GURU NANAK INSTITUTE OF TECHNOLOGY
An Autonomous Institute under MAKAUT
2022
ANALOG ELECTRONIC CIRCUITS
EC402

TIME ALLOTTED: 3 HOURS **FULL MARKS: 70**

The figures in the margin indicate full marks.
Candidates are required to give their answers in their own words as far as practicable

GROUP – A
(Multiple Choice Type Questions)

Answer any *ten* from the following, choosing the correct alternative of each question: **10×1=10**

			Marks	CO No
1.	(i)	An astable multivibrator generates a) triangular waveform b) sinusoidal waveform c) square waveform d) None of these	1	CO5
	(ii)	A Schmitt trigger uses a) Negative feedback b) Positive feedback c) Pull up resistor d) Compensating capacitor	1	CO2
	(iii)	The expression of closed loop gain Af for negative feedback amplifier is a) $A/(1+A\beta)$ b) $A/(1-A\beta)$ c) $1/(1+A\beta)$ d) $1/(1-A\beta)$	1	CO2
	(iv)	CMRR of an Ideal OP-AMP is a) 0 Db b) 100dB c) 1000dB d) infinity	1	CO4
	(v)	The undistorted output signal is available when the Q-point is a) Near saturation point b) Near cut-off point c) In middle of active region d) Anywhere of the load line	1	CO1

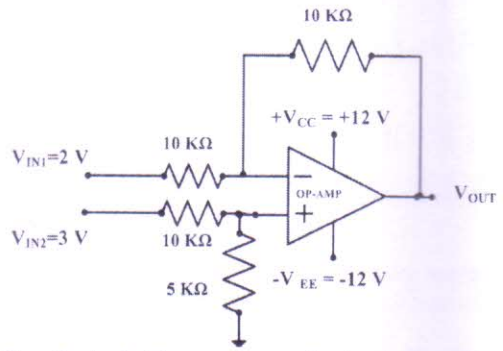
(vi)	The transformer-coupled amplifier provide a) impedance matching b) maximum voltage gain c) maximum current gain d) d) large bandwidth	1	CO2
(vii)	Maximum efficiency of class-B power amplifier is a) 25% b) 50% c) 78.5% d) 90%	1	CO3
(viii)	Conduction angle of class –A power amplifier is a) 360 Degree b) in between 180 to 360 Degree c) less than 180 Degree d) 180 Degree	1	CO3
(ix)	Transistor in power amplifier is _____ a) An active device b) A passive device c) A op-amp d) A voltage generating device	1	CO3
(x)	If RESET pin of 555 IC is made low, then output impedance of an OP-AMP is a) output is high b) output is low c) IC will not work d) IC may be damaged	1	CO5
(xi)	The condition of oscillator a) $A\beta=1$ b) Feedback must be regenerated c) Phase angle must be zero d) All of these	1	CO2
(xii)	If the Q point is……., the negative part of input signal is clipped at output a) near saturation point b) near cut-off point c) middle of active region d) anywhere of the load line	1	CO1

GROUP – B
(Short Answer Type Questions)

Answer any ***three*** from the following: **3×5=15**

		Marks	CO No
2.	Draw and explain the Schmitt trigger circuit using Op-Amp.	5	CO4
3.	Explain the operation of Transformer coupled class A power amplifier.	5	CO2

4. Determine the output voltage of the following circuit. 5 CO4



5. Define the hybrid parameters for basic transistor circuit in any configuration and give its hybrid model. 5 CO1

6. With a neat diagram, explain the principle of operation of an antilog amplifier. 5 CO3

GROUP – C
(Long Answer Type Questions)
Answer any ***three*** from the following: **3×15=45**

			Marks	CO No
7.	(a)	What are effects of negative feedback on the performance parameters of an amplifier?	4	CO3
	(b)	Find out the (i) condition to sustain oscillation and (b) an expression of oscillation frequency in a Wien bridge oscillator circuit.	7	CO3
	(c)	In a Hartley oscillator,L_1=0.02mH, and C=0.047μF.When the frequency of the oscillator is 100KHz,determine the value of L_2.Assume mutual inductance is negligible.	4	CO2
8.	(a)	Draw the functional block diagram of 555 timer.	5	CO5
	(b)	Explain the operation of monostable multivibrator using 555 timer.	5	CO5
	(c)	Draw the circuit diagram of an astable multivibrator with 50% duty cycle output using 555 timer.	5	CO5
9.	(a)	Draw the circuit diagram of RC coupled amplifier. Explain the operation and its frequency response.	10	CO1
	(b)	Draw the equivalent circuit for common source follower of JFET amplifier.	5	CO2
10.	(a)	Draw the circuit diagram of a push-pull class B power amplifier and explain its working.	7	CO3
	(b)	Calculate the power conversion efficiency of it and maximum collector power dissipation.	8	CO3
11.		Write short notes on any three of the followings:	**3x5=15**	
	(a)	Instrumentation amplifier	5	CO4
	(b)	Practical integrator circuit.	5	CO3
	(c)	Comparator	5	CO2
	(d)	Four basic feedback topologies.	5	CO2