



**II. Fill in the blanks by choosing appropriate answer from those given in the bracket:  $5 \times 1 = 5$**   
[ a) data b) modulation c) biasing d) impedance e) switching speed]

16. FET has high .....
17. Application of suitable voltage across the terminals of a transistor is called .....
18. CC amplifier is used to match .....
19. Process of changing some characteristics of carrier in accordance with instantaneous value of the signal is called .....
20. Flip-Flops are used to store .....

**PART B**

**III. Answer any FIVE questions:  $5 \times 2 = 10$**

21. Mention any two advantages of voltage divider biasing.
22. Write the steps involved in drawing DC equivalent circuit of an amplifier.
23. Calculate gain of a negative feedback amplifier with gain,  $A = 100$  and feedback factor  $\beta = 0.1$ .
24. Determine frequency of Hartley oscillator. Given  $L_1 = 4 \text{ mH}$ ,  $L_2 = 2 \text{ mH}$  and  $C = 10 \text{ nF}$ .
25. Compare forward characteristics of power diode for two different junction temperatures.
26. Write minterm designation table for two input variables.
27. Write any two comparisons between Microprocessor and Microcontroller.
28. Mention any four operators used in C programming.
29. Distinguish between uplink and downlink signals.

**PART C**

**IV. Answer any FIVE questions:  $5 \times 3 = 15$**

30. Obtain the relations between FET parameters.
31. Give any three differences between positive feedback and negative feedback.
32. Draw the circuit diagram of phase shift oscillator. Write the expression for its frequency of oscillations.
33. Determine frequency of tank circuit having  $L = 1 \mu\text{H}$  and  $C = 0.01 \mu\text{F}$ .
34. Draw the block diagram of basic communication system and explain the function of each block.
35. Explain diode detector circuit.
36. Determine  $V_{dc}$  and  $I_{dc}$  of SCR HWR. Given firing angle is  $90^\circ$  and rms voltage of ac input to the rectifier is  $230 \text{ V}$  and load is  $10 \Omega$ .
37. What is half-adder? Draw the logic diagram of half adder using only NAND gates.
38. What is Internet? Mention the important techniques used for Bluetooth operation.

**PART D (SECTION-1)**

**V. Answer any THREE questions:  $5 \times 3 = 15$**

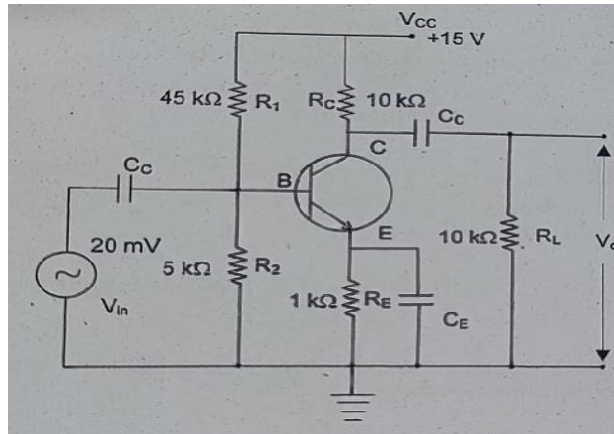
39. With a neat circuit diagram explain the working of two stage RC-coupled amplifier.
40. With the circuit diagram derive an expression for output voltage of three input op-amp adder.
41. Derive an expression for instantaneous voltage equation of AM wave.
42. Prove the universal properties of the NOR gate.
43. Write an assembly language program to add two numbers 1FH and B4H and store the result in R0. Verify the result by binary addition.
44. Write a C-program to accept the three integers and print the largest amongst them.

**PART D (SECTION-2)**

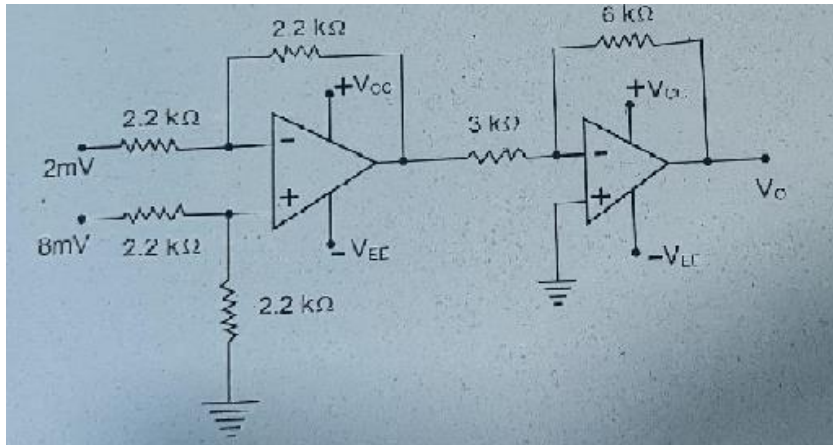
**VI. Answer any TWO questions:**

**5 × 2 = 10**

45. Calculate the voltage gain, input impedance and output impedance in the circuit for a silicon transistor.  
Given  $\beta = 100$  and  $r_e' = 26\text{mV}/I_E$ .



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



47. A 10 kW carrier wave is amplitude modulated at 80% depth of modulation by a sinusoidal modulating signal. Calculate the total power and side band power of the AM wave.
48. Simplify the Boolean Expression  $Y = \sum m(1, 3, 5, 7, 13, 15) + \sum d(0, 12, 14)$  using K-map. Draw the NAND Gate equivalent circuit to realize the simplified equation.

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