



JAIN COLLEGE, J C Road Bangalore

Mock Paper -1, January - 2016

Time: 3 Hours 15 Minutes

II PUC- Electronics (40)

Max. Marks: 70

PART-A

I. Answer all the following questions: -

10 × 1 = 10

1. Is FET a current controlled device or a voltage controlled device?
2. Which region of a transistor acts as a closed switch?
3. What is the value of slew rate in an ideal op-amp?
4. Mention IF for standard AM super heterodyne receiver.
5. Find the value of frequency deviation for $m_f=12$ and $f_m=5\text{KHz}$
6. Name the device used in controlled rectifier?
7. Write the excess-3 code for 83_{10} .
8. Which code is used in shift position encoders?
9. Write the syntax for if-else statement.
10. What is a Bluetooth?

PART-B

II. Answer any five of the following: -

5 × 2 = 10

11. Name two types of JFET.
12. Mention any two characteristics of a CC amplifier.
13. In a negative feedback amplifier, $A=100$, $\beta=0.04$ and $V_i=50\text{mV}$. Find gain with feedback and loop Gain?
14. Draw the equivalent circuit of transmission lines for low frequency.
15. Determine anode current I_A of SCR when $I_G=0$. Given $(\alpha_1+\alpha_2)=0.98$ and $(I_{CO1} + I_{CO2}) = 1\text{mA}$.
16. Convert 1001_G to Binary using XOR gates.
17. Mention any four features of C programming.
18. Expand CDMA and URL.

PART-C

III. Answer any five of the following: -

5 × 3 = 15

19. With relevant diagram explain the concept of DC load line.
20. With a neat block diagram derive an expression for input impedance with feedback.
21. With a neat circuit diagram explain the working of phase shift oscillator.
22. Mention the different layers of Ionosphere and explain each layer.
23. Draw the circuit diagram of single phase AC voltage controllers with input and output waveforms.
24. Determine the V_{dc} and I_{dc} of SCR HWR given firing angle is 90° and peak voltage of ac input to the rectifier is 325.2V and load is 10Ω .
25. Write an assembly language program to add two 8-bit numbers and store the result in R2. The numbers are 47H and 9DH.
26. With a neat block diagram explain the operation of OFC system.

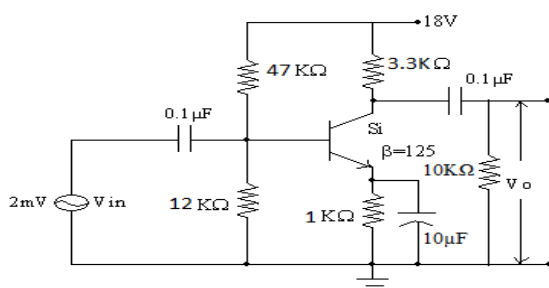
PART-D

IV. Answer any three of the following: -

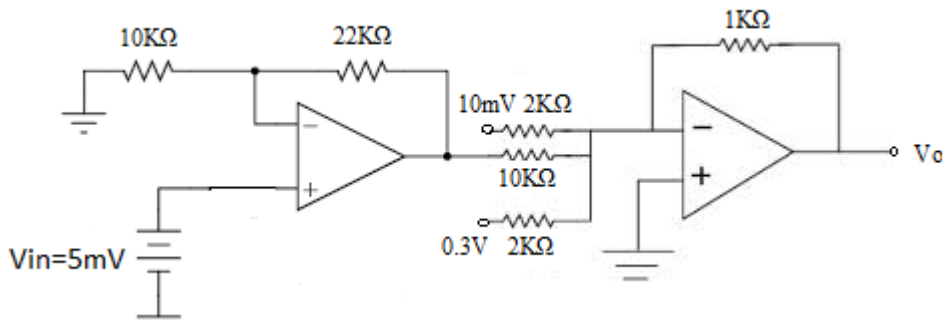
3 × 5 = 15

27. For the circuit shown below, determine I_E , r_e , A_v and r_{in} for the given values $V_{BE}=0.3\text{V}$ and

$$r_e = \frac{52\text{mV}}{I_E}$$



28. Find the output voltage for the given circuit below.



29. A colpitt's oscillator oscillates at 1.13MHz . If the inductor in the feedback network has a value of $20\mu\text{H}$ and one of the capacitor values is $0.1\mu\text{F}$. Calculate the value of the other capacitor.
30. An antenna has an impedance of 50Ω . An unmodulated AM signal produces a current of 4.8A . The percentage of modulation is 90. Calculate the carrier power, the total power and Sideband power.
31. Simplify the Boolean expression $Y = \sum m(0,2,4,8,10) + \sum d(11,12,13,14)$ using K-map. Draw the NAND Gate equivalent circuit to realize the simplified equation.

