UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, December 2017

Program: B. Tech(EE)   Semester –   V
Subject (Course): LIC   Max. Marks   : 100
Course Code   : ELEG263   Duration   : 3 Hrs
No. of page/s: 01

Attempt all questions.

	SECTION A		Marks[20]
1.	Describe the virtual ground concept for OP AMP IC uA741.	**[5]**	CO3
2.	Elaborate the working of peak detector with the help of circuit and waveform	**[5]**	CO3
3.	Discuss the effect of negative feedback on input and output resistance of OP AMP.	**[5]**	CO2
4.	Describe the output voltage of an differentiator circuit with OP AMP and discuss the frequency response of ideal & practical differentiator circuit.	**[5]**	CO2
	SECTION B		**Marks[40]**
5.	Draw a dual input, balanced output differential amplifier with R_C=2.2 KΩ, R_E=4.7 KΩ, Rin1=Rin2=50 Ω, +Vcc=10V, -V_{EE}= -10V and βdc=βac=100 and V_{BE}= 0.715V (a) Determine the I_{CQ} and V_{CEQ} values (b) Determine the voltage gain (c) Determine the input and output resistance	**[10]**	CO1
6.	An 8bit A/D converter accepts an input signal of range 0 to 10V. (a) Calculate the minimum value of the input voltage required to generate a change of 1 LSB. (b) What input voltage will generate all 1s at the A/D converter output? (c) Calculate the digital output for an input voltage of 4.8V.	**[10]**	CO4
7.	(a) Elaborate circuit of Anti- logarithmic amplifier. (b) Discuss Sample and hold circuit with OP AMP.	**[5+5]**	CO3
8.	(a) Justify the non-inverting configuration of OP AMP is voltage series feedback. (b) Derive the expression for voltage to current converter.	**[5+5]**	CO4
	SECTION C		**Marks[40]**
9.	Design a wide band pass filter with f_L=200 Hz, f_H= 1KHz and passband gain of 4. Also calculate the quality factor of designed filter and draw the frequency response of the filter.	**[20]**	CO3
10.	(a) Design and draw an astable multivibrator using IC555 timer for a frequency of 1KHz and a duty cycle of 70%. (b) Design and discuss the working of a power supply with 5V DC output with the help of voltage regulator and precision full wave rectifier.	**[10+10]**	CO4

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	SECTION A		Marks[20]
1.	Draw and discuss the working of successive approximation analog to digital converter.	**[5]**	**CO4**
2.	Discuss and draw precision full wave rectifier with OP-AMP	**[5]**	**CO3**
3.	For 741C non inverting OP-AMP with R_1=1 KΩ, R_F= 10 KΩ, A=200000, Ri=2 MΩ, Ro= 75 Ω, fo= 5Hz, supply voltages= ±15V, output voltage swing= ±13V. Compute the A_F, R_{iF}, R_{oF}, f_F, V_{ooT}	**[5]**	**CO2**
4.	Justify the inverting configuration of OP AMP is voltage shunt feedback.	**[5]**	**CO2**
	SECTION B		**Marks[40]**
5.	For a single input, balanced output differential amplifier with R_C=2.2 KΩ, R_E=4.7 KΩ, Rin1=Rin2=50 Ω, +Vcc=10V, $-V_{EE}$= -10V and βdc=βac=100 and V_{BE}= 0.715V 　(a) Calculate the I_{CQ} and V_{CEQ} values 　(b) Discuss the voltage gain 　(c) Determine the input and output resistance	**[10]**	**CO1**
6.	Elaborate digital to analog converter and draw & explain the working of – 　(a) Binary weighted resistors 　(b) R and 2R resistors	**[10]**	**CO4**
7.	Design a circuit with output as summing circuit, scaling circuit and average circuit should be 12V, 6V and 4V respectively.	**[10]**	**CO3**
8.	(a) Derive the expression for current to voltage converter. (b) Elaborate circuit of logarithmic amplifier	**[5+5]**	**CO4**
	SECTION C		**Marks[40]**
9.	Design a second order high pass filter with f_L= 1KHz and passband gain of 1.58. Draw the frequency response of the designed filter.	**[20]**	**CO3**
10.	i.) Design and discuss working of a sawtooth waveform generator for 10V peak and frequency of 200Hz. Assume V_i=2V and V_{ref}=10V. ii.)Design a monostable multivibrator with IC555 timer for a pulse period of 1ms.	**[10+10]**	**CO4**