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Reg. No....................................

Name..

B.Sc. DEGREE (C.B.C.S.S.) EXAMINATION, MAY 2014

Second Semester

Vocational Course—PROGRAMMING LANGUAGE I—ANSI–C

(For Vocational Subject Computer Applications of Model II Physics)

[2013 admissions]

Time : Three Hours

Maximum : 60 Marks

Candidates can use non-programmable scientific Calculators / Mathematical tables.

Part A

Very short answer questions.
Answer all questions.
Each question carries 1 mark.

1. What are C tokens ? Give *two* examples.

2. What is a variable ? When do you need a variable ?

3. Explain the use of a modulus operator.

4. Locate errors in the following :

    (a) $scanf(\% d, \% f, \% c, \overset{"}{} x, y, z)$;

    (b) $printf("d, \%f", x, y)$;

5. What do you mean by forward and backward jumps ? Explain.

6. Differentiate between an array and an ordinary variable.

7. Give the number of elements and the size in memory of each of the following :

    (a) int m [3] [4] ;

    (b) float a [5] [6] ;

8. How does the function definition differ from the function declaration ?

$(8 \times 1 = 8)$

Part B

Brief answer questions.
Answer any six questions.
Each question carries 2 marks.

9. Explain precedence and associativity with examples. What is their importance ?

10. What are library functions ? Mention any four library functions in C, giving their syntax.

Turn over

11. Convert the following mathematical expressions into C expressions :

    (a) $z = e^x + \log y + pqr(s - t)$.

    (b) $y = \sin wt \cos \dfrac{w\pi}{t}$.

12. Compare the use of "if-else" statement with the use of the ? : operator. In particular, in what way can the ? : operator be used in place of an "if-else" statement ?

13. What happens when the value of the expression in the "switch" statement matches the value of one of the case labels ? What happens when the value of this expression does not match any of the case labels ?

14. What is the minimum number of times that a "do-while" loop can be executed ? Compare with a " while " loop and explain the reasons for the difference.

15. What is meant by a function call ? From what parts of a program can a function be called ?

16. How is the first line of a function definition written ? What is the purpose of each item, or group of items ?

17. How are initial values written in a one-dimensional array definition ? Must the entire array be initialised ?

18. How are multidimensional arrays defined ? Compare with the manner in which one-dimensional arrays are defined ?

$$(6 \times 2 = 12)$$

Part C

Short Essays / Problems.
Answer any **four** *questions.*
Each question carries 4 marks.

19. A C program contains the following declarations and initial assignments :

        int $i = 8, j = 5, k$;

        float $x = 0.05, y = -0.01, z$;

        char $a, b, c, = \;'c\,', d = \;'d\,'$;

    Determine the value of each of the following assignment expressions :

    (a) $x \;\mathbb{X} = 2$;

    (b) $K = (j == 5)?i:j$;

    (c) $a = (c < d)?c:d$;

    (d) $i - = (j > 0)?j:0$;

20. List all types of constants in C. Give examples. Explain the differences between them. Show how much memory space is required for each type.

21. Write a program in C that prints a table of trigonometric values for $\sin\theta$, $\cos\theta$ and $\tan\theta$. The angle θ should go from 0 to 2π in 30 steps.

22. Explain syntax and use of "switch" statement with a program example.

23. Write a function in C to check whether a given integer is a prime or not.

24. Write a C program which calculates the mean, variance and standard deviation of a set of N numbers.

$(4 \times 4 = 16)$

Part D

Essay / Long answer questions.
Answer any two questions.
Each question carries 12 marks.

25. Write a C program to find the number of :

    (a) Thousands.   (b) Five hundreds.

    (c) Hundreds.   (d) Fifties.

    (e) Twenties.   (f) Tens.

    (g) Fives.   (h) Two's.

    (i) One's.

    currencies in an amount given.

26. Write a C program to accept two arrays, merge them and print the merged array in ascending order.

27. Write a C program to read a line and find the following in the line :

    (a) Number of capital letters ;

    (b) Number of small letters ;

    (c) Number of numerals ;

    (d) Number of punctuation marks ; and

    (e) Number of words.

28. Write a function for matrix addition and another function for matrix multiplication. Using these functions, write a main program to read matrices A and B and calculate $A + AB + BA + B$.

$(2 \times 12 = 24)$