AE – Instrumentation

1. Which of the following is a desirable characteristic of an instrument?
   a. High drift
   b. High measuring tag
   c. High fidelity $
   d. Poor reproducibility

2. The core of a coil has a length of 10 cm. The self-inductance is 8 mH. If the core length is doubled, all other quantities remaining the same, the self-inductance will be
   a. 32 mH
   b. 16 mH
   c. 8 mH
   d. 4 mH $

3. Which of the following judges the accuracy of an instrument ?
   a. Dead Zone
   b. Drift
   c. Static Error $
   d. None of the above

4. If the diameter of a wire is doubled, its current carrying capacity becomes
   a. One fourth
   b. Half
   c. Double
   d. Four times $

5. To increase Q factor of a coil, the wire should be
   a. Long
   b. Thin
   c. Thick $
   d. Long and thin

6. An RLC series circuit is underdamped. To make it overdamped, the value of R
   a. Has to be increased $
   b. Has to be decreased
   c. Has to be reduced to zero
   d. None of these

7. Mechanical impedance is the ratio of
   a. RMS force to RMS velocity $
   b. RMS force to RMS displacement
   c. RMS displacement to RMS velocity
   d. None of the above

8. The stability of a linear system is
   a. Dependent on the system only $
   b. Dependent on the input function only
   c. Both a and b
   d. Cannot be determined

9. For a system to follow arbitrary inputs accurately, the bandwidth needs to be
   a. Large $
   b. Small
   c. Extremely small
   d. Neither extremely small nor extremely large

10. Microwave resonators are used in
    a. Microwave oscillators
    b. Microwave narrow band amplifiers
    c. Microwave frequency meters
    d. All of the above $

11. Which of the following is non-radiating?
    a. Open two wire
    b. Coaxial $
    c. Both a and b
    d. None of the above

12. A woofer should be fed from a
    a. Low pass filter $
    b. High pass filter
    c. Band pass filter
    d. Band stop filter

13. A cycloconverter can be
    a. Step up
    b. Step down
    c. Step up or step down $
    d. None of these happen

14. Which of the following is true?
    a. Work function is the maximum energy required by the fastest electron at 0 K to escape from the metal surface
    b. Work function is the minimum energy required by the fastest electron at 0 K to escape from the metal surface $
    c. Work function is the minimum energy required by the fastest electron at 272 K to escape from the metal surface
    d. None of the above

15. A transponder is a satellite equipment which
    a. Receives a signal from Earth station and amplifies
    b. Changes the frequency of the received signal
    c. Retransmits the received signal
    d. All the above $

16. The Fourier series of an odd periodic function contains
    a. Odd harmonics only
    b. Even harmonics only
    c. Sine harmonics only $
    d. Cosine harmonics only

17. A cordless telephone using separate frequencies for transmission in base and portable units is known as
    a. Duplex arrangement $
    b. Half duplex arrangement
    c. Either a or b
    d. None of these

18. What does MICR stand for?
    a. Magnetic Ink Character Recognition $
    b. Magnetic Ink Chart Receipt
    c. Magnetic Ink Chart Recognition
    d. Magnetic Ink Character Receipt

19. In a strain measuring device using a strain gauge, the output quantity is
    a. Voltage $
    b. Resistance
    c. Impedance
    d. Either (a) or (b)

20. The household energy meter is
    a. Indexing instrument
    b. Recording instrument
    c. Integrating instrument $
    d. None of the above

21. An amplifier has a large ac input signal. The clipping occurs on both the peaks. The output voltage will be nearly a
    a. Sine wave
    b. Square wave$
    c. Triangular wave
    d. Either a or c

22. Which of the following statements is true?
    a. Maximum efficiency of class B power amplifier is 50%.
    b. Maximum efficiency for class B-operation can be 78.5% $
    c. Maximum efficiency for class B-operation can be more than 100%
    d. None of the above

23. Which of the following computer memories is fastest?
    a. Cache$
    b. Primary
    c. Mass storage
    d. Off line back up

24. The fabrication of microstrip line is done by
    a. Photo etching
    b. Printed circuit technique $
    c. Oxidation
    d. Cladding

25. Tracking of extra-terrestrial objects requires
    a. High transmitting power
    b. Very sensitive receiver
    c. Fully steerable antenna

d.   All of the above $

26. In radar systems, what does PRF stands for?
    a.   Power Return Factor
    b.   Pulse Return Factor
    c.   Pulse Repetition Frequency $
    d.   Pulse Response Factor

