JAIN COLLEGE, J C Road Bangalore

Mock Paper -1, January - 2019

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

PART-A

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

1. Define amplification factor of FET.
2. Which transistor amplifier has low output impedance?
3. What is a differential amplifier?
4. Define noise in communication system.
5. Determine modulation index m_a of AM. Given Vmax=10V and Vmin=6V.
6. What is a demodulation?
7. Expand ASCII.
8. Write the logic circuit for the expression Y=AB using NOR gates.
9. Write C equivalent expression for Y= $\sqrt{a^2 + b^2}$.
10. Define Wi-Fi.

PART-B

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

11. Mention different types of biasing circuit. Which type of bias circuit is called as a universal bias circuit?
12. Write the important steps to draw AC equivalent circuit.
13. Draw the block diagram of voltage shunt and current series negative feedback.
14. Mention Barkhausen's criterion condition for sustained oscillation.
15. A silicon power diode has V_j=0.4V, R_{on} in drift region of 0.002Ω and I_F=75A. Determine V_{AK}.
16. Realize NOT and AND gate using NAND gate.
17. Briefly explain logical instruction of 8051 microcontroller.
18. Expand ISP and TCP with reference to internet.

PART-C

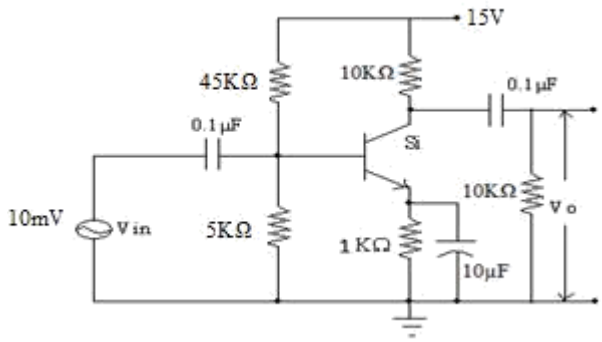
III. Answer any five of the following: - **5 × 3 = 15**

19. Explain the working of n-channel J-FET.
20. With neat block diagram, derive the expression for output impedance with negative feedback.
21. Explain ground wave, space wave and sky wave propagation in communication system.
22. What is a transmission line? Mention the primary constant of transmission line and its application.
23. Draw the circuit diagram and output waveform of DC to AC invertor.
24. Distinguish between non punch through and non-punch through type in power diode.
25. How do you represent i) logical AND ii) logical OR iii) logical NOT operators in C programming?
26. Explain with the block diagram, the working of optic fiber communication system and Write its application.

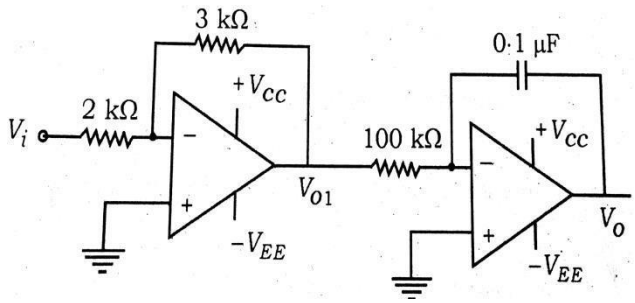
PART-D

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 Vi=5 sin100πt



29. Determine the frequency of oscillation of wein-bridge oscillator for,
    (a) R1=R2=R=15KΩ and C1=C2=C=100nF.
    (b) R1=R2=R=1KΩ and C1=C2=C=0.01μF.
30. A 25MHz carrier is modulated by a 500Hz modulating signal. If the carrier voltage is 5V and maximum deviation is 10KHz, write the equation for the FM wave.
31. Simplify the Boolean function Y = f(A,B,C, D) = Σm (1,3,5,6,8,9,11,12) + Σd (0,7,14) using K- map. Draw the logic circuit using NAND gate to realize the simplified expression.

