ELECTRONICS AND COMMUNICATION ENGINEERING

QUESTION BANK

Course Title: Electronics Devices and Circuits
Course Code: 25EC303
Regulation: NR25

UNIT–III
BJT BIASING

S.No	Questions	BT	CO	PO
	Part –A(Short Answer Questions)			
1	Define transistor biasing.	L2	3	1
2	Why is biasing necessary in transistor circuits?	L2	3	1
3	Define operating point (Q-point).	L2	3	1
4	What is stabilization?	L2	3	1
5	What is a DC load line?	L2	3	1
6	Define thermal runaway.	L2	3	1
7	What are the requirements of transistor biasing?	L2	3	1
8	What is fixed bias circuit?	L2	3	1
9	Draw the fixed bias circuit.	L2	3	1
10	What is collector-to-base bias?	L2	3	1
11	What is voltage divider bias?	L2	3	1
12	Which biasing method provides the best stability?	L2	3	1
13	Define stability factor.	L2	3	1
14	State the ideal value of stability factor.	L1	3	1
15	What are the causes of thermal runaway?	L2	3	1
16	Define ICBO.	L2	3	1
17	Define stability factor S.	L2	3	1
18	What is meant by self-biasing?	L2	3	1
19	Why is voltage divider bias called self-bias?	L2	3	1
20	Compare fixed bias and voltage divider bias.	L3	3	2
	Part– B(Long Answer Questions)			
S.No	**Questions**	**BT**	**CO**	**PO**
1	Explain the need for transistor biasing and stabilization.	L3	3	2
2	Explain the concept of operating point and its significance.	L3	3	2
3	Explain DC load line analysis and determination of Q-point.	L4	3	2
4	Draw the DC load line and explain active, saturation and cut-off regions.	L4	3	2
5	Explain the fixed bias circuit and derive its stability factor.	L4	3	2
6	Explain the collector-to-base bias circuit and derive its stability factor.	L4	3	2
7	Explain the voltage divider bias circuit and derive its stability factor.	L4	3	2
8	Compare fixed bias, collector-to-base bias and voltage divider bias methods.	L4	3	2

9	Explain thermal runaway and methods to avoid it.	L3	3	2
10	Derive the expression for stability factor S.	L4	3	2
11	Explain the effect of temperature on transistor operation.	L3	3	2
12	Discuss the advantages and disadvantages of various biasing techniques.	L4	3	2
13	Explain compensation techniques used to improve thermal stability.	L3	3	2
14	Design a voltage divider bias circuit for a given Q-point.	L3	3	3
15	Compare the stability factors of fixed bias, collector-to-base bias and voltage divider bias circuits.	L4	3	2
16	Design a collector-to-base bias circuit using silicon transistor to achieve a stability factor of 20, with VCC = 16V, VBE = 0.7V, VCEQ = 8V, ICQ = 4mA and β = 50.	L3	3	1,2,3
17	An NPN silicon transistor with β = 50 is used in a common emitter circuit with VCC = 10V, RC = 2KΩ. The bias is obtained by connecting a 100KΩ resistance from collector to base. Find: (i) Q-Point (ii) Stability factor S.	L3	3	1,2
18	Draw a fixed bias circuit and explain its operation. Calculate the Stability factor.	L3	3	1,2
19	Design a self-bias (voltage divider bias) circuit using silicon transistor to achieve a stability factor of 10, with VCC = 16V, VBE = 0.7V, VCEQ = 8V, ICQ = 4mA and β = 50.	L3	3	1,2,3