BRAINWARE UNIVERSITY

Term End Examination 2021 - 22
Programme – Bachelor of Technology in Electronics & Communication Engineering
Course Name – Sensors and Transducers
Course Code - OEC802B
(Semester VIII)

Time allotted : 1 Hrs.25 Min.   **Full Marks : 70**

[The figure in the margin indicates full marks.]

Group-A

(Multiple Choice Type Question)   1 x 70=70

Choose the correct alternative from the following :

(1) How many strain-gauge are required in the Loadcell

   a) One   b) Four

   c) Two   d) Five

(2) The LVDT can be used to measure

   a) Level   b) Acceleration

   c) Speed   d) All of these

(3) What will be comercial straingaue resistance

   a) 350ohm   b) 500 ohm

   c) 0 ohm   d) 10000 ohm

(4) minimum resistance of potentiometer should have

   a) Infinite resistance   b) zero resistance

   c) Low resistance   d) Zero resistance

(5) Which of the one will choose for the weight measurement

   a) thermocouple   b) rtd

   c) loadcell   d) lvdt

(6) sensor used to measure level

   a) lvdt   b) loadcell

   c) rtd   d) thermistor

(7) The linear variable differential transformer transducer is

   a) Capacitive transducer   b) Inductive transducer

   c) Resistive transducer   d) Non-inductive transducer

(8) Which one represent active transducer

   a) Strain gauge   b) Thermistor

   c) LVDT   d) Thermocouple

(9) What is the principle of operation of LVDT

    a) Mutual inductance   b) Self-inductance

    c) Permanence   d) Reluctance

(10) Capacitive transducer is used for

    a) Static measurement   b) Dynamic measurement

    c) Transient measurement   d) Both static and dynamic

(11) Which transducer is known as 'self-generating transducer

    a) Active transducer   b) Passive transducer

    c) Secondary transducer   d) Analog transducer

(12) Which of the following is not a characteristic of an ideal transducer

    a) dynamic   b) Low linearity

    c) High repeatability   d) low noise

(13) which parameter changes in straingauge according to pressure

    a) current   b) Voltage

    c) inductance   d) Resistance

(14) Value of temaparature coefficient of Strain gauge is

    a) low   b) High

    c) zero   d) infinite

(15) Gauge factor in a strain gauge must be

    a) high   b) low

    c) medium   d) small

(16) Charecteristics of Strain gauge is

    a) tangential   b) exponential

    c) non-linear   d) linear

(17) Semiconductor strain gauges are used for

    a) low gauge factor values   b) high gauge factor values

    c) zero gauge factor value   d) infinite gauge factor value

(18) In metallic gauges resistance changes due to

    a) temperature   b) current

    c) voltage   d) dimension

(19) A Wheatstone bridge has

    a) low sensitivity   b) zero sensitivity

    c) high sensitivity   d) infinite sensitivity

(20) Commonly used electrical strain gauge is

    a) open type   b) closed type

    c) unbounded type   d) bonded type

(21) Photoconductive transducers produce output

    a) due to change in inductance   b) due to change in light

    c) due to change in resistance   d) due to change in temperature

(22) Piezoelectric transducer consists of

    a) copper rod   b) aluminum wire

    c) gold crystal   d) quartz crystal

(23) A transducer that converts measurand into the form of pulse is called

    a) Active transducer   b) Analog transducer

    c) Digital transducer   d) Pulse transducer

(24) In wire wound strain gauges, the change in resistance is due to

    a) Change in diameter of the wire   b) Change in length of the wire

    c) Change in both length and diameter   d) Change in resistivity

(25) Bonded wire strain gauges are

    a) Exclusively used for construction of transducers   b) Exclusively used for stress analysis

    c) Used for both stress analysis and construction of t ransducer   d) Pressure measurement

(26) LVDT windings are wound on

    a) Steel sheets   b) Aluminium

    c) Ferrite   d) Copper

(27) Transducer is a device which converts physical into electrical quantity,S2: Transducer is also called as sensor

    a) S1 is true & S2 is false   b) S2 is true & S1 is false

    c) Both S1 & S2 are true   d) Both S1 & S2 are false

(28) The two secondary voltages in a LVDT

    a) Are independent of the core position   b) Vary unequally depending on the core position

    c) Vary equally depending on the core position   d) Are always in phase quadrature

(29) Photo conductive cell consists of a thin film of

    a) Quartz   b) Lithium sulphate

    c) Barium titanate   d) Selenium

(30) The capacitance microphone is used for the detection of

    a) Heart rate   b) Blood flow

    c) Heart sound   d) Foot pressure

(31) Fiber optic sensor can be used to sense

    a) Displacement   b) Power

    c) Current   d) Resistance

(32) The resistance of LDR _____ when exposed to radiant energy

    a) Remains unaltered   b) Increases

    c) Reaches maximum   d) Decreases

(33) Shunt-type ohmmeters have on their scale

    a) zero ohm marking on the right corresponding to zero current   b) zero ohm marking on the right corresponding to full scale current

    c) infinite ohm marking on the right corresponding to zero current   d) infinite ohm marking on the right corresponding to full scale current