27. The number of digits in octal system is
    a.   7
    b.   8 $
    c.   9
    d.   10

28. In cellphone communication base antennas are connected to other base antennas in
    a.   Line of sight communication $
    b.   Ionospheric propagation
    c.   Ground wave propagation
    d.   D. medium wave propagation

29. Ferrites have which of the following?
    a.   Low copper loss
    b.   Low eddy current loss $
    c.   Low resistivity
    d.   Higher specific gravity compared to iron

30. The power dissipation in a transistor is the product of
    a.   Emitter current and emitter to base voltage
    b.   Emitter current and collector to emitter voltage
    c.   Collector current and collector to emitter voltage $
    d.   None of the above

31. A geosynchronous satellite
    a.   Has the same height as that of the Earth
    b.   Has a circular orbit $
    c.   Rotates in the polar plane
    d.   Has all of the above

32. Satellite launch sites are invariably located on Eastern seaboards to ensure that
    a.   Launch takes place westward
    b.   Expenditure of propulsion fuel is reduced during plane changing
    c.   The satellite achieves circular orbit quickly
    d.   Spent rocket motor and other launcher debris falls into the sea $

33. Orbital disturbances of a geosynchronous satellite are caused by the
    a.   Moon
    b.   Sun
    c.   Earth
    d.   All of the above $

34. The temperature below which certain materials are antiferromagnetic and above which they are paramagnetic is called
    a.   Weiss temperature
    b.   Curie temperature

    c.   Neel temperature $

    d.   None of the above

35. A current is flowing through a conductor with non-uniform area of cross-section. Then
    a.   Current will be different at different cross-sections.
    b.   Current will be the same at all the cross-sections.
    c.   Current will be different but current density will be same at all the cross-sections
    d.   Current will be the same but current density will be different at different cross-sections $

36. Which of the following is true as regards to photo emission?
    a.   Velocity of emitted electrons is dependent on light intensity
    b.   Rate of photo emission is inversely proportional to light intensity
    c.   Maximum velocity of electron increases with decreasing wave length $
    d.   Both holes and electrons are produced

37. When a voltage is applied to a semiconductor crystal then the free electrons will flow
    a.   Towards positive terminal $
    b.   Towards negative terminal
    c.   Either towards positive terminal or negative terminal
    d.   Towards positive terminal for 1 µs and towards negative terminal for next 1 µs

38. What is the phenomenon of overlap in converter operation is due to?
    a.   Source resistance
    b.   Source inductance $
    c.   Both source resistance and source inductance
    d.   High value of firing angle

39. At room temperature, the current in intrinsic semiconductor is due to
    a.   Holes
    b.   Electrons
    c.   Ions
    d.   Holes and electrons $

40. When a material becomes a superconductor, its resistivity becomes
    a.   Very small
    b.   Zero$
    c.   About 10% of normal value
    d.   About 20% of normal value

41. Semi conducting materials are all
    a.   Elements
    b.   Compounds
    c.   Elements or compounds $
    d.   Elements or mixtures

42. A dynamometer wattmeter is connected in ac circuit. The reading will be
    a.   V – A product
    b.   Average power $
    c.   Peak power
    d.   None of these

43. The current rating of a cable depends on
    a.   Length of cable
    b.   Diameter of cable $

c. Both length and diameter of cable

d. None of the above

44. In control systems the magnitude of error voltage

a. Is very small $

b. Is very large

c. Neither small nor large

d. May be any value from 0 to 50 V

45. It is desired that transmission line and load should match for a range of frequencies. The best method is

a. To use a balun

b. To use a single stub of adjustable position

c. To use a double stub $

d. To use a broad band amplifier

46. An RC oscillator uses

a. One RC combination

b. Two RC combinations

c. At least three RC combinations $

d. Either (a) or (b)

47. Induction wattmeter can be used in

a. AC circuit only $

b. DC circuit only

c. Both ac and dc circuit

d. AC 3 phase only

48. In cell phone antennas are

a. Monopole $

b. Loops

c. Helical

d. Lens

49. Which of the following laws of electromagnetic theory is associated with the force experienced by two loops of a wire carrying currents?

