

EIGHTH (B) PAPER

(C Language and Numerical Methods)

(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 expressions for the following algebraic expressions : 3
- (i) $\frac{2AB + 2BC + 2CA}{2A}$

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

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

Or

- (a) What are the three basic data types in C? How are they used in variable declaration? Give examples. 3
- (b) 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 formatted input and output commands, write a simple C program to enter one integer and one real number, and then print the integer and real number entered. 2

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Or

- (a) What are standard library functions and user-defined functions? How are these functions declared in C program? 4
- (b) Write a C programming code for defining a function to interchange two integers. 3

3. Explain the workings of IF, If-Else and nested If-Else statements using flow diagrams. Write a C program using If-Else statement to compare two integers and print the larger integer. 4+3=7

Or

- (a) What are arrays? Explain declaration and initialization of arrays in C with examples. 3
- (b) Write a C program to calculate the sum of the first 5 integers using While loop statement. 4

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  $2x^3 - 2.5x - 5 = 0$  by Newton-Raphson method. 3

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( Turn Over )

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Or

Explain Gregory-Newton forward difference interpolation. Given the following data, estimate  $f(1.83)$  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 rules of numerical integration. Compute the integral  $\int_0^1 e^{-x^2} dx$  using both Simpson's rules. The values of  $y = e^{-x^2}$  are 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

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

4+3=7

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

Booklet No. **A**

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DEGREE 5th Semester  
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..... ) Exam., **2017**  
Subject .....  
Paper .....

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DEGREE 5th Semester  
(Arts / Science / Commerce /  
..... ) Exam., **2017**  
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Regn. No. ....  
Subject .....  
Paper .....  
Descriptive Type  
Booklet No. B .....

**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, overwriting 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.

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Scrutiniser(s)

Signature of  
Examiner(s)

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Invigilator(s)

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( 5th Semester )

**PHYSICS**

EIGHTH (B) PAPER

**( C Language and Numerical Methods )**

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

(a) getch() ( )

(b) getc() ( )

(c) getche() ( )

(d) getchar() ( )

3. The output of the following C program

```
{
 int sum;
 for (int a=1; a<3; a=a+1)
 {
 sum=a+2;
 }
 printf(a);
}
```

will be

(a) 2 ( )

(b) 4 ( )

(c) 6 ( )

(d) 8 ( )

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4. The number of significant figures 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)  $10110_2$  ( )

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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.

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2. Write a C program to execute summation of two integers using function.

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

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4. What are absolute and relative errors?

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5. What are binary and hexadecimal number systems?

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