KLE Society's

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MODEL QUESTION PAPER - I

Class	**: II PU**	**Subject**	**: Electronics**	**Subject Code**	**: 40**
Year	**: 2020 – 21**	**Duration**	**: 3 hour 15 minutes**	**Maximum Marks**	**: 70**

Note: 1) Question paper has **four** parts **A,B,C** and **D**.
2) Part-**A** is **compulsory**.
3) Part-**D** has **two** parts. Part-**I** is from **problems**, Part-**II** is of **essay type** questions.
4) Circuit diagrams/timing diagrams/truth tables are drawn **wherever** necessary.
5) Problems without necessary formula/formulae carry **no** marks.

PART A

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

1. Draw the symbol of p-channel JFET.
2. What is biasing of a transistor?
3. Define stability factor.
4. What are the functions of input and output coupling capacitors in an amplifier?
5. What is emitter follower?.
6. List out any two characteristics of an ideal op-amp.
7. What are sinusoidal oscillators?
8. Define skip zone.
9. Which are the components of AM wave carrying information?
10. Name the self complementing code.

PART B

Answer any FIVE questions **5 X 2 = 10**

11. Given g_{m0}=5mS, V_{GS}=-2V and V_P=-3V. Find the value of g_m.
12. Write the steps involved in drawing the AC equivalent of an amplifier.
13. Draw the circuit of first order low pass active filter.
14. Determine the output voltage of an op-amp summing amplifier given $R_1=R_2=R_3=R_F=10K\Omega$, V_1=5V, V_2=-2Vand V_3=1V.
15. Mention the limitations of LC oscillators.
16. Draw the block diagram of basic communication system.

17. Draw the pin diagram of IC 7402.
18. Convert $AB + \overline{C}$ into canonical SOP.

PART C

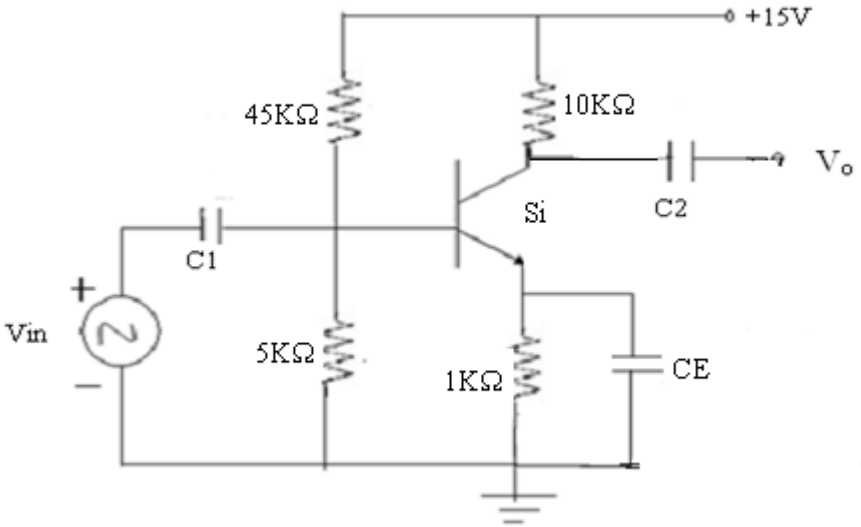
Answer any FIVE questions. **5 X 3 = 15**

19. Explain the construction of n-channel JFET with neat circuit diagram.
20. Derive an expression for the Q-point in voltage divider bias.
21. Give any three comparison between CB, CE and CC amplifiers.
22. Draw the block diagram for different types of coupling.
23. The input impedance of an amplifier is 2KΩ. If the gain of the amplifier is 500 and feedback fraction is 0.9%, calculate the input impedance with negative feedback.
24. Draw the block diagram of an op-amp and explain the function of each block.
25. Explain the different layers of ionosphere.
26. Realize half adder using only NAND gates. Write its truth table.

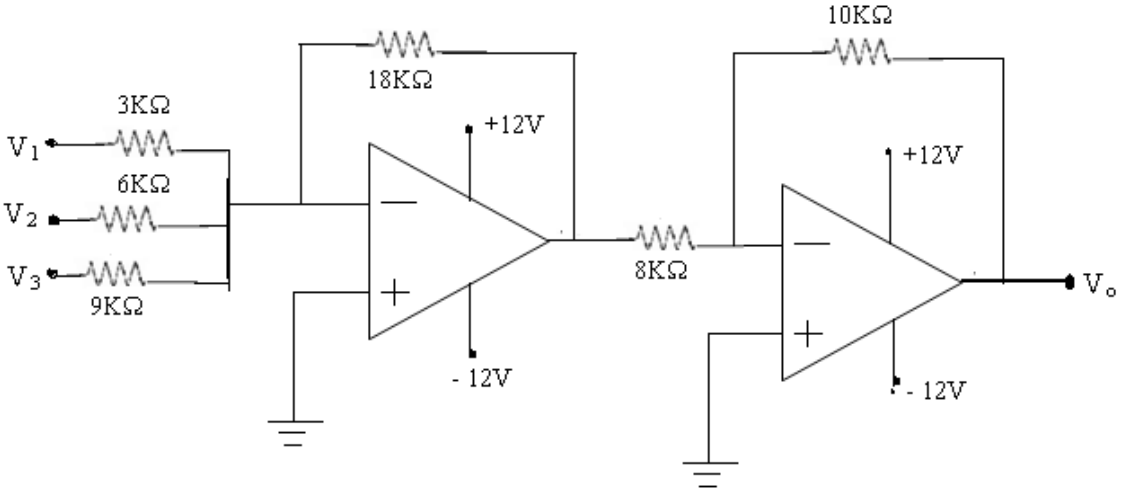
PART D

I. Answer any THREE of the following. **3 X 5 = 15**

27. For the given CE amplifier circuit using silicon transistor, calculate: a)voltage across 5KΩ b)I_E c) $Z_{in(base)}$ d)Z_{in} e)Z_o. Given β=100



28. Find the output voltage Vo for the following circuit:
    Given: $V_1 = 1$ V, $V_2 = 2$ V, $V_3 = -1$ V.



29. Determine the frequency of oscillation of Wein bridge oscillator for the following values.
    (a) R1=R2=R=10KΩ and C1=C2=C=10μF.
    (b) R1=R2=R=2.2KΩ and C1=C2=C=0.1μF.

30. A sinusoidal carrier voltage V_c=80 sin 2π x 10^5t is amplitude modulated by a sinusoidal voltage Vm=32 sin 2π x 10^3t. Write the equation of the AM wave and draw its frequency spectrum.

31. Simplify the following Boolean expression by using K-map.
    Y=∑m(4,5,7,9,11,12,13,15) + ∑d(1,3,8)
    Draw the logic circuit for the simplified expression using only NAND gates.

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

32. With a circuit diagram explain the working of a two stage RC coupled amplifier . Show the input and output waveforms.
33. Obtain the expression for output impedance of voltage series negative feedback amplifier.
34. What is op-amp integrator? Derive an expression for the output of op-amp integrator.
35. With a circuit diagram explain the working of Wein Bridge oscillator.
36. Derive the expression for instantaneous voltage of AM wave
37. Realize AND, OR, NOT and XNOR gates using NOR gates.