

PART 2:

TEST YOURSELF SECTION

TEST YOURSELF –EXAM 1

1. ECE Board Exam November 1995

What is an electronic measuring equipment used in navigation operating in 1GHz band which provides bearing and distance indication?

A. TACAN

B. ODR

C. ILS

D. DME

2. ECE Board Exam November 1995

Find the output of four (4) lead acid cells.

A. 3.2 V

B. 8.4 V

C. 5.8 V

D. 1.6 V

3. ECE Board Exam November 1995

The reciprocal of capacitance is called

A. elastance

B. permittivity

C. conductance

D. permeability

4. ECE Board Exam November 1995

An advantage of full-wave rectifier over half-wave rectifier.

A. Each diode can cool-off during half of each input cycle.

B. The ripple frequency is lower.

C. The tube will conduct during both halves of the cycle.

D. Output voltage is lower with more ripples.

5. ECE Board Exam November 1995

What composes all matter whether a liquid, solid or gas?

A. Atoms

B. Electrons

C. Protons

D. Neutrons

6. ECE Board Exam November 1995

What is the majority carrier in an N material?

- A. Holes
- B. Neutrons
- C. Electrons**
- D. Protons

7. ECE Board Exam November 1995

A very high resistance connected in parallel with smoothing capacitors in a high voltage DC system is called a

- A. dropping resistor
- B. shunt
- C. divider
- D. bleeder**

8. ECE Board Exam November 1995

What is the smallest part of a computer language?

- A. Binary
- B. Byte
- C. Bit**
- D. Word

9. ECE Board Exam November 1995

A user-program that has the ability to move a robot axis to any position within its range

- A. Point-to-point**
- B. Continuous path
- C. Positive stop
- D. Pick-and-place

10. ECE Board Exam November 1995

What level is used to represent logic-1 in a negative logic circuit?

- A. Negative transition level
- B. Low level**
- C. Positive transmission level
- D. High level

11. ECE Board Exam November 1995

What law in electronics where an induced current will be in such a direction that its own magnetic field will oppose the magnetic field that produces the same?

- A. Electromagnetic law
- B. Nortons law
- C. Lenz law**
- D. Maxwells law

12. ECE Board Exam November 1995

What is the reason why robot actuators have lesser capabilities than electric or hydraulic robot actuators?

- A. It has quick response
- B. It always has oil leaks
- C. It always has all or nothing motion**
- D. It has high initial cost

13. ECE Board Exam November 1995

_____ has the unit of electron volt.

- A. Charge
- B. Potential difference
- C. Energy**
- D. Current

14. ECE Board Exam November 1995

What is the unit of magnetic flux in SI system?

- A. Weber**
- B. Maxwell
- C. Tesla
- D. Gauss

15. ECE Board Exam November 1995

What element possesses four valence electrons?

- A. Insulator
- B. Semi-insulator
- C. Semiconductor**
- D. Conductor

16. ECE Board Exam November 1995

What level is used to represent logic-0 in a negative logic circuit?

- A. High level**
- B. Low level
- C. Negative transition level
- D. Positive transition level

17. ECE Board Exam November 1995

In an Amplitude-Modulated (AM) radio transmitter, the modulator is _____.

- A. How amplification can be thought of as a decision making process**
- B. How semiconductor replace vacuum
- C. A digital decision
- D. How to adapt a radio transmitter to make it useful as multiplier circuit.

18. ECE Board Exam November 1995

Which of the following is the probable output if all inputs of a TTL gate are binary 1?

- A. Determinable
- B. Binary 0**
- C. Binary 1
- D. Indeterminate

19. ECE Board Exam November 1995

Term used to describe sudden reverse conduction of an electronic component caused by excess reverse voltage across the device.

- A. Cut-off
- B. Saturation
- C. Avalanche**
- D. Reversion

20. ECE Board Exam November 1995

Given the two voltages:

$$S(t)=10\cos(\omega t+30 \text{ degrees})\text{volts}$$

$$Q(t)=15\cos(\omega t+45 \text{ degrees})\text{volts}$$

Find $V(t)=S(t) + Q(t)$

- A. $V(t)=5.9\cos(\omega t+71 \text{ degrees})\text{volts}$
- B. $V(t)=24.8\cos(\omega t+39 \text{ degrees})\text{volts}$**
- C. $V(t)=25\cos(\omega t+75 \text{ degrees})\text{volts}$
- D. $V(t)=13.6\cos(\omega t+75 \text{ degrees})\text{volts}$

21. ECE Board Exam November 1995

What type of materials formed when trivalent material is doped with silicon or germanium?

- A. N type
- B. N and P type
- C. PN type
- D. P type**

22. ECE Board Exam November 1995

What is the degree of exactness of measurement when compared to the expected value of the variable being measured?

- A. Accuracy**
- B. Error
- C. Deviation
- D. Precision

23. ECE Board Exam November 1995

The overall gain of an amplifier in cascade is

- A. the sum
- B. the average of each
- C. the product**
- D. 100 % the sum

24. ECE Board Exam November 1995

_____ is a byte of data stored in a memory location.

- A. 8 bits
- B. Character
- C. 4 bits
- D. Memory word**

25. ECE Board Exam November 1995

An instrument used to measure one location in terms of coordinates.

- A. Global Positioning System**
- B. Hydrometer
- C. Altimeter
- D. Increductometer

26. ECE Board Exam November 1995

How do you measure the current in a circuit without an ammeter?

- A. By computing the values of resistance
- B. Measure voltage drop across tube
- C. Measure voltage drop across known resistor**
- D. Divide total circuit resistance by the total circuit load

27. ECE Board Exam November 1995

_____ is retrieving data from memory.

- A. Accessing
- B. Getting
- C. Encoding
- D. Reading**

28. ECE Board Exam November 1995

Materials with permeabilities slightly less than that of free space are referred to as

- A. diamagnetic**
- B. ferromagnetic
- C. non-magnetic
- D. paramagnetic

29. ECE Board Exam November 1995

_____ can erase EPROMS.

- A. Applying a 21-volt pulse
- B. Applying ultraviolet rays**
- C. Turning off the power
- D. Blowing fuse

30. ECE Board Exam November 1995

What materials possess permeabilities slightly less than that of free space?

- A. Non-magnetic
- B. Diamagnetic**
- C. Paramagnetic
- D. Ferromagnetic

31. ECE Board Exam November 1995

An LC circuit resonates at 2000 kHz and has a Q of 100. Find the lower and upper cut-off frequencies.

- A. 1950 kHz, 2050 kHz
- B. 1900 kHz, 2100 kHz
- C. 1990 kHz, 2010 kHz**
- D. 1980 kHz, 2020 kHz

32. ECE Board Exam November 1995

Find the ripple factor (K_r) of a sinusoidal signal with peak ripple of 4 volts and an average of 30.

- A. 0.094**
- B. 0.013
- C. 0.130
- D. 0.94

33. ECE Board Exam November 1995

The term "Fully Saturated" for a transistor refers to:

- A. the collector current at its maximum value**
- B. the collector current at its minimum value
- C. the transistor's beta at its maximum value
- D. the transistor's alpha at its maximum value

34. ECE Board Exam November 1995

The _____ grid in an electron tube is where the input signal is usually applied.

- A. screen
- B. control**
- C. bias
- D. supression

35. ECE Board Exam November 1995

If three amplifiers with a gain of 8 each are in cascade, how much is the overall gain?

- A. 72
- B. 24
- C. 512**
- D. 8

36. ECE Board Exam November 1995

_____ is a pn junction semiconductor device that emits noncoherent optical radiation when biased in the forward direction, as a result of a recombination effect.

- A. LASER
- B. JUGFET
- C. LED**
- D. Optical cavity

37. ECE Board Exam November 1995

What do you call the force which sets up or tends to set up magnetic flux in a magnetic circuit?

- A. Electromotive force
- B. Potential difference
- C. Magnetomotive force**
- D. Dynamic force

38. ECE Board Exam November 1995

Silicon diodes are used in a two-diode full-wave rectifier circuit to supply a load of 12 volts DC. Assuming ideal diodes and the load resistance is 12 ohms, compute the efficiency of the rectifier in percentage.

- A. 5.8
- B. 75
- C. 95.7
- D. 81.2**

39. ECE Board Exam November 1995

In order to match the load to the generator means making load resistance _____.

- A. increased to more of generator's internal resistance
- B. equal to generator's internal resistance**
- C. decreased
- D. lowered than generator's internal resistance

40. ECE Board Exam November 1995

The purpose of installing thyrectors across the incoming power lines to speed the control system is to _____.

- A. cause the motor to caution
- B. protect drive circuits from high voltage transient surges**
- C. increase counter-emf
- D. allow the field winding current to continue flowing

41. ECE Board Exam November 1995

The base SI unit of luminous intensity is

- A. lux
- B. lumen
- C. candela**
- D. lambert

42. ECE Board Exam November 1995

The portion of the weld interval during which welding current is flowing

- A. Heat subinterval**
- B. Release interval
- C. Cool interval
- D. Squeeze interval

43. ECE Board Exam November 1995

The difference in energy between the valence and conduction bands of a semiconductor is called

- A. band gap**
- B. extrinsic photoeffect
- C. conductivity
- D. energy-density

44. ECE Board Exam November 1995

_____ is a segment register which normally accesses variables in the program.

- A. Extra
- B. Stack**
- C. Data
- D. Code

45. ECE Board Exam November 1995

What is the range of audio frequency?

- A. 10 to 10,000 Hz
- B. 16 to 20,000 Hz**
- C. 3 to 2,000 kHz
- D. 10 to 2,000 Hz

46. ECE Board Exam November 1995

A _____ is a storage device used to accommodate a difference in rate of flow of data or time of occurrence of events when transmitting from one device to another.

- A. Accumulator
- B. Buffer**
- C. Modem
- D. Register

47. ECE Board Exam November 1995

Solve the collector current if base current is 200 mA and the current gain is 20.

- A. 10 A
- B. 4 A**
- C. 1 A
- D. 40 A

48. ECE Board Exam November 1995

_____ is the specific gravity reading for a good lead-acid cell.

- A. 1170
- B. 1270**
- C. 1070
- D. 1370

49. ECE Board Exam November 1995

_____ refers to BCD counter

- A. Decade counter**
- B. Shift relay
- C. Frequency divider
- D. Binary counter

50. ECE Board Exam November 1995

The typical number of bits per dynamic memory location is

- A. 1**
- B. 8
- C. 2
- D. 16

51. ECE Board Exam November 1995

Find voltage regulation of a generator when full-load voltage is 110 V and no-load voltage is 120.

