BRAINWARE UNIVERSITY

Term End Examination 2020 - 21

Programme – Bachelor of Science (Honours) in Computer Science

Course Name – Digital Electronics and Instrumentation

Course Code - EC301

Semester / Year - Semester III

Time allotted : 85 Minutes Full Marks : 70

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A

(Multiple Choice Type Question) 1 x 70=70

1. *(Answer any Seventy)*

(i) Convert (0.345)10 into an octal number.

a) (0.16050)8 b) (0.26050)8

c) (0.19450)8 d) (0.24040)8

(ii) In an ECL the output is taken from _____.

a) Emitter b) Base

c) Collector d) Junction of emitter and base

(iii) What is one disadvantage of an S-R flip-flop?

a) It has no Enable input b) It has a RACE condition

c) It has no clock input d) Invalid State

(iv) In D flip-flop, if clock input is LOW, the D input _____.

a) Has no effect b) Goes high

c) Goes low d) Has effect

(v) On subtracting (001100)2 from (101001)2 using 2's complement, we get_____.

a) 1101100 b) 11101

c) 11010101 d) 11010111

(vi) The full form of ECL is _____.

a) Emitter-collector logic
b) Emitter-complementary logic
c) Emitter-coupled logic
d) Emitter-cored logic

(vii) What is the octal equivalent of the binary number: 10111101

a) 675
b) 275
c) 572
d) 573

(viii) Which of the following circuit can be used as parallel to serial converter?

a) Multiplexer
b) Demultiplexer
c) Decoder
d) Digital counter

(ix) How many stages a DTL consist of?

a) 2
b) 3
c) 4
d) 5

(x) Before an SOP implementation, the expression would require a total of how many gates?

a) 1
b) 2
c) 4
d) 5

(xi) TTL is a _____.

a) Current sinking
b) Current sourcing
c) Voltage sinking
d) Voltage sourcing

(xii) The full form of TCTL is _____.

a) Transistor-coupled transistor logic
b) Transistor-capacitor transistor logic
c) Transistor-complemented transistor logic
d) Transistor-complementary transistor logic

(xiii) In the toggle mode a JK flip-flop has_____.

a) J = 0, K = 0
b) J = 1, K = 1
c) J = 0, K = 1
d) J = 1, K = 0

(xiv) Most demultiplexers facilitate which type of conversion?

a) Decimal-to-hexadecimal
b) Single input, multiple outputs
c) AC to DC
d) Odd parity to even parity

(xv) In 1-to-4 demultiplexer, how many select lines are required?

a) 2
b) 3
c) 4
d) 5

(xvi) The decimal equivalent of the binary number (1011.011)2 is _____.

a) (11.375)10
b) (10.123)10
c) (11.175)10
d) (9.23)10

(xvii) The octal equivalent of the decimal number (417)10 is _____.

a) (641)8
b) (619)8
c) (640)8
d) (598)8

(xviii) In Boolean algebra, the OR operation is performed by which properties?

a) Associative properties
b) Commutative properties
c) Distributive properties
d) All of these

(xix) (A + B)(A’ * B’)

a) 0
b) AB
c) 1
d) AB’

(xx) The Boolean function A + BC is a reduced form of _____.

a) AB + BC
b) (A + B)(A + C)

c) A’B + AB’C
d) (A + C)B

(xxi) The expression Y=(A+B)(B+C)(C+A) shows the _____ operation.

a) AND
b) NAND
c) SOP
d) POS

(xxii) There are _____ Minterms for 3 variables (a, b, c).

a) 0
b) 2
c) 8
d) 1

(xxiii) TTL is called transistor–transistor logic because both the logic gating function and the amplifying function are performed by _____.

a) Resistors
b) Bipolar junction transistors
c) One transistor
d) Resistors and transistors respectively

(xxiv) A full adder logic circuit will have _____.

a) Two inputs and one output
b) Three inputs and three outputs
c) Two inputs and two outputs
d) Three inputs and two outputs

(xxv) Which input values will cause an AND logic gate to produce a HIGH output?

