

**LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034**



**B.Sc. DEGREE EXAMINATION – PHYSICS**

**FOURTH SEMESTER – NOVEMBER 2016**

**PH 4506 – ELECTRONICS - I**

Date: 07-11-2016

Dept. No.

Max. : 100 Marks

Time: 01:00-04:00

**PART – A**

**Answer All Questions.**

**(10 X 2 = 20 MARKS)**

1. State Maximum power transfer theorem.
2. What are hybrid parameters?
3. Define operating point and obtain its value for a collector load of  $4k\Omega$  and quiescent current of  $1mA$ .  
Given  $V_{cc} = 10V$ .
4. Mention the different techniques adopted for coupling of amplifier stages.
5. What is meant by transistor biasing?
6. Define CMRR and express it in decibels.
7. What is a demultiplexer?
8. Draw the logic symbol and write the truth table of a D flip-flop.
9. Give the difference between monolithic and hybrid circuits.
10. What is photolithography?

**PART – B**

**Answer ANY FOUR Questions.**

**(4 x 7.5 = 30 marks)**

11. State Norton's theorem. Discuss its application to circuit analysis with a suitable illustration. (2+5.5)
12. With a neat diagram explain the working of a Monostable Multivibrator. (7.5)
13. Explain the working of a summing amplifier. How can it be modified to function as a difference amplifier? (5+2.5)
14. Explain the working of a three bit binary ripple counter with the logic diagram, truth table and wave form diagram. (7.5)
15. Describe the fabrication of a capacitor in a monolithic integrated circuit. (7.5)

**PART C**

**Answer ANY FOUR questions**

**(4 x 12.5 = 50 marks)**

16. Obtain expressions for  $A_i$ ,  $A_v$  and  $Z_i$  in terms of 'h' parameters for a transistor amplifier connected in common emitter configuration. Find the h parameters when
- (a) Output ac is short-circuited;  $I_b=10\mu\text{A}$ ;  $I_c=1\text{mA}$ ;  $V_{be}=10\text{mV}$ . .
- (b) Input ac open-circuited;  $V_{be}=0.65\text{mV}$ ;  $I_c=60\mu\text{A}$ ;  $V_{ce}=1\text{V}$ . (9+3.5)
17. Explain transistor RC coupled amplifier with special reference to frequency response. A single stage amplifier has a voltage gain of 60V,  $R_c=500\Omega$  and input impedance is  $1\text{k}\Omega$ . Calculate the overall gain when two such stages are cascaded through RC coupling. (10+2.5)
18. Describe the working of an n-channel or p-channel FET with a properly biased circuit. Explain the drain and transfer characteristics for the same. (6.5+3+3)
19. (a) Describe the working of a JK flip-flop with necessary circuit using gates and truth table.
- (b) Design a JK master slave flip flop using gates and explain its operation. (7.5+5)
20. Describe with necessary diagrams the steps involved in the epitaxial-diffused fabrication process for integrated circuits. (12.5)

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