



# JAIN COLLEGE

463/465, 18th Main Road, SS Royal, 80 Feet Road  
Rajarajeshwari Nagar, Bangalore - 560 098

Date :

**SUBJECT : ELECTRONICS**

**II PUC  
Mock II**

**Timings Allowed: 3 Hrs 15 Minutes**

**Total Marks: 70**

- Note:** i. Question paper contains **four** parts.  
ii. Part **A** is compulsory. Part **D** contains two sub parts (a) **problems** (b) **essay** type questions.  
iii. Explanation **without** circuit diagram, wherever necessary, does not **carry** mark

## **PART - A**

**Answer ALL questions. Each question carries ONE mark.**

**1X10 = 10**

1. In which region of characteristics a transistor behaves as a closed switch.
2. Write the minimum number of op-amp required to realize the output given by equation  $V_0 = V_1 - 2V_2 + 4V_3$ , where  $V_1, V_2, V_3$  are input voltages.
3. What is a carrier wave?
4. Mention the intermediate frequency of an AM receiver.
5. Write the symbol n-channel enhancement type MOSFET
6. Mention any one non-weighted code.
7. What is a sequential logic circuit?
8. How many input pins are present in 8051?
9. Expand ASCII
10. Why are the cells in hexagon shape during cell splitting?

## **PART - B**

**Answer any FIVE questions. Each question carries TWO marks.**

**2X5 = 10**

11. Explain the terms drain resistance ( $r_d$ ) and transconductance ( $g_m$ ).
12. Mention the biasing conditions for a transistor to operate in active region.
13. In an amplifier upper cut-off frequency is  $f_z = 500\text{KHz}$  and  $A = 100$ . Determine lower cut-off frequency when negative feedback of  $\beta = 0.02$  is introduced.
14. Write the expression for frequency of oscillation and gain in RC phase shift oscillation.
15. What are characteristics of a good receiver?
16. Write the expression for load voltage and load current of SCR half wave rectifier.
17. Mention two types of errors that occur in C programming.
18. Draw the diagram of satellite transponder system.

## **PART - C**

**Answer FIVE questions. Each question carries THREE marks.**

**3X5 = 15**

19. Write a note on selection of Q-point.
20. Mention the advantages of negative feedback.
21. Sketch electromagnetic wave. What is the speed of EM wave in free space?
22. Explain non-punch through type power diode.
23. A pn junction diode has a reverse saturation.
24. Distinguish between synchronous and asynchronous counters.

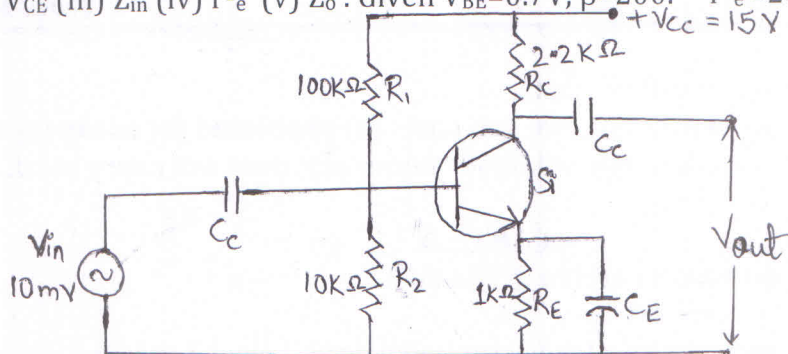
25. Write any three features of 8051 microcontroller.  
 26. What is the RADAR? Mention any two applications.

**PART - D**

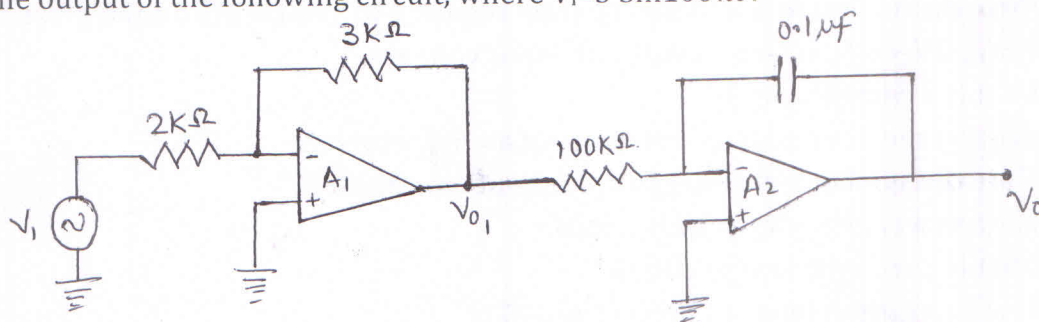
a) Answer **THREE** questions. Each question carries **FIVE** marks.

5X3 = 15

27. For a given CE amplifier circuit using silicon transistor. Find  
 (i)  $I_c$  (ii)  $V_{CE}$  (iii)  $Z_{in}$  (iv)  $r_e^1$  (v)  $Z_o$ . Given  $V_{BE}=0.7V$ ,  $\beta=200$ .  $r_e^1=26mV/I_E$



28. Find out the output of the following circuit, where  $V_i=5 \sin 100\pi t$ .



29. A Hartley oscillator oscillates at 15KHz. If the capacitor in the tank circuit has a value of 0.01  $\mu F$  and one of the inductor in 1mH, calculate the value of other inductor.  
 30. When the modulation percentage is 75% and AM transmitter has carrier of 12KW power, what would be the power carried by single side band?  
 31. Clock frequency for the T flip-flop is 1KHz. What is the output frequency of T flip-flop when T input is high.

Convert the following Boolean expression into canonical SOP form

- (a)  $Y = AC + B\bar{C}$   
 (b)  $Y = AB + C$

**PART - E**

b) Answer **FOUR** questions. Each question carries **FIVE** marks.

5X4 = 20

32. Explain the working of two stage RC coupled amplifier.  
 33. Derive an expression for the output of logarithmic amplifier using op-amp.  
 34. Obtain an expression for the total power carried by an AM wave.  
 35. Explain the working of Master Slave JK flip-flop with logic circuit. Draw its timing diagram.  
 36. Why is 8051 known as 8-bit processor?  
 37. What is debugging? Explain the different types of error that occur in C programming language.

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