- A. 1 %
- B. 9.09 %**
- C. 90.0 %
- D. 10 %

52. ECE Board Exam November 1995

In a system with MOS devices, the main bus loading factor is likely to be

- A. resistive
- B. current
- C. capacitive**
- D. static charge

53. ECE Board Exam November 1995

The first recipient in E-mail communication.

- A. Host**
- B. Mail box
- C. Computer`
- D. Disk

54. ECE Board Exam November 1995

When a power supply is constructed to operate from either 240V or 120V ac lines such that it will have same secondary output, its primary when connected from 240V must be

- A. split into halves and connected in parallel**
- B. connected in series
- C. connected in parallel
- D. split into halves and connected in series

55. ECE Board Exam November 1995

Which has the largest diameter of the following dry cells?

- A. Type C
- B. Type AA
- C. Type AAA
- D. Type D**

56. ECE Board Exam November 1995

_____ is an output applied to Read Only Memory (ROM).

- A. Multiplexer
- B. Address**
- C. Input code
- D. Data

57. ECE Board Exam November 1995

_____ is a kind of memory where only manufacturer can store program and has a group of memory locations each permanently storing a word.

- A. ROM**
- B. SOS memory
- C. RAM
- D. Hard Memory

58. ECE Board Exam November 1995

_____ is an excess property of P-type semiconductor.

- A. Neutron
- B. Proton
- C. Electron
- D. Hole**

59. ECE Board Exam November 1995

The best way to control speed of an AC induction motor is by varying the _____

- A. supply frequency
- B. both supply voltage and frequency simultaneously**
- C. supply voltage
- D. series resistance of the field

60. ECE Board Exam November 1995

There are _____ identical cells in parallel needed to double the current reading of each cells.

- A. 3
- B. 4
- C. 2**
- D. 1

61. ECE Board Exam November 1995

Two heaters A and B are in parallel across supply voltage V. Heater A produces 500 kcal in 20 minutes and B produces 1000 kcal in 10 minutes. The resistance of A is 10 ohms. What is the resistance of B, if the same heaters are connected in series voltage V?

- A. 0.14 ohms
- B. 4.5 ohms
- C. 2.5 ohms**
- D. 4.5 ohms

62. ECE Board Exam November 1995

_____ is a low frequency oscillation which sometimes occurs under fault condition in electron tube circuits.

- A. Ping pong
- B. Jitter
- C. Glitch
- D. Motor boating**

63. ECE Board Exam November 1995

The longer the diameter of a wire, the _____ is its resistance.

- A. unstable
- B. higher
- C. stable
- D. lesser**

64. ECE Board Exam November 1995

When an atom gains an additional _____, it results to a negative ion.

- A. neutron
- B. proton
- C. electron**
- D. atom

65. ECE Board Exam November 1995

_____ refers to circuits with 10 to 100 integrated circuits.

- A. IC
- B. Monolithic
- C. MSI**
- D. SSI

66. ECE Board Exam November 1995

What is the most stable type of biasing?

- A. Current feedback
- B. Fixed bias
- C. Voltage divider**
- D. Voltage feedback

67. ECE Board Exam November 1995

If the gain of an amplifier without feedback is 10 and with negative feedback is 8, then the feedback fraction is

- A. 0.025
- B. 0.9
- C. 0.8
- D. 0.225**

68. ECE Board Exam November 1995

The _____ is an analog component that has two inputs, one inverting and the other non-inverting, and a single output terminal.

- A. counter
- B. op amp**
- C. register
- D. flip-flop

69. ECE Board Exam November 1995

What do you call the duration within it takes to read the content of a memory location after it has been addressed

- A. Execution time
- B. Data rate
- C. Cycle time
- D. Access time**

70. ECE Board Exam November 1995

What term in electronics is used to express how fast energy is consumed?

- A. Load
- B. Power**
- C. Conductance
- D. Volt

71. ECE Board Exam November 1995

If a sine wave voltage varies from 0-200 V, how much is its instant voltage at 90%?

- A. 200 V**
- B. Half of its maximum voltage
- C. 100 V
- D. Minimum voltage

72. ECE Board Exam November 1995

Device that increases power content from an input signal.

- A. Attenuator
- B. Amplifier**
- C. Oscillator
- D. Transformer

73. ECE Board Exam November 1995

What is the lagging effect between the magnetizing force applied and the flux density?

- A. Hysteresis**
- B. Permeance
- C. Reluctance
- D. Eddy Currents

74. ECE Board Exam November 1995

A solid-state device which only gives a “1” output if all its inputs are also “1” is called

- A. an AND gate**
- B. a NAND gate
- C. a NOR gate
- D. an OR gate

75. ECE Board Exam November 1995

How much is the resistance of Germanium slag 10 cm long and cross sectional area of 1 squared cm?

- A. 5.5 k ohm
- B. 550 k ohm**
- C. 55 k ohm
- D. 550 ohm

76. ECE Board Exam November 1995

A _____ is a device which can test all pins of an IC at the same time.

- A. logic probe
- B. current tracer
- C. logic clip**
- D. pulser

77. ECE Board Exam November 1995

Current carried by each of two long parallel conductors is doubled if their separation is also doubled, the force between them would

- A. increase four-fold
- B. become half
- C. increase two-fold**
- D. remain the same

78. ECE Board Exam November 1995

What is the first stage in electronic troubleshooting?

- A. Statistical analysis
- B. Symptom analysis**
- C. Diagnostics
- D. Initiate plate testing

79. ECE Board Exam November 1995

Circuit that transforms dc from one voltage level to another or from one frequency to another

- A. Coupler
- B. Clipper
- C. Comparator
- D. Converter**

80. ECE Board Exam November 1995

_____ is an orderly pattern of combined silicon atoms.

- A. Covalent bond
- B. Valence orbit
- C. Semiconductor
- D. Crystal**

81. ECE Board Exam November 1995

A crystal with its major flat surfaces cut so that they are perpendicular to a mechanical axis of the original quartz crystal is called

A. a Y-cut crystal

B. a Z-cut crystal

C. an XY-cut crystal

D. an X-cut crystal

82. ECE Board Exam November 1995

A good material conductor should have _____ valence electrons.

A. 21

B. 1

C. 3.5

D. 10

83. ECE Board Exam November 1995

The objective of a capacitor is to

A. block AC and passes DC current

B. block DC and passes AC current

C. stores AC current

D. blocks AC current

84. ECE Board Exam November 1995

_____ is the characteristic of an oscillator that enables it to sustain oscillation after removal of the control stimulus.

A. Momentum

B. Fly-wheel effect

C. Damping

D. Forced oscillations

85. ECE Board Exam November 1995

_____ is the term used to express the amount of electrical energy in an electrostatic field.

A. Coulombs

B. Watts

C. Volts

D. Joules

86. ECE Board Exam November 1995

_____ is a device that stays on once triggered and stores one of two conditions as a digital circuit.

- A. Gate
- B. Latch**
- C. Integrator
- D. Oscillator

87. ECE Board Exam November 1995

When the cells are in series, voltages add, while current capacity is _____.

- A. the same as one cell**
- B. zero
- C. infinite
- D. the sum of each cell

88. ECE Board Exam November 1995

In shift registers made up of several flip-flops, the clock signal indicates _____.

- A. a bit of information stored in the flip-flop
- B. information of time
- C. what time is it
- D. when to shift a bit of data from input of the flip-flop to the output**

89. ECE Board Exam November 1995

A dc voltage supply is measured at 50 V and drops to 25 V when the load is connected. What is the value of "voltage regulation"?

- A. 5 %
- B. 50 %
- C. 8.33 %
- D. 11.11 %**

90. ECE Board Exam November 1995

Which of the following statements is correct?

- A. Transistor has two terminals
- B. Open resistor has small resistance
- C. Typical power rating of a carbon-composition resistor ranged from 0.125 W to 2W**
- D. Potentiometer has two terminals

91. ECE Board Exam November 1995

_____ is the major characteristics of an IC

- A. Complication
- B. Size**
- C. Power consumption
- D. Speed

92. ECE Board Exam November 1995

Find the sum of binary number 1010 and 0011.

- a) 1021
- b) 1101**
- c) 1011
- d) 1111

93. ECE Board Exam November 1995

The loss of electrical energy in counter balancing the residual magnetism in each cycle is called

- A. Eddy current loss
- B. Hysteresis loss**
- C. Copper loss
- D. Leakage loss

94. ECE Board Exam November 1995

In order to simplify a circuit, in analysis and computation the diode is normally assumed as _____

- A. zero
- B. ideal**
- C. imaginary
- D. infinite

95. ECE Board Exam November 1995

Files in an E-mail communication are send thru _____

- A. disk
- B. mailbox
- C. wires
- D. attachment**

96. ECE Board Exam November 1995

An audible tone generated by combining two different frequencies in a non-linear circuit or as sound waves in air is called

- A. side tone
- B. beat tone**
- C. heterodyne
- D. deadbeat

97. ECE Board Exam November 1995

_____ are electrons at the outer shell.

- A. Inside shell electrons
- B. Conductor electrons
- C. Outside shell electrons
- D. Valence electrons**

98. ECE Board Exam November 1995

Solve for flux density (in gauss) from a magnetic flux of 5,000 Mx through a perpendicular area of 2 cm x 5 cm.

- A. 5000 G
- B. 500 G**
- C. 10,000 G
- D. 50 G

99. ECE Board Exam November 1995

Refers to the increased use of data conversion circuits as a result of increased application.

- A. OP AMPS
- B. Linear circuits
- C. Computers**
- D. Digital equipment

100. ECE Board Exam November 1995

The decibel gain of cascaded amplifiers equals the

- A. sum of voltage and current gains
- B. product of individual gains**
- C. difference of individual gains
- D. sum of individual gains

TEST YOURSELF – EXAM 2

1. ECE Board Exam March 1996

What is a group of circuits that provides timing and signals to all operation in the computer?

- A. Output unit
- B. Memory unit
- C. Control unit**
- D. Input unit

2. ECE Board Exam March 1996

Where does voltage generated in a DC generator depend?

