G.PULLAIAH COLLEGE OF ENGINEERING & TECHNOLOGY (AT), KURNOOL

B.Tech – II-II Semester (R15) MID I Examinations

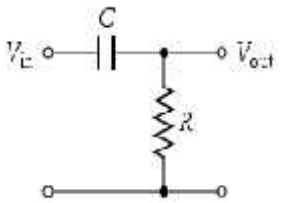
Branch: Electrical & Electronics Engineering

SET 1

Sub: Analog Electronic Circuits **Date: 07-03-2018**

Time: 1½ Hrs. **Max Marks: 30M**

Question 1 is compulsory. Answer one from 2 or 3 and one from 4 or 5

S.No	Questions	Marks	Unit	CO	Cognitive Level
1. (a)	Write an expression for the bandwidth of multistage amplifier.	2	1	C211.1	Understand
1.(b)	Write some advantages and disadvantages of RC coupled amplifier?	2	1	C211.1	Remember
1.(c)	Write the classification of amplifiers According to frequency range, coupling methods and operating point?	2	1	C211.1	Understand
1.(d)	Draw the equivalent circuit of a voltage amplifier & transconductance amplifier.	2	2	C211.2	Analyze
1.(e)	An amplifier has voltage gain with feedback of 500. If the gain without feedback changes by 20% and the gain with feedback should not vary more than 2%, determine the values of open loop gain A and feedback ratio β.	2	2	C211.2	Apply
2.a)	Explain the analysis of RC coupled amplifier (assuming CE configuration) in Low range, Mid- range, High range frequencies	8	1	C211.1	Understand
2.b)	An amplifier rated at 40W output is connected to a 10Ω speaker. (i) Calculate the input power required for full power output if the power gain is 25dB. (ii) Calculate the input voltage for rated output if the amplifier voltage gain is 40dB	2	1	C211.1	Apply
3.a)	Explain low frequency and high frequency analysis and bandwidth(in general case)	8	1	C211.1	Understand
3.b)	For the network shown in figure C = 0.1μF, R = 5KΩ (i) Determine break frequency (ii) Find gain at A_V(dB) = -6dB. 	2	1	C211.1	Apply
4.a)	Draw the circuit diagram which has current series feedback and find its gain, input & output impedance.	7	2	C211.2	Understand
4.b)	An amplifier with a negative feedback gives an output of 12.5 volts with an input of 1.5V. When feedback is removed, it requires 0.25volts input for the same output. Find, (i) Value of voltage gain with out feedback (ii) Value of β if the input and output are in phase and β is real.	3	2	C211.2	Apply
5.a)	Explain current shunt & voltage shunt feedback topology in detail.	8	2	C211.2	Understand
5.b)	An amplifier with stage gain 200 is provided with negative feedback of feedback ratio 0.05. Find the new gain.	2	2	C211.2	Apply

