

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
- Large \$
 - Small
 - Extremely small
 - Neither extremely small nor extremely large
10. Microwave resonators are used in
- Microwave oscillators
 - Microwave narrow band amplifiers
 - Microwave frequency meters
 - All of the above \$
11. Which of the following is non-radiating?
- Open two wire
 - Coaxial \$
 - Both a and b
 - None of the above
12. A woofer should be fed from a
- Low pass filter \$
 - High pass filter
 - Band pass filter
 - Band stop filter
13. A cycloconverter can be
- Step up
 - Step down
 - Step up or step down \$
 - None of these happen
14. Which of the following is true?
- Work function is the maximum energy required by the fastest electron at 0 K to escape from the metal surface
 - Work function is the minimum energy required by the fastest electron at 0 K to escape from the metal surface \$
 - Work function is the minimum energy required by the fastest electron at 272 K to escape from the metal surface
 - None of the above
15. A transponder is a satellite equipment which
- Receives a signal from Earth station and amplifies
 - Changes the frequency of the received signal
 - Retransmits the received signal
 - All the above \$
16. The Fourier series of an odd periodic function contains
- Odd harmonics only
 - Even harmonics only
 - Sine harmonics only \$
 - Cosine harmonics only

17. A cordless telephone using separate frequencies for transmission in base and portable units is known as
- Duplex arrangement \$
 - Half duplex arrangement
 - Either a or b
 - None of these
18. What does MICR stand for?
- Magnetic Ink Character Recognition \$
 - Magnetic Ink Chart Receipt
 - Magnetic Ink Chart Recognition
 - Magnetic Ink Character Receipt
19. In a strain measuring device using a strain gauge, the output quantity is
- Voltage \$
 - Resistance
 - Impedance
 - Either (a) or (b)
20. The household energy meter is
- Indexing instrument
 - Recording instrument
 - Integrating instrument \$
 - 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
- Sine wave
 - Square wave\$
 - Triangular wave
 - Either a or c
22. Which of the following statements is true?
- Maximum efficiency of class B power amplifier is 50%.
 - Maximum efficiency for class B-operation can be 78.5% \$
 - Maximum efficiency for class B-operation can be more than 100%
 - None of the above
23. Which of the following computer memories is fastest?
- Cache\$
 - Primary
 - Mass storage
 - Off line back up
24. The fabrication of microstrip line is done by
- Photo etching
 - Printed circuit technique \$
 - Oxidation
 - Cladding
25. Tracking of extra-terrestrial objects requires
- High transmitting power
 - Very sensitive receiver
 - 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 seaboard 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 μ s and towards negative terminal for next 1 μ s
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?
- Measurement of unknown voltage
 - Measurement of resistance \$
 - Measurement of unknown current
 - Calibration of voltmeter
53. A modem is
- A form of commutator
 - A device for digitizing speech
 - A circuit used for suppressing microwave interference
 - 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
- Milliwatts
 - Kilowatts
 - Picowatts \$
 - Watts
55. A universal shift register can shift
- From left to right
 - From right to left
 - Both from left to right and right to left \$
 - None of the above
56. The first machine cycle of an instruction is always
- A memory read cycle
 - A fetch cycle \$
 - An input/output read cycle
 - A memory write cycle
57. Frequency shift keying is used mostly in
- Telegraphy \$
 - Telephony
 - Satellite communication
 - Radio transmission
58. The effect of negative feedback on distortion and bandwidth is because
- Both are decreased
 - Both are increased
 - Distortion is reduced and bandwidth is increased \$
 - Distortion is increased and bandwidth is decreased
59. Which of the following is a “quiescent operation”?
- Operation when ac signal is not applied \$
 - Operation when ac signal is negative
 - Operation when any type of signal is applied and is either positive or negative
 - Both a and b
60. Potentiometer method of dc voltage measurement is more accurate than direct measurement using a voltmeter because
- It loads the circuit to maximum extent
 - 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 from 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
- DC motor
 - Induction motor
 - Synchronous motor
 - Universal motor \$
70. Identify the odd one?
- Telephone lines.
 - Coaxial cables.
 - Modem \$
 - Microwave systems
71. The direction of current in an A.C. circuit
- Is from positive to negative
 - Is always in one direction
 - Varies from instant to instant \$
 - Cannot be determined
72. A drill considered as a cutting tool having zero rake, is known as a
- Flat drill
 - Parallel shank twist drill
 - Straight fluted drill \$
 - Tapered shank twist drill
73. Which of the following is true with respect to an integral controller?
- The output is proportional to input
 - The rate of change of output is proportional to input \$
 - The output is proportional to rate of change of input
 - None of the above
74. A ceiling fan uses
- Split phase motor
 - Capacitor start and capacitor run motor
 - Universal motor
 - Capacitor start motor \$
75. The frequency of which of the following is the highest?
- Micro waves
 - Light rays
 - Gamma rays \$
 - Radio waves
76. In the context of electronic systems, which of the following statements is true?
- Repetitive-pulse waveforms are encountered more often than single pulses \$
 - Repetitive-pulse waveforms are encountered less often than single pulses
 - Repetitive-pulse waveforms are encountered about as often as single pulses
 - Cannot be deduced without further data
77. The direction of current in an A.C. circuit
- Is from positive to negative
 - Is from negative to positive
 - Is always in one direction
 - Varies from instant to instant \$