- A. Field resistance and flux
- B. Field and armature currents
- C. Flux and speed**
- D. Speed and field resistance

3. ECE Board Exam March 1996

_____ is the most influential factor in the switching speed of saturated bipolar transistor

- A. Charge stored**
- B. Collector current
- C. HFE
- D. Base current

4. ECE Board Exam March 1996

What is a pi-network?

- A. A Power Incidence Network
- B. A network consisting of one inductor and two capacitors or two inductors and one capacitor**
- C. A network consisting entirely of four inductors or four capacitors
- D. An antenna matching network that is isolated from ground

5. ECE Board Exam March 1996

_____ is the property of a material which opposes creation of magnetic flux?

- A. Resistance
- B. Permeance
- C. Reluctance**
- D. Conductance

6. ECE Board Exam March 1996

The purpose of cells connected in parallel is to

- A. increase internal resistance
- B. increase voltage output
- C. decrease current capacity
- D. increase current capacity**

7. ECE Board Exam March 1996

What does SI magnetic flux refer?

- A. Weber**
- B. Flux
- C. Maxwell
- D. Lines

8. ECE Board Exam March 1996

_____ is a type of linear regulator used in applications requiring efficient utilization of the primary power source.

- A. A series regulator**
- B. A shunt regulator
- C. A constant current source
- D. A shunt current source

9. ECE Board Exam March 1996

When a switch is closed, it has a total resistance of

- A. 1000 ohms at room temperature
- B. unstable
- C. infinity
- D. zero**

10. ECE Board Exam March 1996

How many turns are needed to produce a magnetizing force of 5000 A.t. for a coil of 50 amperes?

- A. 1,000 turns
- B. 5,000 turns
- C. 100 turns**
- D. 500 turns

11. ECE Board Exam March 1996

When an SCR is triggered or on condition, its electrical characteristics are similar to what other solid-state device (as measured between its cathode and anode)?

- A. The junction diode**
- B. The varactor diode
- C. The tunnel diode
- D. The hot-carrier diode

12. ECE Board Exam March 1996

What special type of diode is capable of both amplification and oscillation?

- A. Point contact diode
- B. Junction diode
- C. Zener diode
- D. Tunnel diode**

13. ECE Board Exam March 1996

A static memory generally contains

- A. electrons
- B. positive ions
- C. row decoders**
- D. holes

14. ECE Board Exam March 1996

Which is the majority carrier in an N-type semiconductor?

- A. Electrons**
- B. Positive ions
- C. Negative ions
- D. Holes

15. ECE Board Exam March 1996

Steel is hard to magnetize because of its _____.

- A. high retentivity
- B. low permeability**
- C. high permeability
- D. high density

16. ECE Board Exam March 1996

When you increase the resistance in a circuit, the flows of electrons will _____

- A. flow faster
- B. be constant
- C. be decreased**
- D. be stopped

17. ECE Board Exam March 1996

Current in a chemical cell refers to the movement of _____

- A. negative ions only
- B. negative and positive ions**
- C. positive ions only
- D. negative hole charge

18. ECE Board Exam March 1996

What is the effect of light in a photodiode?

- A. Reverse current**
- B. Limits flow of current
- C. Forwards current
- D. Renders unstable current

19. ECE Board Exam March 1996

What is the effect in terms of bandwidth when the Q of a single-tune stage is doubled?

- A. Doubled
- B. The same
- C. Halved**
- D. Four times

20. ECE Board Exam March 1996

_____ is the dc motor control senses.

- A. Resistance
- B. Counter emf**
- C. Field voltage
- D. Armature current

21. ECE Board Exam March 1996

What is the range of voltage rating available in zener diodes?

- A. 2.4 volts to 200 volts**
- B. 1.2 volts to 7 volts
- C. 3 volts to 2000 volts
- D. 1.2 volts to 5.6 volts

22. ECE Board Exam March 1996

Find which type of network provides the greatest harmonic suppression.

- A. Pi-network
- B. Pi-L-network**
- C. Inverse-Pi-network
- D. L-network

23. ECE Board Exam March 1996

What type of transformer that is used to protect technicians and operators from deadly electrical shock?

- A. Absorber transformer
- B. Step-down transformer
- C. Step-up transformer
- D. Isolation transformer**

24. ECE Board Exam March 1996

What is residual magnetism?

- A. The external magnetic field when the current is flowing through the exciting coil.
- B. The flux density, which exist in the iron core when the magnetic field intensity is reduced to zero.**
- C. The flux density, which exist in the iron core when the magnetic field intensity is at its maximum value.
- D. The flux density when the magnetic core is saturated.

25. ECE Board Exam March 1996

When batteries have cells connected in series the effect is

- A. reduced output voltage
- B. increased current supply
- C. increased voltage supply**
- D. reduced internal resistance

26. ECE Board Exam March 1996

How many OP-AMPS does window comparator require?

- A. 2**
- B. 4
- C. 3
- D. 1

27. ECE Board Exam March 1996

What is the memory element used in clocked sequential logic circuit?

- A. Gates
- B. Flip-flop**
- C. Static-RAM
- D. Read-only memory

28. ECE Board Exam March 1996

Semiconductors which are considered to be “low power” or “small signal” usually have power dissipation ratings of

- A. 1 watt or less**
- B. 5 watts or less
- C. exactly 1 watt
- D. 10 watt or less

29. ECE Board Exam March 1996

_____ for a transistor to be cut-off

- A. Maximum current flows from emitter to collector
- B. The transistor is at its operating point
- C. No current flows from emitter to collector**
- D. There is no base current

30. ECE Board Exam March 1996

A _____ is an instruction in a source language that is to be replaced by a defined sequence of instructions in the same source language

- A. statement
- B. source code
- C. mnemonic
- D. macro-instruction**

31. ECE Board Exam March 1996

Common-base (CB) amplifier has _____ compared to common-emitter and common collector amplifiers.

- A. a higher input resistance
- B. a larger current gain
- C. a lower input resistance**
- D. a larger voltage gain

32. ECE Board Exam March 1996

_____ currents are wasteful currents which flow in cores of transformers and produces heat.

- A. Residual
- B. Eddy**
- C. Sneak
- D. Magnetizing

33. ECE Board Exam March 1996

Which of the following photocell is most sensitive to?

- A. Radio waves
- B. Sound waves
- C. Light waves**
- D. Heat waves

34. ECE Board Exam March 1996

What is the resonant frequency of a circuit when L of 1 microhenry and C of 10 picofarads are in series?

- A. 15.9 MHz
- B. 50.3 MHz**
- C. 15.9 MHz
- D. 50.3 kHz

35. ECE Board Exam March 1996

What is the law that determines polarity of an induced voltage?

- A. Norton's Law
- B. Thevenin's Law
- C. Lenz Law**
- D. Faraday's Law

36. ECE Board Exam March 1996

The science of physical phenomena at very low temperatures, approaching absolute zero is called _____

- A. Crytanalysis
- B. Cybernetics
- C. Temperature inversion
- D. Cryogenics**

37. ECE Board Exam March 1996

If a dry cell has an internal resistance of 0.50 ohm and an emf of 2 volts, find power delivered in a one ohm resistor?

- A. 1.33 watts
- B. 1.66 watts
- C. 3.66 watts
- D. 1.77 watts**

38. ECE Board Exam March 1996

What happens in the resistance of copper wired when its temperature is raised?

- A. Decreased
- B. Steady
- C. Increase**
- D. Zero

39. ECE Board Exam March 1996

Refers to the part of computer that performs mathematical operations

- A. CPU
- B. Flip-flop
- C. Assembly Language
- D. ALU

40. ECE Board Exam March 1996

_____ is called a memory device which holds fixed set of data in a circuit.

- A. RAM
- B. Register
- C. Logic
- D. ROM**

41. ECE Board Exam March 1996

When a voltage of 100 V at 50 Hz is applied to a choking coil A, the current taken is 8A and the power is 120 W, when applied to a coil B, the current is 10 A and the power is 120 W. What power will be taken when 100 V is applied to the two coils connected in series?

- A. 4737 W
- B. 140 W**
- C. 70 W
- D. 1454 W

42. ECE Board Exam March 1996

The current needed to operate a soldering iron which has a rating of 600 watts at 110 volts is

- A. 5.455 A**
- B. 66,000 A
- C. 18,200 A
- D. 182 A

43. ECE Board Exam March 1996

An interval required to address and read out memory word

- A. Propagation delay
- B. Pulse duration
- C. Settling time
- D. Access time**

44. ECE Board Exam March 1996

When a logic circuit rejects an unwanted signal, this is termed as _____

- A. logic levels
- B. noise margin**
- C. power consumption
- D. propagation delay

45. ECE Board Exam March 1996

What is responsible for the phenomenon when voltages across reactances in series can often be larger than the voltage applied to them?

- A. Capacitance
- B. Resistance
- C. Conductance
- D. Resonance**

46. ECE Board Exam March 1996

How many symbols do hexadecimal digital number system used?

- A. 16**
- B. 4
- C. 8
- D. 32

47. ECE Board Exam March 1996

What is the equivalent of decimal 47 in binary?

- A. 111011
- B. 111101
- C. 110111
- D. 101111**

48. ECE Board Exam March 1996

What is the logic circuit having two or more inputs but only one output with high output if any or all inputs are high, with low output only when all inputs are low?

- A. AND gate
- B. OR gate**
- C. NOR gate
- D. NAND gate

49. ECE Board Exam March 1996

Determine which is not a dynamic test instrument

- A. Oscilloscope
- B. Logic monitor**
- C. Logic
- D. Logic

50. ECE Board Exam March 1996

How much voltage regulation does commercial power supply have?

- A. 10% and above
- B. Within 1%**
- C. 15% and above
- D. 10%

51. ECE Board Exam March 1996

_____ is called an electronic transfer from one stage to the next.

A. Coupling

B. Swamping

C. Doping

D. Mixing

52. ECE Board Exam March 1996

_____ capability is analogous to permeance.

A. Admittance

B. Conductance

C. Reluctance

D. Resistance

53. ECE Board Exam March 1996

Which is a common use for point-contact diode?

A. As a constant current source

B. As a constant voltage source

C. As an RF detector

D. As a high voltage rectifier

54. ECE Board Exam March 1996

Which of the following is not a secondary type cell?

A. Lithium

B. Lead-acid

C. Silver cadmium

D. Silver-zinc

55. ECE Board Exam March 1996

What do you call the piece of equipment in an oscilloscope used to indicate pulse condition in a digital logic circuit?