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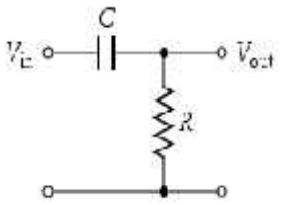
1.(c)	Write the classification of amplifiers According to frequency range, coupling methods and operating point?	2	1	C211.1	Understand
1.(d)	Draw the equivalent circuit of a voltage amplifier & transconductance amplifier.	2	2	C211.2	Analyze
1.(e)	An amplifier has voltage gain with feedback of 500. If the gain without feedback changes by 20% and the gain with feedback should not vary more than 2%, determine the values of open loop gain A and feedback ratio β.	2	2	C211.2	Apply
2.a)	Explain the analysis of RC coupled amplifier (assuming CE configuration) in Low range, Mid- range, High range frequencies	8	1	C211.1	Understand
2.b)	An amplifier rated at 40W output is connected to a 10Ω speaker. (iii) Calculate the input power required for full power output if the power gain is 25dB. (iv) Calculate the input voltage for rated output if the amplifier voltage gain is 40dB	2	1	C211.1	Apply
3.a)	Explain low frequency and high frequency analysis and bandwidth(in general case)	8	1	C211.1	Understand
3.b)	For the network shown in figure C = 0.1μF, R = 5KΩ (iii) Determine break frequency (iv) Find gain at A_V(dB) = -6dB. 	2	1	C211.1	Apply
4.a)	Draw the circuit diagram which has current series feedback and find its gain, input & output impedance.	7	2	C211.2	Understand
4.b)	An amplifier with a negative feedback gives an output of 12.5 volts with an input of 1.5V. When feedback is removed, it requires 0.25volts input for the same output. Find, (iii) Value of voltage gain with out feedback (iv) Value of β if the input and output are in phase and β is real.	3	2	C211.2	Apply
5.a)	Explain current shunt & voltage shunt feedback topology in detail.	8	2	C211.2	Understand
5.b)	An amplifier with stage gain 200 is provided with negative feedback of feedback ratio 0.05. Find the new gain.	2	2	C211.2	Apply

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SET 2

Sub: Analog Electronic Circuits **Date: 07-03-2018**

Time: 1½ Hrs. **Max Marks: 30M**

Question 1 is compulsory. Answer one from 2 or 3 and one from 4 or 5.

S.No	Questions	Marks	Unit	CO	Cognitive Level
1. (a)	What is gain bandwidth product? Derive the equation $f_i = h_{fe} f_\beta$	2	1	C211.1	Understand
1.(b)	Write different coupling schemes used in multistage amplifiers?	2	1	C211.1	Understand
1.(c)	Write some differences between BJT RC coupled amplifier & FET RC coupled amplifier?	2	1	C211.1	Analyze
1.(d)	What are the advantages & applications of negative feedback amplifiers?	2	2	C211.2	Remember
1.(e)	The voltage gain of an amplifier without feedback is 60dB. It decreases to 40dB with feedback. Calculate the feedback factor	2	2	C211.2	Apply
2.a)	Discuss the effect of emitter bypass capacitor on low frequency response of BJT amplifiers.	8	1	C211.1	Understand
2.b)	Three identical non interacting cascaded stages have a overall upper 3dB frequency of 32kHz and a lower 3dB frequency of 16Hz. Calculate the lower and upper 3-dB frequencies of individual stages.	2	1	C211.1	Apply
3.a)	What are cascaded amplifiers? Obtain the expressions for overall voltage gain, current gain and power gain.	6	1	C211.1	Understand
3.b)	A multistage amplifier is to be constructed using four identical stages, each of which has a lower cut-off frequency of 15 Hz and upper cut-off frequency of 30 kHz. (a) What will be the lower and upper cut-off frequencies of the multistage amplifier? (b)If the mid band voltage gain of each stage is 8.2, what will be approximate gain of multistage amplifier at 7.5 kHz and at 300 kHz?	4	1	C211.1	Apply
4.a)	Draw the circuit diagram which has current series feedback and find its gain, input & output impedance.	7	2	C211.2	Understand
4.b)	Calculate the gain, input impedance, output impedance of voltage series feedback amplifier having A=300, R_i = 1.5kΩ, R_0 = 50k Ω and β = 1/12.	3	2	C211.2	Apply
5.a)	Explain current series & voltage series feedback topology in detail	8	2	C211.2	Understand
5.b)	An amplifier requires an input signal of 60mV to produce a certain output.with a negative feedback to get the same output, the required input signal is 0.5 volts. The voltage gain with feedback is 90. Find	2	2	C211.2	Apply

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SET 2

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Time: 1½ Hrs. **Max Marks: 30M**

Question 1 is compulsory. Answer one from 2 or 3 and one from 4 or 5.

