

Chapter 3: Number Systems and Digital Device

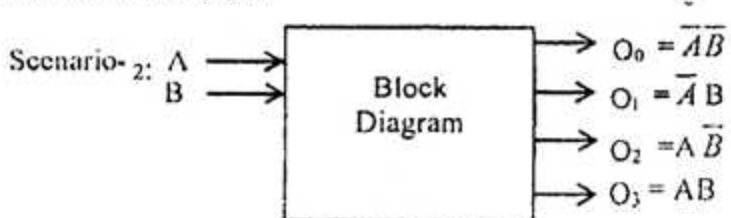
Creative Essay Type

1. ► Price of product "A" is tk. C3 and that of "B" is tk. (303)₃ [RAJUK Uttara Model College, Dhaka]

- What is Encoder? 1
- Why $7 + 5 = 14$? Explain. 2
- Calculate total price of product A and B in Octal number system. 3
- Calculate difference between the price of A and B using by the method of addition. 4

Ans: English Version HSC ICT Note Chapter 3 Ques. No. 29 of Answer Paper.

2. ► Scenario-1: Sumon wanted to subtract the number (7)₈ from the number (E)₁₆.



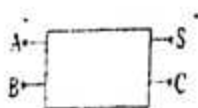
[Dhaka Commerce College]

- What is truth table? 1
- What is the cause behind using binary number system in designing computer? Explain. 2
- Show the method of 2's complement to perform the task of Suman mentioned in scenario-1 of the stem. 3
- If there are three inputs are used in the block diagram of scenario-2 in the stem, then show truth table and logic circuit of the obtained circuit. 4

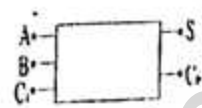
Ans: See English Version HSC ICT Note Chapter 3 Ques. No. 39 of Answer Paper.

3. ► Observe the following diagrams and answer the questions:

Input Output Input Output



block diagram-1



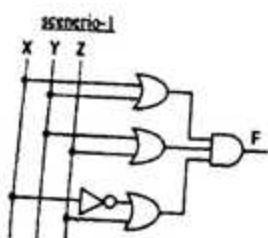
block diagram-2

[Adamjee Cantonment College]

- What is Register? 1
- Is the number (258)₈ correct or not? Explain. 2
- In block diagram-1, draw the logic circuit and truth table with explanation for the output S. 3
- Is it possible to execute logic circuit in block diagram-2 by block diagram-1? Analyze and give your opinion. 4

Ans: See English Version HSC ICT Note Chapter 3 Ques. No. 41 of Answer Paper.

4. ►



scenario-2

$$F = (M + N)MN$$

[Shaheed Bir Uttam Lt. Anwar Girls College]

- What is adder? 1
- Explain the circuit to convert Human language into code. 2
- Simplify the circuit in the stem. 3
- Implement the equation in the stem with only NAND gates. 4

Ans: See English Version HSC ICT Note Chapter 3 Ques. No. 45 of Answer Paper.

5. ► Read the stem given below and answer the question that follows-(i) (1101011)₂ and (ii) (5F.E7)₁₆.

[BIAM Laboratory School & College, Bogura]

- What is ASCII code? 1
- Why called NOR Gate is universal Gate? Explain. 2
- What will be the next number of the above stem in part (i) and convert it in octal form. 3
- Convert the above stem in part (ii) Binary number and Decimal number. 4

Ans: See English Version HSC ICT Note Chapter 3 Ques. No. 53 of Answer Paper.

6. ►



Figure :1



Figure :2

[Cantonment English School & College, Chattogram]

- What is Unicode? 1
- Distinguish between register and flip flop. 2
- Implement the gate depicted above with the help of basic, gates only. 3
- "The gate depicted in figure:1 can be implemented using only gate depicted in figure:2" — Analyze. 4

Ans: See English Version HSC ICT Note Chapter 3 Ques. No. 57 of Answer Paper.

► Question No. a (Knowledge based)

Ques-1. What is code? [All B. 18]

Ans: Code is the technique to express any information (number, sound or other signs) shortly with full security.

Ques-2. What is counter?

Ans: A counter is a device which stores the number of times a particular event or process has occurred, often in relationship to a clock signal.

Ques-3. What is Boolean assumption? [D.B. 17]

Ans: In Boolean algebra, Boolean assumption are the rules of logical addition and logical multiplication.

Ques-4. What is register?

Ans: Register is one kind digital device which is constructed from the combination of some flip-flops.

Ques-5. What is the full form of ASCII?

Ans: Full form of ASCII is American Standard Code for Information Interchange.

► Question No. b (Comprehension based)

Ques-1. Explain 3 base number system.

Ans: Base is the total number or symbols used in a number system. 3 base number system is a number system where 3 basic symbols are exist. If we compare the base with numbers then the highest number will be less than one of the base. Basic symbols or numbers in 3 base number system are 0, 1, 2. So, the number system constructed with only 0, 1, 2 is 3 base number system.

Ques-2. Unicode was the mostly used alphanumeric code. Explain. [D.B. 17]

Ans: Alphanumeric codes, also called character codes, are binary codes used to represent alphanumeric data. The codes write alphanumeric data, including letters of the alphabet, numbers, mathematical symbols and punctuation marks, in a form that is understandable and process able by a computer. Alphanumeric codes are also originated to use the working efficiency of various products since these products require signs and other symbols.

Ques-3. Which type of number is 5D? Explain.

Ans: 5D is a hexadecimal number. Because, in hexadecimal number total 16 numbers are used (from 0 to 15(F)). So, D is the 13th number of hexadecimal number. That's why 5D is a hexadecimal number.

Ques-4. Binary 1+1 and Boolean 1+1 are not same. Explain.

Ans: When Boolean algebra follow all the rules of addition then we will get $1+1=1$. It is called Boolean assumption. This plus sign (+) is used as logical OR in Boolean algebra. In Boolean algebra in the case of addition (OR), if the value of any input is 1, then the addition result will be 1, otherwise it will give 0 as the output. This equation $1+1=1$ has no match with normal algebra. So, it can be said that binary 1+1 and Boolean 1+1 are not same.

Ques-5. XOR gate is more preferable than OR gate. Explain.

Ans: Advantage of X-OR gate comparing to OR gate is discussed below.

