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UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
Online End Semester Examination, January 2021

Course: Principles of Programming Languages   **Semester: I**
Program: B.Tech. CSE   **Time: 3 hrs.**
Course Code: CSEG 1010   **Max. Marks: 100**

SECTION A (30 marks)
1. **Each Question will carry 5 marks.**
2. **Instruction: Complete the Statement/Select the correct answer(s)**

S.No.	Question	CO
Q1	**(a)** What is the need of a base-8 system? *(i) Requires less number of digits to represent data than the base-2* *(ii) Need more number of digits to represent data than the base-2 system* *(iii) Needs the same number of digits to represent data as with the base-2 system* *(iv) Needs the same number of digits to represent data as with the base-10 system* **(b)** Which of the following statement is correct when considering a Linker? *(i) Translate assembly language to machine code* *(ii) Places the program in the memory for the purpose of execution.* *(iii) Combines the separately compiled modules of a program into a form suitable for execution* *(iv) It is required to create a preprocessed code*	CO1
Q2	**(a)** Identify the correct statement(s) about Syntax. (Multiple Answer Type) *(i) Syntax is the study of meaning in language.* *(ii) Syntax of a programming language is the form of its expressions, statements, and program units.* *(iii) Syntax of a programming language is the meaning of those expressions, statements, and program units.* *(iv) Syntax rules of a language specify which strings of characters from the language's alphabet are in the language.* **(b)** Which statement(s) is/are true about Memory Unit? (Multiple Answer Type) *(i) Most RAM used for primary storage in personal computers is volatile memory* *(ii) Memory unit is the collection of storage units or devices used to store the binary information in the form of bits.* *(iii) Auxiliary memory may also refer to secondary memory or external memory.* *(iv) If flash drives are used instead of the hard disks, then the secondary storage can go above primary memory in the hierarchy.*	CO1

Q3	**(a)** _____ is an user-defined ordinal type in which the range of possible values can be easily associated with the set of positive integers. *(i) Array (ii) Pointers (iii) Enumeration (iv) Union* **(b)** In many languages, it is possible for the same variable to be associated with different addresses at different times in the program. Identify a suitable example. *(i) Aliases (ii) Subprogram with a local variable* *(iii) Program with a non-Local variable (iv) Structure and Union*	CO2
Q4	**(a)** If z = -3, x = 2*244>>2, y = ~z. Find the value of x and y. Consider >> and ~ are bitwise operators in C. *(i) x = y = 122 (ii) x = 122, y = 2 (iii) x = 244, y = 1 (iv) x = 1, y = 2* **(b)** If the following statements b = 5, a = 5*(b++), c = 5*(++b) are executed sequentially in the given order, what will be the value of a, b and c after all the above statements are executed. *(i) a=35,b=5,c=35 (ii) a=25,b=5,c=35 (iii) a=25,b=7,c=35 (iv) a=25,b=7,c=25*	CO2
Q5	**(a)** _____ in the runtime environment is generally caused by the error situation that cannot be detected by the static program. Whereas, _____ is a notification that something specific has occurred, such as a mouse click on a graphical button. *(i) Binding, Exception (ii) Core Dump, Event (iii) Object instantiation, Core Dump* *(iv) Exception, Event* **(b)** Identify the false statement. *(i) Before using the members of a class, object must be created.* *(ii) After the constructor being called, memory for an object is allocated.* *(iii) Objects cannot be passed by reference.* *(iv) Size of object depends on its class data members.*	CO4
Q6	**(a)** In Logic Programming, knowledge base is a collection of _____ and _____. *(i) predicates, atoms (ii) queries, goals (iii) facts, rules (iv) facts, queries* **(b)** _____ construct is used to create local variables in LISP or Scheme. *(i) getloc (ii) let (iii) deflocal (iv) typep*	CO4

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SECTION B (50 marks)

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1. **Each Question will carry 10 marks.**
2. **Instruction: Write short/brief notes.**

Q7	Demonstrate how flowchart and algorithm can be used to design a solution to find sum of series 1 + 1/2 + 1/3 + ...1/n. (5+5 marks)	CO1
Q8	Mention the properties of an Array. With suitable code snippets explain working with 1D and 2D arrays. (3+7 marks)	CO2
Q9	**(a)** List down the differences between Pointer and Reference variables. (5 marks) **(b)** How are Structures and Union different from each other? Justify with examples. (5 marks)	CO2
Q10	What are the differences between recursion and iteration? Explain with examples.	CO3

Q11	**(a)** Write brief notes on Exception handling and Concurrency. (5+5 marks) **(OR)** **(b)** Write brief notes on Encapsulation and Inheritance. (5+5 marks)	CO4

SECTION-C (20 marks)
1. **Each Question will carry 20 marks.**
2. **Instruction: Write long answer. Internal choice available.**

| **Q12** | **(a)** Provide the general syntax of a function and state what is a Function Signature. Discuss about Overloaded Methods with suitable examples. (6+14 marks)
(OR)
(b) Write a program whose main() gets two numbers from the user, invokes the following functions and handles the returned values suitably.
    (i) "float ellipse_area(int, int)" returns the area of ellipse to main(). Consider: area of ellipse = π x minor_radius x major_radius.
    (ii) "void swap(int *, int*)" swaps two numbers using bitwise operator and displays them.
    (iii) "char* is_big(int num1, int num2)" returns "Yes" if 'num1' is greater than 'num2', returns "No" if 'num1' is lesser than 'num2', and returns "Equal" to main() if 'num1' and 'num2' are equal. | CO3 |