



Roll No:

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

BTECH
(SEM III) THEORY EXAMINATION 2021-22
ANALOG & DIGITAL ELECTRONICS

Time: 3 Hours**Total Marks: 70****Note: 1.** Attempt all Sections. If require any missing data; then choose suitably.**SECTION A****1. Attempt all questions in brief.****2 x 7 = 14**

a.	Why photodiode is always used in reverse bias condition ?
b.	Write the characteristics of Ideal Op-amp.
c.	Write demerits of Colpitts oscillator.
d.	Design the function with logic gates for $F = AB+BC+A'C$
e.	Discuss the race around condition of JK flip flop.
f.	Construct an AND gate using 2: 1 multiplexer.
g.	The content of 4-bit register is initially 1101. The register is sifted six time to right with the serial input being 101101. What is the content of the register after sixth shift?

SECTION B**2. Attempt any three of the following:****7 x 3 = 21**

a.	Differential between Schottky barrier diode and conventional semiconductor diode. Explain the operation and construction of Schottky diode. Also draw its characteristics.
b.	Explain the basic principle of feedback amplifiers. Differential positive and negative feedback amplifier with the help of its advantages.
c.	Explain the working of Hartley Oscillator with the help of suitable circuit diagram. Drive its expression for frequency of oscillation.
d.	Solve the minimal SOP using K-map. $Y(A, B, C, D) = \sum_m (1, 5, 6, 12, 13, 14) + d(2, 4)$
e.	Draw and explain the circuit of Ring Counter. Write the output states of this counter.

SECTION C**3. Attempt any one part of the following:****7 x 1 = 7**

(a)	Explain the construction and operation of photo diode. Give the characteristics and application of photo diode. How photodiode can be used as photoresistor.
(b)	State basic phenomenon of tunneling. Explain the tunnel diode, give its equivalent circuit diagram, characteristics, and application.

4. Attempt any one part of the following:**7 x 1 = 7**

(a)	Explain various topologies used in negative feedback amplifier.
(b)	Differentiate CE and CB configuration. Derive the relations for frequency response for CE configuration.

Roll No:

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

BTECH
(SEM III) THEORY EXAMINATION 2021-22
ANALOG & DIGITAL ELECTRONICS

5. Attempt any *one* part of the following: 7 x 1 = 7

(a)	Draw and explain the working of Wien bridge oscillator? Compare the performance of RC oscillators and LC oscillators.
(b)	Explain the operation and construction of CLAP Oscillator. Also give the merits and demerits of this oscillator.

6. Attempt any *one* part of the following: 7 x 1 = 7

(a)	What is difference between combinational and sequential circuits. Explain the design of a 8:1 multiplexer, with its truth table and Boolean expression.
(b)	Construct a full adder and implement the full adder with the help of half adders. Also implement the full adder with NAND gates only.

7. Attempt any *one* part of the following: 7 x 1 = 7

(a)	Differentiate between synchronous and asynchronous counters. Design a 4 bit synchronous UP/DOWN counter.
(b)	Explain the operation of Universal Shift register with help of neat diagram.