A. Logic probe

B. Probe

C. Electroscop

D. Galvanometer

56. ECE Board Exam March 1996

How many bits, binary pattern represent the decimal numbers 0 to 9 in binary coded decimal?

- A. 4**
- B. 1
- C. 2
- D. 8

57. ECE Board Exam March 1996

Which is the principal characteristic of a varactor diode?

- A. It has a very high PIV
- B. It has a negative resistance region
- C. Its internal capacitance varies with the applied voltage**
- D. It has a constant voltage under conditions of varying current

58. ECE Board Exam March 1996

What is the law whereby the attraction or repulsion between two magnetic poles is directly proportional to their strength?

- A. Coulomb's law
- B. Newton's law
- C. Coulomb's first law**
- D. Norton's law

59. ECE Board Exam March 1996

Efficient oscillators are those that are class _____.

- A. AB
- B. B
- C. C**
- D. A

60. ECE Board Exam March 1996

_____ refers to a circuit that stores pulses and produces an output pulse when specified number of pulses is stored.

- A. Counter**
- B. Register
- C. Flip-flop
- D. Buffer

61. ECE Board Exam March 1996

How many lithium cells in series are needed for a 12 V battery?

- A. 12 cells
- B. 4 cells**
- C. 8 cells
- D. 10 cells

62. ECE Board Exam March 1996

_____ is a linear electronic voltage regulator

- A. A regulator that has a ramp voltage at its output
- B. A regulator in which the control device is switched on or off, with the duty cycle proportional to the line or load conditions
- C. A regulator in which the pass transistor switches from the “off” state to the “on” state
- D. A regulator in which the conduction of a control element is varied in direct proportion to the voltage or load current.**

63. ECE Board Exam March 1996

The particles that make up the lattice in ionic crystal

- A. Molecules
- B. Ions
- C. Electrons**
- D. Neutron

64. ECE Board Exam March 1996

Parallel cells have the same voltage as one cell but have _____.

- A. unstable resistance
- B. less current capacity
- C. fluctuating power output
- D. more current capacity**

65. ECE Board Exam March 1996

A digital word consisting of only four bits is called a

- A. dibit
- B. quad
- C. pixel
- D. nibble**

66. ECE Board Exam March 1996

The reason for the thin layer of varnish over the copper coil pattern is to prevent

- A. oxidizing**
- B. flux
- C. corrosion
- D. dioxide

67. ECE Board Exam March 1996

_____ is the output voltage of a carbon-zinc cell.

- A. 3.5 V
- B. 2.5 V
- C. 1.5 V**
- D. 0.5 V

68. ECE Board Exam March 1996

Speed of a logic circuit is normally expressed as _____

- A. logic levels
- B. speed immunity
- C. propagation delay**
- D. power consumption

69. ECE Board Exam March 1996

_____ is the term used to express the ratio of the change in the dc collector current to a change in base current in a bipolar transistor.

- A. Gamma
- B. Beta**
- C. Alpha
- D. Delta

70. ECE Board Exam March 1996

_____ refers to a program that translates and then immediately executes statements in a high level language.

- A. Interpreter**
- B. Synchronous
- C. Interface
- D. Operating system

71. ECE Board Exam March 1996

_____ is the property of magnetic materials which retain magnetism after magnetizing force is withdrawn.

- A. Reluctivity
- B. Resistivity
- C. Retentivity**
- D. Conductivity

72. ECE Board Exam March 1996

A _____ is a junction field effect transistor with a Schottky barrier instead of a normal semiconductor junction.

- A. biFET
- B. MOSFET
- C. MESFET**
- D. JUGFET

73. ECE Board Exam March 1996

Term used for response in an electrical circuit.

- A. The frequency at which power factor is at a minimum
- B. The highest frequency that will pass current
- C. The frequency at which capacitive reactance equals inductive reactance**
- D. The lowest frequency that will pass current

74. ECE Board Exam March 1996

_____ is the progressive decay with time in the amplitude of the free oscillation in a circuit.

- A. Decrement
- B. Pulse decay time
- C. Damping**
- D. Dancing

75. ECE Board Exam March 1996

What do you call a circuit that changes pure binary code into ASCII?

- A. Decoder
- B. Encoder
- C. Demultiplexer
- D. Code converter**

76. **ECE Board Exam March 1996**

Which of the following statement is incorrect?

- A. Open transistor has three (3) terminals
- B. Transistors have three (3) terminals
- C. Potentiometer has three (3) terminals

D. Typical power rating of carbon-composition resistors ranged from 0.001 W to 0.1 W

77. **ECE Board Exam March 1996**

Which statement is not true?

- A. The internal resistance of a cell limits the amount of output current

B. Two electrodes of the same metal provide the highest voltage output

- C. Secondary cell can be recharged
- D. The negative terminal of a chemical cell has a charge of excess electrons

78. **ECE Board Exam March 1996**

What type of circuit whose parameters are constant which do not change with voltage of current?

- A. Lumped circuit
- B. Tuned circuit
- C. Reactive circuit

D. Linear circuit

79. **ECE Board Exam March 1996**

_____ is gaseous tube which uses a pool of liquid mercury as its cathode.

- A. Thyatron

B. Phanotron

- C. Klystron
- D. Ignition

80. **ECE Board Exam March 1996**

What do you call an electromagnet with its core in a form of magnetic ring?

- A. Polarization
- B. Irradiation

C. Toroid

- D. Doping

81. ECE Board Exam March 1996

_____ is the procedure by which an atom is given a net charge by adding or taking away of electron.

- A. Polarization
- B. Irradiation
- C. Ionization**
- D. Doping

82. ECE Board Exam March 1996

What do you call an electronic component that is a non-linear resistor and its resistance is function of the voltage across it?

- A. Triac
- B. IC
- C. Varistor**
- D. Thyristor

83. ECE Board Exam March 1996

Find the half-power bandwidth of a resonant circuit which has a resonant frequency of 1.8 MHz and a Q of 95.

- A. 189 Hz
- B. 1.89 kHz
- C. 58.7 kHz
- D. 18.9 kHz**

84. ECE Board Exam March 1996

A dynamic memory will store information

- A. as long as power is applied to the memory
- B. as long as power is applied and the memory is refreshed periodically**
- C. even when power is not applied to the memory
- D. when power is applied at regular intervals

85. ECE Board Exam March 1996

The energy of an oscillator can be source by _____

- A. coupling a small coil close to the tube
- B. capacitance of inductive coupling from tuned circuit**
- C. inserting resistor in the grid circuit
- D. connecting capacitor across the supply

86. ECE Board Exam March 1996

Refers to that part of computer that interprets and executes instructions

- A. ACC
- B. ALU
- C. CPU**
- D. Compiler

87. ECE Board Exam March 1996

What is the gain of a vacuum tube having the following parameter amplification factor is 80, external plate-load resistance of 30,000 ohms and the tubes internal plate resistance is 10,000 ohms?

- A. 60**
- B. 20
- C. 30
- D. 40

88. ECE Board Exam March 1996

_____ is the region in a transistor that is heavily doped

- A. Collector
- B. Ground
- C. Base
- D. Emitter**

89. ECE Board Exam March 1996

Which class of amplifier has the highest linearity and least distortion

- A. Class A**
- B. Class AB
- C. Class C
- D. Class B

90. ECE Board Exam March 1996

_____ is the unit of reluctance.

- A. Gauss
- B. Weber
- C. Maxwells
- D. At/Wb**

91. ECE Board Exam March 1996

Find the value of voltage regulation having a dc voltage of 67 V without load and with full load current drawn the output voltage drops to 42 V.

- A. 59.5 %**
- B. 15.9 %
- C. 62.6 %
- D. 32.5 %

92. ECE Board Exam March 1996

What is the reason why more cells can be stored in a given area with dynamic cells?

- A. They consume less power
- B. They are smaller**
- C. They are larger
- D. They travel faster

93. ECE Board Exam March 1996

Which of the following is a characteristic of cascaded amplifier?

- A. Double each amplifier's gain
- B. Each amplifiers gain is increased
- C. Increased overall gain**
- D. Total gain is decreased

94. ECE Board Exam March 1996

How do you determine if diode is defective?

- A. Diode resistance is either very low or very high on either direction**
- B. High current
- C. Very low current
- D. High voltage

95. ECE Board Exam March 1996

Avalanche breakdown is primarily dependent on the phenomenon of

- A. doping
- B. collision
- C. recombination
- D. ionization**

96. **ECE Board Exam March 1996**

What network facility is used to interconnect distinct networks physically?

- A. Relays
- B. Routers
- C. Repeaters
- D. Bridges**

97. **ECE Board Exam March 1996**

Diagram showing procedures which are followed and actions taken is called

- A. functional block diagram
- B. circuit diagram
- C. flow chart**
- D. schematic diagram

98. **ECE Board Exam March 1996**

Find the dielectric constant of air

- A. Approximately 1**
- B. Approximately 0
- C. Approximately 2
- D. Approximately 4

99. **ECE Board Exam March 1996**

_____ refers to the term remote sensing with regard to a linear voltage regulator.

- A. The feedback connection to the error amplifier is made directly to the load**
- B. The load connection is made outside the feedback loop
- C. The error amplifier compares the input voltage to the reference voltage
- D. Sensing is accomplished by wireless inductive loops

100. **ECE Board Exam March 1996**

Transition region refers to _____ with regard to transistor.

- A. the area of maximum N-type charge
- B. the area maximum P-type
- C. the point where wire leads are connected to the P or N type material
- D. an area of low charge density around P-N junction**

TEST YOURSELF – EXAM 3

1. ECE Board Exam November 1996

What is a medium of communication with a computer where programs are written in mnemonics?

- A. Assembly Language
- B. High level Language
- C. Machine Language**
- D. Low level Language

2. ECE Board Exam November 1996

The arrow in the symbol of a transistor indicates the direction of

- A. Electron current in the collector
- B. Donor ion current
- C. Electron current in the emitter
- D. Hole current in the emitter**

3. ECE Board Exam November 1996

Digital ICs are mostly

- A. hybrid
- B. thick film
- C. thin film
- D. monolithic**

4. ECE Board Exam November 1996

A _____ is a program which converts instruction written in a source language into machine code which can be read and acted upon by the computer.