PART-E

V. Answer any four of the following: -

$4 \times 5 = 20$

32. With a neat circuit diagram explain the working of class B push pull amplifier.
33. With a circuit diagram of 4 bit DAC using R-2R ladder network. With explanation write the conversion table of DAC.
34. Draw the block diagram of FM SHD receiver and explain the function of each block.
35. Explain the working of JK flip-flop with logic circuit. Draw its timing diagram and write its truth table.
36. Why 8051 microcontroller is known as 8 bit processor? Briefly explain data transfer instruction, Arithmetic instruction and logical instruction.
37. a) Write a C program to accept the three integers and print the largest amongst them.
b) Mention different types of errors in C programming language.

(3+2)



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Mock Paper -2, January - 2016

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 voltage controlled device?
2. What is a DC load line?
3. Mention one application of a comparator.
4. How many sidebands are present in FM.
5. Define selectivity of a receiver.
6. Draw the symbol of TRIAC.
7. Expand EBCDIC.
8. Define min-term.
9. How many I/O pins are present in 8051 microcontroller.
10. What is a keyword in C program?

PART-B

II. Answer any five of the following: -

5 × 2 = 10

11. Explain briefly the parameters of FET.
12. Mention the steps to obtain DC equivalent circuit of a CE amplifier.
13. An amplifier with $Z_i=1K\Omega$ has a voltage gain $A= 1000$. If a negative feedback of $\beta=0.01$ is applied to it. Calculate the input impedance of the feedback amplifier.
14. Draw the pin diagram of IC 555 timer.
15. Differentiate between AM and FM.
16. Write Shockley diode equation for current through the power diode and explain its terminology.
17. Write the meanings of the following operators in C programming?
a) = = b) &&
18. Write a note on internet.

PART-C

III. Answer any five of the following: -

5 × 3 = 15

19. What is meant by stability factor? Mention the parameters which affect stabilization.
20. Draw the block diagram of voltage shunt, current series and current shunt feedback.
21. Define the following terms in communication.
a) skip zone b) skip distance c) single hop.
22. Derive an expression for anode current I_A of an SCR when gate current I_G is zero.
23. Draw the circuit diagram of chopper using MOSFET. Draw the gate signal and output load voltage waveforms of a DC chopper.
24. Convert $A + BC + \bar{A}B$ into its canonical SOP and write the expression in min term.
25. Name the addressing modes of the following instructions.
a) MOV A, R0
b) MOV R0, 40H
c) MOV A, @R0
26. With a neat diagram explain briefly satellite communication system.

PART-D

IV. Answer any three of the following: -

3 × 5 = 15

27. Each of three cascaded amplifier stages has a voltage gain of 20dB, 25dB, 30dB. What is the overall voltage gain in dB? What is the actual voltage gain?
28. Design an op-amp adder circuit to realize the output, $V_o=3V_1-2V_2+V_3$. Assume $R_f=10K\Omega$.
29. Determine the frequency of oscillations of a Hartley oscillator when
(a) $L_1= 2mH$, $L_2= 4mH$ and $C= 10nF$
(b) $L_1= 1mH$, $L_2= 3mH$ and $C= 0.1\mu F$

30. A frequency modulated signal is given by $75\sin[2\pi \times 90 \times 10^6 t + 6\sin 200\pi t]$ determine
- the modulating signal frequency
 - the carrier frequency
 - frequency deviation
 - modulation index.
31. Simply the Boolean expression $Y = \sum m(0, 2, 4, 6, 8, 10, 11, 12, 14, 15) + \sum d(9, 13)$ using K-map. Draw the NAND Gate equivalent circuit to realize the simplified equation.

PART-E

V. Answer any four of the following: -

4 × 5 = 20

- With a neat circuit diagram explain the working of direct coupled amplifier.
- With a circuit diagram derive an expression for an op-amp integrator.
- With a neat circuit diagram explain the working of AM collector modulator.
- What is a full adder? Realize full adder circuit using two half adder with the output equations and write its truth table.
- Explain the following instructions of 8051 microcontroller:
 - ADD A, #data,
 - MOV A, direct,
 - INC A
 - MOV DPTR, # FFFEh
 - SUBB A, R1
- Write a C program to find the roots of a quadratic equation using switch case.
