JAIN COLLEGE V V Puram **II PUC Mock Paper 2 – January 2025**	**Course:** II PUC **Subject:** Electronics **Max. Marks:** 70 **Duration:** 3 hour

Instructions: 1. The question paper has four parts A, B, C and D.
2. Part - A is compulsory.
3. Part - D consists of essay type questions and problems together.
4. Circuit diagrams, timing diagrams and truth tables must be drawn wherever necessary.
5. Solve the problems with necessary formulas.

PART A

I. Select the correct answer from the choices given: **15 x 1 = 15**

1. Name a voltage-controlled device.
   a) Diode b) BJT c) FET d) None of the above
2. In which transistor region the collector current is almost constant in CE output characteristics
   a) active region b) Cut off region c) Saturation region d) Ohmic region
3. Which of the following transistor Amplifier has highest voltage gain
   a) CB Amplifier b) CC Amplifier c) CE Amplifier d) CS Amplifier
4. The type of Feedback used in oscillators
   a) Positive b) Negative c) Voltage-series d) Current series
5. The phase difference between input and output in an OPAMP Inverting amplifier is
   a) 0^0 b) 180^0 c) 90^0 d) 270^0
6. The OP-AMP circuit which acts as a high-pass filter
   a) Differentiator b) Integrator c) Adder d) Subtractor
7. Which of the following is RC Oscillator
   a) Phase shift oscillator b) Hartley oscillator c) Crystal oscillator d) Colpitt's oscillator
8. Which of the ionosphere persists during both day and night time
   a) D layer b) E layer c) F layer d) None of the layer
9. For exact modulation in AM valve of modulation Index is
   a) $m_a>1$ b) $m_a<1$ c) $m_a=1$ d) $m_a=0$
10. PBJT is expanded as
    a) Power Bijunction transistor b) Polar Bijunction transistor
    c) Power Bijunction transformer d) None of the above
11. Group of 8 adjacent cells in a KMAP is called as
    a) Quad b) Octet c) Pair d) Hexet
12. The logic gate used for construct binary arithmetic circuits is
    a) X-OR gate b) NOR gate c) AND gate d) OR gate
13. The addressing mode of the instruction Mov A, # 43
    a) Indirect b) Immediate c) Register d) Direct
14. The correct C equivalent expression for A=1/2bh
    a) a=0.5 *b*h b) a=0.5*b*h c) a=(b*h)/2 d) both b and c
15. Uplink frequency in satellite communication
    a) 6 GH_Z b) 4 GH_Z c) 10 GH_Z d) 15 GH_Z

II. Fill in the blanks by choosing appropriate answer from the given in the bracket: 5 x 1 = 5
[a) slew rate b) damped c) Modulation Index d) Self complimentary e) high frequency]

16. CB amplifier is suitable for …….. application
17. The rate of change of output of OP-AMP is called ……
18. Electrical oscillations whose amplitude decreases with time are known as …… oscillations.
19. The ratio of maximum frequency deviation to the modulating frequency is…….
20. Excess-3 code is also known as ……...

PART B

III. Answer any FIVE questions: 5 X 2 = 10

21. What are the leakage currents? Mention different type of leakage current.
22. An amplifier with Zi=1KΩ, has a voltage gain A=100. If negative feedback of β=0.1 is applied to it, calculate the input impendence of the feedback amplifier.
23. A wein bridge oscillation has R1=R2=R=15kΩ and C1=C2=100nF.Determine the frequency of oscillation.
24. Name the two types of modulation.
25. Draw forward and reverse characteristics of power diode.
26. Express y=AB+ABC+BC in canonical form.
27. What is addressing mode? Mention any two types of addressing mode.
28. Write the block diagram for RADAR.