OR gate is mainly logical OR gate. Output is equal to logical addition of inputs. It can't do any work only it can do logical addition. But X-Or gate is not any basic gate because it is the combination of AND, OR and NOT gate. Again, we can get it as an integrated circuit. Through this gate we can gate the output by comparing different gates. That means if the inputs are odd number of 1 then the output will be 1, otherwise the output will be 0. This X-OR gate is also used to shorten the circuit. SO, X-OR gate has more advantages comparing with OR gate.

Creative Multiple Choice

- Which based number was used by ancient Babylon people to present large number?
a) 02 based b) 04 based
c) 30 based d) 60 based **(d)**
- Which based number was used by ancient Babylon people to present small number?
a) 10 based b) 4 based
c) 7 based d) 2 based **(a)**
- Which number system didn't have any use of zero?
a) Roman and European
b) Indian and Arabian
c) Indian and subcontinent
d) Arabian **(a)**
- Where the first fraction number was used?
a) Greek b) Iraq
c) India d) Egypt **(d)**
- What does the system of expressing numbers called?
a) Number system b) Binary
c) Decimal d) Octal **(a)**
- What did people of ancient "Babilon" use for counting?
a) 4 types system
b) 3 types system
c) 2 types system
d) 1 type system **(c)**
- In which AD Indian people learned number system from the Arabians?
a) 420 AD b) 510 AD
c) 500 AD d) 600 AD **(c)**
- What does left side of the radix point of a fractional number say?
a) Integer b) Fraction
c) Radix Point d) Irrational **(a)**
- Non-positional number systems are —

i. I, II ii. 748 iii. i, ii, iii

Which one is correct?

- a) i and ii b) i and iii
c) ii and iii d) i, ii and iii **(d)**

10. What is the base of octal number? [Dj. B.-17]

- a) 2 b) 8
c) 10 d) 16 **(b)**

11. How many types of number system are there depending on base? [J. B.-17]

- a) 2 b) 3
c) 4 d) 5 **(c)**

12. What is the previous number of $(10)_2$?

- a) 0 b) 1
c) 7 d) 9 **(b)**

13. What is the previous number of $(10)_8$?

- a) 0 b) 1
c) 7 d) 9 **(c)**

14. What is the next number of $(7)_8$?

- a) 1 b) 7
c) 10 d) 16 **(c)**

15. What is the next number of F?

- a) 1 b) 7
c) 10 d) 16 **(d)**

16. Into how many types number systems are divided?

- a) 2 b) 3
c) 8 d) 10 **(a)**

17. Into how many types number systems are divided depending on base?

- a) 2 b) 3
c) 4 d) 5 **(c)**

18. How many signs are there in decimal number system?

- a) 2 b) 8
c) 10 d) 16 **(c)**

19. Which is the base of binary number system?

- a) 16 b) 10
c) 8 d) 2 **(d)**

20. Which number system is basically used by computers?

- a) Decimal b) Binary
c) Octal d) Hexadecimal **(b)**

21. Which is the base of hexadecimal number system?

- a) 2 b) 8
c) 10 d) 16 **(d)**

22. Which is the base of octal number system?

- a) 2 b) 10
c) 8 d) 2 **(c)**

23. Which one is the base of decimal number system?

- a) 16 b) 10
c) 8 d) 2 **(b)**

24. III number can be — [B. B.-17]

- i. Binary ii. Ocatl
iii. Decimal

Which is the following is correct?

- a) i b) iii
c) i & iii d) i, ii & iii **(d)**

25. 645 number is –
 i. Hexadecimal
 ii. Octal
 iii. Decimal
 Which of the following is correct?
 (a) i and ii (b) i and iii
 (c) ii and iii (d) i, ii and iii
26. Machine language is structured by—
 i. Two signals
 ii. 0 and 1
 iii. OFF and ON
 Which one is correct?
 (a) i and ii (b) i and iii
 (c) ii and iii (d) i, ii and iii
27. A number may have —
 i. integer part
 ii. fraction part
 iii. radix point
 Which one is correct?
 (a) i and ii (b) i and iii
 (c) ii and iii (d) i, ii and iii
28. Binary number system is structured from the concept of —
 i. ON & OFF
 ii. High & Low
 iii. Positive & Negative
 Which one is correct?
 (a) i and ii (b) i and iii
 (c) ii and iii (d) i, ii and iii
29. 549 number is —
 i. Octal ii. Decimal
 iii. Hexadecimal
 Which one is correct?
 (a) i and ii (b) i and iii
 (c) ii and iii (d) i, ii and iii
30. To calculate the value of positional number, we need —
 i. Total number
 ii. Own value of the number
 iii. Local value of the number
 Which one is correct?
 (a) i and ii (b) i and iii
 (c) ii and iii (d) i, ii and iii
31. Different types of decimal numbers are —
 i. $(.119)_{16}$
 ii. $(95.61)_{10}$
 iii. $(657.99)_{10}$
 Which one is correct?
 (a) i and ii (b) i and iii
 (c) ii and iii (d) i, ii and iii
32. 86 can be —
 i. Octal
 ii. Hexadecimal
 iii. Decimal
 Which one is correct?
 (a) i and ii (b) i and iii
 (c) ii and iii (d) i, ii and iii

Read the stem and answer question no 33 and 34.

- Jubair is doing binary number system math in the class room. Jubair's friend Nasir converts his binary number into 16 base number system and said that this number system is used for doing complex and multidimensional calculations in the computer.
33. What is the name of the number system used by Nasir?
 (a) Binary (b) Octal
 (c) Decimal (d) Hexadecimal
34. Nasir's used number system is used in —
 i. Mainframe computer
 ii. Super computer
 iii. For doing complex calculation
 Which one is correct?
 (a) i and ii (b) i and iii
 (c) ii and iii (d) i, ii and iii
35. Which one is equivalent of $(1110.11)_2$ in headecimal? [D.B.-17]
 (a) E.3 (b) E.8
 (c) E.C (d) C.E
36. What is the binary value of $(37.125)_{10}$? [C. B.-17]
 (a) 100101.01 (b) 100101.001
 (c) 101001.01 (d) 101001.001
37. $(1101)_2 = (?)_{10}$
 (a) 15 (b) 14
 (c) 13 (d) 12
38. What is the previous value of $(10)_{16}$?
 (a) 9 (b) A
 (c) E (d) F
39. What does '0' indicate in number $(1110)_2$?
 (a) BPS (b) BCD
 (c) LSB (d) MSB
40. What is called the binary number in short?
 (a) Bit (b) Byte
 (c) Kilobyte (d) Megabyte
41. What is the equivalent binary value of $(27)_{10}$?
 (a) 10011 (b) 11011
 (c) 11010 (d) 10101
42. What is the largest number in octal number system?
 (a) 1 (b) 7
 (c) 8 (d) 9
43. What is the equivalent decimal number of 4D hexadecimal?
 (a) 17 (b) 52
 (c) 64 (d) 77
44. $(BABA)_{16}$ is how much smaller from $(DADA)_{16}$?
 (a) $(1010)_2$ (b) $(2020)_2$
 (c) $(3030)_2$ (d) $(4040)_2$
45. What is the hexadecimal value of $(100101.101011)_2$?
 (a) 25.AC (b) 45.53
 (c) 37.53 (d) 94.AC
46. What is the full form of MSB?
 (a) Most Scientific Bit
 (b) Most Significant Byte
 (c) Most Significant Bit
 (d) Most sign Bit

