

KATHMANDU UNIVERSITY
End Semester Examination [C]
December, 2018

Mark scored:

Level : B.E.

Course : EEEG 214

Year : II

Semester: II

Exam Roll No.:

Time: 30 mins.

F.M. : 20

Registration No.

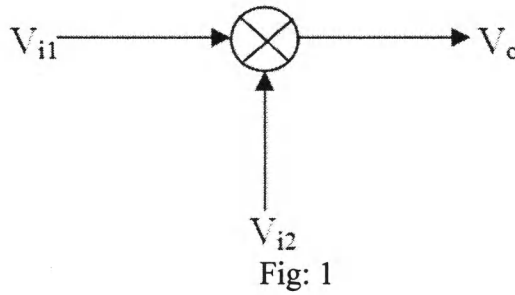
Date DEC 30 2018

SECTION "A"
[20 Q.×1=20 marks]

Choose the best answer.

1. Negative feedback is used in _____.
[a] oscillator [b] multiplier [c] schmitt trigger [d] amplifier
2. Negative feedback in an electronic system, _____ of the system.
[a] increases the gain [b] increases the stability
[c] decreases the impedance [d] decreases the bandwidth
3. Y feedback is applied in order to realize an ideal _____.
[a] CCVS [b] CCCS [c] VCVS [d] VCCS
4. The gain of a Wein bridge oscillator is _____.
[a] 1 [b] 3 [c] 6 [d] 9
5. For the condition $A_o\beta = 1$, the pole pairs of an oscillator system lies _____.
[a] at the right half of S plane [b] at the left half of S plane
[c] exactly at the $j\omega$ axis [d] at infinity
6. In frequency domain, cosine wave of 100 Hz shows _____.
[a] a line [b] a circle [c] a rectangle [d] a square
7. Schmitt trigger can be best described as a/an _____.
[a] amplifier [b] sine to square wave converter
[c] oscillator [d] VCO
8. _____ oscillator is one of the most stable oscillators.
[a] RC phase shift [b] Wein bridge [c] Coliptt [d] Crystal
9. _____ gate can be used as a phase detector.
[a] OR [b] NOR [c] XOR [d] NAND
10. _____ is used to convert voltage amplitude into frequency.
[a] PLL [b] VCO [c] amplifier [d] multiplier

11. The output voltage (V_o) of the circuit in Figure 1 is _____ volts.
 [a] $V_{i1}V_{i2}$ [b] $(V_{i1}V_{i2})/30$ [c] V_{i1}/V_{i2} [d] $V_{i1} + V_{i2}$



12. Frequency addition and subtraction can be done by using a/an _____.
 [a] amplifier [b] multiplier [c] VCO [d] PLL
13. Circuit shown in Figure 2 is a/an _____.

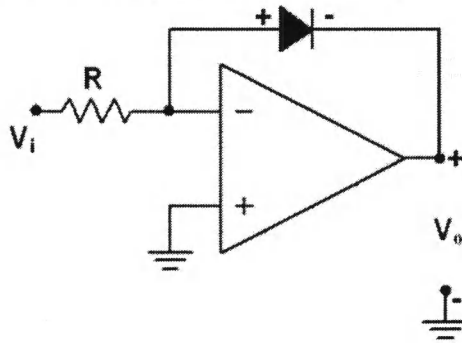


Fig: 2

- [a] log amplifier [b] antilog amplifier
 [c] rectifier [d] filter

14. Circuit shown in Figure 3 is a/an _____ gate.
 [a] AND [b] OR [c] NOR [d] NOT

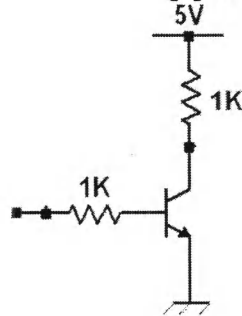
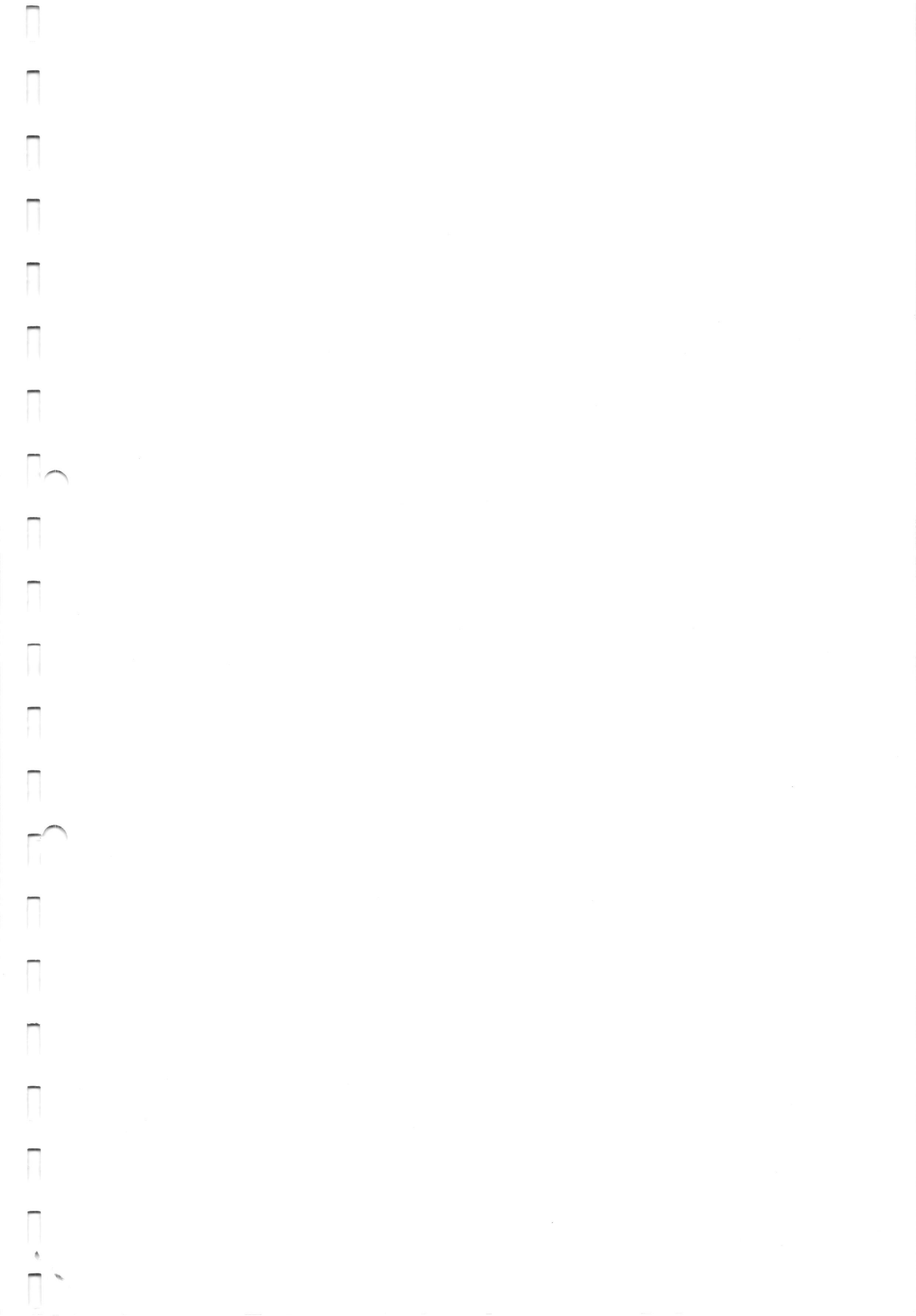


