



BRAINWARE UNIVERSITY

Term End Examination 2020 - 21

Programme – Bachelor of Science (Honours) in Computer Science

Course Name – Electronics Measurement

Course Code - BCS304A

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) A basic bridge consists of -

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

(ii) Wheatstone bridge is used to measure

- | | |
|---------------|------------|
| a) Voltage | b) Current |
| c) Resistance | d) Power |

(iii) An ac bridge uses a detector in the form -

- | | |
|---------------|--------------|
| a) Ammeter | b) Voltmeter |
| c) Headphones | d) Wattmeter |

(iv) In measurement system which of the following undesirable static characteristics are

- | | |
|------------------------------|---------------------------|
| a) Drift & Static error | b) Accuracy & Sensitivity |
| c) Drift, static & dead zone | d) None of these |

(v) Frequency can be measured by using

- | | |
|--------------------|--------------------|
| a) Schering Bridge | b) Andasore Bridge |
| c) Wien Bridge | d) Maxwell Bridge |

(vi) In the electro dynamometer type of wattmeter

- a) The current coil is made fixed
- b) The pressure point is fixed
- c) Any of the two coils can be fixed
- d) Both the coils should be moveable

(vii) . 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

(viii) Schering bridge is also used to measure

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

(ix) A 0 – 10 A ammeter has a guaranteed accuracy of 1% of full scale deflection. The limiting error while reading 2.5 A is

- a) 0.01
- b) 0.02
- c) 0.04
- d) None of these

(x) A wattmeter has a full scale range of 2500 W. It has an error 1% of true value. What would be range of reading if true power is 1250W?

- a) 1225W – 1275W
- b) 1245W – 1255W
- c) 1200 W – 1300W
- d) 1237.5 W – 1262.5 W

(xi) The power in a circuit is measured by measuring a current through a resistor. The current is measured with an accuracy of 1.5% and the tolerance band of the resistor 0.5%. The errors are limiting or guarantee errors. The accuracy with which power is measured is

- a) 0.01125
- b) 0.035
- c) 0.02
- d) 0.025

(xii) 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

(xiii) A set of readings has a wide range and therefor it has

- a) Low precision
- b) High precision
- c) Low accuracy
- d) High accuracy

(xiv) Focusing and accelerating anodes are _____

- a) rectangular
- b) cylindrical
- c) spherical
- d) square

(xv) The degree of closeness of the measured value of a certain quantity with its true value is known as

- a) Accuracy
- b) Precision
- c) Standard
- d) Sensitivity

(xvi) Noise is a function of _____

- a) voltage
- b) current
- c) bandwidth
- d) frequency

(xvii) 1 Angstrom (\AA) = _____

- a) 10^{-6}m
- b) 10^{-8}m
- c) 10^{-10}m
- d) 10^{-12}m

(xviii) A Wien bridge oscillator is suitable for

- a) RF generator
- b) Function generator
- c) Pulse generator
- d) AF generator

(xix) The principle used in the operation of a function generator is by using an

- a) LC oscillator
- c) Integrator

- b) RC oscillator
- d) Derivation

(xx) A pulse generator generating a square wave has a duty cycle of

- a) 0.25
- c) 0.75
- b) 0.5
- d) 0.4

(xxi) The comparator used in a function generator produces

- a) Square wave
- c) Sine wave
- b) Triangular wave
- d) Pulse wave

(xxii) A sweep generator is used for

- a) Fault finding
- c) Amplification
- b) Frequency generation
- d) Alignment

(xxiii) Picture centering and aspect ratio using a pattern generator can be checked by the pattern

- a) Horizontal bar
- c) Cross bar
- b) Vertical bar
- d) Checker bar

(xxiv) Consider the following statements in respect of a Wien bridge. 1. It is suitable for measurement of capacitance. 2. It is not affected by harmonics present in the applied voltage. 3. It is suitable for measurement of frequency. Which of these statements are corrected?

