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FOR KARNATAKA CLASS 12 PREPARATION

Karnataka 2nd PUC Model Question Paper 2027 for Electronics (Paper 4)

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 – 4

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. Name a voltage controlled device.

   a) SCR b) BJT c) FET d) TRIAC

2. In which region does a transistor behaves as a closed switch?

   a) Active region b) Cut off region

   c) Saturation region d) Inversion region

3. Conduction angle for Class B power amplifier is

   a) 60^0 b) 180^0 c) 270^0 d) 360^0

4. Disadvantage of negative feedback is

   a) Decrease in gain b) Increases in bandwidth

   c) Stabilization in gain d) Reduction in noise

5. Input stage of op-amp consists of

   a) Darlington pair b) Inverting amplifier

c) Differential amplifier d) Emitter follower

6. The feedback component used in the op-amp integrator circuit is

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

7. How many RC sections are present in a Phase shift oscillator?

a) One b) Two c) Three d) Four

8. Line of sight waves are also called as

a) Space wave b) Ground waves c) Sky waves d) None of these

9. If the amplitude of the modulating signal is half of the carrier signal, then the modulation index $\mathbf{m_a}$ is

a) 0 b) 0.5 c) 1 d) 1.5

10. Drift layer of a power diode is also called

a) Metalization layer b) Anode terminal

c) Epitaxial layer d) Substrate layer

11. Excess-3 code is an example for

a) Non-weighted code b) BCD code

c) ASCII Code d) Weighted code

12. In a Flip Flop SET condition stands for

a) Q = 0, $\bar{Q}$ = 0 b) Q = 0, $\bar{Q}$ = 1 c) Q = 1, $\bar{Q}$ = 0 d) Q = 1, $\bar{Q}$ = 1

13. How many I/O pins are present in 8051 microcontroller?

a) 16 b) 24 c) 32 d) 40

14. 'Not equal to' operator in C programming is

a) ~ b) != c) =! d) ≠

15. Carrier of information in optical fiber communication system is

a) Water b) Light c) Copper d) Silicon

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

[a) buffer b) demodulator c) phase d) linear e) network e) transmission]

16. CC amplifier is also called ……

17. Inverting amplifier circuit is a ……. application of op-amp.

18. In a oscillator circuit the feedback signal is in ……. with the input signal.

19. Diode detector is called as ……

20. Gray code is used to reduce error that occurs in data …….

PART B

III. Answer any FIVE questions: 5 x 2 = 10

21. On the output characteristics of a transistor in CE mode, mark different regions of transistor operation.

22. In an amplifier upper cut-off frequency f_2 = 500 kHz and A = 100. Determine upper cut-off frequency when negative feedback of β = 0.02 is introduced.

23. Determine frequency of Wein bridge oscillator having $R_1 = R_2 = R$ = 15 kΩ and $C_1 = C_2 = C$ = 100 nF.

24. Draw the block diagram of AM Transmitter.

25. Sketch schematic section of a power diode showing impurities atom densities.

26. Realize XOR gate using basic gates.

27. Mention any four addressing modes.

28. Compare Wi-Fi and Bluetooth

PART C

IV. Answer any FIVE questions: 5 x 3 = 15

29. Define drain resistance (r_d), transconductance (g_m) and amplification factor (μ) in JFET.

30. Give any three differences between positive feedback and negative feedback.

31. What is piezoelectric effect? Draw the circuit diagram of crystal oscillator.

32. Write a note on D layer, E layer and F layer.

33. Discuss the need for modulation with reference to length of the antenna.

34. Determine V_{dc} and I_{dc} of SCR HWR. Given firing angle is 0^0 and rms voltage of ac input to the rectifier is 230 V and load is 10 Ω.

35. Convert the Boolean expressions Y = AC + B$\bar{C}$ into canonical SOP form.

36. Write any three uses of fiber optic communication.

PART D (Section I)

V. Answer any THREE questions: **3 x 5 = 15**

37. Explain the working of two stage RC coupled amplifier.

38. Obtain an expression for the output of op-amp differentiator circuit.

39. Why RS flip flop is converted into D flip flop. Explain the working of D Flip-flop with logic circuit and truth table.

40. Write a program to add F1H and 0EH, save the result in register R0. What is the content of R0 after execution of the program?

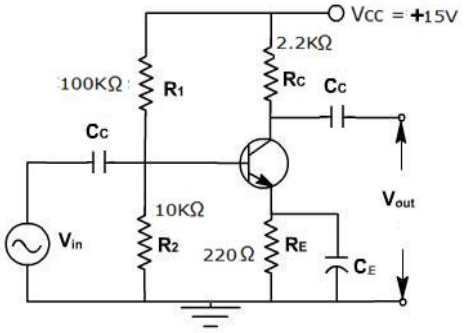
41. Write a c-program to accept radius (in float) and print area of the circle.

PART D (Section II)

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

42. For the CE amplifier circuit using silicon transistor given below, find

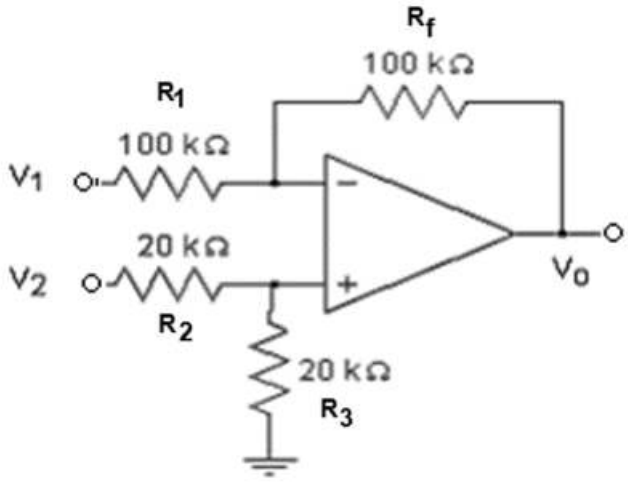
(i) r_e^1 ii) Z_o iii) A_v iv) A_p v) $Z_{in(base)}$.



Given I_E = 3.01 mA and β = 100.

V_{BE} = 0.7 V, $r_e^1 = \frac{26mV}{I_E}$.

43. Determine the output voltage of the following circuit when V_1 = 1 V and V_2 = -1V



44. Determine the power content of each of the sidebands and of the carrier of an AM signal that has a percentage modulation of 85% contains 1000 W of total power.

45. Simplify Y = f(A, B, C, D) = ∑m(0, 1, 2, 4, 5, 8, 9, 10, 12, 13) and draw the logic circuit for simplified expression using NAND gates.

PART-E

(For visually challenged students only)

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

Calculate (i) r_e^1 (ii) Z_o (iii) A_v (iv) A_p (v) $Z_{in(base)}$. 5

43. An op-amp subtractor circuit is given with R_1 = 100 kΩ, R_2 = 20 kΩ, R_3 = 20 kΩ, R_f = 100 kΩ, V_1 = 1 V, V_2 = 2V. Determine the output voltage V_0. 5

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