S.No	Questions	Marks	Unit	CO	Cognitive Level
1. (a)	What is gain bandwidth product? Derive the equation $f_1 = h_{fe} f_\beta$	2	1	C211.1	Understand
1.(b)	Write different coupling schemes used in multistage amplifiers?	2	1	C211.1	Understand
1.(c)	Write some differences between BJT RC coupled amplifier & FET RC coupled amplifier?	2	1	C211.1	Analyze
1.(d)	What are the advantages & applications of negative feedback amplifiers?	2	2	C211.2	Remember
1.(e)	The voltage gain of an amplifier without feedback is 60dB. It decreases to 40dB with feedback. Calculate the feedback factor	2	2	C211.2	Apply
2.a)	Discuss the effect of emitter bypass capacitor on low frequency response of BJT amplifiers.	8	1	C211.1	Understand
2.b)	Three identical non interacting cascaded stages have a overall upper 3dB frequency of 32kHz and a lower 3dB frequency of 16Hz. Calculate the lower and upper 3-dB frequencies of individual stages.	2	1	C211.1	Apply
3.a)	What are cascaded amplifiers? Obtain the expressions for overall voltage gain, current gain and power gain.	6	1	C211.1	Understand
3.b)	A multistage amplifier is to be constructed using four identical stages, each of which has a lower cut-off frequency of 15 Hz and upper cut-off frequency of 30 kHz. (a) What will be the lower and upper cut-off frequencies of the multistage amplifier? (b)If the mid band voltage gain of each stage is 8.2, what will be approximate gain of multistage amplifier at 7.5 kHz and at 300 kHz?	4	1	C211.1	Apply
4.a)	Draw the circuit diagram which has current series feedback and find its gain, input & output impedance.	7	2	C211.2	Understand
4.b)	Calculate the gain, input impedance, output impedance of voltage series feedback amplifier having A=300, R_i = 1.5kΩ, R_0 = 50k Ω and β = 1/12.	3	2	C211.2	Apply
5.a)	Explain current series & voltage series feedback topology in detail	8	2	C211.2	Understand
5.b)	An amplifier requires an input signal of 60mV to produce a certain output.with a negative feedback to get the same output, the required input signal is 0.5 volts. The voltage gain with feedback is 90. Find	2	2	C211.2	Apply

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SET 3

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Time: 1½ Hrs. **Max Marks: 30M**

Question 1 is compulsory. Answer one from 2 or 3 and one from 4 or 5.

S.No	Questions	Marks	Unit	CO	Cognitive Level
1. (a)	Write a brief note on logarithms and decibels	2	1	C211.1	Understand
1.(b)	Explain about different types of distortions that occur in amplifier circuits?	2	1	C211.1	Understand
1.(c)	Compare voltage shunt and current shunt feedback?	2	2	C211.2	Analyze
1.(d)	What are the steps to be carried out for complete analysis of a feedback amplifier?	2	2	C211.2	Understand
1.(e)	For an amplifier, 3 dB gain is 200 and higher cut-off frequency is 20KHZ. Find the gain of an amplifier at frequency=100 KHZ	2	1	C211.1	Apply
2.a)	Draw the circuit of single stage amplifier and derive the expression for high frequency response and its gain bandwidth product.	8	1	C211.1	Understand
2.b)	Three identical non interacting amplifier stages in cascade have an overall gain of 2 dB down at 50 Hz compared to mid band. Calculate the lower cutoff frequency of the individual stages.	2	1	C211.1	Apply
3.a)	Draw the high frequency hybrid -Π model for a transistor in CE configuration, explain the significance of each component and Derive the expression for the CE short circuit current gain A_I as a function of frequency	8	1	C211.1	Understand
3.b)	The input power of a device is 10000W at a voltage of 1000V. the output power is 500W and the output impedance is 20Ω. (i) Find the power gain in decibels. (ii) Find the voltage gain in decibels.	2	1	C211.1	Apply
4.a)	Draw the circuit diagram of voltage shunt feedback amplifier and derive the expressions for voltage gain and feedback factor	7	2	C211.2	Understand
4.b)	A voltage series negative feedback amplifier has a voltage gain without feedback of A = 50, input resistance R_i = 2 kΩ, output resistance R_O = 15 kΩ and feedback ratio of 0.01. Calculate the voltage gain, input resistance and output resistance of the amplifier with feedback?	3	2	C211.2	Apply
5.a)	Explain the effect of negative feedback on amplifier characteristics	7	2	C211.2	Understand
5.b)	An amplifier has a voltage gain of 400, f_1=50Hz, f_2=200KHz and a distortion of 10% without feedback. Find the voltage gain, f_{1f}, f_{2f} and D_f when a neagative feedback is applied with feedback ration of 0.001.	3	2	C211.2	Apply