47. What is the full form of LSB?
 (a) Latest Significant Bit
 (b) Least Significant Bit
 (c) Least Sign Byte
 (d) Least Scientific Byte
48. Who is the inventor of octal number system?
 (a) Charles Babbage (b) King 7th Charles
 (c) LedyAdda (d) Blaise Pascal
49. What will be the result if we convert $(1.25)_{10}$ into binary?
 (a) $(0.025)_2$ (b) $(1.01)_2$
 (c) $(2.05)_2$ (d) $(10.1)_2$
50. What is the BCD value of $(78)_{10}$?
 (a) 01111001 (b) 01111000
 (c) 01101000 (d) 01101100
51. What is the equivalent binary value of $(12)_{10}$?
 (a) $(1101)_2$ (b) $(1100)_2$
 (c) $(1111)_2$ (d) $(1010)_2$
52. What is the binary value of $4C$?
 (a) 11001100 (b) 01001100
 (c) 01001010 (d) 011001101
53. What is the decimal value of AD ?
 (a) 173 (b) 177
 (c) 178 (d) 179
54. Rubina's age is $(3A)_{16}$. What is her age in binary number?
 (a) 00111010 (b) 10111010
 (c) 00111011 (d) 00101011
55. What is the base of binary number?
 (a) 2 (b) 8
 (c) 10 (d) 16
56. What is the decimal value of $DADA$?
 (a) 155332 (b) 56026
 (c) 43962 (d) 125672
57. Which number system is used by computer to do its internal works?
 (a) Decimal (b) Binary
 (c) Octal (d) Hexadecimal
58. What is the next number of 9 in hexadecimal?
 (a) 10 (b) C
 (c) B (d) A
59. If we find any decimal result as 94, what will be its hexadecimal value?
 (a) 6F (b) 6E
 (c) 5F (d) 5E
60. What is the 1's complement of 10110?
 (a) 01001 (b) 10110
 (c) 01000 (d) 10111
61. What is the octal value of the binary number 1010?
 (a) 8 (b) 12
 (c) 100 (d) 10
62. What is the equivalent hexadecimal of $(1110.11)_2$?
 (a) E.3 (b) E.8
 (c) E.C (d) \odot E
63. What is the 2's complement of $(10011)_2$?
 (a) 01101 (b) 01010
 (c) 10001 (d) 00110
64. The equivalent value of $(110110)_2$ — [All Board-18]
 i. $(66)_8$
 ii. $(54)_{10}$
 iii. $(36)_{16}$
 Which one is correct?
 (a) i and ii (b) i and iii
 (c) ii and iii (d) i, ii and iii
65. Equivalent value of $(1010)_2$ — [C. B.-17]
 i. $(10)_{10}$ ii. $(12)_8$
 iii. $(14)_{16}$
 Which of the following is correct?
 (a) i & ii (b) ii & iii
 (c) i & iii (d) i, ii & iii
66. Equivalent value of $(23)_8$ is —
 i. $(010011)_2$
 ii. $(13)_{16}$
 iii. $(19)_{10}$
 Which of the following is correct?
 (a) i and ii (b) i and iii
 (c) ii and iii (d) i, ii and iii
67. Equivalent value of $(BF)_{16}$ is —
 i. $(10111111)_2$
 ii. $(29)_8$
 iii. $(191)_{10}$
 Which one is correct?
 (a) i and ii (b) i and iii
 (c) ii and iii (d) i, ii and iii
- Read the following stem and answer question no 68 and 69:
 M^(a) Atik said Kamal, "What is your age?" Kamal said that his age is $(101101)_2$.
68. Equivalent number of Kamal's age is — [Dj. B.-17]
 (a) $(25)_8$ (b) $(35)_8$
 (c) $(55)_8$ (d) $(65)_8$
69. What will be Kamal's age in binary number after ten years? [Dj. B.-17]
 (a) $(101011)_2$ (b) $(101110)_2$
 (c) $(101111)_2$ (d) $(110111)_2$
- Read the stem and answer question no. 70 and 71:
 Computer teacher Mr. Safiq sir writes the number $(77)_8$ on the board
70. Decimal number of the above mentioned number is — [J. B.-17]
 (a) 56 (b) 63
 (c) 64 (d) 77
71. Which one is the next number of the above mentioned number? [J. B.-17]
 (a) $(78)_8$ (b) $(100)_8$
 (c) $(200)_8$ (d) $(777)_8$

Read the stem and answer question no 72 and 73.

When Mr. Parthib asked one of his students to say his roll number, his student replied that his roll is 1101 in binary.

72. What will be the addition result if we $(1001)_2$ with the binary number mentioned in the stem?

- (a) $(10110)_2$ (b) $(01100)_2$
(c) $(10010)_2$ (d) $(11110)_2$ **(a)**

73. Equivalent value of the above binary number is

- i. $(13)_{10}$ ii. $(11)_{16}$ iii. $(15)_8$

Which one is correct?

