Q. Code: 270736

Reg. No. | | | | | | | | | | | | | |

B.E. / B.TECH. DEGREE EXAMINATIONS, MAY 2024

Third Semester

EC22304 – ELECTRONIC CIRCUITS

(Electronics and Communication Engineering)

(Regulation 2022)

TIME: 3 HOURS **MAX. MARKS: 100**

COURSE OUTCOMES	STATEMENT	RBT LEVEL
CO 1	Choose appropriate biasing circuits for BJT and MOSFET discrete amplifiers.	**4**
CO 2	Design and analyze BJT amplifier.	**4**
CO 3	Analyze the modeling of MOSFET amplifiers.	**4**
CO 4	Design feedback amplifiers and analyze stabilization techniques and Oscillators.	**4**
CO 5	Analyze Power amplifiers and tuned amplifiers.	**4**

PART- A (20 x 2 = 40 Marks)

(Answer all Questions)

		CO	RBT LEVEL
1.	Justify the need for Biasing in Transistor.	**1**	**3**
2.	What are the disadvantages of collector feedback bias?	**1**	**2**
3.	Why is the operating point selected at the centre of the active region?	**1**	**2**
4.	Compare BJT and FET.	**1**	**4**
5.	Compare the cascade and cascode amplifier.	**2**	**2**
6.	Evaluate the importance of the Darlington circuit.	**2**	**3**
7.	Why multistage amplifiers are required?	**2**	**2**
8.	In a hybrid-Π model, obtain g_m for I_C = 3mA.	**2**	**3**
9.	Define pinch-off voltage in FET.	**3**	**2**

10.	Draw the small signal ac equivalent of FET.	**3**	**3**
11.	Define drain resistance and transconductance in a FET.	**3**	**2**
12.	Define BiMOS amplifiers.	**3**	**2**
13.	What are the advantages of introducing negative feedback?	**4**	**2**
14.	List the four basic feedback topologies.	**4**	**2**
15.	State the Barkhausen criterion for an oscillator.	**4**	**2**
16.	Write down the advantages of RC phase shift oscillator.	**4**	**2**
17.	List the advantages and disadvantages of tuned amplifiers.	**5**	**2**
18.	How to eliminate cross-over distortion in Class B amplifiers.	**5**	**3**
19.	Define Power Amplifier.	**5**	**2**
20.	Define Q factor of resonant circuit.	**5**	**2**

PART- B (5 x 10 = 50 Marks)

		Marks	CO	RBT LEVEL
21. (a)	Analyze the self-bias circuit for CE configuration and examine the stability factors S, S' and S'' for the collector to base bias circuit.	**(10)**	**1**	**3**
	(OR)			
(b)	In a FET amplifier which uses the voltage divider bias has V_{DD}=15V, R_1=2 MΩ, R_2 = 230 KΩ, R_D=2.1 KΩ R_S=1.2 KΩ, I_{DSS}= 6mA and V_P= -5V. Determine the following, (a) I_{DQ} and V_{GSQ} (b) V_D (c) V_S (d) V_{DS}	**(10)**	**1**	**3**
22. (a)	Examine the Small signal analysis of the Common Emitter amplifier using the h-parameter model.	**(10)**	**2**	**3**
	(OR)			
(b)	Explain the Darlington amplifier with a circuit diagram and also derive its current gain, input impedance and output impedance.	**(10)**	**2**	**3**

		Marks	CO	RBT LEVEL
23. (a)	Derive voltage gain, input and output impedance of common source JFET amplifier with neat circuit diagram and equivalent circuit.	**(10)**	**3**	**3**
	(OR)			
(b)	Derive voltage gain, input and output impedance of MOSFET source follower with neat circuit diagram and equivalent circuit.	**(10)**	**3**	**3**
24. (a)	Explain about Voltage series feedback amplifier and derive the expression for input impedance and output impedance.	**(10)**	**4**	**3**
	(OR)			
(b)	Explain the working of a Hartley oscillator with a neat circuit diagram and derive the frequency of oscillation.	**(10)**	**4**	**3**
25. (a)	Explain the working of transformer coupled class A power amplifier with neat diagram and derive its efficiency	**(10)**	**5**	**3**
	(OR)			
(b)	Describe in detail about the Single tuned amplifier and derive the gain, resonant frequency and cutoff frequency	**(10)**	**5**	**3**

PART- C (1 x 10 = 10 Marks)

(Q.No.26 is compulsory)

		Marks	CO	RBT LEVEL
26.	Design a voltage divider bias circuit for the specified conditions. V_{CC}=12v, V_{CE}=6v, I_C=1mA, S=30, β=100 and V_E=1v.	**(10)**	**1**	**5**

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