78. What is the Response of a system to a sinusoidal input is called?
- Impulse
 - Frequency \$
 - Unit step
 - 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
- Insulator
 - Conductor
 - Solid semi – conductor \$
 - Liquid semi - conductor
80. Which of the following is not a differential pressure flow meter ?
- Venturimeter
 - Rotameter \$
 - Flow nozzle
 - Orificemeter
81. Which of the following undergoes minimum volumetric expansion for a given temperature change ?
- Methyl Alcohol
 - Carbon Tetrachloride
 - Mercury \$
 - Water
82. Why is a system with a double pole at the origin unstable?
- Since the corresponding term in the time domain decays linearly with time
 - Since the corresponding term in the time domain grows linearly with time \$
 - Since the corresponding term in the time domain grows exponentially with time
 - Since the corresponding term in the time domain remains constant
83. Why are thermal wells are used in temperature measurement?
- To guard against corrosive and oxidizing action on the thermocouple materials \$
 - To increase the sensitivity
 - To increase the fidelity
 - To reduce measuring lag
84. Photoelectric transducers are used for the measurement of those parameters, which can be used to produce variation in
- Current
 - Voltage
 - Light intensity \$
 - Flux density
85. Which of the following is a “contact” pyrometer?
- Infrared pyrometer
 - Optical pyrometer
 - Radiation pyrometer
 - Resistance pyrometer \$

86. The operation to obtain a surface finish in the range of $0.75\ \mu\text{m}$ to $1.25\ \mu\text{m}$, is called
- Grinding
 - Honing
 - Lapping
 - Buffing
87. The lathe centres are provided with standard taper known as
- Seller's taper
 - Chapman taper
 - Morse taper
 - Brown and Sharpe taper
88. The tool material, for faster machining, should have
- Red harness
 - Toughness
 - Wear resistance
 - All of the above
89. Surface grinding is done to produce
- Tapered surface
 - Flat surface
 - Internal cylindrical holes
 - All the above
90. The lathe spindles are usually made hollow and provided with
- Internal taper
 - External taper
 - Internal and External taper
 - No taper
91. In electro-discharge machining, tool is made of
- Copper
 - Brass
 - Copper – Tungsten alloy
 - All of the above
92. The method of grinding used to produce a straight or tapered surface on a work piece, is
- Form grinding
 - Surface grinding
 - Internal cylindrical grinding
 - External cylindrical grinding
93. Internal gears can be made by
- Hobbing
 - Milling
 - Shaping with rack cutter
 - Shaping with pinion cutter
94. LVDT is used to measure
- Displacement
 - Temperature
 - Pressure
 - None of the above

95. Which of the following controllers has the least maximum deviation?
- P controller
 - P – I controller
 - P – D controller
 - 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?
- Peltier effect
 - Thomson effect
 - Seebeck effect
 - Joule heating effect
97. Cryogenics is a branch of science dealing with which of the following?
- Crystal growth
 - Friction and wear
 - Low temperature
 - High temperature
98. The primary winding of a power transformer should always be
- Open
 - Shorted
 - Switched
 - Fused
99. The SI unit of which of the following is named after Andre Marie Ampere?
- Power
 - Potential difference
 - Electric current
 - Energy
100. Which device illustrates the principle of electro – mechanical conversion?
- Amplifier
 - Transformer
 - Battery charger
 - Electric bell