GURU NANAK INSTITUTE OF TECHNOLOGY
An Autonomous Institute under MAKAUT
2021
ANALOG ELECTRONIC CIRCUITS (Backlog)
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)	Which of the following statement is true? Negative feedback in an amplifier a) reduces gain b) increase frequency and phase distortion c) reduces bandwidth d) increases noise	1	CO3
	(ii)	An instrumentation amplifier a) is a differential amplifier b) has a gain less than 1 c) has very high output impedance d) has low CMRR	1	CO6
	(iii)	Which one of the following oscillator is used for the generation of high frequencies? a) R-C phase shift b) Blocking oscillator c) Wien bridge d) LC oscillator	1	CO3
	(iv)	How can the duty cycle be changed for an astablemultivibrator? a) By adding another capacitor to the circuit b) By adding diodes to the circuit c) By adding an inductor to the circuit d) The duty cycle cannot be changed	1	CO3
	(v)	In a logarithmic amplifier, the logarithmic effect of the input is obtained from a) non-linear device, like diode or transistor b) negative feed-back c) the Op-Amp itself d) the inverting input terminal	1	CO4

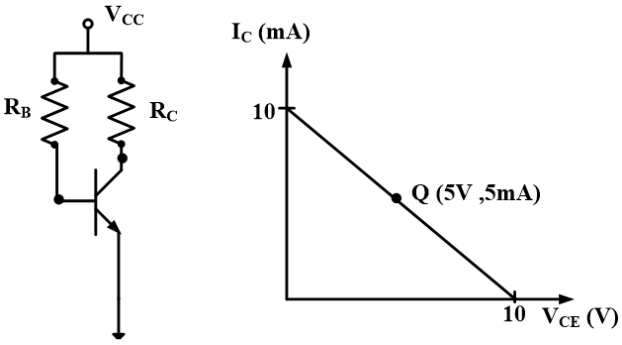
(vi)	Operational amplifier are used to amplify a) ac signal only b) dc signal only c) both ac and dc signal d) none of these	1	CO6
(vii)	Which power amplifier can deliver maximum load power? a) Class A b) Class AB c) Class B d) Class C	1	CO5
(viii)	The condition of oscillator a) Aβ=1 b) Feedback must be regenerated c) Phase angle must be zero d) All of these	1	CO3
(ix)	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
(x)	A comparator with a Schmitt trigger has a) two trigger levels. b) a fast response. c) a slow response. d) one trigger level.	1	CO6
(xi)	The transformer-coupled amplifier provide a) impedance matching b) maximum voltage gain c) maximum current gain d) large bandwidth	1	C01
(xii)	For a wide range of oscillations in the audio range, the preferred oscillator is a) Hartley b) Phase-shift c) Colpitt d) Wine bridge	1	CO3

GROUP – B
(Short Answer Type Questions)

(Answer any *three* of the following) **3 x 5 = 15**

		Marks	**CO No.**
2. a)	Represent a comparative study for Astable & Monostable Multivibrator.	3	CO5

b)	One circuit and its load line is shown in the Fig. Determine the value of VCC and RC of the circuit.	2	CO1



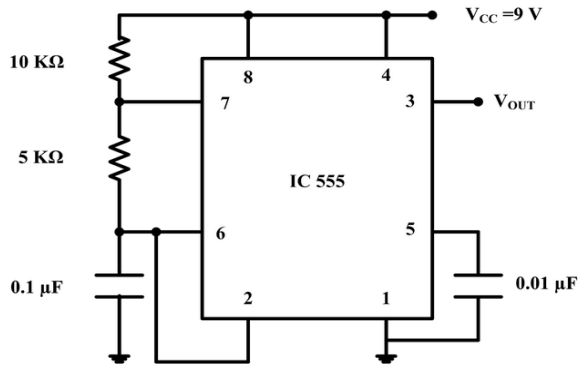
3.	Draw a Wein-bridge oscillator circuit and derive an expression for the frequency of oscillation.	5	CO4
4.	With a neat diagram, explain the principle of operation of an antilog amplifier.	5	CO4
5.	Explain the operation of Transformer coupled class A power amplifier.	5	CO5
6	Draw and explain the Practical integrator circuitusing Op-Amp.	5	CO6

GROUP – C
(Long Answer Type Questions)

(Answer any *three* of the following) **3 x 15 = 45**

		Marks	CO No.
7. a)	Draw the circuit diagram of an instrumentation amplifier using a transducer bridge. Explain its operation.	5	CO6
b)	With a net diagram explain the concepts of "load line" and "Q point" of a transistor.	5	CO1
c)	Derive the condition for sustained oscillation and the expression for the frequency of oscillation of Colpitt's Oscillator	5	CO2
8.a)	Explain the operation of monostablemultivibrator using 555 timer.	5	CO5
b)	Draw the circuit diagram of an astablemultivibrator with 50% duty cycle output using 555 timer.	5	CO4
c)	Why bistablemultivibrator is called a flip-flop multivibrator? Calculate the frequency and duty cycle of the output of an astablemultivibrator using timer 555. Assume R_1=25k ohm, R_2 =50 K ohm and C=0.1μF.	5	CO4

9.a)	What is the maximum voltage and minimum voltage across pin no. 2 of the following circuit ?	4	CO5



b)	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
c)	Draw and explain the working of a push-pull class B power amplifier with propercircuit diagram.	7	CO3
10.a)	Calculate the power conversion efficiency of it and maximum collector power dissipation.	7	CO3
b)	What is comparator? Explain non-inverting or inverting comparator?	5	CO6
c)	"Ideally the Bandwidth of Op-Amp is infinite"- What is the advantage?	3	CO2
11.	Write short notes on any three of the following:	3X5=15	
a)	Feedback topologies	5	CO3
b)	Schmitt trigger circuit.	5	CO6
c)	Hartley Oscillator	5	CO4
d)	Structure of MOSFET with proper notification.	5	CO3
e)	Precision rectifier	5	CO4