Reg. No.															

Question Paper Code	13266

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

Fourth Semester

Electronics and Communication Engineering

20ECPW401 - ELECTRONIC CIRCUITS WITH LABORATORY

Regulations - 2020

Duration: 3 Hours | Max. Marks: 100

PART - A (MCQ) (20 × 1 = 20 Marks)

Answer ALL Questions

		Marks	K – Level	CO
1.	The biased transistors work in …..regions. (a) 1 (b) 2 (c) 3 (d) 4	1	K1	CO1
2.	What are the basic specifications required to design a bias circuit? (a) The supply voltage (b) Value of I_C (c) Value of V_{CE} (d) All of the mentioned	1	K1	CO1
3.	The operating point…… (a) Changes in temperature (b) Does not change with temperature (c) Is always constant (d) Equals to infinity	1	K1	CO1
a	For BJT small signal analysis, magnitude of the AC signal applied for amplification must be…. (a) Small (b) Large (c) Both small and large at a times (d) None of the mentioned	1	K1	CO2
5.	The increase in input capacitance Ci over the capacitance from gate to source is called ….. (a) Miller Effect (b) Phase shift (c) Coupling capacitance (d) Bypass capacitance	1	K1	CO2
6.	Cascading amplifiers limits the …. at high and low frequencies. (a) Gain (b) Bandwidth (c) Phase (d) All of the mentioned	1	K1	CO2
7.	The bandwidth of an amplifier is increased by 1000 times by using a negative feedback. If the open loop gain of the amplifier is 100, what is the closed loop gain ? (a) 100 (b) 0.1 (c) 0.01 (d) 0.001	1	K1	CO3
8.	The total harmonic distortion of an amplifier_____when negative feedback is incorporated in it? (a) increases (b) decreases (c) either increases or decreases (d) remains constant	1	K1	CO3
9.	Which of the following is an example of a positive feedback amplifier used in audio processing? (a) Power amplifier (b) Comparator (c) Inverting amplifier (d) Current amplifier	1	K1	CO3
10.	What are the unique features of double tuned amplifier? (a) Coupling (b) Decides the amplifier's frequency response (c) Both coupling and decides the amplifier's frequency response (d) None of the mentioned	1	K1	CO4
11.	What an amplifier has to offer when using a stagger tuning? (a) Greater bandwidth (b) Faster pass band (c) No. of number of stages used (d) All of the mentioned	1	K1	CO4
12.	What happens when the cascading of single tuned amplifier is done? (a) Bandwidth increases (b) Bandwidth reduces (c) Bandwidth = 0 (d) Bandwidth = Infinity	1	K1	CO4
13.	Which of the following mulltivibrators are also called a one-shot? (a) Astable (b) monostable (c) bistable (d) Schmitt trigger	1	K1	CO5
14.	Which of the following is not a multivibrator (a) Bistable (b) Astable (c) Monostable (d) Miller oscillator	1	K1	CO5

15. A bistable multivibrator has how many stable stable states? *1 K1 CO5*
(a) zero (b) one (c) two (d) either two or one
16. A bistable circuit with RC network in the negative- feedback becomes a…circuit *1 K1 CO5*
(a) Schmitt trigger (b) monostable (c) Astable (d) none of the mentioned
17. What is the main advantage of Class A power amplifiers despite their low efficiency? *1 K1 CO6*
(a) High efficiency in converting input power to output power
(b) High linearity and low distortion
(c) Low voltage gain
(d) Low power handling capacity
18. In Class A power amplifiers, the transistor is biased in the …..... region of its characteristics, which results in continuous conduction and constant power dissipation. *1 K1 CO6*
(a) Cutoff (b) Saturation (c) Linear (d) Active
19. A two-transistor class B amplifier is generally known as.... *1 K1 CO6*
(a) dual amplifier (b) symmetrical amplifier
(c) differential amplifier (d) push pull amplifier
20. The transistor amplifier with 85% efficiency is likely to be a.... *1 K1 CO6*
(a) Class A amplifier (b) Class B amplifier (c) Class AB amplifier (d) Class C amplifier