(34) Controlling torque in a meggar is provided by

    a) control springs   b) balance weights

    c) control coil   d) any one of the above

(35) The loss of charge method is used for measurement of

    a) high value capacitances   b) dissipation factor of capacitances

    c) low value resistances   d) high value resistances

(36) Two sets of readings are taken in a Kelvin's double bridge with the battery polarity reversed in order to

    a) eliminate the error due to contact resistance   b) eliminate the error due to thermo-electric effect

    c) eliminate the error due to change in battery voltage   d) all of these

(37) Kelvin's double bridge is called 'double' because

    a) 1it has double the accuracy of a Wheatstone bridg   b) its maximum scale range is double that of a Whea

e   tstone bridge

c) it can measure two unknown resistances simultaneously, i.e., double the capacity of a Wheatstone bridge

d) it has two additional ratio arms, i.e., double the number of ratio arms as compared to a Wheatstone bridge

(38) By which process ,zero adjustment should be done in series type ohmmeters

a) changing the shunt resistance across the meter movement

b) changing the series resistance

c) changing the series and the shunt resistance

d) changing the battery voltage

(39) High resistances using the voltmeter–ammeter method should be measured with

a) voltmeter connected to the source side

b) ammeter connected to the source side

c) any of the two connections

d) readings are to be taken by interchanging ammeter and voltmeter positions

(40) Schering bridge can be used for measurement of

a) capacitance and dissipation factor

b) dissipation factor only

c) inductance with inherent loss

d) capacitor but not dissipation factor

(41) In 2-wattmeter method for measurement of power in a star-connected 3 phase load, magnitude of the two wattmeter readings will be equal

a) at zero power factor

b) at unity power factor

c) at 0.5 power factor

d) readings of the two wattmeters will never be equal

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

a) cathode

b) focusing electrodes

c) vertical deflecting plates

d) post-deflection acceleration anode

(43) Sampling oscilloscopes are specially designed to measure

a) very high frequency

b) very low frequency

c) microwave frequency

d) none of these

(44) A double beam oscilloscope has

a) two screens

b) two electron guns

c) two different phosphor coatings

d) one waveform divided into two parts

(45) In a digital oscilloscope, the A/D converters are usually

a) ramp type

b) flash type

c) integrating type

d) successive approximate type

(46) Maxwell inductance capacitance bridge can be used for

a) measurement of inductance

b) measurement of capacitance and inductance

c) measurement of resistance

d) measurement of voltage and current

(47) The bridge balance equation can be written in

a) impedance form

b) resistance form

c) conductance form

d) admittance form

(48) At high Q values, the angular balance condition is

a) satisfied

b) not satisfied

c) independent of Q factor

d) partially affected

(49) A galvanometer is used as a

a) current source

b) voltage source

c) null detector

d) input impedance

(50) The arm consisting of the standard known resistance is known as

a) standard arm

b) resistance arm

c) accurate arm

d) known arm

(51) In an open loop control system

a) Output is independent of control input

b) Output is dependent on control input

c) Only system parameters have effect on the control output

d) None of the above

(52) A control system in which the control action is somehow dependent on the output is known as

a) Closed loop system

b) Semiclosed loop system

c) Open system

d) None of the above

(53) In closed loop control system, with positive value of feedback gain the overall gain of the system will

a) decrease

b) increase

c) be unaffected

d) any of the above

(54) Which of the following is an open loop control system

a) Field controlled D.C. motor

b) Ward leonard control

c) Metadyne

d) Stroboscope

(55) A car is moving at a constant speed of 50 km/h, which of the following is the feedback element f or the driver

a) Clutch

b) Eyes

c) Needle of the speedometer

d) Steering wheel

(56) A control system working under unknown random actions is called

a) computer control system

b) digital data system

c) stochastic control system

d) adaptive control system

(57) An automatic toaster is a_____ loop control system

a) open

b) closed

c) partially closed

d) any of the above

(58) By which of the following the control action is determined when a man walks along a path

a) Brain

b) Hands

c) Legs

d) Eyes

(59) _____ increases the steady state accuracy

a) Integrator

b) Differentiator

c) Phase lead compensator

d) Phase lag compensator

(60) Traffic light system is the example of

a) Open-loop system

b) Closed-loop system

c) Both (a) and (b)

d) None of these

(61) A control system with excessive noise, is likely to suffer from

a) saturation in amplifying stages

b) loss of gain

c) vibrations

d) oscillations

(62) Zero initial condition for a system means

a) input reference signal is zero

b) zero stored energy

c) ne initial movement of moving parts

d) system is at rest and no energy is stored in any of its components

(63) Transfer function of a system is used to calculate which of the following

a) The order of the system

b) The time constant

c) The output for any given input

d) The steady state gain

(64) In a control system the output of the controller is given to

a) final control element

b) amplifier

c) comparator

d) sensor

(65) Which of the following is the not the ideal input to a controller
    a) Servo signal   b) Desired variable value
    c) Error signal   d) Sensed signal

(66) The principle of homogeneity and superposition are applied to
    a) Linear time invariant systems   b) Nonlinear time invariant systems
    c) Linear time variant systems   d) Nonlinear time invariant systems

(67) A transfer function has two zeroes at infinity. Then the relation between the numerator(N) and the denominator degree(M) of the transfer function is
    a) N=M+2   b) N=M-2
    c) N=M+1   d) N=M-1

(68) Transfer function of the system is defined as the ratio of Laplace output to Laplace input considering initial conditions _____
    a) 1   b) 2
    c) 0   d) infinite

(69) Calculate the poles and zeroes for the given transfer function $G(s) = 5 (s+ 2)/ (s^2 + 3s + 2)$
    a) -2, (-1, -2)   b) 2, (-1, 2)
    c) 2, (1, 2)   d) -2, (1, -2)

(70) The number of roots in the left half of the s-plane of the given equation $s^3 + 3s^2 + 4s + 1 = 0$ is
    a) One   b) Three
    c) Two   d) Zero