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MODEL QUESTION PAPER

II PUC

2024

II PU ELECTRONICS (40) MODEL

QUESTION PAPER

Time: 3 Hour15min **Max. Marks:70**

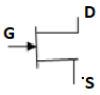
Instructions:

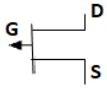
1. **The question paper has four parts A, B, C and D.**
2. **Part - A is compulsory.**
3. **Part –D(Section 1) consists of essay type questions and Section-2 Problems.**
4. **Circuit diagrams, timing diagrams and truth tables must be drawn wherevernecessary.**
5. **Solve the problems with necessary formulas.**

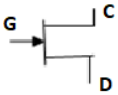
PART A

I. Select the correct answer from the choices given: **15 x 1 =15**

1. The correct circuit symbol for N-channel JFET is

a) 

b) 

c) 

d) 

2. In which transistor region the collector current is almost constant in CE output characteristics
   a) Cutoff Region b) active region c) Saturation region d) Ohmic region
3. Which of the following transistor Amplifier has highest voltage gain
   a) CB Amplifier b) CC Amplifier c) CE Amplifier d) CS Amplifier
4. Which among the below statements are true w.r.t.voltage series type of negative feedback
   Statement I: It increases the bandwidth
   Statement II: Decreasesthe output impedance
   a) I is true and II is false b) I is false and II is true
   c) I and II both are true d) I and II both are false
5. The OP AMP amplifiercircuit with feedback resistance 2.2KΩ and another resistanceof 1K Ω produces the output voltage of -2.2v when the input is applied to its pin 2. The input voltage to the circuit must be
   a) 2.2v b) -1v c) 1v d) -2.2v
6. The OPAMP circuit which acts as a high-pass filter
   a) Differentiator b) Integrator c) Adder d) Subtractor
7. Which of the following is aRC Oscillator
   a) Phase shift oscillator b) Hartleyoscillator
   c) Colpitts's oscillator d) Crystal oscillator
8. The ionosphere layerspersistsduring both day and night time among the following list are
   1) D layer 2) F layer 3) E layer

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a)All the three layers b) both D and E c) only F layer d) only D layer

9. What must be the permissible modulation index value to obtain maximum power in an AM transmitter?

a) $m_a>1$ b) $m_a<1$ c) $m_a=1$ d) $m_a=0$

10. PBJT is expanded as

a)Power Bijunction transistor b) Polar Bijunction transistor

c) Power Bijunction transformer d) None of the above

11. The number of variables that can be eliminated by a Quad in a KMAP is

a) 2 b)4 c) 3 d) 1

12. Consider a LED bulb in a room which is operated by a two way switch, The ON/OFF condition of the LED bulb resembles the function of which gate

a) X-OR gate b) NOR gate c) NAND gate d) OR gate

13. The addressing mode of the instruction Mov A, #43

a) Indirect b) Immediate c) Register d) Direct

14. The correct C equivalent expression for A=1/2 bh

a) 0.5 *b*h b) A=0.5*b*h c) a=(b*h)/2 d) both b and c

15. Uplink frequency in satellite communication

a) 6 GHz b) 4GHz c) 10GHz d) 15GHz

II Fill in the blanks by choosing appropriate answer from those given in the bracket: 5 x 1 =5

[a) Universal b) Source c)Modulation Index

d) Self complimentary e) RC coupled f) Drain]

16. _____ is the terminal which supplies majority change carries in JFET
17. Voltage divider bias is also called as _____.
18. The multistage amplifier used for AF amplification is_____.
19. The ratio ofmaximum frequency deviationto the modulating frequency is _____.
20. Excers-3 code is also known as _____.

PART B

III Answer any FIVE questions: 5 x 2 =10

21. What are the leakage currents? Mention different types of leakage current.
22. Write the steps involved in drawing AC equivalent circuit of an amplifier.
23. An amplifier with Zi=1kΩ, has a voltage gain A=100. If a negative feedback of $\beta = 0.1$ is applied to it, calculate the input impendence of the feedback amplifier.

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24. A wein bridge oscillation has $R_1=R_2=R=15k\Omega$ and $C_1=C_2=100nF$. Determine the frequency of oscillation.
25. Draw forward and reverse characteristics of power diode.
26. Express y=AB+ABC+BC in canonical form.
27. What is an addressing mode? Mention any two types of addressing modes.
28. Write the general syntax for if -else statement in C language.
29. Write the block diagram for RADAR.

