

Total No. of Printed Pages—16

HS/XII/A.Sc.Com/CAP/14

2 0 1 4

COMPUTER APPLICATION

(Science / Arts / Commerce)

(Theory)

Full Marks : 70

Time : 3 hours

The figures in the margin indicate full marks for the questions

General Instructions :

- (i) Write all the answers in the Answer Script.
- (ii) Attempt Part—A (Objective Questions) serially.
- (iii) Attempt all parts of a question together at one place.
- (iv) Part—A (Objective Questions) is to be attempted according to stream as mentioned.
- (v) Attempt Part—B [Descriptive (Unit—I)] according to stream as mentioned.

(PART : A—OBJECTIVE)

(Marks : 35)

SECTION—I

(Marks : 25)

1. Fill in the blanks from the list of words/phrases given below : $\frac{1}{2} \times 20 = 10$

(For Science stream candidates only)

- (a) When each term of a logic expression contains all variables, it is said to be in —.

(2)

- (b) For a two-variable K-map, the variable $\overline{A}B$ has the value —.
- (c) The number of rows in the truth table for a function of 3 literals will be —.
- (d) When a product of sums form of logic expression is in canonical form, each sum term is called a —.
- (e) The output of — gate will be 1 only if the inputs x and y are equal to 1.

(For Arts/Commerce stream candidates only)

- (a) The full form of FTP is —.
- (b) The protocol for remote login is —.
- (c) ISP is an abbreviation for —.
- (d) DNS translates domain names to —.
- (e) Each separate hyperlink within a large picture or drawing is called a —.

(3)

(For all Science/Arts/Commerce stream candidates :
C Language)

- (f) The — statement violates the rules of structured programming.
- (g) In — method, address of the variable is passed by the calling function to the called function.
- (h) A function that uses another function is known as the — function.
- (i) Parameters used in function call are called —.
- (j) arr [3] = 10; initializes the — element of the array with the value 10.
- (k) In an array, every element is accessed using a —.
- (l) An expression that evaluates to a/an — value may be used as an index.
- (m) — is the address of the first element in the array.
- (n) The size of memory allocated for a variable depends upon its —.
- (o) The — operator informs the compiler that the variable is a pointer variable.
- (p) Allocating memory at run time is known as —.

- (q) The — mode opens a file for reading as a binary file.
- (r) — contains related information of the same or different data types.
- (s) — is a program that processes the source code before it passes through the compiler.
- (t) The — is used to give symbolic names to numeric constants.

List of words/phrases :

| | | | |
|------------------------|---------------------------|----------------|------------------------|
| Array name | Internet Service Provider | IP address | minterm |
| call-by-reference | user defined | break | rb |
| call-by-value | number | goto | actual values |
| called | third | dual | Telnet |
| calling | FTP | integer | #define |
| compiler | const | canonical form | subscript |
| data type | hyperspot | * | File Transfer Protocol |
| File Transmit Protocol | maxterm | # | data memory allocation |
| hot spot | dynamic memory allocation | 10 | arguments |
| Pre-processor | fourth | 01 | URL |
| Structure | Internet Service Protocol | AND | 2^3 or 8 |

(5)

2. State whether the following statements are *True* or *False* : $\frac{1}{2} \times 20 = 10$

(For Science stream candidates only)

- (a) A prime implicant is an implicant which can be wholly enclosed by a larger implicant on a Karnaugh map.
- (b) According to the distributive law of Boolean algebra, $X \cdot Y \cdot Z = (X \cdot Y) \cdot (X \cdot Z)$.
- (c) When a sum of products form of logic expression is in canonical form, each product term is called a maxterm.

(For Arts/Commerce stream candidates only)

- (a) A web browser is a program that is used to view pages and navigate the Internet.
- (b) Microsoft Outlook, Outlook Express and Eudora are examples of web browsers.
- (c) In FrontPage, to add page color, you will have to click on Edit option on the menu bar.

(For all Science/Arts/Commerce stream candidates :
C Language)

- (d) The loop control variable may be updated before or after the loop iterates.
- (e) The default label can be placed anywhere in the switch statement.

