SUBJECT CODE : 15PH/MC/EL14

B.Sc. DEGREE EXAMINATION NOVEMBER 2017
BRANCH III - PHYSICS
FIRST SEMESTER

COURSE   :   MAJOR – CORE
PAPER   :   ELECTRONICS – I
TIME   :   3 HOURS   MAX. MARKS : 100

SECTION – A

I ANSWER ALL THE QUESTIONS :   **(30 x 1 = 30)**
CHOOSE THE CORRECT ANSWER**:**

1. One nibble has these many bytes.
   a. 2   b.4   c. 6   d. 8
2. A bubbled AND gate produces output as a,
   a. OR gate b. AND gate   c. NAND gate d. NOR gate
3. Boolean algebra is an algebraic structure with two arithmetic operations
   a. addition and subtraction   b. subtraction and multiplication
   c. addition and multiplication   d. addition and division
4. In the following function each term is known as max term.
   a. SOP b. POS c. hybridd. both SOP and POS
5. Give the decimal value of binary 10010.
   a. 6_{10} b. 9_{10}c.18_{10} d. 20_{10}
6. A J-K flip-flop is made to toggle for the input.
   a. J=0; K=0   b. J=0; K=1   c. J=1; K=0 d. J=1; K=1
7. The instruments(s) used in troubleshooting a digital circuit is/are,
   a. Logic probe   b. oscilloscope c. pulser   d. all of the above.
8. A pulse has a period of 15 ms. Its frequency is,
   a. 6.66 Hz   b. 66.66 Hz   c. 666.66Hz   d. 15 Hz
9. A multiplexer has,
   a. one input and several ouputs   b. one input and one output
   c. several inputs and several outputs d. several inputs and one out
10. The most commonly used ICs are of this type,
    a. thin films   b.monolithicc. hybrid   d. none
11. The active components in an IC are,
    a. Resistorsb. Capacitorsc. Transistors and diodes   d. none
12. Plastic leaded chip carrier (PLCC) packages have leads on,
    a. one side   b.two sides c. three sides   d. four sides
13. A type of digital circuit technology that uses bipolar junction transistors is _____
    a. TTLb. CMOS   c. LSI   d. NMOS
14. LEDs are usually made of materials like,
    a. Ga and Asb.C and Si c.Ge and As   d. P and Si
15. A photodiode in photoconductive mode is given this bias,
    a. forward b. reverse   c. either forward or reverse d. no bias

II. FILL IN THE BLANKS:
16. A Binary digit is called as _____.
17. The simplified form of expression $(A + B)(A + \overline{B})$ is _____
18. Karnaugh map with four variables has _____ cells.
19. The circuit used to store one bit of data is known as _____.

20. The symbol refers to _____

...2

III. TRUE OR FALSE:

21. Two variables and its compliments are dropped ina K map to form a quad.
22. The solution of (A+1) is A.
23. SOP function could be implemented directly with NOR-NOR circuit.
24. Flip flop output is always complementary.
25. A seven segment display can display only first seven decimal numbers.

IV. Answer Briefly:

26. What is the Octal equivalent of 7_{10}?
27. What is modulus of a counter?
28. What is an LED?
29. Find 1's compliment of 12_{10}.
30. Draw the half adder circuit.

SECTION – B

ANSWER ANY FIVE QUESTIONS: (5 x 5 = 25)

31. Discuss briefly about binary, octal and hexadecimal number system.

32. Explain the working of full-adder with neat diagram and truth table.

33. State and prove De Morgan's theorem.

34. Explain the working of a JK flip-flop.

35. Brief about SSI, MSI, LSI and BLSI.

36. Explain how the integrated resistors and capacitors are made.

37. What does the colour of LED depend? Explain.

SECTION – C

ANSWER ANY THREE QUESTIONS: (3 x 15 = 45)

38. Show: (a) addition in binary form $66_{10} + 27_{10}$

   (b) subtraction in binary form $23_{10} - 47_{10}$

39. For the given Boolean expression, $Y = \overline{A}B\overline{C}D + \overline{A}BC\overline{D} + A\overline{B}C\overline{D}$

   (a) Show the simplified NAND – NAND circuit.

   (b) Show the simplified NOR – NOR circuit. Using Karnaugh Map.

40. What is register? Explain how the left shift and right shift registers work.

41. Explain in details the various stages involved in IC fabrication.

42. Explain the principle, operation, characteristics, working and applications of a photodiode.

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