PART C

IV Answer anyFIVEquestions: 5 x 3 =15

30. Explain the working of n-channel JFET
31. Derive the expression for voltage gain of a voltage series type negative feedback.
32. Explain piezo electric effect and write the equivalent circuit for a crystal.
33. Determine the frequency of Colpitts's oscillator which uses L=10mH, $C_1=0.1\mu F$ and C2=0.1μF.
34. Define the following terms w.r.t wireless communication a)Skip distance b)Critical frequency c)Critical angle.
35. What is the need for modulation.
36. Determine V_{dc} and $I_{dc}$of SCR HWR. Given firing angle is 90^0 and rms voltage of input to the rectifier is 220v and load is 20Ω.
37. What is full adder? Write the logic circuit for full adder using 2 Half –Adders.
38. Draw the diagram of explain the function of satellite transponder system.

PART D(SECTION-I)

V Answer any THREE questions: 3 x 5 =15

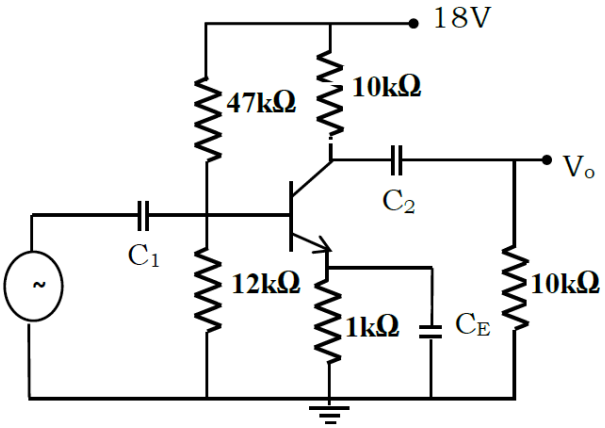
39. Write a neat circuit diagram explain the working of two stage direct coupled amplifier.
40. What is an Adder? Derive the expression for the output voltage for a 2 input OP-AMP adder.
41. With the help of block diagram explain the function of SHD AM radio receiver.
42. Construct AND, OR, NOT and XOR gates using NAND gates.
43. Write an ALP to perform multiplication of two numbers and store the results in registers R_0 and R_1.
44. Write a C program to check whether the entered two numbers are same or not.

(SECTION-II)

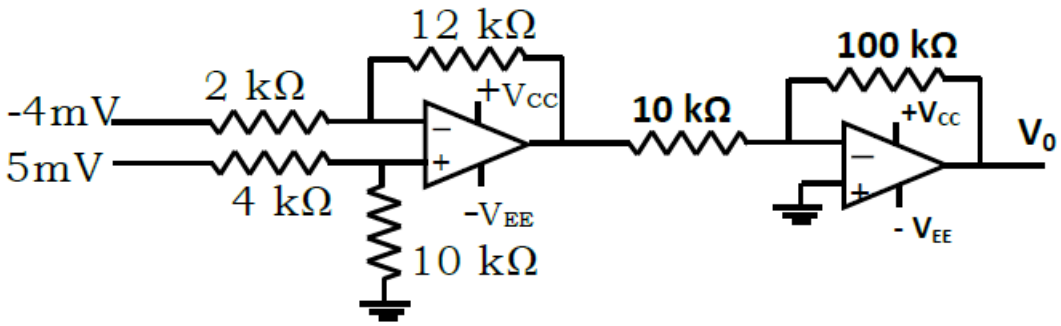
VI. Answer any TWO questions: 2 x 5 =10

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45. Calculate the voltage gain andinput impedance in the circuitgivenbelow.Givenβ =100 andr_e' =26mV/I_E.



46. Find the output voltage Voin the op-amp circuitgiven



47. The current of an AM transmitter is 8A when only carrier is sent, it increases to 8.65A when the carrier is amplitude modulated. Find the percentage modulation. Determine the antenna current when the depth of modulation is 0.75.
48. Simplify the following expression using K-MAP and the NAND gate equivalent current for the simplified expression.

$$F(ABCD) = \sum m\,(0,2,4,6,8,14,15) + \sum d\,(7,10,12,13)$$

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