- (a) i (b) ii
(c) i and iii (d) ii and iii **(c)**

74. What is the 2's complement of decimal number 12? [R.B.-17]

- (a) 00001100 (b) 11111100
(c) 11110011 (d) 11110100 **(d)**

75. What is the summation of $(100)_2$ and $(AA)_{16}$? [Ctg. B.-17]

- (a) 1AA (b) 1B
(c) AF (d) AE **(d)**

76. $A + BC = ?$

- (a) $(A + B) + (\bar{A}C)$
(b) $(A + C) + (\bar{A}B)$
(c) $(A + B)(A + C)$
(d) $(A + B) + (A + C)$ **(c)**

77. Where the extra sign bit is used to express negative and positive number in binary number?

- (a) leftmost (b) rightmost
(c) at any side (d) both side **(d)**

78. What is the 2's complement of 5?

- (a) 1101 (b) 1001
(c) 1010 (d) 1011 **(d)**

79. $(525)_8 + (624)_8 = (?)_8$

- (a) 1525 (b) 1624
(c) 1351 (d) 1461 **(c)**

80. In binary addition, $1+0+1 = ?$

- (a) 10 (b) 01
(c) 00 (d) 11 **(a)**

81. How many systems are there to construct negative number?

- (a) Two (b) Three
(c) Four (d) Five **(b)**

82. What will be the result if we subtract binary 1001 from binary 101000?

- (a) $(10000)_2$ (b) $(11111)_2$
(c) $(10101)_2$ (d) $(11001)_2$ **(b)**

83. What is the 2's complement of 22 for 8 bit register?

- (a) 11101001 (b) 11101010
(c) 00010001 (d) 11000011 **(b)**

84. Calculate the multiplication two positive number in 2's complement method –

- i. By adding repeatedly
ii. Make the value of sign bit '0' after the

multiplication

iii. By subtracting repeatedly

Which of the following is correct?

- (a) i and ii (b) i and iii
(c) ii and iii (d) i, ii and iii **(a)**

85. Structure used for presenting $(-42)_{10}$ is —

- i. Real value structure
ii. 1's complement
iii. 2's complement

Which one is correct?

- (a) i and ii (b) i and iii
(c) ii and iii (d) i, ii and iii **(d)**

86. How many bits of code with parity bit? [D.B.-17]

- (a) 3 (b) 4
(c) 7 (d) 8 **(d)**

87. Binary code with three bits is called what?

- (a) Octal code (b) Hexadecimal code
(c) binary code (d) ASCII code **(a)**

88. How many signs are present in ASCII code?

- (a) 128 (b) 256
(c) 64 (d) 512 **(b)**

89. By which code, each decimal number can be expressed in equivalent binary code?

- (a) Unicode (b) EBCDIC
(c) BCD (d) ASCII **(c)**

90. Which code is only for decimal number?

- (a) ASCII (b) EBCDIC
(c) Unicode (d) BCD **(d)**

91. How many codes are not used in BCD?

- (a) 3 (b) 4
(c) 5 (d) 6 **(d)**

92. Which code does not use in BCD?

- (a) 0100 (b) 1000
(c) 1001 (d) 1010 **(d)**

93. What is the BCD value of $(469)_{10}$?

- (a) $(010001101001)_{BCD}$
(b) $(100001001)_{BCD}$
(c) $(1001101001)_{BCD}$
(d) $(1010101010)_{BCD}$ **(a)**

94. How many bits the 1101 number have?

- (a) 3 (b) 4
(c) 5 (d) 6 **(b)**

95. What is called the alphabet, number, mathematical sign and special sign used in computer?

- (a) BCD code (b) Alphanumeric code
(c) ASCII code (d) Unicode **(b)**

96. How many alphabet, number and special sign is made usable in EBCDIC code?

- (a) 64 (b) 128
(c) 256 (d) 512 **(c)**

97. What is the full form of BCD?

- (a) Binary Coded Display
(b) Binary Coded Decimal
(c) Binary Coronary Display
(d) Binary Coronary Decimal **(b)**

98. What is the bit number of EBCDIC code?

- (a) 4 (b) 7
(c) 8 (d) 16

(c)

99. Unicode is constructed with how many numbers?

- (a) 4 (b) 8
(c) 16 (d) 32

(c)

100. BCD is constructed with how many numbers?

- (a) 2 (b) 4
(c) 8 (d) 16

(b)

101. How many number bits are there in ASCII-8 code?

- (a) 2 (b) 4
(c) 8 (d) 16

(c)

102. Bengali alphabet is included in which code?

- (a) BCD (b) ASCII
(c) UNICODE (d) EBCDIC

(c)

103. How many types of parity bits are there?

- (a) 2 (b) 3
(c) 4 (d) 5

(d)

104. Who is the inventor of ASCII code?

- (a) George Boolean (b) Robert Brown
(c) Robert Beemer (d) Ada Augusta

(c)

105. In which type of computer EBCDIC code is used?

- (a) Daffodil (b) IBM
(c) HP (d) Dell

(b)

106. For transferring alphanumeric data we use —

- i. ASCII code ii. EBCDIC code
iii. Unicode

Which one is correct?

- (a) i and ii (b) i and iii
(c) ii and iii (d) i, ii and iii

(d)

107. Alphanumeric codes are —

- i. BCD ii. ASCII
iii. Unicode

Which one is correct?

- (a) i and ii (b) i and iii
(c) ii and iii (d) i, ii and iii

(d)

108. Parity bits are —

- i. fraction parity ii. Even parity
iii. Odd parity

Which one is correct?

- (a) i and ii (b) i and iii
(c) ii and iii (d) i, ii and iii

(c)

109. Numeric codes are —

- i. BCD code ii. Octal code
iii. Hexadecimal code

Which one is correct?

- (a) i and ii (b) i and iii
(c) ii and iii (d) i, ii and iii

(d)

Look at the following figure and answer question no 110 and 111.

ASCII-8

1	0	0	0	0	0	1
---	---	---	---	---	---	---

110. What is expressed by the above code?

- (a) A (b) B
(c) D (d) E

(a)

111. In the above code —

- i. parity bit is present
ii. zone bit is present
iii. Number bit is present

Which one is correct?

