Que. No. 5

a) The Boolean expressions simplifies to: **(6 M)**

i) (A + B)'.(A'+ B')'

ii) (X + Y).(X + Y')

iii) (B + BC) (B + B'C) (B + D)

b) Find the simplest equation which implements the K-map represented by the following Sum of Products expression of logic function f(W,X,Y,Z) = Σ (0, 1, 2, 8, 11) + d (3, 9, 15). **(4 M)**

c) Find the simplest equation which implements the K-map shown below is **(2 M)**

	$\bar{C}$	C
$\bar{A}\bar{B}$	0	0
$\bar{A}B$	1	1
AB	1	1
$A\bar{B}$	0	1

Que. No. 6

a) Implement the Boolean functions: **(6 M)**

i) F=x'y'z +x'yz' + xyz' + xyz using a 4:1 MUX

ii) F=A'B'C'D+A'B'CD+A'BC'D'+AB'CD+ABC'D'+ABC'D+ABCD'+ABCD using an 8:1 MUX

b) Design four bit Binary to Gray Code Converter. **(6 M)**

********* All the Best *********

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE – RAIGAD -402 103

Semester Examination – December - 2019

Branch: Electrical and Electronics Engineering **Sem.:- IV**

Subject:- Analog and Digital Electronics (BTEEE406B) **Marks: 60**

Date:- 04/12/2019 **Time:- 3 Hr.**

==========

Instructions to the Students

1. Each question carries 12 marks.
2. Attempt **any five** questions of the following.
3. Illustrate your answers with neat sketches, diagram etc., wherever necessary.
4. If some part or parameter is noticed to be missing, you may appropriately assume it and should mention it clearly

---

Que. No. 1

a) How transistor is used as an amplifier. **(4 M)**

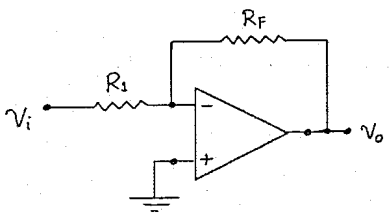
b) Explain Crossover Distortion in Amplifiers. **(8 M)**

Que. No. 2

a) List and State any four characteristics of an ideal OPAMP. **(4 M)**

b) Explain inverting amplifier configuration of an operational amplifier and derive the expressions for its gain. **(4 M)**

Find the gain of the inverting amplifier shown below, Consider $R_1 = 1k\Omega$ and $R_F = 10k\Omega$.



For the circuit shown, if the OP-AMP can source maximum of 15mA current, then find the maximum current that the circuit can deliver to next stage. when

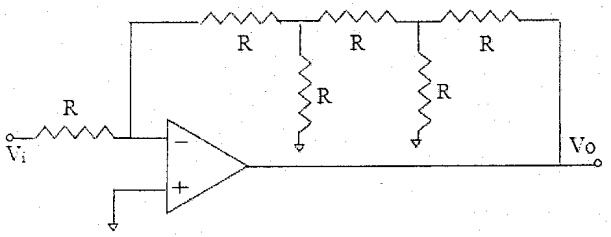
i. $R_F:R_1 = 1k\Omega:100\Omega$.

ii. $R_F:R_1 = 10k\Omega:1k\Omega$.

Iii. $R_F:R_1 = 100k\Omega:10k\Omega$

Assume maximum swing of OP-AMP = 0 to 10 V.

c) Find the gain of the circuit shown below, **(4 M)**



Que. No. 3

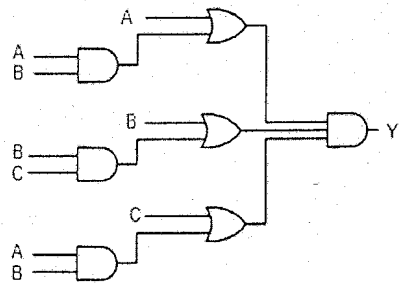
a) Convert the given numbers into equivalent numbers of their other number systems. **(4 M)**

Decimal	Binary	Octal	Hexa-decimal
33			
	1110101		
		703	
			1AF

b) How many minimum numbers of 2-input NAND gates are required for implementing a 2-input XOR and XNOR functions and also draw their equivalent logic gates diagram using NAND gates only. **(4 M)**

c) i) State the De-Morgan's theorem of Boolean algebra and Simplify complement of the function X + YZ using De-Morgan's theorem. **(4 M)**

ii) Which gate is equivalent to the given circuit?



Que. No. 4

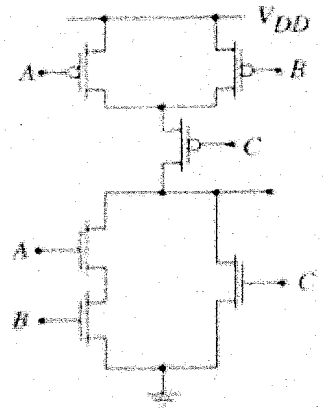
a) Convert the flipflops: **(6 M)**

i) SR to D

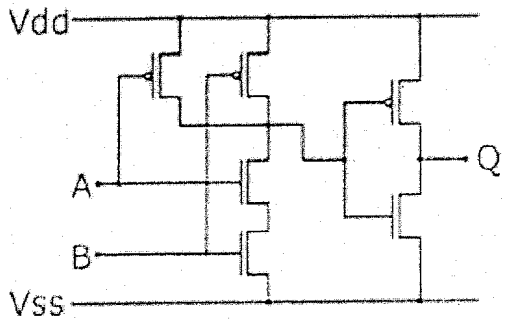
ii) JK to T

b) Which logic function is implemented by CMOS complex logic structure shown in figure below? **(4 M)**

i)



ii)



c) The Boolean expression f(A,B,C,D) = Σ (3, 7, 11, 13, 14, 15) simplifies to: **(2 M)**