

STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI – 600 086.
(For candidates admitted during the academic year 2008-09 & thereafter)

SUBJECT CODE : PH/MC/EL14
B.Sc. DEGREE EXAMINATION NOVEMBER 2009
BRANCH III - PHYSICS
FIRST SEMESTER

REG. No. _____

COURSE : MAJOR – CORE
PAPER : ELECTRONICS I
TIME : 30 MINS.

MAX. MARKS : 30

SECTION – A
TO BE ANSWERED IN THE QUESTION PAPER ITSELF

ANSWER ALL QUESTIONS: (30 x 1 = 30)

I CHOOSE THE CORRECT ANSWERS:

1. Thevenin's theorem gives
a) a current source b) a voltage source c) a resistive source d) a capacitive source
2. which of the following is not a correct Boolean identity?
a) $A + 1 = 1$ b) $A + A = A$ c) $A + 1 = A$ d) $A + 0 = A$
3. The Boolean expression $A+B.C = (A+B).(A+C)$ is TRUE because of
a) Associative law b) Commutative law c) Distributive law d) Complimentary law
4. AND-OR network is identically equivalent to which of the following network?
a) NOR-NOR b) OR-AND c) NAND-OR d) NAND-NAND
5. In a Four variable K-map, for a Quad, 'N' number of variables & their compliments Drop-Out from the reduced expression – where N =
a) ONE b) TWO c) THREE d) FOUR
6. Don't Cares in K-map help in further reduction of the Boolean expression – Do you agree?
a) NO b) Don't Care c) YES d) Redundant
7. The race problem encountered in counters is overcome in,
a) R-S Flip Flop b) D Flip flop c) J-K Flip Flop d) M/S J-K Flip Flop
8. The no. of states skipped in a Mod 5 ripple Counter is,
a) ONE b) TWO c) THREE d) NONE
9. The number of Flip Flops required to store a DECIMAL NUMBER 1001 is
a) 4 b) 9 c) 10 d) 16
10. The Boolean Expression, $Y=A+A+0+1+1$ is equal to
a) 1 b) 2A c) 2 d) 2A+2

11. The Boolean Expression, $Y=A.A.0.1.1$
a) 0 b) 1 c) 2 d) A
12. In RS Flip Flop's Truth Table, the condition $R=1; S=1$
a) SETs the FF b) RESETs the FF c) is ILLEGAL d) Toggles the FF
13. FULL ADDER circuit adds 'n' Bits at a time, where $n=?$
a) 2 b) 3 c) 4 d) 8
14. In monolithic IC fabrication Si O₂ Layer acts as
a) a Semiconductor b) a Conductor c) an Insulator d) a Catalyst
15. Monolithic in Greek means
a) on a integrated base b) on a micro substrate c) on a single stone d) on a macro base

II STATE WHETHER TRUE OR FALSE:

16. AND gate is one of the Universal gates.
17. Ex-OR gives the Boolean Expression for SUM in a Half ADDER.
18. Bubbled NAND gives OR function.
19. K map represents the output for all input cases.
20. The Maximum value for an Integrated Resistor is 100 K Ω .

III FILL IN THE BLANKS:

21. Number of Flip Flops necessary for constructing a MOD10 ripple counter is _____
22. The sum of Products form leads to _____-network.
23. Maximum power is transferred when input and output loads are _____
24. LED gives out light when _____ biased
25. In K-Map while grouping, each group should at least have one independent 1, otherwise it is termed as a _____ Group.

IV ANSWER IN ONE OR TWO SENTENCES:

26. Draw the circuit to get an OR function using AND & NOT gates.

27. State Super position Theorem.

28. Define Energy source.

29. State Norton's theorem.

30. State Demorgan's Theorems.

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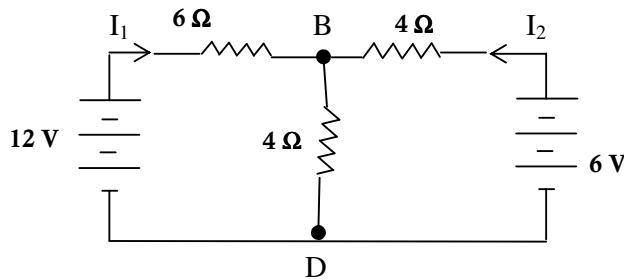
B.Sc. DEGREE EXAMINATION NOVEMBER 2009
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SECTION – B

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

1. Implement OR, AND, NOT and EX-OR function using NOR gates.
2. SIMPLIFY the logic function using K-Map and realize the logic circuit using NAND gates. $F(ABCD) = \sum m(1,3,7,11,15)$ and don't care (0,2,5).
3. Show that i) $\overline{A+B+C} = \bar{A} \cdot \bar{B} \cdot \bar{C}$ ii) $AC + B + B\bar{D} + AB\bar{D} + \bar{A}C = B + C$
4. What is a register? Explain the shift right register.
5. A truth table has a '1' output from 0000 to 1001; has a '0' output from 1010 to 1011; the remaining are don't cares. Implement a simplified logic circuit using K-Map and NAND gates.
6. Show that the compliment of $(A + B)(B + C)(C + A) = \bar{A} \cdot \bar{B} + \bar{B} \cdot \bar{C} + \bar{C} \cdot \bar{A}$
7. Use superposition theorem to calculate the current in each branch of the network given below:



SECTION – C

ANSWER ANY THREE QUESTIONS:

(5 x 15 = 45)

1. Explain Thevenin's theorem with an example.
2. Describe the circuit of M/S Flip Flop and explain its working
3. Implement a 4-Bit Parallel Binary Adder / Subtractor circuit using Full Adders & Ex-OR gates. Explain the functioning of the Circuit with a suitable example.
4. Draw the logic circuit and explain the functioning of the following counters.
 - i) MOD 5 – Ripple Counter
 - ii) Down Counter
5. Describe the Fabrication of Integrated Circuit Diodes, Transistors and a Resistor.

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