

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 2010
BRANCH III - PHYSICS
FIRST SEMESTER

REG. No. _____

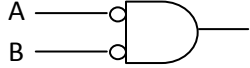
COURSE : MAJOR – CORE
PAPER : ELECTRONICS I
TIME : 30 MINS.

MAX. MARKS : 30

SECTION – A

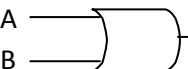
TO BE ANSWERED IN THE QUESTION PAPER ITSELF
ANSWER ALL QUESTIONS: (30 x 1 = 30)

I CHOOSE THE CORRECT ANSWERS:

- In Thevenin's theorem, the output voltage of an ideal voltage source is
(a) zero (b) constant
(c) dependent on load resistance (d) dependent on internal resistance
- Under the condition of maximum power transfer, a voltage source is delivering a power of 30 W to the load. The power produced by the source is
(a) 30 W (b) 45 W (c) 60 W (d) 90 W
-  The output of this gate is
(a) $\bar{A}.\bar{B}$ (b) $A.B$ (c) $\overline{A+B}$ (d) $A+B$
- $A(\bar{A} + B) = ?$
(a) $\bar{A}.B$ (b) $A.\bar{B}$ (c) $A + B$ (d) $A.B$
- The fundamental product is also termed as
(a) Minterm (b) Maxterm (c) POS (d) SOP
- A logic gate in which all inputs must be high to get a low output is called
(a) an OR gate (b) an AND gate (c) a NOR gate (d) a NAND gate
- A NOT gate is also called as
(a) an inverter (b) a converter (c) a rectifier (d) an universal gate
- The four 1's grouped together in a Karnaugh map is called
(a) a Pair (b) a Quad (c) an Octet (d) a group
- An AND-OR combination can be directly replaced by a _____ combination circuit
(a) NAND-NAND (b) NOR-NOR (c) NOR-NAND (d) OR-AND

10. Which of the following flip flops is used as latch
 (a) JK flip flop (b) D flip flop (c) RS flip flop (d) T flip flop
11. A ring counter is same as
 (a) Up-Down counter (b) Parallel counter
 (c) Shift register (d) Asynchronous counter
12. This cannot be fabricated on an IC
 (a) diodes (b) transistors (c) resistors (d) transformers
13. The number of components in LSI is
 (a) 20 to 100 (b) 100 to 1000
 (c) 1000 to 10,000 (d) 10,000 to 1,00,000
14. The SiO_2 layer in an IC acts as
 (a) a resistor (b) an insulating layer
 (c) a capacitor (d) mechanical output
15. Most popular types of ICs are
 (a) thin film (b) thick film (c) hybrid (d) monolithic

II STATE WHETHER TRUE OR FALSE

16.  is a NOR gate.

17. $ABC\bar{C} + \bar{A}\bar{B}C$ is a SOP expression.

18. In a Karnaugh map, 'Don't Care' conditions are represented as 'Zeros'.

19. The expression for 'borrow' in a full subtractor is $\bar{A}B + BC + C\bar{A}$.

20. Shift registers can be constructed using JK flip flops.

III FILL IN THE BLANKS:

21. Norton's theorem is _____ of Thevenis's theorem.

22. Under the condition of load resistance (R_L) = internal resistance (R_i), the load is said to be _____ to the source.

23. The Norton's current is sometimes called as _____ current.

24. Using Duality principle, the Boolean expression $A+1 = 1$ becomes _____

25. When clock is applied simultaneously to all flip flops, it is called _____ Counter

IV ANSWER IN ONE OR TWO SENTENCES:

26. State Thevenin's Theorem

27. How is resistance R_N measured in Norton's network

28. Find the compliment of $A+B+\overline{CD}$

29. What is meant by modulus of a counter? How many states are there in a mod 8 counter?

30. What is meant by a monolithic IC?

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B.Sc. DEGREE EXAMINATION NOVEMBER 2010

BRANCH III – PHYSICS

First Semester

COURSE: **MAJOR – CORE**

PAPER: **ELECTRONICS I**

TIME: **2½ HOURS**

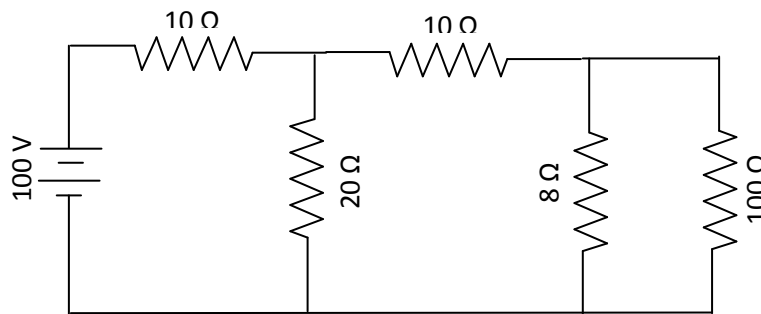
MAX. MARKS: **70**

SECTION – B

ANSWER ANY **FIVE** QUESTIONS:

(5 x 5 = 25)

1. Using Thevenin's Theorem, find the current through 100 Ω resistance connected across terminals A & B in the following circuit.



2. State and prove De Morgan's Theorem.
3. State the laws of Boolean algebra and classify them.
4. Explain a D flip flop and its functioning.
5. Simplify using Karnaugh map: $Y = f(A, B, C, D) = \sum (0, 2, 5, 7, 8, 10, 13, 15)$.
6. Explain the working of a Ripple counter.
7. State some advantages and disadvantages of Integrated Circuits.

SECTION – C

ANSWER ANY **THREE** QUESTIONS:

(3 x 15 = 45)

8. Explain Norton's theorem with an example.
9. Explain the working of an half adder and a full adder with neat diagrams
10. Show that NOR and NAND gates are Universal building blocks.
11. Explain with circuit, the working of (i) an RS flip flop and (ii) a JK Master-slave flip flop.
12. Describe the fabrication of a Monolithic IC.

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