a) At least one input is HIGH
b) At least one input is LOW
c) All inputs are HIGH
d) All inputs are LOW

(xxvi) A basic bridge consists of _____.

a) Two arms
b) Three arms
c) Four arms
d) Five arms

(xxvii) In Measurement System which of the following static characteristics are desirable?

a) Accuracy
b) Sensitivity

c) Accuracy& Sensitivity
d) None of these

(xxviii) A pressure measurement calibrated between 10 bar & 250 bar. The scale of the instrument is _____.

a) 10 bar
b) 240 bar
c) 250 bar
d) 260 bar

(xxix) Maxwell inductance-capacitance bridge is used for measurement of inductance of _____.

a) Low queue Coil
b) Medium Queue Coil
c) High Queue Coil
d) Low & Medium Queue Coil

(xxx) In order that the bridge shown in this figure:

a) I1=I2& I3=I4
b) R1 R4 =R2 R3
c) Both option a and b
d) None of these

(xxxi) In electro dynamometer type wattmeter, the inductance of pressure coil circuit produces error

a) which is constant irrespective of the power factor of food
b) Which is heir at low power factors
c) Which is lower at low power factors
d) None of these

(xxxii) Q-meter is defined as-

a) Reactance divided by resistance
b) Resistance divided by reactance
c) Resistance divided by impedance
d) Impedance divided by resistance

(xxxiii) Schering bridge is also used to measure _____.

a) Q-meter
b) Resistance
c) Frequency
d) Dissipation factor

(xxxiv) A 0 – 300 V voltmeter an error of 2% of full scale deflection. What

would be the range of readings if true voltage is 30V?

a) 24 V – 36 V
b) 29.4 V – 30.6 V
c) 20 V – 40 V
d) None of these

(xxxv) The permanent magnet moving coil ammeter the deflection of the pointer is proportional to product of flux density of magnetic field produced by the permanent magnet and the current in the moving coil. If the strength of the permanent magnet becomes 95% of the original, the meter gives erroneous reading resulting into error. This error can be classified as_____.

a) Gross error
b) Systematic error
c) Random error
d) None of these

(xxxvi) The voltage of a circuit is measured by a voltmeter having an input impedance comparable with the output impedance comparable with the output impedance of the circuit thereby causing error in voltage measurement. This error may be called _____.

a) Gross error
b) Random error
c) Error caused by loading effect
d) Error caused by misuse of instruments

(xxxvii) A batch of resistors has a mean value of 100.00 and a standard deviation . The probability corresponding to 2 is 0.9546. The value of odds that randomly selected resistor will lie within 100.00+- 0.40 is _____.

a) 1 to 1
b) 15 to 1
c) 21 to 1
d) 256 to 1

(xxxviii) Uncertainty distribution is used for -

a) Analysis of multi-sample data
b) Analysis of single-sample data
c) Analysis of both single and multi sample data
d) None of these

(xxxix) Modulation in modern signal generator is done internally by signals of frequency-

a) 400 Hz and 1000Hz
b) 600Hz and 2000Hz
c) 1000Hz and 5000Hz
d) 10000Hz and 40000Hz

(xl) A frequency divider used in a modern signal generator-
a) Divides the frequency by 2
b) Doubles the frequency
c) Divides the frequency by 10
d) Multiply the frequency by 2

(xli) Frequency divides are obtained by the use of _____.
a) LC network
b) AND gate
c) Flip-flop's
d) RC network

(xlii) In a function generator, the resistance diode network is used to produce-
a) Square wave
b) Sine wave
c) Triangular wave
d) Pulse wave

(xliii) The frequency of a function generator is varied in varying_____.
a) LC network
b) Constant current sources
c) RC network
d) Constant voltage sources

(xliv) A pulse generating generated a pulse waveform has a duty cycle of_____.
a) 0.25
b) 0.4
c) 0.75
d) 0.5

(xlv) The frequency sweeper provides the modulating voltage which varies the _____.
a) Inductance
b) Capacitance
c) Resistance
d) Voltage

(xlvi) A wobbluscope is used for alignment of a/an_____.

