The candidate should ensure that this question paper contains 3 printed pages.

M.Sc. (I Sem)
PHY-105

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M.Sc. (FIRST SEMESTER) EXAMINATION, DECEMBER 2015

PAPER : PHY–105

COMPUTER PROGRAMMING (PROGRAMMING IN C)

TIME ALLOWED : THREE HOURS

Maximum Marks—100

(1) *No supplementary answer-book will be given to any candidate. Hence the candidates should write the answers precisely in the Main answer-book only.*

(2) *All the parts of one question should be answered at one place in the answer-book. One complete question should not be answered at different places in the answer-book.*

Attempt all FIVE questions.

The paper consists of two Parts.

PART A : *Question No. 1 contains 10 short answer questions. Each question is of two marks.*

PART B : *Attempt four questions with internal choice. The limit of each answer is five pages. Each question is of 20 marks.*

PART - A

(Contains *10 short* answer type questions, each carry *2 marks*)

Q.1 Name any four language evaluation criteria.

Q.2 How syntax of a programming language is different from its semantics?

Q.3 What is an alias?

Q.4 Define binding and binding time.

Q.5 What is a descriptor?

Q.6 What is the size of the character array '*name*' in the following declaration?

char *name* [ ] = "Bharat";

Q.7 What are the design issues for the names?

Q.8 What is the difference between a synthesized and inherited attribute?

Q.9 Write a *for* statement that print the following sequence of values:
36, 32, 28, 24, 20, 16, 12, 8, 4, 0, -4

Q.10 What is a block? **2 x 10 = 20**

PART - B
(Contains 4 questions, each carry *20 marks*)

Q.1 What do you mean by Grammar with respect to programming languages? What do you mean by ambiguity of a grammar?

```
<assign>  → <id>  : =  <expr>
<id>  → A | B | C
<expr> → <expr> + <expr>
        | <expr> * <expr>
        | ( <expr> )
        | <id>
```

Using above grammar, draw parse tree for the sentence `A := B + C * A` . Is the grammar ambiguous? Prove it.

OR

What is a parser? To illustrate parsing use a simple kind of grammar and Recursive Descent Parsing approach. **20**

Q.2 What do we mean by static and dynamic semantics? Describe the basic concept of Operational Semantics by giving examples of operational semantics for "*for*" and "*if*" structures.

OR

What is a function? Explain following: (i) Function prototype, (ii) Function call, (iii) Function definition and (iv) Passing arguments to a function—By-value and By-reference. **20**

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P. T. O

Q.3 Discuss the following primary design issues for arithmetic expressions:
(i) Operator precedence rules (ii) Operator associativity rules and (iii) Order of operand evaluation.

OR

Write a C program which must include two functions, one which sorts (using bubble sort) an integer array and another for swapping two integer values supplied to it. The function for sorting must use the function for swapping integers. **20**

Q.4 What do you mean by Selection statements? Discuss various design issues for Two-way selection statements and Multiple-selection construct. Describe giving suitable examples.

OR

What is a pointer variable? How it is declared? What is the purpose of the data type included in the declaration? What is the purpose of indirection or dereferencing operator? What is the relationship between the address of a variable *var1*, value represented by variable *var1* and the pointer variable *varPtr* pointing to variable *var1*? Describe giving suitable examples. **20**