- a) 1,2 & 3
- c) 1 & 3
- b) 2 & 3
- d) 1 & 2

(xxv) In Wien bridge

- a) Balanced conditions are independent of frequency
- c) Capacitance is measured in terms of standard in terms of standard inductance.
- b) Balanced conditions are dependent on frequency
- d) Frequency is measured in terms of resistance and capacitance values

(xxvi) Schering bridge can be used to measure which one of the following?

- a) Q of a coil
- b) Inductance and Q-value
- c) Very small resistance
- d) Capacitance and its power factor

(xxvii) The dielectric loss of capacitor can be measured by which one of the following?

- a) Wien bridge
- b) Owen bridge
- c) Schering bridge
- d) Maxwell bridge

(xxviii) AC bridges

- a) Have leakage error and eddy current errors only
- b) Have residual errors, frequency errors and wave form errors only
- c) both Have leakage error and eddy current errors only and Have residual errors, frequency errors and wave form errors only
- d) Are free from errors

(xxix) The usage of electronic instruments is becoming more extensive because they have

- a) A high sensitivity and reliability
- b) A fast response and compatibility with digital computers
- c) The capability to respond to signals from remote places
- d) All of these

(xxx) Chopper stabilized dc amplifier type electronic voltmeter overcomes the effect of

- a) Amplifier CMRR
- b) Amplifier sensitivity
- c) Amplifier drift
- d) Electromagnetic interference

(xxxi) In an electronic ohmmeter, an op-amp is used as a

- a) Summer
- b) Multiplier
- c) Buffer amplifier
- d) Integrator

(xxxii) Which one of the following multi-range voltmeters has high and constant input impedance?

- a) PMMC voltmeter
- b) Electronic voltmeter
- c) Moving iron voltmeter
- d) Dynamometer type voltmeter

(xxxiii) Oscilloscope is a basically a

- a) Voltmeter
- b) Ammeter
- c) Wattmeter
- d) Energy meter

(xxxiv) CRT aquadag carries

- a) Aqueous solution of graphite
- b) Sweep voltage
- c) Secondary emission
- d) None of these

(xxxv) Phase inverter is used in an amplifier in the CRO because _____

- a) phase inversion is needed
- b) no phase inversion is needed
- c) it is needed to operate a push pull
- d) it provides voltage stability

(xxxvi) Why is a delay line used in a CRO?

- a) to boost the signal
- b) to distort the signal
- c) to provide signal delay
- d) for stability

(xxxvii) The Miller sweep circuit normally used in a CRO is basically

- a) A voltage to current converter circuit
- b) A current to voltage converter circuit
- c) An integrator circuit
- d) A differentiator circuit

(xxxviii) In a CRT, the highest positive potential is given to

- a) Focusing electrodes
- b) Cathode
- c) Vertical deflection plates
- d) Post deflection acceleration anode

(xxxix) Dynamometer type wattmeter has _____

- a) strong magnetic field
- b) intermediate magnetic field

c) weak magnetic field

d) no magnetic field

(xl) Lissajous pattern obtained on the screen of a CRO can be used to determine

a) Phase shift

b) Amplitude shift

c) Voltage amplitude

d) None of these

(xli) When a sinusoidal signal 220V, 50Hz produced on CRO's vertical deflection of 2 cm at a particular setting of the vertical control, what would be the value of the voltage to be applied is produce a deflection of 3 cm for the same vertical gain?

a) 330V

b) 220V

c) 110V

d) 55V

(xlii) A dc voltage of 1 V is applied to the X-plates of a CRO and an ac voltage $2 \sin 100 t$ is applied to the Y-plates. The resulting display on the CRO screen will be a

a) Vertical straight line

b) Horizontal straight line

c) Sine wave

d) Slant line

(xliii) Successive approximation type DVM is based on the principle of _____

a) acceleration of an object

b) weight of an object

c) velocity of an object

d) momentum of an object

(xliv) What is the role of logic control and sequencer in a successive approximation type DVM?

a) generate analog voltage

b) generate power

c) generate current through resistance

d) generate sequence code

(xlv) Q meter operator is the principle of _____

a) Series resonance

b) Current resonance

c) Self-inductance

d) Eddy currents

(xlvi) A circuit tuned to a frequency of 1.5 MHz and having an effective capacitance of 150 pF. In this circuit, the current falls to 70.7 % of its resonant value. The deviates from the resonant frequency are 5 kHz. Effective resistance of the circuit is?

