Sri Bhagawan Mahaveer Jain College, V.V. Puram

II PUC MOCK PAPER II

ELECTRONICS

Time : **3 Hours 15 Minutes** [Total No. of questions:37] [Max. 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 mark**.

PART- A

Answer **all** questions: **(10x1=10)**

1. What is trans-conductance in FET?
2. What should be the biasing condition of a BJT for amplification?
3. What is the significance of CMRR?
4. Define noise figure.
5. What is an antenna?
6. Draw the circuit symbol of SCR.
7. Write XS3 code for $15_{(10)}$.
8. What is edge triggering in flip-flops?
9. What is PSW?
10. Mention the size of memory allocated for a double data type in C-programming.

PART- B

Answer any **FIVE** questions: **(5x2=10)**

11. Write a note on stability factor for BJT.
12. In a negative feedback amplifier A=800, $\beta = 0.04$. Determine gain with feedback.
13. What is a tank circuit? Draw the waveform for a practical tank circuit.
14. Define deviation ratio. What is Deviation Ratio for commercial FM broadcasting?
15. Draw the labeled circuit of two transistor model for SCR.
16. Explain the instructions (i) DIV AB
    (ii) CLR C.
17. Write the syntax for '**for'** loop.
18. Draw the block diagram of Satellite communication system.

PART- C

Answer any **FIVE** questions: **(5x3=15)**

19. Explain the working of n-channel JFET.
20. Derive an expression for input impedance of voltage series negative feedback amplifier.
21. Write a note on ground waves.
22. Derive an expression for m_a in terms of $\mathbf{V}_{max}$ and $\mathbf{V}_{min}$.
23. Write the two steps involved in writing the AC equivalent circuit of CE amplifier. What is the purpose of C_E?
24. What is a chopper? Write any two applications of power electronics.
25. Draw the logic circuit of half adder using NAND gates, write its truth-table and write the Boolean expression for the outputs.
26. What is call handoff? Explain how it is achieved.

PART- D

I. Answer any **THREE** questions: **(3x5=15)**

27 If an amplifier is provided with the input voltage 5mV, the maximum voltage gain is 2000 for a signal frequency of 2 KHz. It falls to 1414 at 10 KHz and 50 Hz. Find the output voltage, gain in dB, upper cutoff frequency, lower frequency and bandwidth.

28. Design an OpAmp adder whose output is to be $V_o = 4V_1\text{-}60V_2\text{+}98V_3$.
29. A Hartley oscillator generates a frequency of 91.1 MHz, the value of one of the inductor is 12μH and C = 0.01μF, determine the value of other inductor and the gain required.
30. A 93.2MHz carrier is frequency modulated by a 5 kHz sine wave. The resultant FM signal has a frequency deviation of 50 kHz. Determine C.S, highest and lowest frequencies attained by the FM signal and modulation index.
31. Simplify Y(ABCD)=$\sum m(0,2,4,8,10) + \sum_d m(12,14)$ using K-map and draw the logic circuit for the simplified expression using NAND gates only.

PART- D

II. Answer any **FOUR** questions: **(4x5=20)**

32. With the circuit diagram, explain the operation of class B power amplifier.
33. Derive an expression for the output voltage of op-amp integrator.
34. Draw the block diagram of FM transmitter and explain the working of each block.
35. Explain the working of a RS flip-flop. Write the timing diagram.
36. Write a note on address bus, data bus and ports in 8051 microcontroller.
37. Write a C program to determine whether a given number is prime number.