JAIN COLLEGE, J C Road Bangalore

Mock Paper -1, January - 2017

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

PART-A

I. Answer all the following questions: - **10 × 1 = 10**

1. What is pinch-off voltage?
2. Name any one parameter of the transistor which is temperature dependent.
3. How many op-amps present in LM324?
4. What is an active filter?
5. Carrier wave is represented by $v_c = 40 \sin (2\pi \times 10^6) t$. What is the amplitude of carrier wave?
6. Draw the circuit symbol of SCR.
7. How many variables does a pair eliminate?
8. Define min term.
9. How many register banks are present 8051?
10. What is the size of an integer in C programming?

PART-B

II. Answer any five of the following: - **5 × 2 = 10**

11. Derive the relation $\mu = r_d \times g_m$.
12. What is cross-over distortion? Sketch graph showing cross-over distortion.
13. In a negative feedback amplifier lower cut off frequency f_1=100Hz, A=1000. Determine higher cut off frequency when negative feedback with β=0.01 is applied.
14. What are Pre-emphasis and De-emphasis?
15. Draw the circuit diagram of chopper using MOSFET, Draw gate signal and output load voltage waveforms of a DC chopper.
16. Briefly explain the function of i) program counter ii) accumulator in microcontroller 8051.
17. Write the meanings of the following operators in C-programming?
    i) == ii) &&
18. Distinguish between uplink and downlink signals.

PART-C

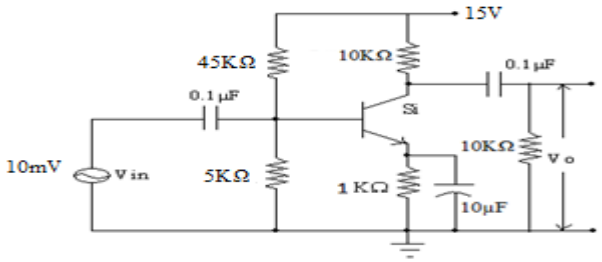
III. Answer any five of the following: - **5 × 3 = 15**

19. Name the different biasing circuit. Which biasing circuit is used to get better faithful amplification?
20. With a neat block diagram derive an expression for voltage gain with negative feedback.
21. With relevant diagram, explain ionospheric propogation.
22. Explain the construction of power diode with diagram.
23. At what firing angle does SCR of FWR must be triggered to supply V_{dc} of 60V to a load . Given V_{rms}= 110V.
24. Distinguish between AM and FM signals.
25. Convert $A+BC+\bar{A}B$ into its canonical SOP and write the expression in minterm designation.
26. With a neat block diagram, explain the operation of a fiber optic communication system..

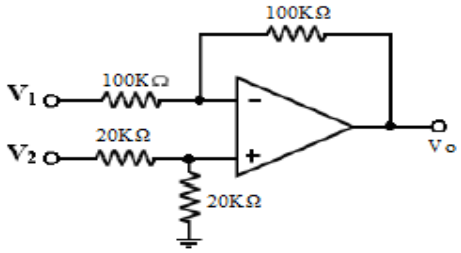
PART-D

IV. Answer any three of the following: - **3 × 5 = 15**

27. CE amplifier circuit with silicon transistor is given below, calculate i) Zin(base), ii) Zo, iii) voltage gain. Given β=100



28. Determine the output voltage when V1=-V2=-1V.



29. The frequency of colpitts oscillator is 18MHz. Design the value of inductor to be used if C1=100pF and C2=10pF.
30. An FM signal has a resting frequency of 105MHz and highest frequency of 105.03MHz, when modulated by a signal of frequency of 5KHz. Determine a) frequency deviation b) carrier swing c) modulation index d) percent modulation e) lowest frequency reached by the FM wave.
31. Simplify the Boolean function Y = f(A,B,C, D) = Σm (0,2,6,8,10,12,14) + Σd (4,9,13) using K- map. Draw the logic circuit using NAND gate to realize the simplified expression.
map. Draw the NAND Gate equivalent circuit to realize the simplified equation.