- a) 2 ohm
- b) 3 ohm
- c) 5.5 ohm
- d) 4.7 ohm

(xlvii) Q factor of a coil measured by the Q Meter is _____ the actual Q of the coil.

- a) Equal to
- b) Same but somewhat lesser than
- c) Same but somewhat higher than
- d) Not equal to

(xlviiii) Output of a digital multimeter is _____

- a) mechanical
- b) optical
- c) electrical
- d) analog

(xlix) A.C. voltages are measured using _____

- a) oscillators and op amps
- b) rectifiers and filters
- c) resistor and capacitor
- d) inductor and resistor

(l) Linear ramp technique is based on _____

- a) voltage measurement
- b) time measurement
- c) current measurement
- d) resistance measurement

(li) Which is the main device used in the linear ramp technique?

- a) exponential ramp
- b) asymptotic ramp
- c) non-linear ramp
- d) linear ramp

(lii) How is input voltage measured?

- a) by using a voltmeter
- b) by counting the pulses
- c) by using a multimeter
- d) by using a transformer

(liii) What is the typical value of the multivibrator?

- a) 10 cycles/second
- b) 0.2 cycles/second
- c) 50 cycles/second
- d) 5 cycles/second

(liv) What are the physical parameters that are to be controlled when a bridge is used in control applications?

- a) area and volume
- b) mass and weight
- c) pressure and temperature
- d) current and voltage

(lv) Effect of negative voltage to the grid is _____

- a) no force
- b) a gravitational force
- c) an attractive force
- d) a repulsive force

(lvi) Horizontal deflection is given by _____

- a) $x = Kx$
- b) $x = Vx$
- c) $x = 1$
- d) $x = Kx Vx$

(lvii) CRO is used for measurement of _____

- a) AC as well as DC current
- b) AC current only
- c) DC current only
- d) AC power only

(lviii) In radio applications, CRO is used for measuring _____

- a) audio frequency range
- b) a narrow range of frequencies
- c) a wide range of frequencies
- d) radio frequency range

(lix) Curve tracers use CRO in _____

- a) diodes
- b) passive devices
- c) active devices
- d) op amps

(lx) In D.C. circuits, power is measured using _____

- a) ohmmeter and galvanometer
- b) ohmmeter and voltmeter

c) ammeter and voltmeter

d) ammeter and galvanometer

(Ixi) A dynamometer type wattmeter consists of _____

a) only potential coil

b) potential and current coils

c) only current coil

d) no coils

(Ixii) When a current carrying coil is placed in the magnetic field?

a) no force is exerted

b) voltage is produced

c) power is generated

d) a force is exerted

(Ixiii) By making use of a CRO _____

a) many characteristics of a signal can be measured

b) only a few characteristics of a signal can be measured

c) no characteristics of a signal can be measured

d) signal can only be displayed

(Ixiv) How is error in measurement reduced?

a) using r.m.s value

b) using absolute value

c) using peak to peak value

d) using a voltmeter

(Ixv) Clock pulses are controlled _____

a) automatically

b) using microcontrollers

c) using valves

d) manually

(Ixvi) Why is dual slope method preferred over ramp techniques?

a) no noise

b) partial noise

c) average noise

d) maximum noise

(Ixvii) What is the output voltage in a dual slope integrating type DVM?

a) differential of the input

b) multiple of the input

c) integral of the input

d) zero

(lxviii) For single frequency value, the most sensitive detector is _____

- a) tuned detector
- b) vibration galvanometer
- c) headphone
- d) oscillator

(lxix) What is applied to the two opposite junctions of a bridge circuit.

- a) source of voltage
- b) source of current
- c) source of power
- d) source of impedance

(lxx) The principle on which a bridge circuit operates is

- a) null indication
- b) ampere's rule
- c) partial indication
- d) kirchhoff's laws