- (a) i and ii (b) i and iii
(c) ii and iii (d) i, ii and iii

(c)

112. Which is the simple form of $F = \overline{AB} \cdot \overline{BC}$? [D.B.-17]

- (a) $A \oplus BC$ (b) ABC
(c) $AB + AC$ (d) \overline{ABC}

(b)

113. $A + BC = (A + B)(A + C)$ theorem is — [R.B.-17]

- (a) interchange (b) correspondence
(c) basic (d) division

(b)

114. Which one is a basic theorem? [B.B.-17]

- (a) $A + 1 = A$ (b) $A + 0 = A$
(c) $A + A = 0$ (d) $A + A = 1$

(b)

115. How many value contain each variable of Boolean algebra?

- (a) 2 (b) 4
(c) 3 (d) 7

(d)

116. What is the table called which revealed the result of different gate?

- (a) Logic gate (b) Boolean theorem
(c) Boolean constant (d) Truth table

(d)

117. If P, Q, R and S are the four Boolean constant then, how many combination can be possible with them?

- (a) 4 (b) 8
(c) 16 (d) 32

(c)

118. Which one is the De-Morgan law?

- (a) $A \oplus B = \overline{AB} + \overline{AB}$
(b) $\overline{AB} = \overline{A} + \overline{B}$
(c) $\overline{A \oplus B} = \overline{A} \overline{B} + AB$
(d) $A + AB = A$

(b)

119. Which one is the simplest value of $F = \overline{ABC} + \overline{ABC}$

- (a) $\overline{A+B+C}$ (b) \overline{ABC}
(c) ABC (d) $A + B + C$

(c)

120. In Boolean algebra, $A + \sim A = ?$

- (a) A (b) A^2
(c) 1 (d) 1A

(c)

121. In Boolean algebra, $A \oplus 0 = ?$

- (a) 0 (b) 1
(c) A (d) B

(d)

122. If $F = A + \sim AB + \sim AB$ then, what is the simplest value of F?

- (a) 0 (b) 1
(c) A (d) B

(b)

123. Boolean relation, $A + \bar{A} = 1$, what is its dual relation?

- (a) $A + \bar{A} = 0$ (b) $A + \bar{A} = 1$
 (c) $\bar{A} + \bar{A} = \bar{A}$ (d) $\overline{A + A} = \bar{A}$

124. Who is the inventor of Boolean algebra?

- (a) John Napier (b) George Boole
 (c) Newton (d) Pascal

125. How many types of operations are done in Boolean algebra?

- (a) 2 (b) 3
 (c) 4 (d) 5

126. Which operator gets the most priority in Boolean expression?

- (a) OR (b) AND
 (c) NOT (d) NOR

127. According to Boolean's rule, $1+1=?$

- (a) 0 (b) 1
 (c) 2 (d) 10

128. Result will be A when — [D.B.-17]

- i. $A + A + A$ ii. $\bar{A}A$
 iii. $A \text{ XOR } A$

Which of the following is correct?

- (a) i & ii (b) i & iii
 (c) ii & iii (d) i, ii & iii

129. Truth table is used to —

- i. Prove Boolean theorem
 ii. Prove whether the new function is right or wrong
 iii. Truth table represent which Boolean function

Which of the following is correct?

- (a) i and ii (b) i and iii
 (c) ii and iii (d) i, ii and iii

130. In case of Boolean complement —

- i. $\sim 0 = 1$ ii. $\sim 1 = 0$
 iii. $\sim 1 = 1$

Which of the following is correct?

- (a) i and ii (b) i and iii
 (c) ii and iii (d) i, ii and iii

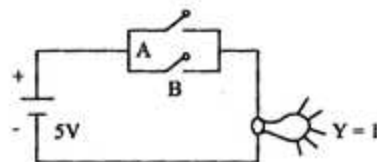
131. Work of logical function is to —

- i. make complex expression easier
 ii. make circuit easily
 iii. Calculate addition

Which one is correct?

- (a) i and ii (b) i and iii
 (c) ii and iii (d) i, ii and iii

Observe the following circuit and answer the question number 132 and 133.



132. In above stem if $Y=1$ then —

- i. $A=0, B=0$ ii. $A=0, B=1$
 iii. $A=1, B=1$

Which of the following is correct?

- (a) i and ii (b) i and iii
 (c) ii and iii (d) i, ii and iii

133. To make $Y=0$ in the above stem, A and B have to be?

- (a) $A=0, B=0$ (b) $A=1, B=0$
 (c) $A=0, B=1$ (d) $A=1, B=1$

134. Which logic has the same input and output line? [D.B.-17]

- (a) AND (b) OR
 (c) NOT (d) NAND

135. Which logic circuit convert alpha numeric character in to binary code, what does it called? [R.B.-17]

- (a) Register (b) Encoder
 (c) Decoder (d) Counter

136. Which one is NAND gate? [C. B.-17]



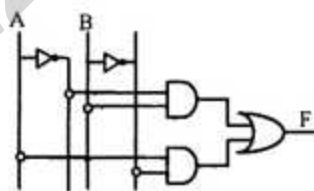
137. For $a=1, b=0$ $a \oplus b = ?$ [C. B.-17]

- (a) 0 (b) 1
 (c) 0, 1 (d) 1, 0

138. If we want to make the output result of input OR gate, then which of the following needs to be applied? [S. B.-17]

- (a) All inputs needs to become 0
 (b) All inputs needs to become 1
 (c) Any of the inputs needs to become 0
 (d) Any of the inputs needs to become 1

139.



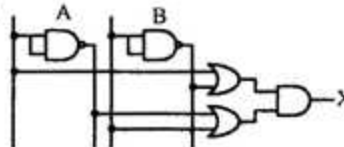
Which of the following is the value of F? [S. B.-17]

- (a) $\bar{A}B + AB$ (b) $A \oplus B$
 (c) $\overline{A \oplus B}$ (d) $AB + \bar{A}B$

140. Which gate is universal gate? [J. B.-17]

- (a) AND (b) NAND
 (c) XOR (d) X-NOR

141.




