



JAIN COLLEGE, J C Road Bangalore
Mock Paper -1, December - 2017

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 transconductance of FET.
2. Which transistor amplifier has low output impedance?
3. What is a CMRR?
4. Define critical angle.
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 XS- 3 CODE for $76_{(10)}$.
9. How many timers 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. What is the need for cascading in amplifier? Mention any two type of cascading amplifier.
13. An amplifier has a bandwidth of 200 KHz and voltage gain of 100. Calculate its bandwidth if 10% negative feedback is introduced.
14. Draw the symbol and equivalent circuit of crystal oscillator.
15. Draw the circuit diagram and output waveform of DC to AC inverter.
16. Mention the features of 8051 microcontroller.
17. Write the syntax for “do-while” statement.
18. Explain frequency reuse and cell splitting.

PART-C

III. Answer any five of the following: -

5 × 3 = 15

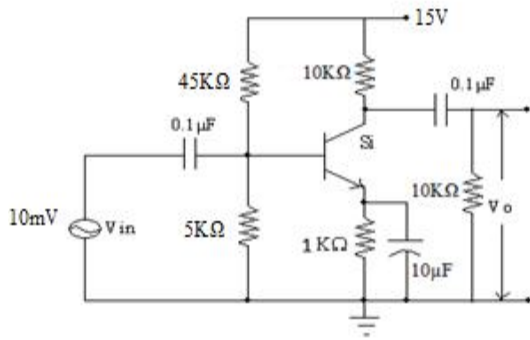
19. Explain the construction of n-channel J-FET.
20. How is bandwidth of an amplifier affected by negative feedback? Explain.
21. With block diagram, explain basic communication system.
22. Determine anode current I_A of SCR given $\alpha_1=0.49$, $\alpha_2=0.49$ and $(I_{CO1}+I_{CO2}) =1mA$.
23. Draw 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

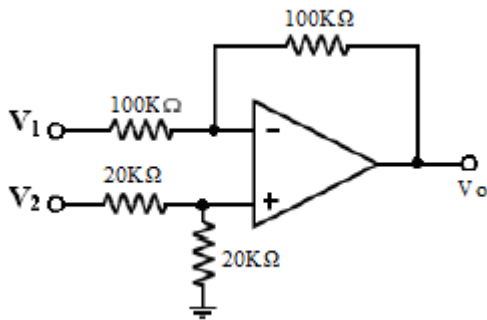
IV. Answer any three of the following: -

3 × 5 = 15

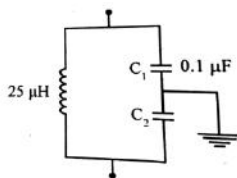
27. CE amplifier circuit with silicon transistor is given below, calculate i) $Z_{in}(\text{base})$, ii) Z_o , iii) voltage gain. Given $\beta=100$



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 $Y = f(A,B,C, D) = \sum m (1,3,5,6,8,9,11,12) + \sum d (0,7,14)$ 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 logarithmic OP-AMP.
34. Derive an expression for total power carried by an AM wave.
35. What is a counter? Draw logic diagram of a 4- bit synchronous UP counter and write its truth table.
36. Write the pin diagram of 8051 microcontroller.
37. Write a C- program to print the sum of first n integers.



JAIN COLLEGE, J C Road Bangalore
Mock Paper -2, December - 2017

Time: 3 Hours 15 Minutes

II PUC- Electronics (40)

Max. Marks: 70

PART-A

I. Answer all the following questions: -

10 × 1 = 10

1. Write the symbol of p-channel JFET.
2. Name the power amplifier in which conduction angle is less than 180° .
3. Define slew rate.
4. What is the IF frequency of AM SHD receiver?
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 serial ports 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 syntax for "if- else" statement.
18. Write the difference between wi-fi and bluetooth.

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. What is loop gain? Draw the block diagram of current series and voltage shunt negative feedback.
21. Define critical angle, critical frequency and skip distance.
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. Draw the block diagram of an AM super heterodyne receiver and explain its working.
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.
