



LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION – PHYSICS

THIRD SEMESTER – APRIL 2013

PH 3504/PH 3502/PH 5501 - ELECTRONICS - I

Date: 29/04/2013
Time: 9:00 - 12:00

Dept. No.

Max. : 100 Marks

PART – A

Answer ALL Questions:

(10x2 = 20 marks)

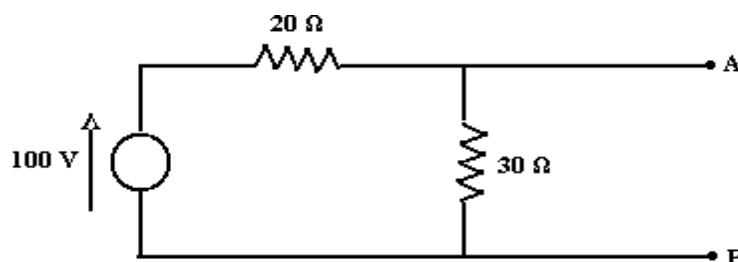
1. State superposition Theorem.
2. What are hybrid parameters? State the drawback of h parameter approach in the design of transistor amplifier.
3. In a transistor circuit, the collector load is $4K \Omega$ and zero signal collector current is $1mA$. Find its operating point if $V_{cc} = 10V$.
4. Name the different methods of biasing a transistor.
5. State two significant differences between a FET and a BJT.
6. Draw the circuit of a summing amplifier.
7. What is a master slave JK flip flop?
8. Differentiate between multiplexer and demultiplexer.
9. How many flip flops are required to construct a MOD-64 and upto what decimal number can this counter store?
10. What is the major drawback of a ripple counter?

PART – B

Answer ANY FOUR Questions:

(4 x 7.5 = 30 marks)

11. Prove Thevenin's theorem in the case of a two terminal network. Find the open circuit voltage and Thevenin resistance for the two terminal network shown below. (6+1.5)



12. With a neat diagram explain the working of a Wein Bridge oscillator. (7.5)

13. State any least four characteristics of an ideal Op-Amp. Solve the simultaneous equations using Op-Amp. $X + Y = 5$; $X - Y = 1$. (2+5.5)
14. Simplify into sum of products $F(A, B, C, D) = \Sigma(0, 1, 2, 3, 5, 7, 8, 9, 11, 14)$ using K-map and draw the logic circuit for the simplified expression. (6+1.5)
15. Write a note on the semiconducting memory devices ROM and RAM. (7.5)

PART C

Answer ANY FOUR questions

(4 x 12.5 = 50 marks)

16. (a) Obtain expressions for the input impedance, current gain and voltage gain in terms of hybrid parameters for a transistor in CE arrangement.
- (b) For a CE transistor amplifier the h parameters are $h_{ie} = 1700 \Omega$, $h_{fe} = 38$, $h_{re} = 1.3 \times 10^{-4}$ and $h_{oe} = 6 \times 10^{-6} \text{ mho}$. Find (i) Input impedance, (ii) Current gain (iii) Voltage gain, if the ac load is $2K\Omega$. (9+3.5)
17. With a neat circuit diagram explain the working of a Class A power amplifier. (11+1.5)
18. Describe the construction and operation of a Silicon Controlled Rectifier. Discuss its current-voltage behaviour and its applications. (7.5+3+2)
19. With the help of necessary logic diagram, truth table and waveforms explain the working of a
(a) clocked RS flip flop (b) JK flip flop (6+6.5)
20. With a neat circuit explain the working of a MOD-5 counter. Construct a three stage Johnson counter and explain its truth table. (6+6.5)

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