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FOR KARNATAKA CLASS 12 PREPARATION

Karnataka 2nd PUC Model Question Paper 2027 for Electronics (Paper 5)

EXAM	YEAR	TYPE	SUBJECT
Karnataka Class 12	2027	Sample Paper	Electronics

Government of Karnataka

Karnataka School Examination and Assessment Board (KSEAB)

6th Cross, Malleshwaram, Bengaluru – 560 003

Model Question Paper – 5

Subject: **II PUC Electronics (40)** **Academic Year: 2026-27**

[Time: 03 Hours] **[Total No. of Questions: 45]** **[Max. Marks: 70]**

Instructions:

1. For PART-A questions, only the first written answers will be considered for evaluation.
2. Part – D consists of two sections.
   Section - I is of essay type questions and Section - II is of problems.
3. Circuit diagram and truth tables must be drawn wherever necessary.
4. Solve the problems with necessary formulae.
5. For questions having diagrams, alternate questions are given at the end of the question paper in separate section for visually challenged students.

PART-A

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

1. The relation between μ, g_m and r_d in JFET is

   a) $r_d = \mu \times g_m$ b) $\mu = g_m \times r_d$ c) $g_m = \mu \times r_d$ d) $\mu = g_m + r_d$

2. The transistor works as an amplifier when the operating point lies in

   a) cut off region b) saturation region

   c) center of active region d) none of these

3. The transistor amplifier which has the current gain less than unity is

   a) common collector b) common base

   c) common emitter d) none of these

4. In a negative feedback amplifier

   a) Input impedance increases b) bandwidth increases

   c) voltage gain increases d) both (a) and (b)

5. An ideal operational amplifier has

   a) infinite input impedance b) zero output impedance

c) infinite bandwidth d) all of these

6. A special case of non inverting amplifier in which all of the output voltage is feedback to the inverting input of the op amp is called
   a) differentiator b) integrator
   c) logarithmic amplifier d) voltage follower
7. The crystal oscillator works on the principle of
   a) Piezomagnetic effect b) Piezoelectric effect c) Both a and b d) None of these
8. The nearest ionospheric layer to the earth surface during day time is
   a) D layer b) E layer c) F_1 layer d) F_2 layer
9. AM wave is distorted when
   a) $m_a = 0$ b) $m_a = 0.5$ c) $m_a = 0.75$ d) $m_a > 1.0$
10. Identify the power device
    a) SCR b) TRIAC c) MOSFET d) all of these
11. Sum of product equation can be realized by
    a) XOR gates b) XNOR gates c) NOR-NOR gates d) NAND-NAND gates
12. BCD code for $(23)_{10}$ is
    a) 00010111 b) 01010110 c) 00100011 d) none of these
13. The data bits of Register A of 8051 is
    a) 64 Bits b) 32 Bits c) 16 Bits d) 8 Bits
14. The operator ' &' in C programming denotes
    a) Bitwise OR b) Logical AND
    c) Bitwise AND d) Exclusive OR
15. The abbreviation of MTSO is
    a) Mobile Technology Switching Office b) Mobile Telephone System Office
    c) Mobile Telephone Switching Office d) Mobile Technology System Office

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

[a) amplifier b) amplitude c) damped d) universal e) zero f) encoder]

16. The circuit which increases the strength of a weak signal is known as …….
17. A zero crossing detector circuit switches its output state every time input signal crosses …….. level.
18. Tank circuit produces …… oscillations

19. In frequency modulation ……of the carrier remains same.
20. Logic gates used to realize other gates are known as …… gates.

PART-B

III Answer any FIVE questions. **5 × 2 = 10**

21. Mention any two types of transistor biasing circuits.
22. In a negative feedback amplifier $V_s = 20$ mV, $V_i = 15$ mV, $V_f = 5$ mV and $V_o = 800$ mV. Determine A, A_f and β.
23. Determine the frequency of oscillation in a transistor Colpitt's oscillator. Given L = 10 mH, $C_{eq} = 50\ n$F.
24. Write the expressions for amplitude and frequency of LSB in AM.
25. Draw the VI characteristics of power diode under forward biased condition for two temperatures.
26. Draw the logic circuit of a full adder using 3 input X-OR gate.
27. Write the features of 8051 microcontroller.
28. Distinguish between uplink and down link signals.