PART C

IV. Answer any FIVE questions: 5 X 3 = 15

29. Explain the working of n-channel JEET.
30. Derive the expression for voltage gain of a voltage series type negative feedback.
31. Explain piezo electric effect and write the equivalent circuit for a crystal.
32. With help of diagram explain ionospheric layers.
33. Draw the black diagram and waveform of SHDAM radio receiver.
34. Determine V_{dc} and I_{dc} of SCR HWR. Given firing angle is 90^0 and rms voltage of ac input to the rectifier is 220 V and load is 20 Ω.
35. What is half-adder? Write the logic circuit for full adder using 2 Half-Adders.
36. Draw the diagram of explain the function of satellite transponder system.

PART D

V. Answer any FIVE questions: 3 X 5 = 15

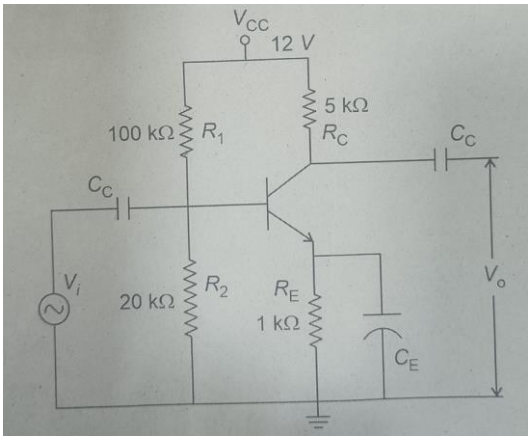
37. Write a neat circuit diagram explain the working of two stage direct coupled amplifier.
38. What is subtractor? Derive the expression for the output voltage of OP-AMP subtractor.
39. Construct AND, OR, NOT and XOR gate using NAND gates.
40. Write an ALP to perform multiplication of two numbers and store the results in registers R_0 and R_1.
41. Write a C-program to check whether the entered two numbers are same or not.

PART D (SECTION-2)

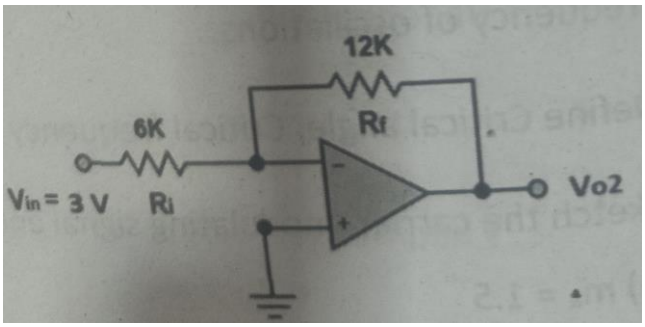
V. Answer any TWO questions: **5 X 2 = 10**

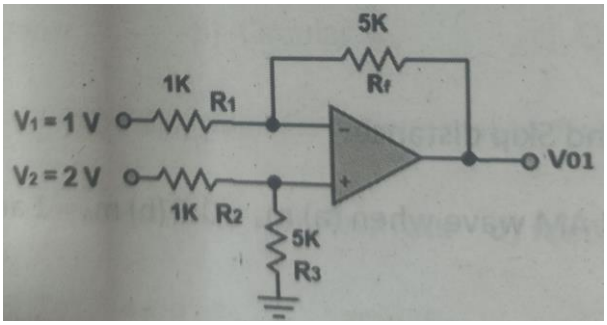
42. Calculate the voltage gain, input impedance and output impedance in the circuit given below. Given β = 100 and re' =26mV/IE. Find

a) V_2 b) I_E c) A_V d) Zin (base) e) Zo



43. Find the output voltage in the op-amp circuit given.





44. The current of an AM transmitter is 8A when only carries are sent, it increases to 8.65A when the carrier is amplitude modulated. Find the percentage modulation. Determine the antenna current when the depth of modulation is 0.75.

45. Simplify the following expression using K-MAP and the NAND gate equivalent current for the simplified expression F(ABCD) = Σm (0,2,4,6,8,14,15) + Σd (10, 12, 13).

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