- A. source code
- B. assembler**
- C. application software
- D. compiler

5. ECE Board Exam November 1996

What is the total resistance of a two equal valued resistor in series?

- A. Twice as one**
- B. The sum of their reciprocal
- C. The difference of both
- D. The product of both

6. ECE Board Exam November 1996

What two elements widely used in semiconductor devices exhibit both metallic and non-metallic characteristics?

- A. Galena and Germanium
- B. Silicon and Gold
- C. Galena and Bismuth

D. Silicon and Germanium

7. ECE Board Exam November 1996

What do you expect when you use the two 20 k-ohms, 1 watt resistor in parallel instead of one 10 k-ohms, 1 watt?

- A. Provide more power**
- B. Provide lighter current
- C. Provide less power
- D. Provide wider tolerance

8. ECE Board Exam November 1996

Find the required battery capacity needed to operate an equipment of 30 Amperes at 5 hours.

- A. 6
- B. 30
- C. 3

D. 150

9. ECE Board Exam November 1996

What does ALU which carries arithmetic and logic operations process?

- A. Binary coded decimal numbers

B. Hexadecimal numbers

- C. Octal numbers
- D. Binary numbers

10. ECE Board Exam November 1996

A static memory will store information

- A. as long as power is applied to the memory

B. even when power is not applied to the memory

- C. as long as power is applied and the memory is refreshed periodically
- D. when power is applied at regular intervals

11. ECE Board Exam November 1996

The conductance of a circuit having three (3) 10 ohms resistors in parallel is

- A. 3.33 S
- B. 0.30 S**
- C. 0.333 S
- D. 30 S

12. ECE Board Exam November 1996

Protons are about _____ heavier than electrons.

- A. 1,800 times**
- B. less than thrice
- C. less
- D. twice

13. ECE Board Exam November 1996

In half-wave rectifier, if a resistance equal to load resistance is connected in parallel with the diode then

- A. circuit will stop rectifying**
- B. output voltage would be halved
- C. output voltage would be doubled
- D. output voltage will remain unchanged

14. ECE Board Exam November 1996

_____ refers to a function of a decade counter digital IC.

- A. Producing one output pulse for every 10 input pulses**
- B. Adding two decimal numbers
- C. Producing 10 output pulses for every input pulse
- D. Decoding a decimal number for display on seven segment

15. ECE Board Exam November 1996

What is the time interval to undertake a refresh operation in a typical dynamic RAM?

- A. 2 ms**
- B. 200 ns
- C. 50 μ s
- D. 22 μ s

16. ECE Board Exam November 1996

Electric energy refers to _____.

- A. Joules divided by time
- B. Volt-coulomb**
- C. Volt-ampere
- D. Watt

17. ECE Board Exam November 1996

What is the process by which AC is converted to pulsating DC?

- A. Charging
- B. Rectification**
- C. Filtering
- D. Clipping

18. ECE Board Exam November 1996

_____ frequency is reached when the capacitive and inductive reactance in a tuned circuit are equal.

- A. Infinite
- B. Resonant**
- C. Pulsating
- D. Zero

19. ECE Board Exam November 1996

A _____ is composed of voltage-controlled oscillator, a phase comparator and a low pass filter, where the oscillator generates the output frequency in response to an error voltage produced by the comparator.

- A. JK flip-flop
- B. error detection
- C. voltage-to-frequency converter
- D. phase-locked loop**

20. ECE Board Exam November 1996

How are the networks able to transform one impedance to another?

- A. Resistance in the networks substitute for resistances in the load**
- B. The matching network can cancel the reactive part of an impedance and change the value of the resistive part of an impedance
- C. The matching network introduces negative resistance to cancel the resistive part of an impedance
- D. The matching network introduces transconductance to cancel the reactive part of an impedance

21. ECE Board Exam November 1996

Which of the following demodulates an RF modulated wave?

- A. RF amp
- B. IF amp
- C. Mixer
- D. Detector**

22. ECE Board Exam November 1996

The ideal internal resistance of an ammeter should be

- A. equal to the circuit's resistance
- B. zero**
- C. infinity
- D. higher than the circuit's resistance

23. ECE Board Exam November 1996

What type of bias is required for an LED to produce luminescence?

- A. Reverse bias
- B. Zero bias
- C. Forward bias**
- D. Inductive bias

24. ECE Board Exam November 1996

What is the resonant frequency of a circuit when L of 2 microhenrys and C of 30 picofarads are in series?

- A. 20.5 kHz
- B. 20.5 MHz**
- C. 2.65 kHz
- D. 2.65 MHz

25. ECE Board Exam November 1996

_____ is a layer of insulating medium that separates the plates of a capacitor.

- A. Insulator
- B. Core
- C. Dielectric**
- D. Space

26. ECE Board Exam November 1996

What is the oscillator of a radar receiver?

- A. Detector
- B. Product detector
- C. Hartley oscillator
- D. Klystron oscillator**

27. ECE Board Exam November 1996

What is the equivalent of decimal number 11 in binary

- A. 1101
- B. 1110
- C. 1111
- D. 1011**

28. ECE Board Exam November 1996

Which of the following ammeters is the most sensitive?

- A. 0-100 micro Ammeter
- B. 0-5 milli Ammeter
- C. micro Ammeter**
- D. 0-50 milli Ammeter

29. ECE Board Exam November 1996

In the concept of induction heating in industrial electronics, the eddy current penetrates to greater depths at

- A. high frequencies**
- B. increasing induction
- C. decreasing induction
- D. low frequencies

30. ECE Board Exam November 1996

Refers to the lowest voltage across any insulator that can cause current flow

- A. Conduction voltage
- B. Breakdown voltage**
- C. Voltage flow
- D. Voltage drop

31. ECE Board Exam November 1996

Type of power-line frequency meter composed of vibrating iron reeds placed in alternating magnetic field

- A. Induction type
- B. Resonant type
- C. Vibrating reed type**
- D. Electrodynamic type

32. ECE Board Exam November 1996

A separately packaged circuit element with its own external connections is called a _____ component.

- A. integrated
- B. discrete**
- C. active
- D. passive

33. ECE Board Exam November 1996

The area of a conductor whose diameter is 0.001 inch is equal to

- A. one angstrom
- B. one circular mill**
- C. one micron
- D. one steradian

34. ECE Board Exam November 1996

_____ is called the time sharing of one line with multiplex signals.

- A. Simultaneous transmission
- B. Bidirectional
- C. Relay
- D. Multiplexing**

35. ECE Board Exam November 1996

A process of constant loses of free electrons and then regaining them is called _____.

- A. induction
- B. ionization**
- C. polarization
- D. electron gaining

36. ECE Board Exam November 1996

Term used for an out-of-phase, non-productive power associated with inductors and capacitors.

- A. Reactive power**
- B. Effective power
- C. Peak envelope power
- D. True power

37. ECE Board Exam November 1996

What do you call the devices that allow computers to communicate with other computers through telephone lines or radio frequency?

- A. Modems**
- B. Disks
- C. Mouse
- D. Super computers

38. ECE Board Exam November 1996

As general rule in the process of industrial electronic heating, the frequency with the thickness of the metal to be heated

- A. is not related
- B. is directly proportional**
- C. varies inversely
- D. varies

39. ECE Board Exam November 1996

A _____ network is a two-port circuit made up of a repeated L, T, pi or H networks.

- A. lattice
- B. hierarchy
- C. hybrid
- D. ladder**

40. ECE Board Exam November 1996

The octal equivalent of binary number 10101100 is

- A. 367
- B. AC16
- C. 254**
- D. 172

41. ECE Board Exam November 1996

Which type of network offers the greater transformation ratio?

- A. L-network
- B. Pi-network**
- C. Constant-K
- D. Constant-M

42. ECE Board Exam November 1996

Refers to the system that has no feedback and is not self-correcting

- A. Close-loop system
- B. Coal slurry system
- C. Feed forward control system
- D. Open-loop system**

43. ECE Board Exam November 1996

Find the equivalent of 10 Oersted (O_e)

- A. 100 Gb/cm
- B. 1 Gb/cm
- C. 10 Gb/cm**
- D. 1 Gb/m

44. ECE Board Exam November 1996

The density of data recorded on magnetic tape is measured in

- A. bit stuffing rate
- B. bit error rate
- C. bits per inch**
- D. bits per second

45. ECE Board Exam November 1996

_____ is called back EMF.

- A. A voltage that opposes the applied EMF**
- B. A current that opposes the applied EMF
- C. An opposing EMF equal to R multiplied by C (RC) percent of the applied EMF
- D. A current equal to the applied EMF

46. ECE Board Exam November 1996

What is the purpose of the rheostat in ohmmeter?

- A. Balancing resistance
- B. Counter resistance of measured circuit
- C. Coil resistance
- D. Compensate aging battery of the meter**

47. ECE Board Exam November 1996

Find the charge in coulombs of dielectric that has a positive charge of 14.5×10 to the 18^{th} power protons.

- A. 29×10 to the 16^{th} coulombs
- B. 14.5×10 to the 16^{th} coulombs
- C. 14.5×10 to the 18^{th} coulombs
- D. 29×10 to the 18^{th} coulombs
- E. None of the above**

48. ECE Board Exam November 1996

_____ is the transmitter receiver triggered by interrogator used mainly in secondary surveillance radar and distance measuring equipment.

- A. Transponder**
- B. ILS
- C. Interrogator
- D. VOR

49. ECE Board Exam November 1996

In electricity, positive electric charge refers to _____.

- A. protons**
- B. neutrons
- C. electrons
- D. atoms

50. ECE Board Exam November 1996

What is the lagging effect between the magnetizing force applied and the flux density?

- A. Hysteresis**
- B. Permeance
- C. Eddy current
- D. Reluctance

51. ECE Board Exam November 1996

Find the Thevenins impedance equivalent across R_2 of a linear close circuit having 10 volt supply in series with two resistors ($R_1= 50$ ohms and $R_2= 200$ ohms).

- A. 400 ohms
- B. 40 ohms**
- C. 4 ohms
- D. 4 k-ohms

52. ECE Board Exam November 1996

What is the process of converting multiple analog input signals sequentially to digital output?

- A. Time division multiplexing
- B. Analog to digital conversion**
- C. Space division multiplexing
- D. Pulse code multiplexing

53. ECE Board Exam November 1996

What is the equivalent of decimal 15 in octal?

