STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI – 600 086.
(For candidates admitted during the academic year 2011-12 & thereafter)

SUBJECT CODE :11PH/MC/BE14

B.Sc. DEGREE EXAMINATION NOVEMBER 2012
BRANCH III - PHYSICS
FIRST SEMESTER

COURSE : MAJOR – CORE
PAPER : BASIC ELECTRONICS
TIME : 30 MINS MAX. MARKS : 30

SECTION – A
ANSWER ALL QUESTIONS: (30 x 1 = 30)

I. CHOOSE THE CORRECT ANSWERS:

1. According to Kirchoff's voltage law, the algebraic sum of all IxR drops and emf's in a closed path is
   a) positive b)negative c)zero d)none of the above

2. In order to obtain maximum power from load terminal the resistance across load terminal should be_____ to circuit resistance
   a) Equal b) less c) greater d) none of the above

3. A 6 ohm and 3 ohm resistance are connected in parallel to 2V, the current through 3 ohm resistance is
   a) 2/3 b) 1/3 c) 4/3 d) 5/3

4. The decimal equivalent of the binary number 10010.1 is
   a)24.5 b) 34.5 c) 34.15 d) 34.05

5. The decimal equivalent of $(46)_8$ is
   a) 38 b) 28 c) 48 d) 30

6. In Boolean algebra (A+B)(A+C) is
   a) AC+B b) (A+B)C c) A+BC d) A(B+C)

7. The design of EX-OR gate requires how many NAND gates
   a) 2 b) 3 c) 5 d) 4

8. The inputs of a NOR gate are connected together, the resulting circuit is
   a) OR gate b) AND gate c) NOT gate d) EX-OR gate

9. The output of full adder is
   a) Difference and borrow b) borrow only c) carry only d) sum and carry

10. Mod-15 counter requires
    a) 4flip flops b) 3 flip flops c) 5flip flops d) 2 flip flops

11. Ripple counter is also called as
    a) Asynchronous counter b) synchronous counter
    c) ring counter d) Johnson counter

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12. MSI contains
    a) 10 gates/chip b) 10-100 gates /chip
    c)100-1000 gates/chip d) more than 1000 gates/chip

13. Toggle state in J-k flip flop is
    a) J=1, K=1 b) J=1, K=0 c) J=0, K=1 d) J=0, K=0

14. An audio amplifier is an example of
    a) Digital IC b) linear IC c) both digital and linear IC d) none of the above

15. ICs are used in
    a) linear device b) digital device c) both a&b d) none of the above

II. FILL IN THE BLANKS

16. The efficiency at maximum power transfer is_____
17. In Boolean algebra $A+\bar{A}$=_____
18. Standard product or fundamental product is called as_____
19. Race round problem occurs in_____ flip-flop
20. SiO_2 layer in an IC acts as_____

III. TRUE OR FALSE.

21. An ideal voltage source has zero resistance
22. In hexadecimal addition $C_H+D_H=9_H$
23. In a NOT gate if the bubble is removed the gate is called a buffer
24. The forbidden state present in S-R flip flop is not defined in a J-K flip-flop
25. Digital ICs process digital signals only

IV. ANSWER BRIEFLY

26. What is constant current source?

27. Draw half adder logic circuit.

28. What is octet in K-map?

29. What is a register?

30. What is a monolithic IC?

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SECTION – B

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

1. State and explain maximum power transfer theorem.

2. Convert $(68)_{10}$ to hexadecimal, octal and binary numbers.

3. Reduce the Boolean expression to five literals and draw a logic circuit
$Y = ABC + A\vec{B}C + AB\vec{C} + \vec{A}\,\vec{B}\,\vec{C} + \vec{A}\,\vec{B}\,C$.

4. Simplify using K-map F(A,B,C,D)=Σ 0,1,2,5,10,11,14,15.

5. What are the advantages of ICs?

6 . Explain full adder with a logic circuit.

7. Explain clocked S-R flip-flop using NAND gate.

SECTION – C

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

8. a) State and explain Thevenins Theorem.
b) Show that when Thevenins circuit is converted to Norton's circuit $I_N=E_0/R_0$ and $R_N=R_0$ are Thevenins voltage and resistance respectively.

9. Explain NAND and NOR as universal building blocks.

10 . Explain two variable, three variable and four variable K-maps with example.

11. Explain the working of decade counter and right –shift register.

12. Explain how resistor, capacitor and transistor can be constructed in a monolithic IC.

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