a) Radio receiver
b) TV receiver
c) Oscilloscope
d) Wave analyze

(xlvii) One multiplexer can take the place of

a) Several SSI logic gates
b) Combinational logic circuits
c) Several Ex-NOR gates
d) Several SSI logic gates or combinational logic circuits

(xlviii) How many shift registers are used in a 4-bit serial adder?

a) 2
b) 3
c) 4
d) 5

(xlix) According to the property of minterm, how many combinations will have value equal to 1 for K input variables?

a) 0
b) 1
c) 2
d) 3

(l) A NAND based S'-R' latch can be converted into S-R latch by placing _____.

a) A D latch at each of its input
b) A D latch at each of its input
c) It can never be converted
d) Both a D latch and an inverter at its input

(li) Ripple counters are also called _____.

a) SSI counters
b) Asynchronous counters
c) Synchronous counters
d) VLSI counters

(lii) Convert binary to octal: (110110001010)2 =?

a) (5512)8
b) (6612)8
c) (4532)8
d) (6745)8

(liii) Binary subtraction of 100101 – 011110 is

a) 111 b) 10101
c) 111000 d) 101010

(liv) For arithmetic operations which one is faster?
a) 1’s complement b) 2’s complement
c) 10’s complement d) 9’s complement

(lv) The digit F in Hexadecimal system is equivalent to …… in decimal system.
a) 13 b) 14
c) 15 d) 16

(lvi) What does minuend and subtrahend denotes in a subtractor?
a) Their corresponding bits of input b) Its outputs
c) Its inputs d) Borrow bits

(lvii) Standard TTL circuits operate with a __ volt power supply
a) 2 b) 5
c) 4 d) 6

(lviii) In RTL NOR gate, the output is at logic 1 only when all the inputs are at
a) logic 0 b) logic 1
c) +10V d) Floating

(lix) The primary advantage of RTL technology was that
a) It results as low power dissipation b) It uses a minimum number of resistors
c) It uses a minimum number of transistors d) It operates swiftly

(lx) TTL circuits with “totem-pole” output stage minimize
a) The power dissipation in RTL b) The time consumption in RTL
c) The speed of transferring rate in RTL d) Propagation delay in RTL

(lxi) To increase fan-out of the gate in DTL

a) An additional capacitor may be used
b) An additional transistor and diode may be used
c) An additional resister may be used
d) Only an additional diode may be used

(lxii) Which logic is the fastest of all the logic families?

a) TTL
b) ECL
c) HTL
d) DTL

(lxiii) The inputs/outputs of an analog multiplexer/de-multiplexer are

a) Bidirectional
b) Unidirectional
c) Even parity
d) Binary-coded decimal

(lxiv) The OR gate output will be low if the two inputs are

a) 0
b) 1
c) 10
d) 11

(lxv) A digital multiplexer is a combinational circuit that selects

a) One digital information from several sources and transmits the selected one
b) Many digital information and convert them into one
c) Many decimal inputs and transmits the selected information
d) Many decimal outputs and accepts the selected information

(lxvi) The digit 10001 in Binary system is equivalent to …… in Hexadecimal system

a) 10
b) 11
c) D
d) F

(lxvii) The basic R-S flip-flop is

a) A monostable multivibrator
b) A bistable multivibrator
c) An astable multivibrator
d) A Schmitt trigger

(lxviii) Which of the following circuits come under the class of combinational logic circuits? 1. Full adder 2. Full subtractor 3. Half adder 4. J-K flip 5. Counter

a) 1 only
b) 3 and 4
c) 4 and 5
d) 1, 2 and 3

(lxix) Which of the following circuits come under the class of sequential logic circuits? 1. Full adder 2. Full subtractor 3. Half adder 4. J-K flip 5. Counter

a) 1 and 2
b) 2 and 3
c) 3 and 4
d) 4 and 5

(lxx) Which one of the statements is not correct?

a) A full adder can be constructed using two half-adders and an OR gate.
b) Two four bit parallel adders can be cascaded to construct 8-bit parallel adder.
c) Ripple carry adder has addition time independent of the number of bits.
d) Carry look ahead is used to speed up the parallel addition.