PART-A

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

1. Define thermal runaway

2. What is an active filter?

3. What is DSB-SC?

4. Define frequency deviation

5. Draw the symbol of TRIAC.

6. Expand EBCDIC

7. Convert $1001_{(2)}$ into gray code.

8. How many interrupt sources are there in 8051 microcontroller?

9. Write C equivalent expression for $y=(4x+8)(5y+z)$

10. What is cell splitting?

PART-B

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

11. What is Pinch-off voltage? What is the value of Drain current at pinch-off?

12. Write the steps involved in drawing AC equivalent circuit of an amplifier.

13. If an amplifier has a bandwidth of 500kHz and voltage gain of 100. What will be the new bandwidth if 5% negative feedback is introduced?

14. Mention any two advantages of a crystal oscillator over LC and RC oscillators.

15. What is the need for modulation?

16. Draw the VI-characteristics of SCR.

17. Write the syntax for "if-else" statement.

18. Mention a few types of protocols used in computer networks.

PART-C

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

19. Derive the equation to determine the co-ordinates of Q-point in voltage divider bias circuit.

20. Draw the frequency response of an amplifier with and without negative feedback.

21. Write a note on D-layer, E-layer and F-layer of ionosphere.

22. Explain Punch through type power diodes.

23. A silicon power diode has V_j of 0.5, R_{ON} in drift region of 0.005Ω. Determine V_{AK} if (a) I_F=80A (b) I_F=200A.

24. Write the logic circuit and truth table of D-flip flop using only NAND gates.

25. Write the difference between microcontroller and microprocessor.

26. Write a short note on satellite communication.

PART-D

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

27. Find the input resistance and voltage gain of the CE transistor amplifier for the data give below

R_1=47Ω, R_2=2KΩ, R_c=3.3KΩ, R_E=1KΩ, V_{cc}=18v, β=100, V_{BE}=0.3v and r_e^1=52mv/I_E

28. Determine the output voltage for the circuit shown below.
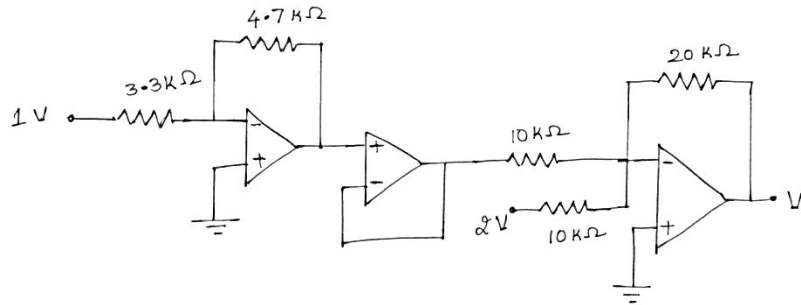
29. A phase shift oscillator uses resistor R= 220Ω. What should be the capacitance values of the capacitor required for a phase shift oscillator of frequency (a) 120Hz (b) 1KHz.

30. A AM wave is represented by V_{am} 70(1+45Sin62.8x10^{3}t)xsin3.14x10^{6}t. it is used for transferring an audio information. Calculate the amplitude and frequencies of audio signal, carrier wave and side bands. Also determine the maximum and minimum amplitude of AM wave.

31. Simplify y=$\sum$m(5,6)+$\sum$d(0,1,4,8,9,12,13,14) using K-map. Draw the logic diagram for te simplified expression using NAND gates.

PART E

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

32. Explain the working of two stage RC coupled amplifier.

33. Obtain an expression for the output of op-amp integrator.

34. Derive an expression for instantaneous voltage of amplitude modulated wave.

35. Explain the working of SISO shift register with relevant diagrams.

36. Write an assembly language program to multiply 05H and 0AH and save the result into register A and B. what is the content of register A and B after execution of the program.

37. Write a C-program to find the roots of a Quadratic equation using Switch case.

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