JAIN COLLEGE

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Rajarajeshwari Nagar, Bangalore - 560 098

Date :   **SUBJECT : ELECTRONICS**

II PUC
Mock I

Timings Allowed: 3 Hrs15Minutes   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. Name any one parameter of the transistor which is temperature dependent.
2. How many op-amp are present in LM324?
3. What is the wave length of audio signal of frequency 20KHz?
4. Find the value of frequency deviation. Given m_f=12 and f_m=5KHz.
5. How many junctions are present in SCR.
6. Which code is used in shaft position.
7. A four bit synchronous counter is applied with clock frequency 16KHz. What is the frequency of MSB(Q_4) bit?
8. How many register banks are present in 8051.
9. What is the command to execute a program in UNIX system?
10. Write the maximum range of Wi-fi.

PART – B

Answer any FIVE questions. Each question carries TWO marks: 2X5 = 10

11. Write the circuit symbol of n-channel and p-channel JFET.
12. What are the disadvantages of direct coupled amplifier?
13. An amplifier has Z_0=5KΩ, voltage gain A=100 and β=0.02. Find the output impedance of the feedback amplifier.
14. Draw the circuit diagram of Wein bridge oscillator.
15. What are pre-emphasis and de-emphasis?
16. Draw the structure of a power diode showing impurity atom densities.
17. Write the syntax of "for loop" statement.
18. Mention any two uses of internet.

PART – C

Answer FIVE questions. Each question carries THREE marks:

                                                                                3X5 = 15

19. Explain the need for biasing.
20. Compare input and output impedance characteristics of four types of feedback coonections.
21. Write a note on D layer, E layer and F layer.
22. Draw the circuit diagram and output waveforms of DC to AC inverter.

23. A silicon power diode has V_j of 0.4V R_{ON} in drift region of 0.002Ω.
24. Distinguish between combinational and sequential logic circuits.
25. Explain the structure of assembly language.
26. Write any three uses of fiber optic communication.

PART – D

a) **Answer THREE questions. Each question carries FIVE marks:**   5X3 = 15

27. If an amplifier is provided with the input voltage 5mV, the maximum voltage gain is 2000

     for signal frequency of 2KHz. If falls to 1414 at 10KHz and 50Hz. Find the output voltage, gain in dB, upper cut-off frequency, lower cut-off frequency and bandwidth.

28. Determine the output voltage V_0 for the following circuit.
     $V_1=1.2V$, $V_2=0.6V$, $V_3=-1.1V$
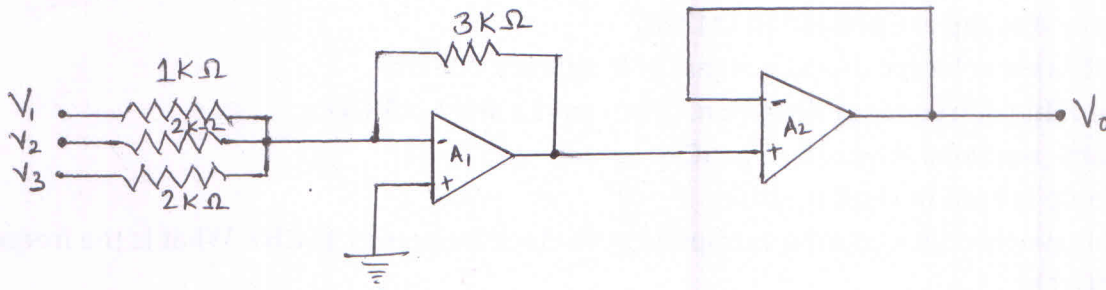
29. A phase-shift oscillator uses resistor $R=220\Omega$. What should be the capacitance values of the capacitors required for a phase-shift oscillator of frequency (a)120Hz (b)1KHz
30. The output of a transmitter is given by $400[1+0.4\sin(6280)t]\sin(3.14 \times 10^7 t)$. this voltage is fed to an antenna of resistance 500Ω. Determine (i)carrier frequency
     (ii)modulation frequency
     (iii)carrier power
     (iv)mean power output
31. Simplfy the Boolean expression $Y=\Sigma m(0,2,4,6,8,10,11,12,14,15)+\Sigma d(9,13)$ using K-map. Draw the logic circuit using NAND gate to realize the simplified expression.

PART - E

b) **Answer FOUR questions. Each question carries FIVE marks:**   5X4 = 20

32. With a circuit diagram explain the working of a CE amplifier.
33. Derive an expression for the output of an op-omp subtractor.
34. Explain the function of a envelop detector.
35. Explain the working of a clocked RS flip-flop using NAND gates. Write its truth table and timing diagram.
36. Explain the multiplication of unsigned two 8-bit numbers using 8051.
37. What is an identifier? Explain rules of declaring the identifier.

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