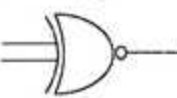
- (a) $A \oplus B$ (b) $\overline{A \oplus B}$
 (c) $\bar{A} \oplus B$ (d) $A \oplus \bar{B}$

142. Which of the following is same type of gate?

- (a) AND, NOR, NOT
 (b) OR, Not, XNOR
 (c) XOR, AND, NOT
 (d) AND NOT, OR

143. When the output of NAND gate will be 0?

- (a) when a input is 0
 (b) when all the input is 0
 (c) when all the input is 1
 (d) when a input is 1

144. When the output of NOR gate will be 0?
 (a) when a input is 0
 (b) when all the input is 0
 (c) when all the input is 1
 (d) when a input is 1 **(b)**
145. Which is used to compare the two bit is same or not?
 (a) XOR gate
 (b) XNOR gate
 (c) AND gate
 (d) OR gate **(a)**
146. Which one reduces the complexity of circuit?
 (a) XOR gate
 (b) XNOR gate
 (c) AND gate
 (d) OR gate **(a)**
147. Which one is done the addition of two binary bit?
 (a) XOR gate
 (b) XNOR gate
 (c) AND gate
 (d) OR gate **(a)**
148. What type of gate has the output of 1 for the same value of two input and 0 for the different values?
 (a) XOR gate
 (b) XNOR gate
 (c) AND gate
 (d) OR gate **(a)**
149. What type of gate has the output of 0 for the same value of two input and 1 for the different values?
 (a) XOR gate
 (b) XNOR gate
 (c) AND gate
 (d) OR gate **(b)**
150. Which gate is used to implement the logic circuit $F=A+BC$?
 (a) OR
 (b) NOR
 (c) AND
 (d) XOR **(b)**
151. What gate is made from OR and NOT gate.
 (a) NAND
 (b) NOR
 (c) XOR
 (d) XNOR **(b)**
152. 
 What type of gate is the figure?
 (a) OR
 (b) AND
 (c) NOT
 (d) NAND **(c)**
153. Which of the following is opposite to logical multiplication?
 (a) AND
 (b) NAND
 (c) NOR
 (d) XOR **(b)**
154. What will be the output for NAND gate if the input is A, B and c?
 (a) ABC
 (b) $\sim ABC$
 (c) A+B+C
 (d) $\sim(A+B_C)$ **(b)**
155. What is the opposite gate of OR gate?
 (a) NAND gate
 (b) NOR gate
 (c) AND gate
 (d) XOR gate **(b)**
156. 
 What type of gate the figure is?
 (a) XOR
 (b) XNOR
 (c) NAND
 (d) NOR **(b)**
157. What type of gate is found, when output of NOR gate enter through NOT gate?
 (a) OR
 (b) XNOR **(b)**
- (c) XOR **(a)**
- (d) AND **(a)**
158. Which logic gate's output is opposite of input?
 (a) AND
 (b) OR
 (c) NOT
 (d) XOR **(c)**
159. What will be the output of OR gate if two inputs are respectively 1 and 0?
 (a) 1
 (b) 0
 (c) 01
 (d) 10 **(a)**
160. How many kinds of basic gates are there?
 (a) 2
 (b) 3
 (c) 4
 (d) 7 **(b)**
161. Which one is a complex gate?
 (a) AND
 (b) OR
 (c) NAND
 (d) NOT **(c)**
162. Which one of the following is a basic gate?
 (a) NOT
 (b) NOR
 (c) NAND
 (d) X-NOR **(a)**
163. In which gate output will be 1 if all the given inputs are 0. [All Board-18]
 i. NAND
 ii. NOR
 iii. X-NOR
 Which one is correct?
 (a) i and ii
 (b) i and iii
 (c) ii and iii
 (d) i, ii and iii **(a)**
164. Output of the NOR gate will be 0(zero) when — [D.J. B.-17]
 i. any output is 0(zero)
 ii. all inputs are 1
 iii. any input is 1(zero)
 Which one is correct?
 (a) i & ii
 (b) i & iii
 (c) ii & iii
 (d) i, ii & iii **(c)**
165. NOT gate form with —
 i. AND + OR
 ii. OR+NOT
 iii. NOT+AND
 Which of the following is correct?
 (a) i and ii
 (b) i and iii
 (c) ii and iii
 (d) i, ii and iii **(b)**
166. The gates that can be used to create XOR gate those are -
 i. OR
 ii. AND
 iii. NOT
 Which of the following is correct?
 (a) i and ii
 (b) i and iii
 (c) ii and iii
 (d) i, ii and iii **(d)**
167. Can be made with NAND gate —
 i. AND gate
 ii. OR gate
 iii. NOT gate
 Which of the following is correct?
 (a) i and ii
 (b) i and iii
 (c) ii and iii
 (d) i, ii and iii **(d)**
168. Used to compare two bits —
 i. OR gate
 ii. XOR gate
 iii. XNOR gate
 Which of the following is correct?
 (a) i and ii
 (b) i and iii
 (c) ii and iii
 (d) i, ii and iii **(c)**

169.



Output of the above circuit will be-

- i. $A + B$
 - ii. $\bar{A}B + A\bar{B}$
 - iii. $A \oplus B$
- Which of the following is correct?
- (a) i and ii
 - (b) i and iii
 - (c) ii and iii
 - (d) i, ii and iii

170. Various logic gates are —

- i. Basic logic gate
- ii. Complex logic gate
- iii. Hybrid logic gate

Which one is correct?

- (a) i and ii
- (b) i and iii
- (c) ii and iii
- (d) i, ii and iii

171. Basic gates are —

- i. OR
- ii. AND
- iii. NOR

Which one is correct?

- (a) i and ii
- (b) i and iii
- (c) ii and iii
- (d) i, ii and iii

172. Boolean operators are —

- i. OR
- ii. AND
- iii. NOT

Which one is correct?

- (a) i and ii
- (b) i and iii
- (c) ii and iii
- (d) i, ii and iii

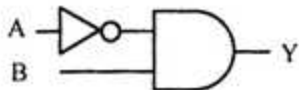
Observe the following stem and answer the question number 173.

P	Q	X
0	0	0
0	1	0
1	0	0
1	1	1

173. Which logic gate is indicated by the resultant output from the truth table?

- (a) OR
- (b) AND
- (c) NOT
- (d) XOR

Answer to the question number 174 in the light of the stem.



