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F. Y. B. Sc. Electronics (Sem. - I) Examination

March - 2023

Electronics : Paper - II

Digital Electronics Circuits

[Total Marks: 50

સૂચના : / Instructions

(1)

નીચે દર્શાવેલ ☛ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
Fill up strictly the details of ☛ signs on your answer book

Name of the Examination:

☛ **F. Y. B. Sc. Electronics (Sem. - I)**

Name of the Subject :

☛ **Electronics : Paper - II Digital Electronics Circuits**

Subject Code No.: **1803000201030092**

Seat No.:

Student's Signature

(2) Figure on the right indicates full marks
(3) All symbols and abbreviations have their usual meaning.
(4) Non-programmable calculators are allowed.
(5) Assume data if necessary.

***O.M.R. Sheet* ભરવા અંગેની અગત્યની સૂચનાઓ આપેલ *O.M.R. Sheet*ની પાછળ છાપેલ છે.**
Important instructions to fillup O.M.R. Sheet are given on back side of the provided O.M.R. Sheet.

Multiple Choice Questions: (1 Mark) **12**

Q. 1. An AND gate

A. Implements logic addition

B. Is equivalent to a series switching circuit

C. Is an any-or-all gate

D. Is equivalent to a parallel switching circuit

Q. 2. Which of the following is not an octal number?

A. 14 B. 28

C. 210 D. 77

Q. 3. What is the major difference between half-adders and full-adders?

A. Nothing basically; full-adders are made up of two half-adders.

B. Full adders can handle double-digit numbers.

C. Full adders have a carry input capability.

D. Half adders can handle only single-digit numbers.

Q. 4. The range of voltages between $V_{L(max)}$ and $V_{H(min)}$ are _____.

A. Unknown B. Unnecessary

C. Unacceptable D. None of the above

Q. 5. The binary addition 1 + 1 + 1 gives

A. 111 B. 11

C. 110 D. 3

Q. 6. An XOR gate produces an output high only when its two inputs are

A. High B. Low

C. Different D. Same

Q. 7. A positive AND gate is also a negative

A. NAND gate B. NOR gate

C. AND gate D. OR gate

Q. 8. A unique advantageous features of CMOS family is its

A. Use of NMOS circuits

B. Power dissipation in nanowatt range

C. Speed

D. Dependence on frequency for power dissipation

Q. 9. The code in which if successive code is one binary number more than its preceding code called the _____.

A. Reflective code

B. Sequential code

C. Gray code

D. EBCDIC code

Q. 10. The 1's complement of 10110011 is _____.

A. 01100001

B. 10011001

C. 01011101

D. 01001100

Q. 11. The hexadecimal digits are 0 to 9 and _____.

A. A to E

B. A to F

C. A to G

D. A to Z

Q. 12. The output of an AND gate is LOW _____.

A. All the time

B. When any input is LOW

C. When any input is HIGH

D. When all inputs are HIGH

Q. 13. What are the two types of basic adder circuits?

A. Sum and carry

B. Half-adder and full-adder

C. Asynchronous and synchronous

D. One and two's complement

Q. 14. The ASCII

A. Is a subset of 8-bit EBCDIC

B. Is used only in Western Countries

C. Is version II of the ASC Standard

D. Has 128 characters, including 32 control characters

Q. 15. How many basic binary subtraction operations are possible?

A. 4 B. 3

C. 2 D. 1

Q. 16. Which of the following combinations cannot be combined into K-map groups?

A. Corners in the same column B. Corners in the same row

C. Overlapping combinations D. Diagonal corners

Q. 17. The active switching element used in all TTL circuits is the _____.

A. BJT B. FET

C. UJT D. MOSFET

Q. 18. Which of the following is an invalid BCD code?

A. 0011 B. 1100

C. 1000 D. 0001

Q. 19. The binary addition 1 + 1 + 1 gives

A. 111 B. 11

C. 110 D. 3

Q. 20. A multiplexer has _____.

A. One input and several outputs

B. One input and one output

C. Several inputs and several outputs

D. Several inputs and one output

Q. 21. Which of the following expressions is in the sum-of-products (SOP) form?

A. (A + B) (C + D)
B. (A)B(CD)
C. AB(CD)
D. AB + CD

Q. 22. The difference of BC5-A2B equals _____.

A. A19
B. A2B
C. 19A
D. 198

Q. 23. The binary numbers A = 1100 and B = 1001 are applied to the inputs of a comparator. What are the output levels?

A. A > B = 1, A < B = 0, A < B = 1
B. A > B = 0, A < B = 1, A = B = 0
C. A > B = 1, A < B = 0, A = B = 0
D. A > B = 0, A < B = 1, A = B = 1

Q. 24. Convert the fractional decimal number 6.75 to binary.

A. 0111.1100
B. 0110.1010
C. 0110.1100
D. 0110.0110

Q. 25. A full-adder has a $C_{in} = 0$. What are the sum (Σ) and the carry (C_{out}) when A = 1 and B = 1?

A. $\Sigma = 0, C_{out} = 0$
B. $\Sigma = 0, C_{out} = 1$
C. $\Sigma = 1, C_{out} = 0$
D. $\Sigma = 1, C_{out} = 1$

Q. 26. The sum of 11011 + 10111 equals _____.

A. 110010
B. 100001
C. 110100
D. 100100

Q. 27. A 7-bit Hamming code is received as 1001010, and then finds the error bit of the correct code.

A. 100 B. 011

C. 110 D. 111

Q. 28. The Gray code for 1101 is

A. 0111 B. 1001

C. 1011 D. 0101

Q. 29. Convert the fractional binary number 1110.1010 to decimal.

A. 14.625 B. 7.50

C. 4.55 D. 16.1010

Q. 30. Add the following hex numbers: $0110_{16} + 10010_{16}$

A. 10120_{16} B. 10020_{16}

C. 11120_{16} D. 00120_{16}

Q. 31. Convert 59.72_{10} to BCD.

A. 111011 B. 01011001.01110010

C. 1110.11 D. 0101100101110010

Q. 32. Conversion of decimal 13_{10} to its octal number equivalent is

A. 17_8 B. 12_8

C. 14_8 D. 15_8

Q. 33. Convert the binary number 010111100_2 to octal.

A. 172_8 B. 272_8

C. 174_8 D. 274_8

Q. 34. How many binary bits are necessary to represent 100 decimal numbers?

A. 9 B. 7

C. 10 D. 8

Q. 35. Convert 173_8 to decimal.

A. 216 B. 173

C. 3D9 D. 123

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SPACE FOR ROUGH WORK