a. Maxwell's law

b. Coulomb's law

c. Ampere's law $

d. Laplace's law

50. The units for transconductance are

a. Ohms

b. Amperes

c. Volts

d. Siemens$

51. The current rating of dc tachogenerator is usually

a. Small

b. High

c. Medium $

d. Either b or c

52. Which of the following measurements carried out using a dc potentiometer does not require standardization of potentiometer?
    a. Measurement of unknown voltage
    b. Measurement of resistance $
    c. Measurement of unknown current
    d. Calibration of voltmeter

53. A modem is
    a. A form of commutator
    b. A device for digitizing speech
    c. A circuit used for suppressing microwave interference
    d. An electronic circuit which carries out modulation and demodulation of a carrier frequency $

54. A typical signal strength received from a geosynchronous communication satellite is of the order of a few
    a. Milliwatts
    b. Kilowatts
    c. Picowatts $
    d. Watts

55. A universal shift register can shift
    a. From left to right
    b. From right to left
    c. Both from left to right and right to left $
    d. None of the above

56. The first machine cycle of an instruction is always
    a. A memory read cycle
    b. A fetch cycle $
    c. An input/output read cycle
    d. A memory write cycle

57. Frequency shift keying is used mostly in
    a. Telegraphy $
    b. Telephony
    c. Satellite communication
    d. Radio transmission

58. The effect of negative feedback on distortion and bandwidth is because
    a. Both are decreased
    b. Both are increased
    c. Distortion is reduced and bandwidth is increased $
    d. Distortion is increased and bandwidth is decreased

59. Which of the following is a "quiescent operation"?
    a. Operation when ac signal is not applied $
    b. Operation when ac signal is negative
    c. Operation when any type of signal is applied and is either positive or negative
    d. Both a and b

60. Potentiometer method of dc voltage measurement is more accurate than direct measurement using a voltmeter because
    a. It loads the circuit to maximum extent
    b. It loads the circuit moderately

c. It does not load the circuit at all $
d. It uses centre zero galvanometer instead of Voltmeters

61. Which of the following is not correct?
    a. A shunt should have a very low resistance
    b. An ammeter should have a very low resistance
    c. An electronic voltmeter draws appreciable current form source $
    d. Voltmeter should have a very high resistance

62. Which power amplifier can deliver maximum load power?
    a. Class A
    b. Class AB
    c. Class B
    d. Class C $

63. A telephone exchange has 12,000 subscribers. If the number of calls originating at peak time is 15,000 in one hour, the calling rate is
    a. 0.8
    b. 1.25 $
    c. 0.85
    d. 1

64. The velocity of sound waves in air
    a. Is constant at all temperatures
    b. Varies directly as temperature
    c. Varies inversely as absolute temperature
    d. Varies directly as square root of absolute temperature $

65. The rate at which information can be carried through a communication channel depends on
    a. Carrier frequency
    b. Bandwidth $
    c. Inverse of transmission loss
    d. Transmitted power

66. Which device has one input and many outputs called?
    a. Multiplexer
    b. Demultiplexer $
    c. Counter
    d. Flip flop

67. Which of the following is true for all metals
    a. Resistivity decreases with increase in temperature
    b. Conductivity decreases with increase in temperature $
    c. The gap between valence and conduction bands is small
    d. Current flow by electrons as well as by holes

68. To protect the diodes in a rectifier and capacitor input filter circuit, it is necessary to use
    a. Surge resistor$
    b. Surge inductor
    c. Surge capacitor
    d. Both a and b

69. The drive motor used in a mixer – grinder is
    a. DC motor
    b. Induction motor
    c. Synchronous motor
    d. Universal motor $

70. Identify the odd one?
    a. Telephone lines.
    b. Coaxial cables.
    c. Modem $
    d. Microwave systems

71. The direction of current in an A.C. circuit
    a. Is from positive to negative
    b. Is always in one direction
    c. Varies from instant to instant $
    d. Cannot be determined

72. A drill considered as a cutting tool having zero rake, is known as a
    a. Flat drill
    b. Parallel shank twist drill
    c. Straight fluted drill $
    d. Tapered shank twist drill

73. Which of the following is true with respect to an integral controller?
    a. The output is proportional to input
    b. The rate of change of output is proportional to input $
    c. The output is proportional to rate of change of input
    d. None of the above

74. A ceiling fan uses
    a. Split phase motor
    b. Capacitor start and capacitor run motor
    c. Universal motor
    d. Capacitor start motor $

75. The frequency of which of the following is the highest?
    a. Micro waves
    b. Light rays
    c. Gamma rays $
    d. Radio waves