174. Y = what?

- (a) $\sim A + B$
- (b) $A \sim B$
- (c) $\sim A B$
- (d) AB

Observe the following figure and answer the questions no. 175 and 176 :



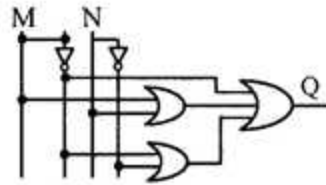
175. Which one is the value of F? [All Board-18]

- (a) AB
- (b) $\bar{A}B$
- (c) $A\bar{B}$
- (d) $\bar{A}\bar{B}$

176. The X-NOR gate can be replaced by which gate to get the output '0'? [All Board-18]

- (a) AND
- (b) OR
- (c) NAND
- (d) NOR

Answer the question number 177 & 178 from the following stem:



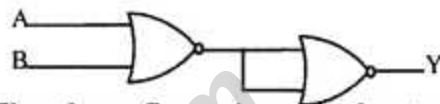
177. What is the value Q in the circuit mentioned in the stem? [R.B.-17]

- (a) 0
- (b) 1
- (c) M
- (d) $M + N$

178. Using which gate instead of OR gate in the stem, will it always be $Q = 1$? [R.B.-17]

- (a) AND
- (b) NOR
- (c) XOR
- (d) XNOR

Answer question no. 179 and 180 by observing the following figure:



179. The above figure is equivalent to which gate? [Dj. B.-17]

- (a) NOT
- (b) AND
- (c) OR
- (d) NOR

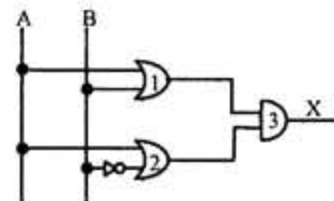
180. Value of Y will be 1 if — [Dj. B.-17]

- i. $A = 0, B = 1$
- ii. $A = 0, B = 0$
- iii. $A = 1, B = 0$

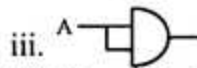
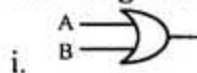
Which of the following is correct?

- (a) i & ii
- (b) i & iii
- (c) ii & iii
- (d) i, ii & iii

Look at the following figure and answer question no. 181:



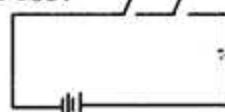
181. Circuit of the simplified value's output of the above figure would be — [C. B.-17]



Which of the following is correct?

- (a) i & ii
- (b) i & iii
- (c) ii & iii
- (d) i, ii & iii

Look at the figure below and answer question nos. 182 and 183:



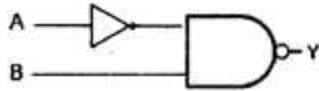
182. Which gate is indicated by the combined circuit of the stem? [J. B.-17]

- (a) AND
- (b) OR
- (c) NOT
- (d) NOR

183. IF NOT gate is added with the output gate of the above figure, then which gate will we get? [J. B.-17]

- (a) AND (b) NAND
(c) X-OR (d) X-NOR

See the logic figure and answer the question number 184 and 185.



184. What is the value of Y?

- (a) $\sim A+B$ (b) $A\sim B$
(c) $A+\sim B$ (d) $\sim A\sim B$

185. To get $Y=1$, value of A and B will be –

- i. $A=0, B=0$
ii. $A=0, B=1$
iii. $A=1, B=0$

Which of the following is correct?

- (a) i and ii (b) i and iii
(c) ii and iii (d) i, ii and iii

Read the stem and answer the question number 186 and 187.

A teacher asked a student's roll number. The student said his roll number 1101 in binary system.

186. What is the sum of $(1001)_2$ and the number that mention in the stem?

- (a) $(01100)_2$ (b) $(10110)_2$
(c) $(10010)_2$ (d) $(11110)_2$

187. The equivalent number of the roll number that mentioned in the stem –

- i. $(13)_{10}$ ii. $(11)_{16}$
iii. $(15)_8$

Which of the following is correct?

- (a) i and ii (b) i and iii
(c) ii and iii (d) i, ii and iii

Read the following stem and answer the question number 188 and 189.

A	B	X
0	0	0
0	1	1
1	0	1
1	1	0

188. Which gate contain the above result?

- (a) AND (b) NAND
(c) XOR (d) XNOR

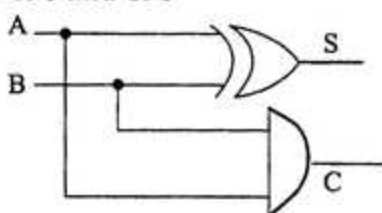
189. The Boolean function of the above truth table will be –

- i. $A\bar{B} + \bar{A}B$ ii. $A\bar{B} + \bar{A}\bar{B}$
iii. $A \oplus B$

Which of the following is correct?

- (a) i and ii (b) i and iii
(c) ii and iii (d) i, ii and iii

Observe the following figure and answer the question number 190 and 191



190. What will be the value of A and B to get output of $C=1$ in the above circuit?

- (a) $A=1, B=0$ (b) $A=1, B=1$
(c) $A=0, B=1$ (d) $A=0, B=0$

191. To crate the figure in the stem is used-

- i. OR gate
ii. AND gate
iii. XOR gate

Which of the following is correct?

- (a) i and ii (b) i and iii
(c) ii and iii (d) i, ii and iii

192. If the input number is 4 in decoder then the output number will be — [C. B.-17]

- (a) 4 (b) 8
(c) 16 (d) 32

193. What is the function of photo detector? [Ctg. B.-17]

- (a) Convert analog signal into digital signal
(b) Convert digital signal into analog signal
(c) Convert electric energy into light energy
(d) Convert light energy into electric energy

194. What will be the output if a encoder has 16 input? [S. B.-17]

- (a) 2 (b) 3
(c) 4 (d) 5

195. What is called the digital circuit that converts the encoded data into coded data?

- (a) Encoder (b) Adder
(c) Decoder (d) Counter

196. Where does encoder exist?

- (a) Processing unit (b) output unit
(c) Input device (d) control unit

197. With the help of what the coded data converted into encoded data?

- (a) Encoder (b) Adder
(c) Decoder (d) counter

198. Where does decoder exist?

- (a) Processing unit (b) output unit
(c) Input device (d) control unit

199. With which circuit data can be converted into computer understandable language?

- (a) resister (b) counter
(c) encoder (d) decoder

200. From which circuit nth number of output is found from 2^n th number of input?

- (a) Adder (b) Multiplexer
(c) Encoder (d) Decoder

201. Which circuit convert the B alphabet into ASCII code?

- (a) Adder (b) Encoder
(c) Decoder (d) Counter

202. Which one works as an inverter?

- (a) AND (b) NAND
(c) NOR (d) NOT

203. How many output lines are there in a 3-to-8 line decoder?

- (a) 4 (b) 5
(c) 8 (d) 16

204. Which circuit provides four outputs from sixteen inputs?

- (a) Encoder (b) Decoder
(c) Register (d) Counter

205. Input of encoder is — [Ctg. B.-17]

- i. Octal number
ii. Decimal number
iii. Hexadecimal number

Which of the following is correct?