Fig: 3

15. _____ is most popular logic family.
 [a] DL [b] RTL [c] DTL [d] CMOS
16. 555 timer is a/an _____.
 [a] chip like op-amp [b] chip for amplification
 [c] chip to generate square wave [d] discrete circuit

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17. Precision rectifiers are used to _____.
[a] filter signal [b] rectify signal
[c] clamp and rectify signal [d] attenuate and rectify signal
18. The basic fabrication material of a semiconductor IC is _____.
[a] iron [b] clay [c] sand [d] carbon
19. _____ is most widely used technique to introduce dopant impurities into semiconductor.
[a] Ion implantation [b] Etching [c] Lithography [d] Deposition
20. Barkhausen criteria is used to design _____.
[a] amplifier [b] oscillator [c] filter [d] adder



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Level : B.E.
Year : II
Time : 2 hrs. 30 mins.

Course : EEG 214
Semester: II
F.M. : 55

SECTION "B"
[5 Q.×11=55 marks]

Attempt any **FIVE** questions.

1. a. Write four advantages and two disadvantages of negative feedback in an amplifier. Draw a circuit showing **Y** feedback in an operational amplifier. [3+3]
- b. What are CCCS, CCVS, VCVS, and VCCS? Derive v_o/v_i in the block diagram shown in Figure 1. [2+3]

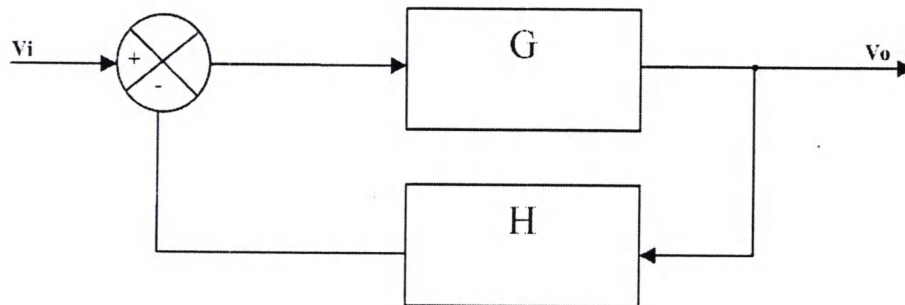


Fig: 1

2. a. Draw the circuit of Wein bridge oscillator and derive the expression for frequency of oscillation. [5]
- b. For the circuit in Figure 2, derive the condition of oscillation. [6]

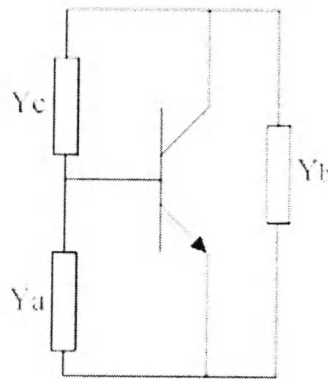


Fig. 2

3. a. Using diode, resistor, and operational amplifier design a circuit to take antilog of input signal. Convert the antilog amplifier into log amplifier. [4+2]
- b. What is a phase detector? How multiplier is used to detect the phase of input signal? [5]

- 4.a. Draw block diagram of a Phase Lock Loop (PLL). Explain lock range and capture range of a PLL. [3+3]
- b. Design with explanation the operation of DTL based NAND gate. [5]
- 5.a. Write all the fabrication steps of a bipolar junction transistor (NPN) and show the cross sectional view and top view as well. [6]
- b. With truth table, draw a circuit of CMOS NOR gate. [5]
- 6.a. What are bistable, astable, and monostable multivibrators? Draw circuit and write two applications of Schmitt Trigger. [3+3]
- b. Design and explain a circuit to generate triangular wave at 2 kHz. [5]