- A. 15
- B. 18
- C. 17**
- D. 16

54. ECE Board Exam November 1996

_____ is the transistor which fabricated as two complementary SCRs in parallel with common gate terminal.

- A. Triac**
- B. Field effect transistor
- C. Bilateral SCR
- D. Unijunction transistor

55. ECE Board Exam November 1996

How many diodes will you use to have a basic half-wave rectifier?

- A. Three
- B. Four
- C. Two
- D. One**

56. ECE Board Exam November 1996

Electric charge of neutron is the same as

- A. proton
- B. electron
- C. current

D. atom

57. ECE Board Exam November 1996

The current of an electric circuit is analogous to _____ parameter of a magnetic circuit.

- A. flux density
- B. reluctance
- C. mmf

D. flux

58. ECE Board Exam November 1996

Find the filter capacitor that will provide 2.5 % ripple filtered voltage having a load of 120 mA, full wave rectified voltage of 36 V dc and 60 Hz supply.

- A. 3117 microfarads
- B. 3207 microfarads
- C. 311.7 microfarads

D. 320.7 microfarads

59. ECE Board Exam November 1996

Which of the following solid state devices work on the phenomenon avalanche breakdown?

- A. Triac
- B. Unijunction
- C. All of the above

D. Light activated SCR

60. ECE Board Exam November 1996

_____ is unipolar semiconductor device which the current is carried by the majority carriers only.

- A. Field-effect transistor**
- B. Point-contact transistor
- C. Zener diode
- D. Junction transistor

61. ECE Board Exam November 1996

_____ is a gate which has 2 or more low input signals to get low output.

- A. AND
- B. Inverter
- C. OR**
- D. NAND

62. ECE Board Exam November 1996

The main reason for the variation of amplifier gain with frequency is

- A. due to interstage transformer
- B. the presence of capacitance both external and internal**
- C. the logarithmic increases in its output
- D. the Miller effect

63. ECE Board Exam November 1996

Component of solar battery which uses light energy to produce electromagnetic force

- A. Alkaline cells
- B. Polymer cells
- C. Lithium cells
- D. Selenium cells**

64. ECE Board Exam November 1996

What is the term called magnetic field?

- A. The force between the plates of a charged capacitor
- B. A force set up when current flows through a conductor**
- C. Current flow through space around a permanent magnet
- D. The force that drives current through a resistor

65. ECE Board Exam November 1996

Find the voltage drop developed across D'Arsonval meter movement having an internal resistance of 1 k-ohm and full deflection current of 150 micro amp.

- A. 150 kV
- B. 150 mV**
- C. 150 V
- D. 150 micro V

66. ECE Board Exam November 1996

Kind of AC-motor, light load high speed or high load low speed

- A. Synchronous motor
- B. Squirrel cage motor
- C. Split phase motor
- D. Universal motor**

67. ECE Board Exam November 1996

One of the following can program bipolar PROMs.

- A. Biasing bipolar transistor
- B. Blowing fuse**
- C. Enfusing input
- D. Charging a gate

68. ECE Board Exam November 1996

In order to maintain same secondary output voltage, a power supply which operate from either 120 V or 240 V ac lines must have primary winding:

- A. split exactly 1/3 from one end
- B. split exactly 1/4 from one end
- C. completely no split**
- D. split exactly 1/2 from one end

69. ECE Board Exam November 1996

What is the counter that follows the binary sequence?

- A. Binary counter**
- B. Simplex counter
- C. Shift counter
- D. Decimal counter

70. ECE Board Exam November 1996

_____ are non-semiconductor devices still used in digital memories.

- A. Gates
- B. Flip-flops
- C. Relay
- D. Magnetic cores**

71. ECE Board Exam November 1996

What is the reference cycle time use in radar, when the signal is transmitted and back to receiver?

- A. 10.1 microsec
- B. 100.0 microsec
- C. 12.4 microsec**
- D. 24.8 microsec

72. ECE Board Exam November 1996

Process in industrial electronics where electrons are emitted from the surface of certain metals when expose to the light is called

- A. photonics
- B. photosensitive
- C. phoovoltaic
- D. photoemission**

73. ECE Board Exam November 1996

A FET can act as an excellent buffer amplifier because

- A. it has a low input impedance and high output impedance
- B. it has a very high voltage gain and low noise level**
- C. it has a high input impedance and low output impedance
- D. smaller size, longer life and lower efficiency
- E. Eddy Currents

74. ECE Board Exam November 1996

What is the smallest element of a matter?

- A. Neutron
- B. Proton
- C. Atom**
- D. Electron

75. ECE Board Exam November 1996

Refers to a pulse transmitter-receiver used in radio navigation and secondary surveillance radar to either a reply from transponder is called

- A. ILS
- B. Interrogator**
- C. Outer maker
- D. Inner maker

76. ECE Board Exam November 1996

A triac behaves like two

- A. diodes in series
- B. resistors and one diode
- C. four-layer diodes in parallel

D. inverse parallel connected SCRs with common gate

77. ECE Board Exam November 1996

_____ is called the flux density produced within, due to its own induced magnetism.

- A. Electromagnetic field intensity
- B. Magnetic field intensity**
- C. Intensity of magnetization
- D. Electric field intensity

78. ECE Board Exam November 1996

The resonant circuit of a tuned-collector transistor oscillator has a resonant frequency of 5 MHz. If the value of capacitance is increased by 50%, calculate the new resonant frequency.

- A. 3.33 MHz
- B. 11.25 MHz
- C. 2.6 MHz

D. 4.08 MHz

79. ECE Board Exam November 1996

The ability of a material to conduct magnetic flux through it refers to

- A. permittivity
- B. permeability**
- C. reluctance
- D. conductivity

80. ECE Board Exam November 1996

_____ is one factor that does not affect resistance.

- A. Cross sectional area
- B. Resistivity
- C. Mass**
- D. Length

81. ECE Board Exam November 1996

Type of power line frequency meter device utilizing a principle of balancing an indicator needle at center at a scale using magnetic fields (resistive and inductive) opposing each other

A. Magnetic type

B. Resonant type

C. Resistive type

D. Electrodynamic type

82. ECE Board Exam November 1996

A measuring device or a meter made, so the pointer rests at the center of its scale zero current.

A. Linear meter

B. Galvanometer

C. Digital meter

D. Non-linear meter

83. ECE Board Exam November 1996

Part of the oscilloscope which produces bright spot through collection of electrons

A. Focus control

B. Heater cathode

C. Aquadag coating

D. Grid

84. ECE Board Exam November 1996

For a processor that uses 4-bit words, the largest number that can be represented using double precision is

A. 255

B. 15 (decimal)

C. 65,535

D. 127

85. ECE Board Exam November 1996

_____ refers to the class of logic circuit containing flip-flops.

A. Combinational

B. Sequential

C. Linear

D. Feedback

86. ECE Board Exam November 1996

How does junction diodes rated?

- A. Maximum reverse current and PIV
- B. Maximum forward current and PIV**
- C. Maximum forward current and capacitance
- D. Maximum reverse current and capacitance

87. ECE Board Exam November 1996

What logic circuit is analogous to a single pole mechanical selector switch?

- A. Decoder
- B. Encoder
- C. Multiplexer**
- D. Exclusive OR

88. ECE Board Exam November 1996

What do you call an electronic measuring equipment used in navigation which provides runway direction, distance and height guidance to permit blind landing?

- A. DME
- B. ODR
- C. TACAN
- D. ILS**

89. ECE Board Exam November 1996

An encoder is an MSI (medium-scale-integration) circuit that

- A. provides an output code that corresponds to which a set of input line is true**
- B. provides a storage of a certain number of binary bits
- C. selects a given output based on binary input code
- D. provides for delivering one of two or more inputs to an output

90. ECE Board Exam November 1996

In a high-fidelity system, the pair of filter which separate audio frequency band signals into two separate groups, one of which is fed to the tweeter and the other to the woofer is called

- A. matching transformer
- B. crossover network**
- C. equalizer
- D. bridge network

91. ECE Board Exam November 1996

How long in nautical miles does the radar travel to and from at 12.4 microseconds?

- A. 2 miles**
- B. 1 miles
- C. 3 miles
- D. 4 miles

92. ECE Board Exam November 1996

The _____ the Q of a circuit, the narrower is its bandwidth.

- A. lower
- B. higher**
- C. broader
- D. selective

93. ECE Board Exam November 1996

Data selector is also called

- A. encoder
- B. decoder
- C. multiplexer**
- D. demultiplexer

94. ECE Board Exam November 1996

The code 1011 in BCD is

- A. 24
- B. letter A
- C. 11
- D. invalid**

95. ECE Board Exam November 1996

What is the equivalent of hexadecimal 1A in decimal?

- A. 27
- B. 26**
- C. 42
- D. 40

96. ECE Board Exam November 1996

_____ is the voltage applied in direct current circuit having a power of 36 watts and total resistance of 4 ohms.

- A. 6V
- B. 9V
- C. 24V
- D. 12V**

97. ECE Board Exam November 1996

A two-pole, one phase motor has _____ field poles.

- A. 8
- B. 2**
- C. 6
- D. 4

98. ECE Board Exam November 1996

_____ is a device used to store electrical energy in an electrostatic field?

- A. Inductor
- B. Battery
- C. Transformer
- D. Capacitor**

99. ECE Board Exam November 1996

A memory circuit that has address inputs has how many storage locations?

- A. 1024
- B. 256
- C. 512**
- D. not determined by sets of input

100. ECE Board Exam November 1996

High sensitive DC voltmeter provides accurate reading when measuring _____ circuits.