(6)

- (f) The calling function must pass parameters to the called function.
- (g) An array stores all its data elements in non-consecutive memory locations.
- (h) A two-dimensional array is nothing but an array of one-dimensional arrays.
- (i) The maximum number of dimensions that an array can have is 4.
- (j) The function `scanf()` can be used to read a line of text that includes white space characters.
- (k) When a string is initialized during its declaration, the string must be explicitly terminated with a null character.
- (l) Array name can be used as a pointer.
- (m) Pointer is a variable that represents the contents of a data item.
- (n) When the memory for an array is allocated, its base address is fixed and it cannot be changed during program execution.
- (o) An array can be assigned to another array.

(7)

- (p) The syntax of the function fputs() is fputs (file_pointer, string_name).
- (q) It is possible to add two pointer variables.
- (r) FILE is a structure which has been defined in the stdio.h header file.
- (s) A structure cannot have a union as its member.
- (t) Pre-processor directives can be more than one line long.

3. Choose and write the correct answer : $\frac{1}{2} \times 10 = 5$

(For Science stream candidates only)

- (a) To obtain the complement of a Boolean expression, the following changes are made
 - (i) By changing each OR sign into an AND sign
 - (ii) By changing each AND sign into an OR sign
 - (iii) By complementing all literals
 - (iv) All of the above
- (b) The dual of the logic expression $X(YZ) + XY + XZ$ is
 - (i) $X + YZ + XY + XZ$
 - (ii) $X + YZ + (X + Y)(X + Z)$
 - (iii) $XY + XZ + (X + Y)(X + Z)$
 - (iv) None of the above

(8)

(For Arts/Commerce stream candidates only)

- (a) For remote login, one can use
- (i) FTP
 - (ii) HTTP
 - (iii) Telnet
 - (iv) None of the above
- (b) Which of the following is not a valid IP address?
- (i) 192.168.0.1
 - (ii) 162.192.200
 - (iii) 82.34.2E.38
 - (iv) 256.192.50.1

**(For all Science/Arts/Commerce stream candidates :
C Language)**

- (c) Which keyword allows a variable to have file scope?
- (i) auto
 - (ii) static
 - (iii) register
 - (iv) extern
- (d) Given an integer array, arr[]; the i-th element can be accessed by writing
- (i) (arr+i)
 - (ii) (i+arr)
 - (iii) arr [i]
 - (iv) All of the above

(e) (&num) is equivalent to writing

(i) &num

(ii) num

(iii) num

(iv) None of the above

(f) While declaring pointer variables, which operator do we use?

(i) address

(ii) arrow

(iii) indirection

(iv) dot

(g) Which of the following is the correct way of declaring a float pointer?

(i) float ptr;

(ii) float ptr;

(iii) float ptr;

(iv) None of the above

(10)

(h) Memory for a structure is allocated at the time of

- (i) structure definition
- (ii) structure declaration
- (iii) function declaration
- (iv) structure variable declaration

(i) A structure member is generally accessed using the

- (i) address operator
- (ii) dot operator
- (iii) comma operator
- (iv) ternary operator

(j) The enumerated data type is derived from which data type?

- (i) int
- (ii) float
- (iii) double
- (iv) char

(11)

SECTION—II

(Marks : 10)

4. Answer any *five* of the following in not more than 3 to 4 sentences each : 2×5=10

(For Science stream candidates only)

- (a) Verify the following Boolean expression through a truth table :

$$XY \quad \bar{X}YZ \quad X\bar{Y}Z \quad XY \quad YZ \quad XZ$$

- (b) Show that

(i) $X \quad XY \quad X$

(ii) $X \quad \bar{X} \quad X \quad Y$

- (c) Explain the terms Prime Implicant and Non-prime Implicant.

(For Arts/Commerce stream candidates only)

- (a) What are the steps to check for slow pages in FrontPage?
(b) What are Servers and Clients?
(c) Briefly explain what are search engines.

**(For all Science/Arts/Commerce stream candidates :
C Language)**

- (d) What is the purpose of the keyword void? Where is this keyword used?
(e) What is a subscript? What range of values is permitted for the subscript of a one-dimensional, n -element array?

(12)

- (f) What is the purpose of the indirection operator?
To what type of operand must the indirection operator be applied?
- (g) What are object like and function like macros?