PART-E

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

32. With a circuit diagram explain the working of class-B push pull amplifier.
33. What is a subtractor? With a neat circuit diagram derive an output equation of OP-AMP subtractor.
34. Explain the working of linear diode detector with the waveform.
35. With a neat block diagram and truth table, explain the working of SISO shift register.
36. Write the pin diagram of 8051 microcontroller.
37. Write a C- program to accept the radius of circle and compute its area and perimeter.

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Mock Paper -2, January - 2019

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 symbol of p-channel JFET.
2. What is a power amplifier?
3. Mention the ideal value of OP-AMP output impedance and bandwidth.
4. Which layer of ionosphere is called Kennely-heaviside layer?
5. What is the efficiency of an AM for 100% modulation?
6. Mention the frequency range of FM radio receiver.
7. What is a sequential logic circuit?
8. Write the truth table of XNOR gate.
9. How many timers are present in 8051 microcontroller?
10. What is a keyword?

PART-B

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

11. Differentiate between JFET and BJT.
12. What is a cross-over distortion? Sketch the graph showing cross-over distortion.
13. The loop gain of a negative feedback amplifier is10 & bandwidth of before feedback is 50KHz. find the bandwidth of an amplifier with feedback
14. Write the pin diagram of IC-555 timer.
15. What are pre-emphasis and de-emphasis networks?
16. Determine the average of DC from chopper. Given T=2mS,Ton=0.5mS and Vs=24V.
17. Distinguish between SJMP and LJMP instruction in 8051 microcontroller.
18. Write the difference up link and down link signal.

PART-C

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

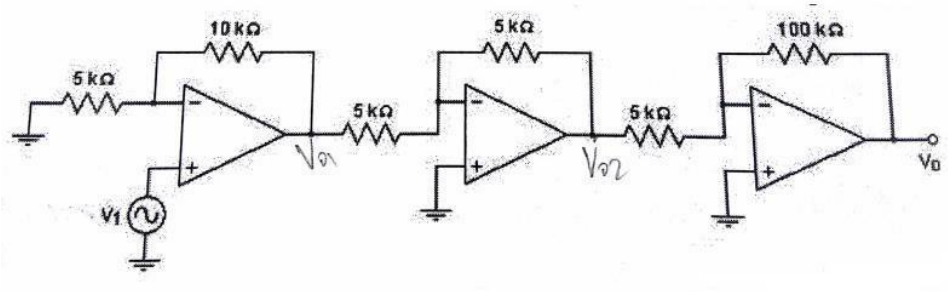
19. Explain the following terms: operating point, leakage current and heat sink.
20. With a neat block diagram, derive the expression for input impedance with negative feedback amplifier.
21. Define critical frequency, fading and skip distance.
22. Derive an expression for anode current I_A of an SCR when gate current I_C is zero.
23. Determine V_{dc} and I_{dc} of SCR HWR. Given firing angle 30^0 and rms voltage of ac input to the rectifier is 30V and R_L is10Ω.
24. With a neat diagram, explain the working of D flip flop with truth table.
25. Write the syntax for 'if-else' statement and 'do while' statement.
26. With a neat circuit diagram explain the operation of satellite transponder system.

PART-D

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

27. A three stage amplifier has voltage gain of 100, 200 and 400 respectively. If the input voltage given at first stage is 10μV, calculate the output voltage at each stage. Also find total voltage gain in dB.

28. Calculate the output of for the given circuit. When Vi=5mV



29. A Hartley oscillator oscillates at 15 KHz. If the capacitor in the tank circuit has a value of 0.01µF and one of the inductors value is 1mH, calculate the value of other inductor.
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) + Σd (5,7,14) using K- map. Draw the logic circuit using NAND gate to realize the simplified expression.

PART-E

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

32. Give the comparison between CB, CE and CC amplifier.
33. What is a differentiator? With a neat circuit diagram derive an output equation of OP-AMP differentiator.
34. Derive an expression for the instantaneous value of FM wave.
35. Explain with circuit diagram and truth table, the working of clocked S R flip-flop using NAND gates.
36. Write an ALP to subtract 37_H from 52_H when CY=0 and store the result in R7.
37. Write a C- program to find sum of n natural number of up to 60.

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