PART-E

V. Answer any four of the following: - 4 × 5 = 20

32. With a circuit diagram explain the working of direct coupled amplifier and draw the frequency response.
33. Explain virtual ground concept and also derive an expression for output of an inverting adder.
34. Derive an expression for instantaneous value of AM wave.
35. Explain the working of D flip flop using NAND gates. Draw its timing diagram and write its truth table.
36. Briefly explain different addressing modes in microcontroller 8051.
37. Write a C program to accept the three integers and print the largest amongst them.

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Mock Paper -2, January - 2017

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

PART-A

I. Answer all the following questions: - **10 × 1 = 10**

1. Write the function of source terminal in JFET.
2. In which region of characteristics a transistor behaves as closed switch?
3. Write minimum number of op-amp required to realize the output given by the equation, $V_0=V_1-2V_2+4V_3$, where V_1,V_2,V_3 are the input voltages.
4. What is the IF frequency of FM SHD receiver?
5. What is the efficiency of an AM for 100% modulation?
6. Write the symbol of TRIAC.
7. A four bit synchronous counter is applied with clock frequency of 16 KHz. What is the frequency of MSB (Q_4) bit?
8. What is a redundant group?
9. How many I/O pins are present in 8051 microcontroller?
10. Expand CDMA**.**

PART-B

II. Answer any five of the following: - **5 × 2 = 10**

11. Name two types of JFET.
12. Write steps involved in drawing AC equivalent circuit of an amplifier?
13. Calculate the gain of a negative feedback amplifier with an open loop gain A=100 & β=1/10
14. Draw the equivalent circuit of transmission lines for low frequency signals.
15. Write any two advantages of static switches.
16. Name the addressing modes of the following instructions:
    i) MOV A,R0 ii) MOV R0,50H.
17. Write the syntax for "for" statement.
18. Mention the important techniques used in Bluetooth operation.

PART-C

III. Answer any five of the following: - **5 × 3 = 15**

19. Explain the formation of depletion regions formed due to gate potential.
20. What is loop gain? Draw the block diagram of current series and voltage shunt negative feedback.
21. Draw the block diagram of a communication system and explain the function of each block.
22. Derive an expression for anode current I_A of an SCR when gate current I_C is zero.
23. A p-n junction diode has a reverse saturation current rating of 50nA at 32^{o}C. What should be the value of the forward current for a forward voltage drop of 0.5V?
24. With a neat diagram, explain the working of T flip flop with truth table.
25. What is debugging? Explain the different errors in C programming?
26. What is RADAR? Mention any two applications.

PART-D

IV. Answer any three of the following: - **3 × 5 = 15**

27. CE amplifier circuit with germanium transistor is given, calculate i) r_e', ii) voltage gain, iii) output impedance. Given β=150,R_1=100KΩ, R_2=10KΩ,R_c=2.2KΩ, R_E=220Ω and V=15V.
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. What should be the value of feedback resistor if the output is doubled.
29. A RC phase shift oscillator uses three identical RC sections in the feedback network. The value of the components are R=680Ω, R_1=1KΩ, R_f=29KΩ and C=220nF. Determine the frequency of oscillations and gain.

30. A 10KW carrier wave is amplitude modulated at 80% depth of modulation by a sinusoidal modulating signal. Calculate the total power, sideband power and transmission efficiency of the AM wave.
31. Simplify the Boolean function Y = f(A,B,C, D) = Σm (0,1,4,6,8,9,12,14) + Σd (5,7) using K- map. Draw the logic circuit using NAND gate to realize the simplified expression.

PART-E

V. Answer any four of the following: - 4 × 5 = 20

32. With a circuit diagram explain the working of class B push pull amplifier.
33. With a neat circuit diagram explain the working of 4 bit R-2R ladder network DAC.
34. Draw the block diagram of an FM receiver and explain its working.
35. Realize AND, OR, NOT and XOR gates using NAND gate and write their respective truth table.
36. Write a program to add two 8-bit numbers and store it in R6. The numbers are 01EH and 01CH.
37. Write all the features of c programming.

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