

LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034



B.Sc. DEGREE EXAMINATION – PHYSICS
THIRD SEMESTER – NOVEMBER 2019
16/17/18UPH3MC02 – ELECTRONICS - I

Date: 31-10-2019
Time: 01:00-04:00

Dept. No.

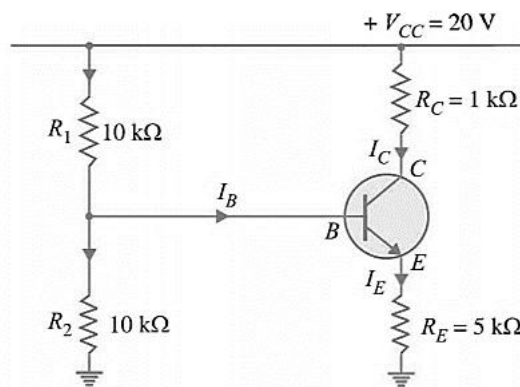
Max. : 100 Marks

PART - A (10 × 2 = 20 MARKS)
ANSWER ALL QUESTIONS.

1. State Superposition theorem.
2. A generator develops 200 V and has an internal resistance of 100 Ω . Find the power delivered to a load of 100 Ω . Comment on the result.
3. What do you understand by d.c. and a.c. load lines?
4. What is the basic difference between astable, monostable and bistable multivibrators?
5. Define Slew rate of an op-amp.
6. Why is the FET called a unipolar device?
7. Draw a full adder circuit using two half adders and suitable gates.
8. What are the different types of shift registers?
9. List out the drawbacks of IC's.
10. What is meant by etching?

PART - B (4 × 7.5 = 30 MARKS)
ANSWER ANY FOUR QUESTIONS.

11. Distinguish between constant voltage and constant current sources. What is their utility?
12. Calculate the emitter current in the voltage divider circuit shown below. Also find the value of V_{CE} and collector potential V_C .

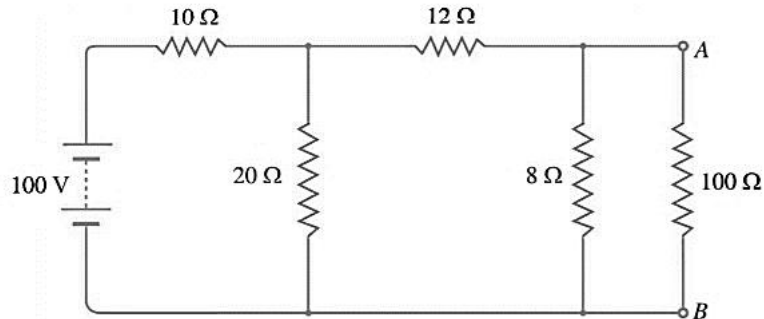


13. With suitable circuit diagram, discuss the operation of a summing amplifier.
14. Construct and explain the working of a 4-bit up/down ripple counter.
15. Give an account on the comparison of IC's based on MOS and bipolar transistor technology.
16. With a neat circuit diagram, explain the operation of a direct coupled amplifier along with their advantages

and disadvantages.

PART - C (4 × 12.5 = 50 MARKS)
ANSWER ANY FOUR QUESTIONS

17. State and explain Thevenin's theorem. Using Thevenin's theorem, find the current through 100 Ω resistance connected across terminals A and B in the given circuit.



18. (a) Explain the action of Colpitt's oscillator with a neat circuit diagram.
(b) A 1 mH inductor is available. Choose the capacitor values in a Colpitt's oscillator so that $f = 1 \text{ MHz}$ and $m_v = 0.25$. **(8.5+4)**
19. Describe the construction and working of E-MOSFET. Also draw and discuss its characteristics.
20. (a) Using Boolean techniques, simplify the expression: $Y = AB + A(B + C) + B(B + C)$
(b) Simplify $f(A,B,C,D) = (0,2,4,5,6,7,8,10,12,13,14,15)$ using k-map. Draw the logic diagram after simplification. **(8.5+4)**
21. Explain how a diode and a transistor can be constructed in a monolithic integrated circuit.
22. With necessary circuit diagrams and truth table, discuss the operation of D flip-flop and T flip-flop.
