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FOR KARNATAKA CLASS 12 PREPARATION

Karnataka 2nd PUC Model Question Paper 2027 for Electronics (Paper 3)

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 – 3

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

[Time: 3 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. Unitless parameter of JFET is

   a) Drain resistance b) Trans-conductance

   c) Amplification factor d) None of these

2. The operating point is also called as

   a) Cut-off point b) Quiescent point c) Saturation point d) Pinch-off point

3. Small signal amplifiers are also called as

   a) Voltage amplifiers b) Power amplifiers

   c) Class B amplifier d) Class C amplifier

4. What happens to the bandwidth of an amplifier when negative feedback is applied?

   a) Remains same b) Increases c) Decreases d) Oscillates

5. Slew rate is expressed in

   a) V/μS b) μS /V c) A/mS d) Ω/μS

6. The feedback component of op-amp differentiator is

   a) Resistor b) Capacitor c) Inductor d) Diode

7. Name the oscillator which does not produce phase shift in feedback path

   a) Phase shift oscillator b) Wein bridge oscillator

   c) Crystal oscillator d) Hartley oscillator

8. The layer of atmosphere which is responsible for sky wave propagation is

   a) Troposphere b) Stratosphere c) Mesosphere d) Ionosphere

9. The intermediate frequency in AM radio receiver is

   a) 455 Hz b) 455 KHz c) 455 MHz d) 455 GHz

10. Identify bidirectional conducting power device.

    a) Power Diode b) Power Transistor c) SCR d) Triac

11. Logic expression for the output of two input XNOR gate is

    a) Y = AB b) Y = A+B c) Y = $\overline{A}$ d) Y= $\overline{A \oplus B}$

12. Gray code is used in shaft position

    a) decoder b) multiplexer c) encoder d) register

13. Microcontroller chip contain

    a) RAM b) ROM c) Timer d) All of these

14. Size of a float data type in C programming is

    a) 1 byte b) 2 bytes c) 4 bytes d) 9 bytes

15. Standard form of GSM is

    a) Global Service for Mobile communication b) General Service for Mobile communication

    c) Global System for Mobile communication d) General System for Mobile communication

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

[a) current b) twice c) invalid state d) oscillator e) summing f) heat sink]

16. CC amplifier has the highest …….. gain.

17. Op-amp inverting adder is also called as …….. amplifier.

18. Positive feedback is used in ……

19. In Amplitude modulation bandwidth is ……. the modulating signal frequency.

20. …… is the disadvantage of SR flip-flop.

PART-B

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

21. Write the expressions for the coordinates of operating point in voltage divider biasing circuit.
22. Calculate the gain of a negative feedback amplifier with an open loop gain

    A = 100 and feedback factor $\beta = \frac{1}{10}$.
23. A RC phase shift oscillator has $R_1 = R_2 = R_3 = R = 10\ k\Omega$ and $C_1 = C_2 = C_3 = C = 0.047\ \mu F$. Determine frequency of oscillations.
24. Write the expression for P_T in terms of P_C. What is the upper limit of m_a in AM?
25. Draw two transistor model of a thyristor.
26. Write the logic diagram of D flip-flop.
27. Briefly explain register addressing mode.
28. Mention the important techniques used in Bluetooth operation

PART-C

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

29. Mention the differences between FET and BJT.
30. Compare input and output impedance characteristics of four types of feedback connections.
31. What is an oscillator? Mention Barkhausen criterion.
32. Draw the block diagram of a communication system and explain the function of each block.
33. Draw the frequency spectrum of an AM wave.
34. Determine V_{dc} and I_{dc} of SCR FWR. Given firing angle is 0^0 and rms voltage of ac input to the rectifier is 230 V and load is 20 Ω.
35. Convert $(1010)_G$ into binary number using XOR gates.
36. What is RADAR? Mention its two applications.

PART-D (Section I)

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

37. With circuit diagram explain the working of CB amplifier.
38. Derive an expression for output voltage of op-amp non inverting amplifier.

39. What is full adder? Realize full adder using block diagrams of two half adders and an OR gate. Write the truth table of full adder.
40. Write an assembly language program to subtract 35H from 4AH and save the result into register R0. Verify the content of R0 after executing the program.
41. Write a C program to accept the three different integers and print the largest amongst them.

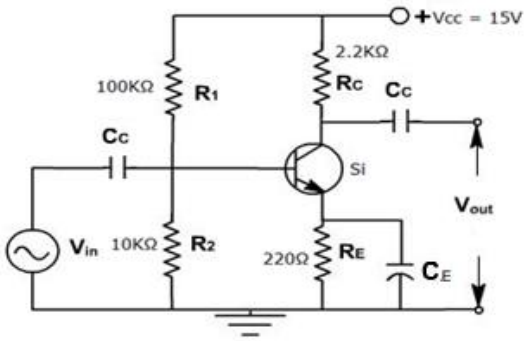
PART-D (Section II)

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

42. For the CE amplifier circuit shown in the circuit, find (a) DC voltage across 10 kΩ, (b) I_E, (c) r_e' (d) $Z_{in(base)}$ (e) Z_o.

Given $V_{BE} = 0.7V$ $r_e' = \frac{26\ mV}{I_E}$

and $\beta = 100$.



43. Design an op-amp circuit to realize the output, $V_o = -(3V_1 + 2V_2 + V_3)$. Assume $R_F = 10$ kΩ.

Determine output voltage when $V_1 = 1$ V, $V_2 = -2$ V and $V_3 = 2$ V.

44. The carrier current of an AM transmitter is 8 A, it increases to 8.65 A when the carrier is amplitude modulated. Find the percentage modulation. Determine the antenna current I_a when the depth of modulation is 0.75 if carrier current remains same.
45. Simplify the Boolean expression $Y = \Sigma m\,(0,2,7,8,10,13) + \Sigma d\,(5,15)$ using K-map. Draw the NAND gate equivalent circuit to realize the simplified equation.

PART-E

(For visually challenged students only)

42. In a single stage CE transistor amplifier $R_1 = 100$ kΩ, $R_2 = 10$ kΩ, $R_C = 2.2$ kΩ, $R_E = 220$ Ω, $V_{CC} = 15$ V, $\beta = 100$, $V_{BE} = 0.7$ V and $r_e' = \frac{26mV}{I_E}$.

Calculate (a) DC voltage across 10 kΩ, (b) I_E, (c) r_e' (d) $Z_{in(base)}$ (e) Z_o.

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