PART - B (10 × 2 = 20 Marks)

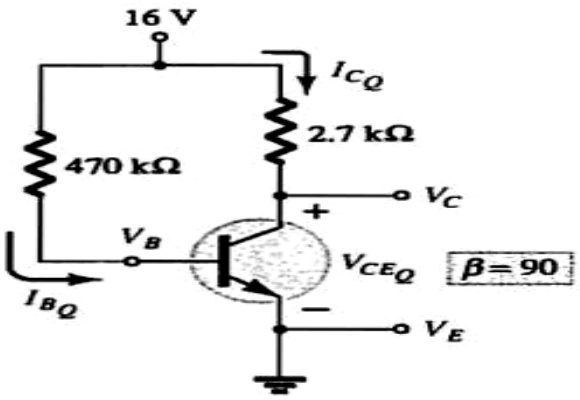
Answer ALL Questions

21. Illustrate the function of Q-point. How it varies the output. *2 K2 CO1*
22. Interpret the requirements of a biasing circuit. *2 K2 CO1*
23. Define the voltage & current gain of an emitter follower. *2 K1 CO2*
24. Draw the small signal equivalent circuit of the Common base amplifier using the h parameter model. *2 K1 CO2*
25. State the Barkhausen Criterion for oscillation. *2 K1 CO3*
26. List the topologies of a negative feedback amplifier. *2 K1 CO3*
27. Infer the ideal response and actual response of tuned amplifiers with a diagram. *2 K2 CO4*
28. Compare loaded Q and unloaded Q. *2 K2 CO4*
29. Find the value of capacitors to be used in an astable multivibrator to provide a train of pulse 2 μsec wide at a repetition rate of 75 KHz with $R_1=R_2=10$ KΩ. *2 K1 CO5*
30. Classify Power amplifiers. *2 K2 CO6*

PART - C (6 × 10 = 60 Marks)

Answer ALL Questions

31. a) For the fixed bias circuit Find the I_{BQ} ,I_{CQ},V_{CEQ} and $V_{C.}$ *10 K2 CO1*



OR

b) Explain the stability factor S, S' and S'' of emitter bias circuit. *10 K2 CO1*

32.	a)	Illustrate a CE amplifier & its small-signal equivalent. Derive its Avs, Ai, Rin, Ro.	*10*	*K2*	*CO2*
		OR			
	b)	Explain the principle of operation of a JFET amplifier. Derive Voltage gain, input and output impedance of common source JFET amplifiers with a neat circuit diagram of its small signal equivalent circuit.	*10*	*K2*	*CO2*
33.	a) i)	Illustrate the effects of negative feedback on the bandwidth of an amplifier.	*5*	*K2*	*CO3*
	ii)	A negative feedback amplifier has voltage gain with feedback of 100.If the gain without feedback changes by 20% the gain with feedback should not vary more than 2%. Determine the value of the open loop gain and feedback ratio.	*5*	*K2*	*CO3*
		OR			
	b)	Explain the working principle of RC phase shift oscillator circuit diagrams that also derive the expression for frequency of oscillation and condition for sustained oscillation.	*10*	*K2*	*CO3*
34.	a)	Show the double tuned amplifier with a neat circuit diagram and derive the expression for 3dB bandwidth.	*10*	*K2*	*CO4*
		OR			
	b)	Illustrate the stability of tuned amplifiers and mention the need of neutralization.	*10*	*K2*	*CO4*
35.	a)	Illustrate the function of emitter coupled monostable Multivibrator and triggering methods for monostable multivibrator.	*10*	*K2*	*CO5*
		OR			
	b)	Illustrate the triggering methods for a bistable multivibrator and explain it by necessary diagrams.	*10*	*K2*	*CO5*
36.	a)	Explain the working of Class B Push pull amplifiers with neat diagrams. Also derive its efficiency.	*10*	*K2*	*CO6*
		OR			
	b)	Illustrate the transfer characteristic, signal waveforms, power dissipation, and power conversion efficiency of Class A amplifiers.	*10*	*K2*	*CO6*