- A. zero resistance
- B. low resistance
- C. at any resistance
- D. high resistance**

TEST YOURSELF – EXAM 5

1. How much current does an electrostatic voltmeter require through it to operate?
A. Zero current
B. Below one ampere
C. One ampere
D. Very high current
2. Determine the equivalent work of 166 watt – second
A. 166 Joules
B. 100 Joules
C. 16.6 Joules
D. 10 Joules
3. Characteristics of the current flow in a series R-L-C circuit at resonance
A. it is dc
B. it is at a minimum
C. it is zero
D. it is at a maximum
4. What is the value of a resistor with colours from left. Orange, blue, gold and silver?
A. 34 ohms +/- 10%
B. 3.6ohms +/- 10%
C. 3.4ohms +/- 10%
D. 36 ohms +/- 10%
5. Which of the following characterizes inductance?
A. tends to oppose dc
B. tends to oppose changes in voltage
C. tends to oppose changes in current
D. oppose all frequencies equally
6. One of the following does not refer to the internal component of a klystron oscillator
A. a collector plate
B. a pair of plates
C. a pair of catcher grids
D. a pair of buncher grids

7. How can electrical current be inducted with a coil and a magnet?
- A. holding the coil and the magnet perfectly stationary
 - B. moving either the magnet or the coil**
 - C. placing the coil parallel to the magnetic field
 - D. placing the coil at right angles with the magnetic field
8. Which of the following integrated circuit contains the most gates?
- A. LSI
 - B. MSI
 - C. VLSI**
 - D. SSI
9. Which of the following is not primary type cell?
- A. Zinc chloride
 - B. Silver zinc**
 - C. Silver oxide
 - D. Carbon zinc
10. A Transformer consist of the following
- A. an inductance and resistance
 - B. a parallel resonant circuit
 - C. a capacitor and inductor
 - D. two coils wound on a common core**
11. What type of tube is used to display a signal on an oscilloscope?
- A. Filament tube
 - B. Cathode ray tube**
 - C. Tetrode
 - D. Pentode
12. Meaning of the term transition region with regard to a transistor.
- A. the point where wire leads are connected to the P or N type material
 - B. an area of low charge density around the P-N junction**
 - C. The area of maximum P-type charge
 - D. The area of maximum N-type charge

13. What is the resonant frequency of a circuit when L of 25 micro henrys and C of 10 picofarads are in parallel?
- A. 63.7 MHz
 - B. 10.1 MHz**
 - C. 63.7 KHz
 - D. 10.1 KHz
14. When should a fuse be replaced with a higher rated unit?
- A. Never**
 - B. When the original value is not available
 - C. If it blows
 - D. When the fuse of the original value is small in size
15. What is the resonant frequency of a circuit when L of 3 micro henrys and C of 40 picofarads are in series?
- A. 1.33 MHz
 - B. 14.5 kHz
 - C. 1.33 kHz
 - D. 14.5 MHz**
16. Find the two stable operating conditions of SCR
- A. conducting and non-conducting**
 - B. oscillating and quiescent
 - C. NPN conduction and PNP Conduction
 - D. forward conducting and reverse conducting
17. A filter having a single continuous transmission band with neither the upper nor the lower cut off frequencies being zero to infinite is called _____
- A. Band pass filter**
 - B. Longitudinal suppression filter
 - C. High pass filter
 - D. Band rejection filter
18. What physical effect will a two parallel wires and with the same direction of current flowing over them?
- A. maintain position
 - B. repel each other
 - C. no physical effect
 - D. attract each other**

19. Determine which item is not a storage device
- A. Card readers**
 - B. CD-ROM
 - C. Diskettes
 - D. Magnetic tape
20. Find the frequency in kilocycles per second in the armature of a 10 pole, 1,200 rpm generator
- A. 100**
 - B. 1000
 - C. 10
 - D. 0.100
21. Ohm's law refers to _____
- A. A current is directly proportional to both voltage and resistance
 - B. power is directly proportional to the resistance and inversely as the current squared
 - C. power is directly proportional to both voltage squared and the resistance
 - D. current varies directly as the voltage and inversely as the resistance**
22. A transistor acts as _____ when saturated
- A. open circuit
 - B. very low resistance**
 - C. very high resistance
 - D. variable resistance
23. Another very useful cell similar to solar cells however the junction is bombarded by beta particles from radioactive materials
- A. Alkaline cells
 - B. Nucleus cells
 - C. Selenium cells**
 - D. Lithium cells
24. What is an element in electronics which serves as a protection against overload?
- A. Fuse**
 - B. Resistor
 - C. Mica
 - D. Semiconductor

25. If two 0.25 micro farad capacitors are connected in series, what will be the total effective capacitance?
- A. **0.125 microfarad**
 - B. 0.0624 microfarad
 - C. 2.5 microfarad
 - D. 0.50microfarad
26. In semiconductor technology the characteristics of a transistor in a cut off refers to a condition when
- A. the transistor is at its operating point
 - B. **no current flow from emitter to collector**
 - C. there is no base current
 - D. maximum current flows from emitter to collector
27. Find the current that flows through the filament of a 400 watts flat iron connected to a 220v power line
- A. 50ma
 - B. 5a
 - C. 5ma
 - D. **500ma**
28. An electronic device draws 300watts from its 24 volt power source. Find the effective resistance
- A. **1.92ohms**
 - B. 19.2ohms
 - C. 1.25ohms
 - D. 12.50ohms
29. _____ is not a type of flip flop
- A. RS
 - B. Latch
 - C. D
 - D. **Register**
30. Which are the principal characteristics of a tunnel diode?
- A. a very high PIV
 - B. a high forward current rating
 - C. a high forward resistance
 - D. **a negative resistance region**

31. What is the flux density in gauss (G) having a flux of 12,000 Mx through a perpendicular area of 6m squared?
- A. 2000G**
 - B. 72000G
 - C. 72G
 - D. 200G
32. What is the distinguishing feature of a class C amplifier?
- A. output is present for less than 180 degrees of the input signal cycle**
 - B. output is present for the entire signal cycle
 - C. output is present for exactly 180
 - D. output is present for more than 180 degrees but less than 360 degrees of the input signal
33. How many nodes are needed to completely analyze a circuit according to Kirchhoff's current law?
- A. two
 - B. all nodes in the circuit**
 - C. one less than the total number of nodes in the circuit
 - D. one
34. What is the process of designing more than 100 gates on a single chip?
- A. LSI**
 - B. SSI
 - C. MSI
 - D. VLSI
35. which of the following cannot be used to make a magnet
- A. Carbon**
 - B. Cobalt
 - C. Iron
 - D. Lodestone
36. The two general types of heating methods in industrial electronics are
- A. frequency and induction heating**
 - B. induction and dielectric heating
 - C. coil and dielectric heating
 - D. coil and frequency heating

37. _____ signal represent the true signal in the truth table
- A. Two
 - B. One**
 - C. Zero
 - D. Four
38. The arrow in the schematic symbol for a diode points in which way?
- A. towards the cathode**
 - B. in the direction of the current flow
 - C. towards the anode
 - D. towards the magnetic north
39. In applying the right hand rule by holding a conductor with your right hand so that the thumb represents the current, the encircling fingers around the conductor represent _____
- A. Electric lines of force
 - B. Electromagnetic field intensity
 - C. Magnetic lines of force**
 - D. Electronic field of force
40. Which of the following describes the action of a capacitor
- A. converts ac into dc
 - B. stores electrical energy**
 - C. opposes changes in the current flow
 - D. creates a dc resistance
41. What do you call the phenomenon whereby substance attracts particle of iron
- A. Permeability
 - B. Magnetism**
 - C. Naturalism
 - D. Electromagnetism
42. Low sensitive dc voltmeter provides accurate reading when measuring _____ circuits
- A. At any resistance
 - B. Low resistance**
 - C. Zero resistance
 - D. High resistance

43. What should be the resolution of a digital voltmeter having a three digit 0-3V?
- A. 15V
 - B. 3mv**
 - C. $\frac{1}{2}$ micro volt
 - D. 30mv
44. The impedance in the study of electronics is represented by resistance and _____
- A. Inductance and capacitance
 - B. Inductance
 - C. Reactance**
 - D. Capacitance
45. One of the following is characteristics of a direct current dc supply voltage
- A. its output reverses polarity
 - B. its value cannot be stepped up or down by transformer**
 - C. easier to amplify
 - D. fluctuates
46. What kind of voltage is applied to the horizontal deflection plates of the oscilloscope
- A. Trigger voltage
 - B. Signal voltage
 - C. Sweep voltage**
 - D. Supply voltage
47. Loop currents should be assumed to flow in which direction?
- A. Straight
 - B. Either c or d arbitrarily selected**
 - C. Counter clockwise
 - D. Clockwise
48. _____ is a parallel LC circuit
- A. Parallel resisting circuit
 - B. Static circuit
 - C. Tank circuit**
 - D. Hartley circuit

49. Find the half power bandwidth of a parallel resonant circuit which has a resonant frequency of 3.6 MHz and a Q of 218.
- A. 606khz
 - B. 58.7khz
 - C. 16.5khz**
 - D. 47.3khz
50. Which type of meter requires its own power source
- A. an voltmeter
 - B. an ammeter
 - C. an ohmmeter**
 - D. a wattmeter
51. In order to have the best efficiency and stability, where on the load line should a solid state power amplifier to be operated?
- A. just below the saturation point**
 - B. at 1.14 times the saturation point
 - C. just above the saturation point
 - D. at the saturation point
52. Group of magnetically aligned atoms
- A. Lattice
 - B. Crystal
 - C. Domain**
 - D. Range
53. How many nickel-cadmium cells are needed in series for a 10v battery?
- A. 8**
 - B. 12
 - C. 5
 - D. 10
54. Five picofarads is equivalent to _____
- A. 5×10 to the -12^{th}**
 - B. 50×10 to the -12^{th}
 - C. 5×10 to the -10^{th}
 - D. 500×10 to the -10^{th}

55. In order to obtain the best temperature stability, what should be the operating voltage of the reference diode in a linear voltage regulator?
- E. approximately 6.0 volts**
 - A. approximately 3.0 volts
 - B. approximately 2.0 volts
 - C. approximately 10.0 volts
56. What determines the resonant frequency of a crystal?
- A. external components
 - B. the temperature of the crystal
 - C. the size and thickness of the crystal material**
 - D. the hermetic seal
57. What is the most important specification for semiconductor diode?
- A. Forward resistance
 - B. Reverse resistance
 - C. Peak inverse voltage**
 - D. Current capacity
58. the term cut-off for a transistor refers to _____
- A. the transistor is at its operating point
 - B. no current flow from the emitter to collector**
 - C. maximum current flow from emitter to collector
 - D. there is no base point
59. What technique is used to increase gain in linear IC's
- A. resistor ratio design
 - B. use of transistor with narrow bases**
 - C. use of high resistance transistor
 - D. use of transistor with wide bases
60. One advantage of hydraulic actuator in industrial robots include _____
- A. great force capability handling heavy loads**
 - B. lower operating cost than the other type
 - C. low initial cost than that the other types
 - D. clean no oil leaks