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S.No	Questions	Marks	Unit	CO	Cognitive Level
1. (a)	Write a brief note on logarithms and decibels	2	1	C211.1	Understand
1.(b)	Explain about different types of distortions that occur in amplifier circuits?	2	1	C211.1	Understand
1.(c)	Compare voltage shunt and current shunt feedback?	2	2	C211.2	Analyze
1.(d)	What are the steps to be carried out for complete analysis of a feedback amplifier?	2	2	C211.2	Understand
1.(e)	For an amplifier, 3 dB gain is 200 and higher cut-off frequency is 20KHZ. Find the gain of an amplifier at frequency=100 KHZ	2	1	C211.1	Apply
2.a)	Draw the circuit of single stage amplifier and derive the expression for high frequency response and its gain bandwidth product.	8	1	C211.1	Understand
2.b)	Three identical non interacting amplifier stages in cascade have an overall gain of 2 dB down at 50 Hz compared to mid band. Calculate the lower cutoff frequency of the individual stages.	2	1	C211.1	Apply
3.a)	Draw the high frequency hybrid -Π model for a transistor in CE configuration, explain the significance of each component and Derive the expression for the CE short circuit current gain A_I as a function of frequency	8	1	C211.1	Understand
3.b)	The input power of a device is 10000W at a voltage of 1000V. the output power is 500W and the output impedance is 20Ω. (i) Find the power gain in decibels. (ii) Find the voltage gain in decibels.	2	1	C211.1	Apply
4.a)	Draw the circuit diagram of voltage shunt feedback amplifier and derive the expressions for voltage gain and feedback factor	7	2	C211.2	Understand
4.b)	A voltage series negative feedback amplifier has a voltage gain without feedback of A = 50, input resistance R_i = 2 kΩ, output resistance R_O = 15 kΩ and feedback ratio of 0.01. Calculate the voltage gain, input resistance and output resistance of the amplifier with feedback?	3	2	C211.2	Apply
5.a)	Explain the effect of negative feedback on amplifier characteristics	7	2	C211.2	Understand
5.b)	An amplifier has a voltage gain of 400, f_1=50Hz, f_2=200KHz and a distortion of 10% without feedback. Find the voltage gain, f_{1f}, f_{2f} and D_f when a neagative feedback is applied with feedback ration of 0.001.	3	2	C211.2	Apply

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SET 4

Sub: Analog Electronic Circuits **Date: 07-03-2018**

Time: 1½ Hrs. **Max Marks: 30M**

Question 1 is compulsory. Answer one from 2 or 3 and one from 4 or 5.