- (a) i & ii (b) i & iii
(c) ii & iii (d) i, ii & iii

206. Decoder used in computer memory —

- i. convert binary number into decimal number
ii. convert ASCII code into alphanumeric code
iii. convert EBCDIC code into alphanumeric code

Which one is correct?

- (a) i and ii (b) i and iii
(c) ii and iii (d) i, ii and iii

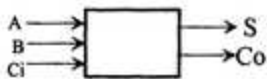
207. What is called the parallel circuit that helps with binary addition?

- (a) OR gate (b) Adder
(c) Resister (d) Counter

208. How many classification of adder has?

- (a) 2 (b) 3
(c) 4 (d) 5

209. Which circuit is the following figure belong to?



- (a) half adder (b) full adder
(c) encoder (d) decoder

210. How many bit can be added by full adder?

- (a) 2 (b) 3
(c) 4 (d) 5

211. Which one is the logic function of carry out of a half adder?

- (a) $C = AB$ (b) $C = \overline{AB}$
(c) $C = A + B$ (d) $C = \overline{A} + \overline{B}$

212. If A, B, C is input then the carry out of a Full Adder will be —

- i. $Co = \overline{A} \overline{B} C + \overline{A} B \overline{C} + \overline{A} B C + A \overline{B} C$
ii. $Co = BC_i + AC_i + AB$

iii. $\overline{A} B C + \overline{A} \overline{B} C + A \overline{B} C + A B C$

Which of the following is correct?

- (a) i and ii (b) i and iii
(c) ii and iii (d) i, ii and iii

213. Implementation gate of full adder is-

- i. Simple
ii. Complex
iii. Universal

Which of the following is correct?

- (a) i and ii (b) i and iii
(c) ii and iii (d) i, ii and iii

Read the following stem and answer question nos. 214 and 215:

A and B are two circuits. A helps to present two numbers in computer's understandable language and B helps to express two numbers multiplication.

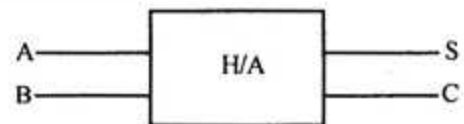
214. B circuit is — [B. B.-17]

- (a) Adder (b) Encoder
(c) Register (d) Counter

215. Circuit A is connected where? [B. B.-17]

- (a) Monitor (b) Key-board
(c) Printer (d) Speaker

Read the following stem and answer the question number 216 and 217



216. What will be the output of C for the above block diagram?

- (a) $A + B$ (b) $\overline{A} B$
(c) $A \oplus B$ (d) $\overline{A B}$

217. In the logic diagram of above circuit there are used —

- i. NOT gate ii. AND gate
iii. XOR gate

Which of the following is correct?

- (a) i and ii (b) i and iii
(c) ii and iii (d) i, ii and iii

218. Which one store the binary data for temporary?

- (a) counter (b) modules
(c) adder (d) register

219. Register can be stay in which gate?

- (a) or (b) and
(c) combination (d) sequence

220. Which one is the element of register?

- (a) counter (b) encoder
(c) adder (d) flip-flop

221. There are how many flip-flop in 8 bit register?

- (a) 4 (b) 8
(c) 16 (d) 32

222. Which one is use as cash-memory in memory device?

- (a) counter (b) modules
(c) adder (d) register

223. Which one is use for storing assembly language information?

- (a) counter (b) modules
(c) adder (d) register

224. How much information a 32 bit register can hold?

- (a) 8 bit (b) 16 bit
(c) 32 bit (d) 64 bit

225. How manytype of registers according to the structure?

- (a) 2 (b) 3
(c) 4 (d) 5

226. How many type of register according to work?

- Ⓐ 2
- Ⓑ 3
- Ⓒ 4
- Ⓓ 5

Ⓓ

227. Related to information and data preservation —

[C. B.-17]

- i. flip-flop
- ii. adder
- iii. register

Which of the following is correct?

- Ⓐ i & ii
- Ⓑ i & iii
- Ⓒ ii & iii
- Ⓓ i, ii & iii

Ⓓ

228. The flip-flop used to create shift register-

- i. S-R
- ii. J-K
- iii. D

Which of the following is correct?

- Ⓐ i and ii
- Ⓑ i and iii
- Ⓒ ii and iii
- Ⓓ i, ii and iii

Ⓓ

229. Buffer register is used in —

- i. Printer
- ii. Keyboard
- iii. Mouse

Which of the following is correct?

- Ⓐ i and ii
- Ⓑ i and iii
- Ⓒ ii and iii
- Ⓓ i, ii and iii

Ⓓ

230. How can number of inputted pulse be counted?

- Ⓐ counter
- Ⓑ modules
- Ⓒ Adder
- Ⓓ resister

Ⓓ

231. What is called the maximum amount of numbers can be counted by counter?

- Ⓐ Flip-flop
- Ⓑ modules

- Ⓒ Adder
- Ⓓ ripple

Ⓑ

232. How many types of asynchronous counter is there?

- Ⓐ 2 types
- Ⓑ 3 types
- Ⓒ 4 types
- Ⓓ 5 types

Ⓐ

233. The simplest sequence of a counter —

- Ⓐ Binary sequence
- Ⓑ Parallel sequence
- Ⓒ Octal sequence
- Ⓓ decimal sequence

Ⓐ

234. How many state of a ring counter created with 5 flip-flop?

- Ⓐ 5
- Ⓑ 10
- Ⓒ 16
- Ⓓ 32

Ⓓ

235. What is maximum number of state of a BCD counter have?

- Ⓐ 8
- Ⓑ 9
- Ⓒ 10
- Ⓓ 11

Ⓓ

236. What is toggle?

- Ⓐ change in state
- Ⓑ no change in state
- Ⓒ repeat
- Ⓓ circuit

Ⓐ

237. Counter used in —

- i. to give timing signal
- ii. Digital watch
- iii. Convert analog signal into digital signal

Which of the following is correct?

- Ⓐ i and ii
- Ⓑ i and iii
- Ⓒ ii and iii
- Ⓓ i, ii and iii

Ⓐ