JAIN COLLEGE, J C Road Bangalore
Mock Paper -1, February - 2015

Time: 3 Hours 15 Minutes **II PUC– Electronics (40)** **Max. Marks: 70**

PART- A

I. Answer all the questions **1 X 10 = 10**

1. What is a DC load line?
2. Define CMRR.
3. A carrier wave of amplitude 20V is amplitude modulated by a sine wave of amplitude 12V. Determine the modulation index.
4. Name the terminals of TRIAC.
5. Which code is used in shift position encoders?
6. Write the Boolean equation for the output of X-OR gate.
7. How many variables are eliminated by a quad?
8. What is the meaning of the instruction MOV A, R0?
9. Define syntax error?
10. What is a transponder?

PART - B

II Answer any FIVE of the following questions **2 X 5 = 10**

11 Write any two differences between FET and BJT.

12 What is cross- over distortion? Sketch a graph showing cross-over distortion.

13 An amplifier has an open loop gain 250 and bandwidth of 100 KHz. If 2% negative feedback is introduced in the circuit. Determine closed gain and bandwidth of feedback amplifier.

14 Mention the condition for obtaining sustained oscillation.

15 Draw the block diagram of digital communication system.

16 Write the Shockley diode equation for current through the power diode and explain its terminology.

17 If a = 3, b= 5 and c= 6, find a && b || c.

18 What is uplink and down link?

PART - C

III Answer any FIVE of the following questions **3 X 5 = 15**

19 What is a Q- point and explain its significance.

20 Derive an expression for input impedance of negative feedback amplifier.

21 Define the different types of wave transmissions.

22 Draw the circuit diagram, input and output wave form of SCR half wave rectifier with RC trigger circuit.

23 At what firing angle does SCR of full wave rectifier must be triggered to supply V_{dc} of 60V to a load? Given V_{in} = 155.5V.

24 Briefly explain logical instructions.

25 Convert A + BC + $\bar{A}$B into its canonical SOP and write the expression in min term.

26 Explain the concept of cell splitting, frequency reuse and call handoff in cellular communication.

PART - D

IV Answer any THREE of the following questions **5 X 3 = 15**

27 Each of three cascaded amplifier stages has a voltage gain of 20dB, 25dB, 30dB. What is the overall voltage gain in dB? What is the actual voltage gain?

28 The output of an op-amp adder is to be $V_0 = 3V_1 – 2V_2 + 5.5V_3$. If the value of the feedback resistor is 30KΩ, find the value of R_1, R_2, and R_3.

29 The tank circuit of a Hartley oscillator has a capacitance C = 100pF, L_1 = 30mH and L_2 = 80mH. Calculate the frequency of oscillation.

30 In a FM modulator a 1MHz carrier is modulated by a 10 KHz sine wave of amplitude 5V. If the deviation constant is 40 KHz/V, calculate (a) frequency deviation (b) modulation index (c) maximum and minimum frequency of the FM wave.

31 Simplify the Boolean function Y = f(A,B,C) = Σm (1,5,7,9,13,15) + Σd (8,10,11,14) using K-map. Draw the logic circuit using NAND gate to realize the simplified expression.

PART - E

V Answer any FOUR of the following questions **5 X 4 = 20**

32 With a circuit diagram explain the working of two stage RC coupled amplifier and draw the frequency response.

33 Derive the expression for the output of an op-amp subtractor.

34 Draw the block diagram of super heterodyne AM receiver and explain the function of each block.

35 Draw the logic diagram of 4 bit up counter. Write its truth table and explain its working.

36 Write the instructions to move value 34H into register A and value3FH into register B, then add them together.

37 Explain briefly arithmetic operators, relational operators and logical operators.

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JAIN COLLEGE, J C Road Bangalore
Mock Paper -2, February - 2015

Time: 3 Hours 15 Minutes **II PUC– Electronics (40)** **Max. Marks: 70**

PART - A

I. Answer all the questions **1 X 10 = 10**

1. Name the biasing circuit which gives excellent stabilization?
2. Mention any one application of comparator.
3. How many side bands are present in FM wave?
4. Mention the frequency of IF of an AM radio receiver.
5. Write the symbol of n – channel enhancement type MOSFET.
6. How many variables are eliminated by an octet?
7. Convert 1010_2 into gray code.
8. How many timers are present in 8051?
9. If a= 5 and b=10, what is the content of 'a' after the execution of a+=b; in a C-programming?
10. Expand URL.

