



JAIN COLLEGE, J C Road Bangalore

Mock Paper -1, January - 2020

Time: 3 Hours 15 Minutes

II PUC– Electronics (40)

Max. Marks: 70

PART-A

I. Answer all the following questions: -

10 × 1 = 10

1. Why FET is called as a voltage controlled device?
2. Which transistor amplifier has high input impedance?
3. What is a CMRR?
4. Define noise in communication system.
5. Mention the IF of FM radio receiver.
6. What is an antenna?
7. Write the Boolean expression for borrow of half subtractor.
8. Write BCD CODE for $128_{(10)}$.
9. How many I/O ports are present in 8051 microcontroller?
10. Write the symbol of **caret**.

PART-B

II. Answer any five of the following: -

5 × 2 = 10

11. Explain stability factor and heat sink.
12. Write the important steps to draw the AC equivalent circuit.
13. Draw the block diagram of voltage shunt and current series negative feedback.
14. Draw the symbol and equivalent circuit of crystal oscillator.
15. Derive an expression for anode current I_A of an SCR when gate current is zero.
16. Mention the features of 8051 microcontroller.
17. Write the syntax for “do-while” statement.
18. Expand ISP and TCP with reference to internet.

PART-C

III. Answer any five of the following: -

5 × 3 = 15

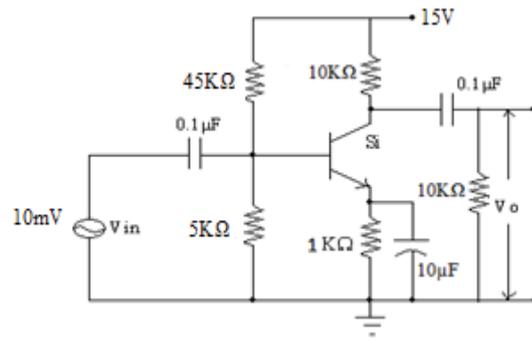
19. Explain the construction of n-channel J-FET.
20. With a neat diagram, derive expression for voltage of amplifier with negative feedback.
21. With block diagram, explain basic communication system.
22. Determine anode current I_A of SCR given $\alpha_1=0.49$, $\alpha_2=0.49$ and $(I_{CO1}+I_{CO2}) = 1\text{mA}$.
23. Draw the circuit diagram of single phase SCR FWR with RC triggering circuit
24. Draw the neat block diagram of FMSHD receiver.
25. How do you represent i) logical AND ii) logical OR iii) logical NOT operators in C programming?
26. Explain with the block diagram, the working of optic fiber communication system and Write its application.

PART-D

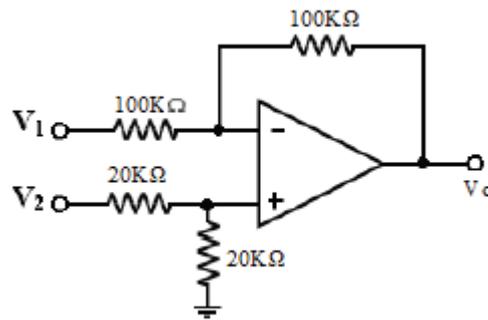
IV. Answer any three of the following: -

3 × 5 = 15

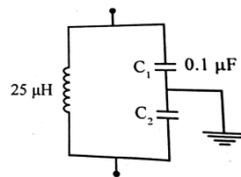
27. CE amplifier circuit with silicon transistor is given below, calculate i) $Z_{in}(\text{base})$, ii) Z_o , iii) voltage gain.
Given $\beta=100$



28. Determine the output voltage when $V_1 = -V_2 = -1V$.



29. The following tank circuit is used in the colpitt's oscillator; it oscillates at 1MHz. Calculate the value of C_2 .



30. A frequency modulated signal is given by $10\sin [6 \times 10^8 + 5\sin (1250t)]$. Calculate (a) carrier frequency (b) modulating frequency (c) modulation index (d) maximum deviation e) carrier swing.
31. Simplify the Boolean function $Y = f(A,B,C, D) = \sum m (0,2,8,9,11,13) + \sum d (3,4,6,10,15)$ using K- map. Draw the logic circuit using NAND gate to realize the simplified expression.