PART-C

IV Answer any FIVE questions **5 × 3 = 15**

29. Explain the effect of V_{GS} on depletion layer and hence on drain current I_D in JFET.
30. Derive an expression for input impedance of negative feedback amplifier.
31. Sketch nature of oscillator output waveforms for (a) $A\beta > 1$, (b) $A\beta < 1$ and (c) $A\beta = 1$
32. What is Line of Sight? Differentiate between radio horizon and optical horizon.
33. What are the characteristics of a good receiver?
34. Determine Vdc and Idc of SCR HWR. Given firing angle is 90^0 and rms voltage of ac input to the rectifier is 230 V and load is 20 Ω.
35. Convert the Boolean expression Y = AB + C into canonical SOP form.
36. Draw the block diagram of a RADAR system.

PART-D (Section I)

V Answer any THREE questions. **3 × 5 = 15**

37. With circuit diagram explain the working of CE amplifier.
38. Derive an expression for the output voltage of a summing amplifier.
39. Realize NOT, OR, AND and XNOR gates using NOR gates.

40. Write instructions to move 56H into register A, 4EH into register R1, then add them together and save the result in register R0. What is the content of R0 after execution of the program?

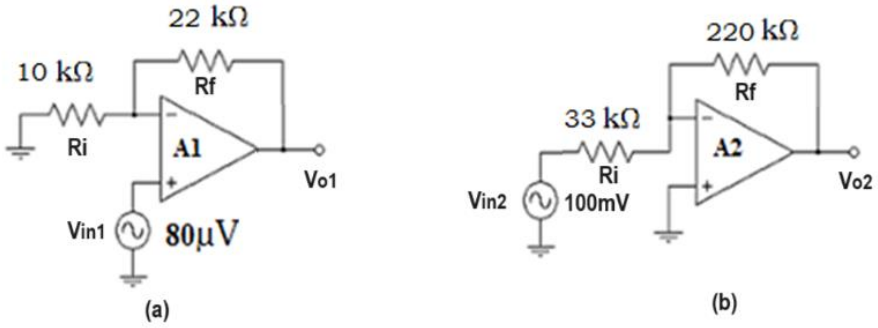
41. Write a C program to accept two integer number and print whether they are equal or not equal.

PART-D (Section II)

VI Answer any TWO questions. **2 × 5 = 10**

42. Find the input impedance, output impedance and voltage gain of the CE transistor amplifier for the data given below: $R_1 = 47\ k\Omega$, $R_2 = 12\ k\Omega$, $R_C = 3.3\ k\Omega$, $R_E = 1\ k\Omega$, $R_L = 10\ k\Omega$, $V_{CC} = 18\ V$, $\beta = 100$, $V_{BE} = 0.7\ V$ and $r_e' = 26mV/I_E$.

43. Calculate the output voltage V_o for the circuit shown below.



(3+2)

44. A 20 kW carrier wave is amplitude modulated at 70% depth of modulation by a sinusoidal modulating signal. Calculate (a) Total Power (b) Side band power (c) Power in each sideband.

45. Simplify the Boolean expression $Y(A, B, C, D) = \Sigma m(4,5,7,9,11,12,13,15) + \Sigma d(1,3,8)$ using K-map. Draw the NAND gate equivalent circuit to realize the simplified expression.

PART-E

(For visually challenged students only)

43. (i) An op-amp noninverting amplifier circuit is given with $R_i = 10\ k\Omega$, $R_f = 22\ k\Omega$ and $V_{in} = 80\ \mu V$. Determine the output voltage V_{01}. 3

(ii) An op-amp inverting amplifier circuit is given with $R_i = 33\ k\Omega$, $R_f = 220\ k\Omega$ $V_1 = 100$ mV. Determine the output voltage V_{02}. 2

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