76. In the context of electronic systems, which of the following statements is true?
    a. Repetitive-pulse waveforms are encountered more often than single pulses $
    b. Repetitive-pulse waveforms are encountered less often than single pulses
    c. Repetitive-pulse waveforms are encountered about as often as single pulses
    d. Cannot be deduced without further data

77. The direction of current in an A.C. circuit
    a. Is from positive to negative
    b. Is from negative to positive
    c. Is always in one direction
    d. Varies from instant to instant $

78. What is the Response of a system to a sinusoidal input is called?
    a. Impulse
    b. Frequency $
    c. Unit step
    d. None of these

79. Thermistor, which has high temperature co-efficient of resistivity, is used as the sensing element in resistance thermometer. It is a/an
    a. Insulator
    b. Conductor
    c. Solid semi – conductor $
    d. Liquid semi - conductor

80. Which of the following is not a differential pressure flow meter ?
    a. Venturimeter
    b. Rotameter $
    c. Flow nozzle
    d. Orificemeter

81. Which of the following undergoes minimum volumetric expansion for a given temperature change ?
    a. Methyl Alcohol
    b. Carbon Tetrachloride
    c. Mercury $
    d. Water

82. Why is a system with a double pole at the origin unstable?
    a. Since the corresponding term in the time domain decays linearly with time
    b. Since the corresponding term in the time domain grows linearly with time $
    c. Since the corresponding term in the time domain grows exponentially with time
    d. Since the corresponding term in the time domain remains constant

83. Why are thermal wells are used in temperature measurement?
    a. To guard against corrosive and oxidizing action on the thermocouple materials $
    b. To increase the sensitivity
    c. To increase the fidelity
    d. To reduce measuring lag

84. Photoelectric transducers are used for the measurement of those parameters, which can be used to produce variation in
    a. Current
    b. Voltage
    c. Light intensity $
    d. Flux density

85. Which of the following is a "contact" pyrometer?
    a. Infrared pyrometer
    b. Optical pyrometer
    c. Radiation pyrometer
    d. Resistance pyrometer $

86. The operation to obtain a surface finish in the range of 0.75 µm to 1.25 µm, is called
    a. Grinding $
    b. Honing
    c. Lapping
    d. Buffing

87. The lathe centres are provided with standard taper known as
    a. Seller's taper
    b. Chapman taper
    c. Morse taper $
    d. Brown and Sharpe taper

88. The tool material, for faster machining, should have
    a. Red harness
    b. Toughness
    c. Wear resistance
    d. All of the above $

89. Surface grinding is done to produce
    a. Tapered surface
    b. Flat surface $
    c. Internal cylindrical holes
    d. All the above

90. The lathe spindles are usually made hollow and provided with
    a. Internal taper $
    b. External taper
    c. Internal and External taper
    d. No taper

91. In electro-discharge machining, tool is made of
    a. Copper
    b. Brass
    c. Copper – Tungsten alloy
    d. All of the above $

92. The method of grinding used to produce a straight or tapered surface on a work piece, is
    a. Form grinding
    b. Surface grinding
    c. Internal cylindrical grinding
    d. External cylindrical grinding $

93. Internal gears can be made by
    a. Hobbing
    b. Milling
    c. Shaping with rack cutter
    d. Shaping with pinion cutter $

94. LVDT is used to measure
    a. Displacement $
    b. Temperature
    c. Pressure
    d. None of the above

95. Which of the following controllers has the least maximum deviation?
    a. P controller
    b. P – I controller
    c. P – D controller $
    d. P – I – D controller

96. Which of the following relates the absorption & evolution of heat at the junctions of a thermocouple to the current flow in the circuit?
    a. Peltier effect $
    b. Thomson effect
    c. Seebeck effect
    d. Joule heating effect

97. Cryogenics is a branch of science dealing with which of the following?
    a. Crystal growth
    b. Friction and wear
    c. Low temperature $
    d. High temperature

98. The primary winding of a power transformer should always be
    a. Open
    b. Shorted
    c. Switched
    d. Fused $

99. The SI unit of which of the following is named after Andre Marie Ampere?
    a. Power
    b. Potential difference
    c. Electric current $
    d. Energy

100. Which device illustrates the principle of electro – mechanical conversion?
    a. Amplifier $
    b. Transformer
    c. Battery charger
    d. Electric bell