VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS), HYDERABAD
Accredited by NAAC with A++ Grade

B.E. (E.C.E.) IV-Semester Backlog Examinations, July/August-2023

Electronic Circuits

Time: **3 hours**

Max. Marks: **60**

*Note: Answer all questions from **Part-A** and any **FIVE** from **Part-B***

Part-A (10× 2 = 20 Marks)

Q. No.	Stem of the question	M	L	CO	PO	PSO
1.	Draw the circuit of half wave rectifier using clipper circuit	2	3	1	3	1
2.	Mention drawbacks of RL filters	2	1	1	1	1,2
3.	Three identical and non-interacting amplifier stages are connected in cascade. Determine the bandwidth of multistage amplifier for upper and lower cutoff frequencies of individual amplifier stage is 100KHz and 100Hz respectively.	2	3	2	3	1
4.	Write the applications of direct coupled amplifiers.	2	1	2	2	1
5.	An amplifier gain without feedback is varied by 50% due to temperature. Determine the variation in amplifier gain with feedback for sensitivity of 0.01.	2	2	3	2	1
6.	List general characteristics of negative feedback amplifier.	2	1	3	1	1
7.	Define barkhausen criteria to generate sustained sinusoidal oscillations.	2	1	4	1	1,2
8.	Mention frequency ranges of RC and LC oscillators	2	1	4	1	1,2
9.	Input DC power to series-fed class-A power amplifier is 10W.Determine the worse case power dissipation in transistor.	2	2	5	2	1,2
10.	State advantages of push-pull power amplifiers	2	1	5	1	1,2

Part-B (5×8 = 40 Marks)

11. a)	Prove that RC low pass filter will act as integrator	4	3	1	3	1,2
b)	Design a clipper circuit for following transfer characteristics. Assume diodes are ideal	4	3	1	3	1

			M	L	CO	PO	
12.	a)	Explain the frequency response of RC coupled amplifier	4	2	2	2	1
	b)	Determine the input impedance, voltage gain, current gain and output impedance of common emitter amplifier for load and source resistance of 10KΩ and 1KΩ respectively. Assume hybrid parameters of transistors are h_{fe}=50,h_{ie}=1.1KΩ and h_{re}=h_{oe}=0.	4	2	2	2	1
13.	a)	Prove that input impedance of voltage series feedback amplifier is $R_{if} = R_i(1 + A\beta)$.where R_i is input impedance of the amplifier without feedback, A is amplifier gain and β is feedback ratio	4	3	3	3	1
	b)	Compare voltage series, current series ,current shunt and voltage shunt feedback amplifiers.	4	3	3	2	1
14.	a)	Explain the RC phase shift oscillator with the help of neat circuit diagram	4	2	4	2	1,2
	b)	Describe amplitude and frequency stability of an oscillator	4	2	4	2	1,2
15.	a)	Describe the working of complimentary push pull class-AB power amplifier with a neat circuit diagram	4	2	5	2	1,2
	b)	A class A transformer coupled power amplifier has zero signal collector current of 50 mA. If the collector supply voltage is 5 V, find (i) the maximum a.c. power output (ii) the power rating of transistor (iii) the maximum collector efficiency.	4	2	5	2	1,2
16.	a)	State and prove clamping circuit theorem	4	3	1	3	1
	b)	Derive the expressions for current gain and input impedance of darlington amplifier using small signal analysis.	4	3	2	2	1
17.		Answer any *two* of the following:					
	a)	When negative voltage feedback is applied to an amplifier of gain 100, the overall gain falls to 50. (i) Calculate the fraction of the output voltage feedback. (ii) If this fraction is maintained, calculate the value of the amplifier gain required if the overall stage gain is to be 75.	4	2	3	2	1
	b)	An amplifier gain and feedback factor of a sinusoidal oscillator are given $A = \dfrac{-h_{fe}}{(2+j\omega)(5+j\omega)}$ and $\beta = \dfrac{1}{10-j\omega}$ respectively .Determine the i) oscillating frequency and ii) hfe of transistor.	4	3	4	3	1,2
	c)	Describe the terms, power efficiency, harmonic distortion and power handling capacity with respect to power amplifier.	4	1	5	2	1,2

M : Marks; L: Bloom's Taxonomy Level; CO; Course Outcome; PO: Programme Outcome

i)	Blooms Taxonomy Level – 1	20%
ii)	Blooms Taxonomy Level – 2	40%
iii)	Blooms Taxonomy Level – 3 & 4	40%

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