PART-E

V. Answer any four of the following: -

4 × 5 = 20

32. With a circuit diagram explain the working of Direct coupled amplifier. Draw the frequency response curve and mention any one advantage of it.
33. With a neat circuit diagram derive an output equation of OP-AMP integrator.
34. Derive an expression for instantaneous voltage of AM wave.
35. What is a counter? Draw logic diagram of a 4- bit synchronous UP counter and write its truth table.
36. Write an ALP to subtract 21H from 30H solve it and store the result in R5.
37. Write a C- program to accept 3 integers and print the largest among them.



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Mock Paper -2, January - 2020

Time: 3 Hours 15 Minutes

II PUC- Electronics (40)

Max. Marks: 70

PART-A

I. Answer all the following questions: -

10 × 1 = 10

1. Define amplification factor of JFET.
2. Name the power amplifier in which conduction angle is less than 180° .
3. Define slew rate.
4. What is the efficiency of AM for 100% modulation?
5. What is the function of limiter in FM transmitter?
6. Define fading in communication system.
7. What is a sequential logic circuit?
8. How many bank registers are present in 8051 microcontroller?
9. What is the meaning of the symbol '~' in character set of C?
10. Expand GSM.

PART-B

II. Answer any five of the following: -

5 × 2 = 10

11. Explain thermal runaway.
12. Write steps involved in drawing DC equivalent circuit of an amplifier?
13. Calculate the gain of a negative feedback amplifier with an open loop gain $A=100$ & $\beta=1/10$.
14. Explain the Barkhausen criterion for sustained oscillation.
15. Write Shockley's diode equation for current through the power diode and explain its terminology.
16. Name the addressing modes of the following instructions:
i) MOV A,R0 ii) MOV B,#CDH.
17. Write the flow chart for "if- else" statement.
18. Write the difference between up-link signal and down-link signal.

PART-C

III. Answer any five of the following: -

5 × 3 = 15

19. Explain the formation of depletion region formed due to gate potential.
20. With a neat diagram, derive expression for input impedance of amplifier with negative feedback..
21. Explain the role of ionosphere in sky wave propagation.
22. Derive an expression for anode current I_A of an SCR when gate current is zero.
23. A p-n junction diode has a reverse saturation current rating of 50nA at 32°C . What should be the value of the forward current for a forward voltage drop of 0.5V?
24. With a neat diagram, explain the working of D flip flop with truth table.
25. What is debugging? Explain the different errors in C programming?
26. What is RADAR? Mention any two applications.

PART-D

IV. Answer any three of the following: -

3 × 5 = 15

27. CE amplifier circuit with germanium transistor is given, calculate i) r_e' , ii) voltage gain, iii) output impedance. Given $\beta=150, R_1=100\text{K}\Omega, R_2=10\text{K}\Omega, R_c=2.2\text{K}\Omega, R_E=220\Omega$ and $V=15\text{V}$.

28. The output of an Op-amp adder is to be $V_0=3V_1-2V_2+5.5V_3$. If the value of the feedback resistor is $30K\Omega$, find the value of R_1 , R_2 and R_3 . What should be the value of feedback resistor if the output is doubled?
29. A RC phase shift oscillator uses three identical RC sections in the feedback network. The value of the components are $R=680\Omega$, $R_1=1K\Omega$, $R_f=29K\Omega$ and $C=220nF$. Determine the frequency of oscillations and gain.
30. A 10KW carrier wave is amplitude modulated at 80% depth of modulation by a sinusoidal modulating signal. Calculate the total power, sideband power and transmission efficiency of the AM wave.
31. Simplify the Boolean function $Y = f(A,B,C, D) = \sum m (0,1,4,6,8,9,12,14) + \sum d (5,7)$ using K- map. Draw the logic circuit using NAND gate to realize the simplified expression.

PART-E

V. Answer any four of the following: -

4 × 5 = 20

32. With a circuit diagram explain the working of class B push pull amplifier.
33. With a neat circuit diagram explain the working of 4 bit R-2R ladder network DAC.
34. Derive an expression for instantaneous voltage of AM wave.
35. Realize AND, OR, NOT and XOR gates using NAND gate and write their respective truth table.
36. Write a program to add two 8-bit numbers 45H and 5EH, solve it and store the result in R6.
37. Write all the features of C- programming
