

B.E. / B.Tech. - DEGREE EXAMINATIONS, NOV / DEC 2024

Third Semester

Electronics and Instrumentation Engineering

(Common to Instrumentation and Control Engineering)

20EIPC303 - ANALOG ELECTRONIC CIRCUITS

Regulations - 2020

Duration: 3 Hours

Max. Marks: 100

PART - A (MCQ) (20 × 1 = 20 Marks)

Answer ALL Questions

	Marks	K- Level	CO
1. Which of the following capacitor is also called as space charge capacitance? (a) Diffusion capacitance (b) Transition capacitance (c) depletion capacitance (d) fixed capacitance	1	K1	CO1
2. In which region the Zener diode will act as voltage regulator? (a) Forward bias region (b) Breakdown region (c) Reverse bias region (d) None of the mentioned	1	K2	CO1
3. According to reverse characteristics, the reverse voltage is increased at a certain value of reverse voltage, the reverse current (a) Increases sharply (b) increases slowly (c) Decreases (d) Remains constant	1	K1	CO1
4. Which of the following is not true about the UJT? (a) UJT consist of two junctions (b) UJT is also known as double-base diode (c) UJT can't be preferred for amplification (d) UJT stands for unijunction transistor	1	K2	CO1
5. _____ is the change in drain current divided by small change in gate or source voltage with a constant drain/source voltage. (a) Transconductance (b)Resistance (c) capacitance (d) conductivity	1	K1	CO2
6. _____ is the region where the device will be in the OFF condition and there is zero amount of current flow through it. (a) saturation region (b) Ohmic or linear region (c) Cut-off region (d) trade off region	1	K2	CO2
7. If the drain voltage is smaller than the gate voltage, the MOSFET act as voltage controlled _____ (a) Current source (b) voltage source (c) capacitor (d) register	1	K1	CO2
8. Due to the....., the n-channel MOSFET is considered better than p-channel MOSFET. (a) Faster operation (b) lower noise level (c) lower input impedance (d) TTL compatible	1	K2	CO2
9. An inverting amplifier is modified to work as a sinusoidal oscillator, and then what is the phase shift provided by the feedback network? (a) 360° (b) 0° (c) 180° (d) 90°	1	K1	CO3
10. Which of the following is the correct start-up condition for an oscillator? (a) the loop gain should be equal to one (b) the loop gain should be greater than one (c) the loop gain should be greater than or equal to one (d) the loop gain should be equal to less than one	1	K2	CO3
11. An amplifier differs from the oscillator because an oscillator... (a) has more gain (b) has less gain (c) does not require DC supply (d) does not require input signal	1	K1	CO3
12. Which of the following is true regarding an oscillator? (a) the gain around the feedback loop is equal to one (b) the gain around the feedback loop is equal to zero (c) the phase shift around the feedback loop is 180° (d) the phase shift around the feedback loop is 0°	1	K2	CO3

13. Which of the following is NOT a characteristic of an ideal operational amplifier (opamp)? 1 K1 CO4
 (a) Infinite input impedance (b) Zero output impedance
 (c) Infinite bandwidth (d) Non-inverting input terminal
14. In clamper circuit a predetermined ____ is added to the output voltage. 1 K2 CO4
 (a) DC level (b) AC level (c) DC and AC level (d) None of the mentioned
15. Sample and hold circuit are used in 1 K1 CO4
 (a) Analog to Digital modulation (b) Digital to analog modulation
 (c) Pulse position modulation (d) All of the mentioned
16. A peak clipper is also called a 1 K2 CO4
 (a) Amplitude limiter (b) Peak detector (c) Holding circuit (d) None of the mentioned
17. The timing capacitor to the ICL 8038 connected at _____ pin number. 1 K1 CO5
 (a) 10 (b) 12 (c) 14 (d) 7
18. The functional block diagram of ICL 8038 contains _____ current sources. 1 K2 CO5
 (a) 1 (b) 3 (c) 2 (d) zero
19. In a switching voltage regulator, the control transistor conducts _____ 1 K1 CO5
 (a) for all the time (b) for only half of the time
 (c) for a part of time (d) when the load current is excessive
20. The switch in the switching voltage regulators turn ON and OFF by the 1 K2 CO5
 (a) voltage supply (b) pulse generator (c) low-pass filter (d) load

PART - B (10 × 2 = 20 Marks)

Answer ALL Questions

21. Define Semiconductor. 2 K1 CO1
22. Explain the advantages of CE configuration. 2 K2 CO1
23. Write the difference between voltage and power amplifier. 2 K2 CO2
24. What is a push pull amplifier? 2 K1 CO2
25. State the Barkhausen's criterion for oscillation. 2 K2 CO3
26. Define positive and negative feedback. 2 K1 CO3
27. Mention some of the linear applications of op-amp. 2 K2 CO4
28. Write any four applications of comparator. 2 K1 CO4
29. Draw the pin diagram of IC 555 timer. 2 K2 CO5
30. Give the purpose of switching regulator. 2 K1 CO5

PART - C (6 × 10 = 60 Marks)

Answer ALL Questions

31. a) Explain the forward and reverse characteristics of a PN junction diode. 10 K2 CO1
OR
- b) Derive the expression for Diffusion and transition capacitance of a PN junction diode. 10 K2 CO1
32. a) Explain about Class A transformer coupled amplifier and derive the expression for efficiency of the same. 10 K2 CO2
OR
- b) Discuss in detail about Class C tuned amplifiers. 10 K2 CO2
33. a) With a neat diagram explain about Colpitt oscillator & derive the expression for frequency of oscillation and condition of oscillation. 10 K2 CO3

OR

- b) Draw and describe the Voltage series and voltage shunt feedback amplifiers. Derive the expression for gain with feedback. Mention the advantages of negative feedback amplifier. 10 K2 CO3
34. a) Draw the circuit of Astable multivibrator and obtain the expression for pulse width. 10 K2 CO4
- OR**
- b) Draw the circuit of Monostable multivibrator and obtain the expression for pulse width. 10 K2 CO4
35. a) Explain IC 8038 function generator and mention its applications. 10 K2 CO5
- OR**
- b) Explain the pin diagram and functional block diagram of 555 timer. 10 K2 CO5
36. a) i) With a suitable waveform explain the operation of the positive and negative clipper circuits. 5 K2 CO4
- ii) Explain the working of SMPS. 5 K2 CO5
- OR**
- b) i) Explain the operation of comparator with its application. 5 K2 CO4
- ii) Write in detail about variable voltage regulators. 5 K2 CO5