JAIN COLLEGE

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

Date: ***SUBJECT: ELECTRONICS***

II PUC

Mock paper I

Timings Allowed: 3 Hrs Minutes. ***Total Marks: 70***

ISTRUCTIONS:

1. The question paper has five parts: A, B, C, D and E.
2. Part A is compulsory.
3. Part D has only problems.
4. Read the instructions given for each part.

Part A

I. Answer ALL Questions: **10x1=10**

1. In which region of characteristics a transistor behaves as a closed switch.
2. How many op-amps are present in LM324?
3. What is the wavelength of the audio signal of frequency 20 KHz?
4. What is the efficiency of an AM for 100% modulation?
5. Name any one power device.
6. How many variables can be eliminated in a quad?
7. What is the disadvantage of JK flip-flop?
8. PIC consists of how many instructions?
9. What is runtime error in 'C' program?
10. Name the materials which are commonly used in fiber optic cables.

Part B

II.Answer any five questions: **5x2=10**

11. Mention the difference between FET and BJT.
12. What is the significance of load line?
13. In an amplifier upper cut-off frequency f_2=500 KHz and A=100. Determine upper cut-off frequency when negative feedback of $\beta = 0.02$ is introduced.
14. What is tank circuit? Write the expression for frequency of oscillation of LC circuits.
15. Distinguish between skip distance and skip zone.
16. What is the function of DC Chopper and draw its symbol.
17. What is data address? Explain.
18. Mention the important techniques used for Bluetooth operation.

Part C

III.Answer any five questions: **5x3=15**

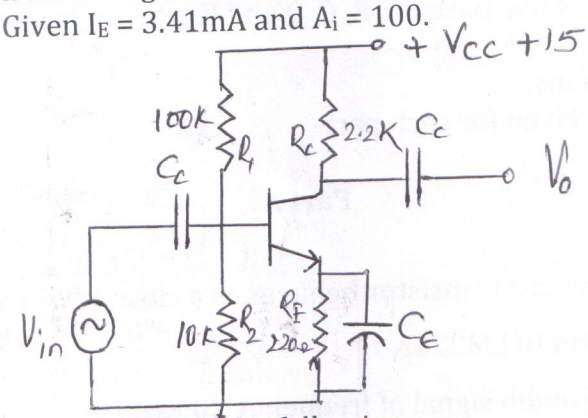
19. What is voltage divider bias? Mention its advantages.
20. Draw the frequency response of an amplifier with and without feedback.
21. Explain the concept of space wave propagation.
22. Show that the ohmic drop makes forward VI characteristics of a power diode is more linear.

23. A silicon power diode has V_j of 0.4V R_{ON} in drift region of 0.002Ω. Determine V_{AK} if (a) I_F = 75A and (b) I_F = 100 A.
24. Distinguish between combinational and sequential logic circuits.
25. Briefly explain the different bits of binary memories of different registers.
26. List the additional features of 3G and 4G cell phone systems.

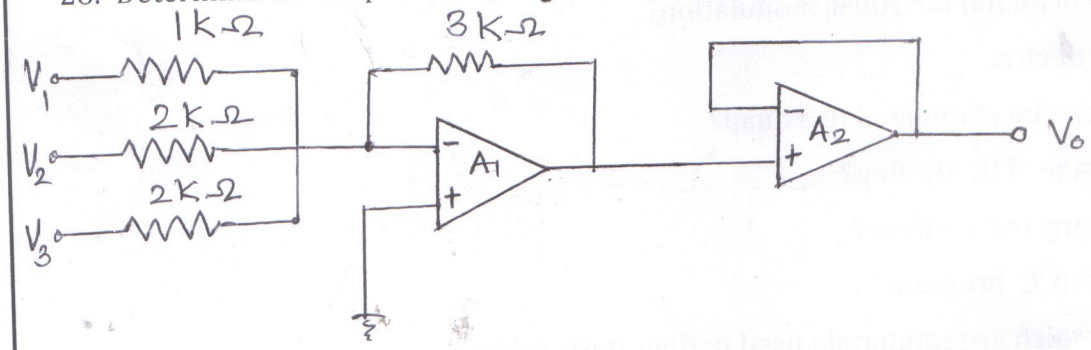
Part D

IV.Answer any three questions: **3x5=15**

27. For the CE amplifier circuit using silicon transistor given below, find i) r_e' ii)A_v iii) A_p iv) voltage gain in dB. Given I_E = 3.41mA and A_i = 100.



28. Determine the output voltage V_o for the following.



29. A Hartley oscillator oscillates at 15 KHz. If the capacitor in the tank circuit has value of 0.01μF and one of the inductor is 1mH, calculate the value of the other inductor.
30. In an FM modulation, the modulation index is 10 and the highest modulation frequency is 15KH2. Calculate the approximate BW of the resultant FM signal and carrier swing.
31. Clock frequency of the T flip-flop is 1 KHz. What is the output frequency of T flip-flop when T input is high.

Convert the following Boolean expressions into canonical SOP form.

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

(b) Y = AB + C.

Part E

Answer any four questions: **5x4=20**

32. Draw the circuit diagram and explain the operation of class B Push-Pull amplifier.
33. With a circuit diagram of 4 bit DAC using R-2R ladder network write the explanation and conversion table.
34. Derive an expression for modulation index in terms of V_{max} and V_{min} in the case of AM.
35. What is an Universal gate? Realise NOT, AND, OR and XOR gates using NAND gates.
36. Why is 8051 known as 8 bit processor? Briefly explain data transfer and arithmetic Instructions.
37. What is an identifier? Explain the rules of declaring the identifier.

****