

**NEW**

**2017**

**Part-I 3-Tier**

**COMPUTER SCIENCE**

**PAPER—I**

**(General)**

*Full Marks : 90*

*Time : 3 Hours*

*The figures in the margin indicate full marks.*

*Candidates are required to give their answers in their own words as far as practicable.*

*Illustrate the answers wherever necessary.*

**Group A**

Answer any *two* questions of the following : 2×15

1. (a) What is memory ?
- (b) What are the functions of a processor ?
- (c) What is hardware ? Give example.

*(Turn Over)*

(d) What is programming language ? Name any two types of languages you know.

(e) Draw flow chart of odd & even number.

$$2+3+(2+1)+(2+2)+3$$

2. (a) Convert followings :

(i)  $(2AC)_{16} = ( ? )_2$

(ii)  $(777)_8 = ( ? )_{10}$

(b) Simplify the following :

$$f(A, B, C, D) = \sum m (0, 1, 6, 7, 9, 10, 11).$$

(c) Design full-Adder circuit and discuss its operation.

(d) What is race condition in flip-flop ? Explain.

$$(2+2)+3+5+3$$

3. (a) What is Algorithm ? Write down the properties of an algorithm.

(b) Write an algorithm of bubble sort technique and find its time complexity.

(c) What is 'big oh' (O) notation ?

$$(2+3)+(5+2)+3$$

4. (a) What is a cache memory ?
- (b) What is hit ratio ?
- (c) Describe the basic Architecture of a computer.
- (d) How many  $128 \times 8$  RAM chip are needed to provide a memory capacity of 4096 bytes ?
- (e) Write a program in C to check whether a given number is an Armstrong number. 1+1+5+3+5

### Group B

Answer any *five* questions of the following : 5×8

5. (a) What is data structure ? What are the types of data structure ? Explain with examples.
- (b) What is stack ? Describe the operations those can be performed on a stack. (1+3)+(1+3)
6. (a) Write the algorithm of binary search technique.
- (b) Design the flow chart of prime number in between 10 to 100. 4+4

7. (a) Write down the properties of BST. Give an example.
- (b) What is 'function' in 'C'? Find factorial of a number using recursion. (2+2)+(1+3)
8. (a) What is pointer? Give an example of 'malloc ( )' function.
- (b) What are the function of 'auto' & 'extern' in C. (1+3)+(2+2)
9. (a) Describe the classification of printers.
- (b) Describe the architecture of a magnetic disk. 4+4
10. (a) Explain IEEE 747 number representation.
- (b)  $(1010101 + 0101010)_2 = ?$
- (c)  $(1010101 - 0101010)_2 = ?$  4+2+2
11. (a) What is ASCII code? What is its bit length? What is the ASCII value of 'B' (Capital 'B').
- (b) Write the full form of EBCDIC.

- (c) What are the difference between BCD and binary number. (2+1+1)+1+3

### Group C

Answer any *five* questions of the following : 5×4

12. (a) Give two examples of back slash ('\') operator and meaning of those.
- (b) What are the bitwise operators in C. 2+2

13. Find the error from the following code in C :

```
int f = 0, n, i
clrsrc ( ) ;
for (i = 0 ; i > n ; i ++ ) ;
f = f * i ;
if (n > 0) ;
printf ("Fact possible \n") ;
else
print ("Impossible )
```

Correct the above code. 2+2

14. Difference between structure and union ? Give declaration syntax of both. 2+2

15. What is array ? Write a program to print an array of 'n' numbers. ( $n = 10$ ) 1+3
16. Write down the difference between RAM and ROM. 4
17. Explain De Morgan's theorem with suitable example. 4
18. (a) What is the difference between '&' and '&&'.  
(b) Design OR gate using NAND gate. 2+2
19. (a) Find 2's complement of (-23).  
(b) What is Direct Access Memory ? 2+2
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