S.No	Questions	Marks	Unit	CO	Cognitive Level
1. (a)	Draw the frequency response of RC coupled Amplifier and state the reason for fall in gain at low frequencies & higher frequencies?	2	1	C211.1	Understand
1.(b)	Write some differences between cascade and cascode amplifier?	2	1	C211.1	Analyze
1.(c)	What is meant by feedback? Define Positive and Negative feedback	2	2	C211.2	Remember
1.(d)	Compare voltage series and current series feedback?	2	2	C211.2	Analyze
1.(e)	An amplifier has Three identical non interacting cascaded stages. Each stage has lower and upper 3dB frequency of 25Hz and 120kHz. Calculate the lower and upper 3-dB frequencies of overall cascade amplifier.	2	1	C211.1	Apply
2.a)	Explain the analysis of RC coupled amplifier (assuming CE configuration) in Low range, Mid-range, High range frequencies	8	1	C211.1	Understand
2.b)	Calculate overall lower 3dB and upper 3dB frequency for a 3-stage amplifier having an individual lower cut off frequency of 40 Hz and upper frequency of 2 MHz	2	1	C211.1	Apply
3.a)	Explain the low frequency high frequency response of FET RC coupled amplifier.	8	1	C211.1	Understand
3.b)	In an R-C coupled amplifier, A_{VM} = 50, f_L = 50 Hz and f_H= 100 KHz. Find the values of frequencies at which the gain reduces to 50 on either side of mid band region.	2	1	C211.1	Apply
4.a)	Draw the circuit diagram of current shunt feedback amplifier and derive the expressions for voltage gain and feedback factor	7	2	C211.2	Understand
4.b)	The distortion in an amplifier is found to be 3%, when the feedback ratio of negative feedback amplifier is 0.04. When the feedback is removed, the distortion becomes 15%. Find the open and closed loop gain.	3	2	C211.2	Apply
5.a)	Draw the block diagram of a feedback amplifier and explain the function of each block in detail	6	2	C211.2	Understand
5.b)	An amplifier has a bandwidth of 200KHz and a voltage gain of 1000. (i) What will be the new bandwidth and gain if 5% negative feedback is introduced. (ii) What is the gain-bandwidth product with feedback & without feedback. (iii) What should be the amount of feedback if the bandwidth required is 1MHz	4	2	C211.2	Apply

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1.(b)	Write some differences between cascade and cascode amplifier?	2	1	C211.1	Analyze
1.(c)	What is meant by feedback? Define Positive and Negative feedback	2	2	C211.2	Remember
1.(d)	Compare voltage series and current series feedback?	2	2	C211.2	Analyze
1.(e)	An amplifier has Three identical non interacting cascaded stages. Each stage has lower and upper 3dB frequency of 25Hz and 120kHz. Calculate the lower and upper 3-dB frequencies of overall cascade amplifier.	2	1	C211.1	Apply
2.a)	Explain the analysis of RC coupled amplifier (assuming CE configuration) in Low range, Mid-range, High range frequencies	8	1	C211.1	Understand
2.b)	Calculate overall lower 3dB and upper 3dB frequency for a 3-stage amplifier having an individual lower cut off frequency of 40 Hz and upper frequency of 2 MHz	2	1	C211.1	Apply
3.a)	Explain the low frequency high frequency response of FET RC coupled amplifier.	8	1	C211.1	Understand
3.b)	In an R-C coupled amplifier, A_{VM} = 50, f_L = 50 Hz and f_H= 100 KHz. Find the values of frequencies at which the gain reduces to 50 on either side of mid band region.	2	1	C211.1	Apply
4.a)	Draw the circuit diagram of current shunt feedback amplifier and derive the expressions for voltage gain and feedback factor	7	2	C211.2	Understand
4.b)	The distortion in an amplifier is found to be 3%, when the feedback ratio of negative feedback amplifier is 0.04. When the feedback is removed, the distortion becomes 15%. Find the open and closed loop gain.	3	2	C211.2	Apply
5.a)	Draw the block diagram of a feedback amplifier and explain the function of each block in detail	6	2	C211.2	Understand
5.b)	An amplifier has a bandwidth of 200KHz and a voltage gain of 1000. (i) What will be the new bandwidth and gain if 5% negative feedback is introduced. (ii) What is the gain-bandwidth product with feedback & without feedback. (iii) What should be the amount of feedback if the bandwidth required is 1MHz	4	2	C211.2	Apply