

B.Tech 6th Semester Exam., 2019

PRINCIPLES OF PROGRAMMING
LANGUAGES

Time : 3 hours

Full Marks : 70

Instructions :

- (i) The marks are indicated in the right-hand margin.
- (ii) There are **NINE** questions in this paper.
- (iii) Attempt **FIVE** questions in all.
- (iv) Question No. 1 is compulsory.

1. Choose the correct option of the following
(any seven) : 2×7=14

- (a) Program subroutines are
- (i) called by other programs
 - (ii) fixed variables
 - (iii) default constants
 - (iv) default variables
- (b) Constants in "C" refer to
- (i) fixed value that do not change during the execution of the program

- (ii) fixed value that can change during the execution of the program
- (iii) fixed value that can change after compilation of the program
- (iv) fixed value that can change after linking the program

(c) An instruction which tells assembler how to deal with whole program is classified as

- (i) direction
- (ii) directive
- (iii) director
- (iv) compiler

(d) Which statement can be used to show menu at least once in menu-drive program?

- (i) While
- (ii) Do-while
- (iii) For
- (iv) All of the above

(e) A special quantity named in a program and its value can be changed is called

- (i) exponent
- (ii) mantissa
- (iii) constant
- (iv) variable

- (f) Set of data whose items are organized together is classified as
- (i) data structure
 - (ii) variable structure
 - (iii) array structure
 - (iv) All of the above
- (g) Word or set of letters that can be used to represent a specific function and is easily memorable is classified as
- (i) symbolic address
 - (ii) line address
 - (iii) mnemonics
 - (iv) None of the above
- (h) Aliasing in the context of programming languages refers to
- (i) multiple variables having the same memory location
 - (ii) multiple variables having the same value
 - (iii) multiple variables having the same identifier
 - (iv) multiple uses of the same variable

- (i) Consider the following program :

Program P2

```

var n : int ;
  procedure W (var x : int)
  begin
    x = x+1;
    print x;
  end
  procedure D
  begin
    var n : int;
    n = 3;
    W(n);
  end
begin//beginP2
  n = 10;
  D;
End

```

If the language has dynamic scoping and parameters are passed by reference, what will be printed by the program?

- (i) 10
- (ii) 3
- (iii) 11
- (iv) 4

(j) Control returns in calling program at correct place exactly from

(i) start of program

(ii) end of program

(iii) its right place

(iv) its left place

2. (a) What is an encapsulation? Explain with example. 7

(b) Explain scalar data type, composite data type, structure data type and abstract data type. 7

3. (a) Explain the significance of sequence control in operating a computer. 7

(b) Also show the process of program interpretation and execution with the help of a diagram. 7

4. (a) Explain the details of the properties that can be bound to the operator "+" in the statement $X = Y + Z$. 7

(b) Explain formal properties of language with example. 7

5. (a) Evaluate the results for the following code using (i) call by value, (ii) call by reference, (iii) call by name and (iv) call by value-result after each swap function : 7

```
main(){int a[3], i = 2; a[0] = 1;a[1] = 1;a[2] = 3; a[3] = 2;
swap(a[i], a[i+1]); i--; swap(a[i], a[i]);}
void swap (int x, int y) {x = x+y; y = x-y; x = x-y;}
```

(b) Which of the codes are legal in C/C++/java syntaxes? If legal, what are the values of x after each execution? 7

```
int x = 2; switch(x) x++;
int x = 2; switch(x) { x++; }
int x = 3; switch(x) {case 1 : if(x>2); case 2 : x++;
                    case 3 : x = x+5; default : break;}
```

6. (a) List the different stages in the process of translation of a high-level program to an object code. 7

(b) Also draw the complete structure of a compiler. 7

7. (a) Define the 5-tuple of a finite state automata machine using an example. 7

(b) Which object-oriented concept is achieved by using overloading and overriding? 7

8. (a) Why is the language termed as better if it is strictly typed checked than the non-strictly typed? Discuss the various reasons/advantages. 7

(b) State which of the following variable declarations are type equivalent under (i) structured equivalence and (ii) name equivalence : 7

```
typedef struct Rec {int x; char y;} Rec 1;  
typedef Rec1 Rec2;  
typedef struct {int x; char y;} Rec3;  
Rec1 a, b; Rec2 c; Rec3 d;
```

9. Write short notes on the following : 3+3+4+4=14

- (a) Binding and binding time
- (b) Constructors
- (c) Abstraction
- (d) Exception handling