PART - B

II. Answer any FIVE of the following questions **2 X 5 = 10**

11. Draw the circuit to study the characteristics of n- channel JFET.
12. Mention any two characteristics of CC amplifier.
13. In negative feedback amplifier lower cut off frequency f_1=100Hz, A=1000. Determine upper cut off frequency when negative feedback with β=0.01 is applied.
14. Draw the circuit diagram Wein bridge oscillator.
15. Sketch modulating signal, carrier signal and FM wave.
16. What is function of DC chopper and draw its symbol.
17. Write the syntax for "if-else" statement.
18. Draw the diagram of a satellite transponder system

PART - C

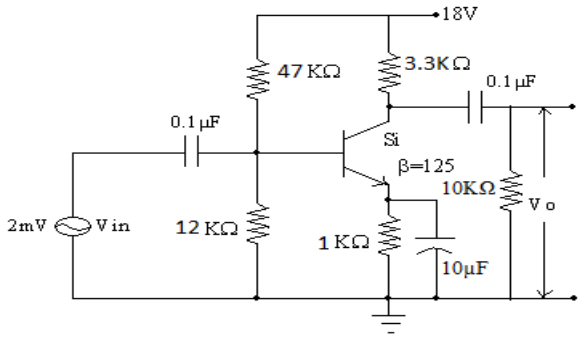
III. Answer any FIVE of the following questions **3 X 5 = 15**

19. Explain the terms thermal runaway, leakage current and heat sink.
20. Write the block diagram of any 3 types of negative feedback connections.
21. Define critical angle, critical frequency and skip distance.
22. Explain punch through type of power diodes.
23. A silicon power diode as V_j (the drop across $p^+ n^-$ junction) of 0.4 V and R_{on} in a drift region 0.002 ohm and forward current I_F = 100A. Determine V_{AK}
24. Distinguish between combinational and sequential logic circuits.
25. Write an assembly language program to add 34H and 56H. Verify the result by binary addition.
26. Draw the block diagram of a RADAR system.

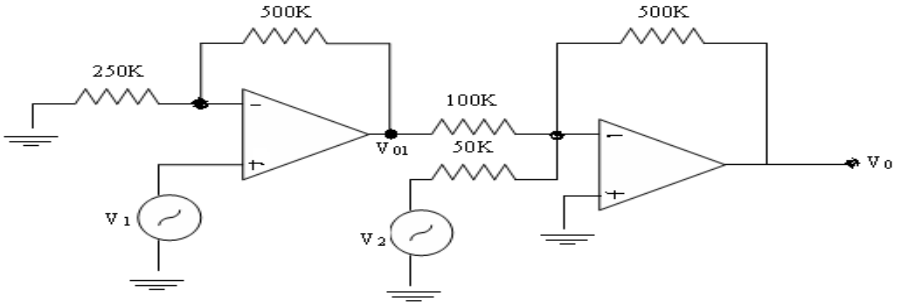
PART - D

IV. Answer any THREE of the following questions 5 X 3 = 15

27. For the circuit shown below, determine I_E, r_e, Av and r_{in} for the given values V_{BE}=0.7v and $r_e=\frac{52mV}{I_E}$



28. Calculate the output voltage if V_1=200mV and V_2=700mV.



29. A phase shift oscillator uses resistor R=220Ω. 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+0.4sin (6280)t)sin(3014X10^7t). This voltage fed to antenna of resistance 500Ω. Calculate (a) carrier frequency (b) modulating frequency (c) carrier power (d) mean power out.
31. Simplify the Boolean function Y = f(A,B,C, D) = Σm (1,3,4,6,9) + Σd (11,12,14) using K- map. Draw the logic circuit using NAND gate to realize the simplified expression.

PART – E

V. Answer any FOUR of the following questions 5 X 4 = 20

32. With a circuit diagram explain the working of direct coupled amplifier and draw the frequency response.
33. With the circuit diagram of 4 bit DAC using R-2R ladder network. With explanation write the conversion table of DAC.
34. Derive an expression for total power carried by an AM wave.
35. Explain the working of master slave JK Flip – Flop with logic circuit. Draw its timing diagram and write its truth table.
36. With example, write the program for multiplication of two bit number using 8051 microcontroller.
37. What is an identifier? Explain rules of declaring the identifier.

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