ADDITIONAL CONTROLLER OF EXAMINATIONS
AU
CHENNAI
600 025

Roll No. | | | | | | | | | | |

ANNA UNIVERSITY (UNIVERSITY DEPARTMENTS)

B.E. / B. Tech / B. Arch (Full Time) - END SEMESTER EXAMINATIONS, APRIL/MAY 2024

ELECTRONICS AND COMMUNICATION ENGINEERING

Semester IV

EC7402 & ELECTRONIC CIRCUITS II

(Regulation 2015)

Time: 3hrs Max.Marks: 100

PART- A (10 x 2 = 20 Marks)

(Answer all Questions)

Q. No	Questions	Marks
1	Write an expression for voltage gain of a feedback amplifier having forward gain A and feedback factor B.	2
2	What is the need of frequency compensation in transistor amplifiers?	2
3	What is the advantage of two stage op-amp?	2
4	Compare the performance of telescopic and folded cascode op-amp topologies	2
5	Write the two Barkhausen criteria to be satisfied to generate oscillations.	2
6	Justify the statement that negative feedback desensitizes the changes in the amplifier gain	2
7	A tuned circuit has resonant frequency of 200KHz and bandwidth of 8KHz. What is the value of Q?	2
8	List-out the advantages of using the transformer in a tuned amplifier circuit	2
9	Draw the circuit of Buck-Boost converter.	2
10	What are the elements used in D.C - D.C converters?	2

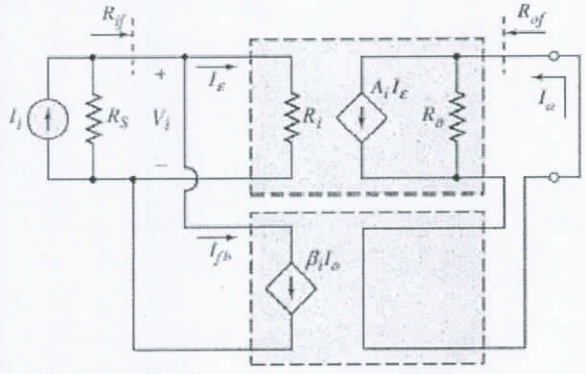
PART- B (5 x 13 = 65 Marks)

Q. No	Questions	Marks
11 (a)	Draw the block diagram representation of four feedback technologies and compare its performance on various gains and impedances.	13
	(OR)	
11 (b) (i)	Draw the single stage current series feedback amplifier using BJT. Derive its overall trans-conductance gain, GMF, Input Impedance, Rif, Output Impedance Rof.	7
(ii)	Determine the trans-resistance gain RMF, Input Impedance, Rif, Output Impedance, Rof of single stage voltage shunt feedback amplifier.	6
12 (a)	Describe slew rate of telescopic op-amp in detail. Also explain the operation of telescopic op-amp	13
	(OR)	
12 (b)	Explain the two-stage op-amp with cascading. Also explain it with single ended output	13
13 (a) (i)	Draw RC Phase Shift Oscillator using BJT, Explain and derive the condition for Oscillation.	8
(ii)	In Colpitt's Oscillator C_1=1uF and C_2=0.2uF. If the frequency of oscillation is 10KHz, find the value of inductor. Also find the required gain for sustained oscillation	5
	(OR)	

13 (b) (i)	Find the operating frequency of Hartley Oscillator if L_1=25μH, L_2= 2mH and mutual inductance between the coils M=5 μH and C=10pF	6
(ii)	Draw the circuit of Clapp oscillator. Explain and derive the condition for oscillation	7
14 (a)	Describe in detail about the analysis of Tuned amplifier's stability issues using neutralization techniques	13
	(OR)	
14 (b)	Explain the operation of single tuned amplifier and derive its cut of frequency.	13
15 (a)	Explain the Buck-Boost Converter with the help of its relevant waveforms. Derive the equation for its output voltage, ripple current, critical values of inductance and capacitance	13
	(OR)	
15 (b)	Explain the operation of the transformer coupled class – AB audio power amplifier. Also derive the expression for its maximum efficiency.	13

PART- C (1 x 15 = 15 Marks)

(Q.No. 16 is Compulsory)

Q. No	Questions	Marks
16 (i)	Explain the operation of Ring Oscillator.	7
(ii)	The circuit parameters of the ideal shunt–series amplifier shown in Fig 1., are Ii = 15μA, If I_b = 8μA, R_i = 250Ω, R_o = 10 k Ω, and β_i = 0.0095 A/A. Determine the values and units of I_ε , I_o, A_i , A_{if} , R_{if} , and R_{of} .  Fig.1	8

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