(PART : B—DESCRIPTIVE)

(Marks : 35)

UNIT—I

(For Science stream candidates only)

5. (a) What is the dual of a Boolean expression? What is the difference between dual and complement? 1+1=2
- (b) Write the other canonical forms of the following : 1+1=2
- (i) $F(a, b, c, d) = (0, 2, 6, 11, 13, 14)$
- (ii) $F(a, b, c, d) = (1, 2, 3, 4, 9, 10, 15)$
- (c) Realize a NOR network for the following Boolean function : 1

$$Y = (A + B)(C + D)$$

OR

6. (a) Explain AND and OR operations with suitable examples of logic statements. 1+1=2
- (b) Simplify the logical expression 2
- $$(X + Y)(\bar{X} + Z)(Y + Z)$$

(13)

(c) Verify using truth tables that

$$XY(X + Y) = X + Y \quad 1$$

7. (a) Explain minterms and maxterms. 2

(b) Convert the following logic expressions into canonical form : 2

(i) $(A + \bar{B})(\bar{B} + C)$

(ii) $B(A + \bar{C})$

(c) What will be the other canonical form of the following function? 1

$$F(a, b, c, d) = (0, 7, 8, 9, 10)$$

OR

8. (a) What is canonical form of logic expressions? 1

(b) Write the product of sum form of the function $F(A, B, C)$. The truth table for F is as follows : 3

| A | B | C | F |
|---|---|---|---|
| 0 | 0 | 0 | 0 |
| 0 | 0 | 1 | 1 |
| 0 | 1 | 0 | 0 |
| 0 | 1 | 1 | 1 |
| 1 | 0 | 0 | 0 |
| 1 | 0 | 1 | 1 |
| 1 | 1 | 0 | 0 |
| 1 | 1 | 1 | 1 |

(c) Draw a Karnaugh map and simplify the following Boolean expression : 1

$$Y + \bar{A}\bar{B}\bar{C} + \bar{A}BC + \bar{A}\bar{B}C$$

(14)

(For Arts/Commerce stream candidates only)

5. (a) Write a short note on cross-platform. 3
(b) What is an email-header? What does it contain? 2

OR

6. (a) List the basic features of the World Wide Web. 3
(b) How can one change the font style and add color to the text in a page? 2
7. Explain Class A, Class B and Class C networks, clearly bringing out the distinction among them. 5

OR

8. (a) Explain radio button and check box. How are they added to a web page? 3
(b) What is an 'image hot spot'? How is it created? 2

(Unit—II, Unit—III and Unit—IV
For all Science/Arts/Commerce stream candidates)

UNIT—II

9. (a) How does an unsigned integer constant differ from an ordinary integer constant? 1
(b) Summarize the rules for naming identifiers. How many characters can be included in an identifier name? 2+1=3

OR

10. (a) What function enables a user to input information while the program is in execution? 1
(b) Write a user-friendly program to convert a given temperature in Fahrenheit to Celsius. 3

(15)

11. (a) Write a program to find the sum of the first n even natural numbers, using a while loop. 2
- (b) When entering a string via the scanf() function, how can a single string which includes white space characters be entered? 1
- (c) What is a symbolic constant? 1

OR

12. (a) What are library functions? Explain the use of gets() and puts(). 1+2=3
- (b) What are escape sequences? Explain with the help of examples. 1

UNIT—III

13. (a) Explain the difference between parameter passing mechanisms—*Call-by-Value* and *Call-by-Reference*. 1½+1½=3
- (b) How is a two-dimensional array defined in terms of an array of pointers? What does each pointer represent? 1+1=2

OR

14. (a) What is a function prototype? 1
- (b) Write a program to search for an element in an array and display its position in the array. 4
15. (a) What is a pointer? What is the relationship between the data item represented by a variable 'var' and the corresponding pointer variable p-var? 1+2=3
- (b) What is meant by dynamic memory allocation? How is the size of the memory block specified? 1+1=2

(16)

OR

- 16.** (a) What is storage class of a variable? What is meant by the scope of a variable within a program? What is the scope of a static external variable? 1+1+1=3
- (b) Suppose an integer quantity is added to or subtracted from a pointer variable. How will the sum or difference be interpreted? 2

UNIT—IV

- 17.** How can structure variables be declared? How are the members of a structure variable assigned initial values? Show with the help of an example. 1½+2=3½

OR

- 18.** What is a macro? Summarize the similarities and differences between macros and functions. 1+2½=3½
- 19.** What is meant by conditional compilation? How is conditional compilation carried out? 1½+2=3½

OR

- 20.** Write a program to copy the contents of one file into another, character by character. 3½