61. When resistors are connected in series what happens?
- A. the effective resistance is decreased
 - B. nothing
 - C. the tolerance is decreased
 - D. the effective resistance is increased**
62. _____ is used to store electrical energy in an electro static field?
- A. a transformer
 - B. a battery
 - C. a capacitor**
 - D. an inductor
63. When comparing rms voltage and average voltage, which of the following statement is true, assuming sine waves?
- A. either the rms voltage or the average voltage might be larger
 - B. the rms voltage is always greater than the average voltage**
 - C. there will always be a very large difference between the rms voltage and the average voltage
 - D. the average voltage is always greater than the rms voltage
64. Which are the three terminals of a TRIAC
- A. gate, anode 1 and anode 2**
 - B. gate, source and sink
 - C. base, emitter and collector
 - D. emitter, base 1 and base 2
65. In semiconductor application, which of the following statement is not true?
- A. An ohmmeter test across the base collector terminal of a transistor should show low resistance in one polarity and high resistance in the opposite polarity
 - B. A triac is a bi-directional
 - C. An ohmmeter test across a diode show low resistance in one polarity and high resistance in the opposite polarity
 - D. An ohmmeter test across the base collector of a transistor should show low resistance for both polarity**

66. What do you call an amplifier which has an output current flowing during the whole input current cycle?
- A. Class AB amplifier
 - B. Class B amplifier
 - C. Class A amplifier
 - D. Class C amplifier**
67. PNP transistor has the following arrangement
- A. P type base, N type emitter, P type collector
 - B. P type emitter, N type base, P type collector
 - C. P type collector, N type base, P type emitter**
 - D. P type emitter, N type collector, P type base
68. How many Maxwell's is 4000 lines of magnetic force?
- A. 200
 - B. 4000**
 - C. 2000
 - D. 400
69. Solve for the base current if collector current is 600ma and the current gain is 20
- A. 30mA**
 - B. 3mA
 - C. 12mA
 - D. 1.2mA
70. Meters with moving coil are normally used for measuring _____
- A. only dc**
 - B. both ac and dc
 - C. % value of dc
 - D. only ac
71. What is the law whereby the force of attraction or repulsion between poles is inversely proportional to the square of the distance between them?
- A. Newton's first law
 - B. Newton's second law
 - C. Norton's law
 - D. Coulomb's law**

72. _____ includes two of the actuator type used in industrial robots
- A. Pneumatic and jointed arm
 - B. Hydraulic and pneumatic**
 - C. Electric and spherical
 - D. Hydraulic and cylindrical
73. find the total force producing magnetic flux of a circuit having a 40v applied across a relay coil with 80 turns on 2 ohms resistance
- A. 16,000 At
 - B. 160.0 At
 - C. 16.00 At
 - D. 1600 At**
74. What do you call a logic gate that has an output of 1 only if a single output is 1?
- A. XOR**
 - B. NOT
 - C. XNOR
 - D. AND
75. What is the simplest type of switch?
- A. Relay
 - B. Toggle switch**
 - C. Knife switch
 - D. AND
76. Single device that converts chemical energy into electrical energy is called _____
- A. Generator
 - B. Battery
 - C. Solar
 - D. Cell**
77. How long will a battery needed to operate a 240 watts equipment, whose capacity is 100 ah and 24 volts rating?
- A. 5hrs
 - B. 10hrs**
 - C. 1hr
 - D. .10 hr

78. How many electrodes does a pentode have?
- A. 4
 - B. 2
 - C. 3
 - D. 5**
79. What do you call the quantity of magnetism retained by a magnetic material after the withdrawal of a magnetizing force?
- A. Left over magnetism
 - B. Coercivity
 - C. Hysteresis
 - D. Residual magnetism**
80. Low sensitive DC voltmeter provides inaccurate result when measuring _____ circuits
- A. high resistance**
 - B. low resistance
 - C. at any resistance
 - D. zero resistance
81. _____ is the air space between poles of magnet
- A. Air gap**
 - B. Free zone
 - C. Free space
 - D. Vacuum
82. What happens in the resistance of a conductor wire when its temperature is lowered?
- A. decreased**
 - B. steady
 - C. zero
 - D. increased
83. For the greatest accuracy, what should the input impedance of a VOM be?
- A. 1000ohms/v
 - B. 50,000ohms/v
 - C. as large as possible**
 - D. as low as possible

84. Determine the percentage error of reading of an ammeter due to ammeter insertion
ammeter parameters include 70 ohms internal resistance and a load resistor of 1.4k ohms
A. 7.5
B. 4.76
C. 3.76
D. 2.9
85. Refers to digital interface in which data character are individually synchronized and may be sent at a time
A. Half duplex
B. Asynchronous
C. Synchronous
D. Simplex
86. A transistor in which N type and P type materials are used is called _____
A. Unijunction
B. TTL
C. Bipolar
D. FET
87. What is the higher voltage level in digital gates and flip-flop circuits?
A. Yes or one
B. One or zero
C. Zero or no
D. Yes or no
88. Refers to a force of field that exist between ions where they either repel or attract each other
A. Resisting field
B. Potential field
C. Dielectric
D. Electromotive

89. The basic difference between a feedback in biasing an amplifier circuit is
- A. biasing circuits may employ positive feedback while amplifier circuits use negative feedback
 - B. biasing circuits have high input impedance while amplifier circuits have low output impedance
 - C. in biasing circuits DC negative feedback is provided while amplifiers employ AC negative feedback**
 - D. in biasing circuits AC negative feedback is provided while amplifier use DC negative feedback
90. What happens if the grid is made more positive than the saturation point?
- A. no other amplification takes place
 - B. the tube stops conducting
 - C. the tube elements might be damaged
 - D. electrons are drawn to the grid and not reach the plate**
91. What is another term for magnetic lines of force?
- A. Flux**
 - B. Magnetic Force
 - C. Armature
 - D. Lodestone
92. The speed of a dc shunt motor can be slowed down under one of the condition below
- A. Increased armature resistance
 - B. Decreased field voltage
 - C. Increased field voltage**
 - D. Increased armature voltage
93. Which of the following is not a basic part of an atom
- A. Electron
 - B. Proton
 - C. Neutron
 - D. Coulomb**
94. Find the normal operating voltage and current of LED
- A. 60v and 20mA
 - B. 5v and 50mA
 - C. 0.7v and 60mA
 - D. 1.7v and 20mA**

95. With the same voltage applied which of the following allows more current?
- A. 25ohms
 - B. 250ohms
 - C. 0.25ohms**
 - D. 2.5ohms
96. Refers to dry storage cell
- A. Carbon-zinc cell
 - B. Edison cell
 - C. Mercury cell
 - D. Nickel-cadmium cell**
97. If 12v are applied to a circuit that consumes 78w, what is the current flow through the circuit?
- A. 6.5A**
 - B. 936A
 - C. 0.15A
 - D. 9.36A
98. Which of the following does not refer to electric energy?
- A. Joule
 - B. Watt second
 - C. Volt coulomb
 - D. Volt ampere**
99. What is the other term for the secondary cells considering its capability to accept recharging
- A. Reaction cell
 - B. Primary cell
 - C. Storage cell**
 - D. Dry cell
100. Ion is _____
- A. an atom with unbalanced charges**
 - B. free electron
 - C. proton
 - D. nucleus without protons

TEST YOURSELF –EXAM 6

1. According to the classical Bohr model, the _____ is viewed as having a planetary-type structure.
A. atom
B. proton
C. electron
D. neutron
2. An n-type semi-conductive material is created by adding impurity atoms that have _____ valence electrons.
A. 2
B. 4
C. 3
D. 5
3. What composes an atom?
A. One nucleus and only one electron
B. Protons, electrons, and nucleus
C. One nucleus and only one proton
D. Electrons and protons only
4. What is nucleus of an atom?
A. It is made up of protons and neutrons.
B. Only protons are there.
C. Protons and electrons are within the nucleus.
D. It is composed only of neutrons.
5. What is the atomic number of silicon?
A. 29
B. 34
C. 14
D. 15
6. What is the atomic number of germanium?
A. 29
B. 34
C. 32
D. 15

7. What is the letter designation of the valence shell in a silicon atom?
A. M
B. N
C. O
D. L
8. Where are valence electrons found?
A. In the closest orbit to the nucleus
B. In various orbits around the nucleus
C. In the most distant orbit from the nucleus
D. In the nucleus of an atom
9. How is positive ion formed?
A. When a valence electron breaks away from the atom
B. When there are more holes than electrons in the outer orbit
C. When the two atoms bond together
D. When an atom gains an extra valence electron
10. How is negative ion formed?
A. When a valence electron breaks away from the atom
B. When there are more holes than electrons in the outer orbit
C. When the two atoms bond together
D. When an atom gains an extra valence electron
11. What is the most widely used semiconductor material in electronic devices?
A. Germanium
B. Silicon
C. Gallium
D. Arsenic
12. What energy band in which free electrons exists?
A. Valence band
B. Conduction band
C. First band
D. Second band

13. How are electron-hole pairs produced?
- A. By recombination
 - B. By thermal energy**
 - C. By ionization
 - D. By doping
14. When an electron falls into a hole this is
- A. recombination**
 - B. ionization
 - C. avalanche breakdown
 - D. doping
15. What hold together the atoms in a semiconductor crystal?
- A. By covalent bonding
 - B. By forces of attraction
 - C. By the interaction of valence electrons
 - D. All of the choices**
16. In a silicon crystal, each atom has
- A. four conduction electrons
 - B. eight valence electrons, four of its own and four shared**
 - C. four valence electrons
 - D. no valence electrons
17. What produces the current in a semiconductor?
- A. The electrons only.
 - B. The holes only.
 - C. Negative ions only.
 - D. By both electrons and holes.**
18. In an intrinsic semiconductor,
- A. the free electrons are thermally produced.
 - B. there are as many free electrons as there are holes.
 - C. there are no free electrons.
 - D. Both A and B above.**

19. What is the difference between semiconductor and an insulator?
- A. The atomic structure.
 - B. The number of free electrons.
 - C. A wider energy gap between the valence band and the conduction band.
 - D. All of the choices.**
20. What is the process of adding impurity to an intrinsic semiconductor?
- A. Doping**
 - B. Recombination
 - C. Ionization
 - D. Annihilation
21. What impurity is added to silicon to create a p-type semiconductor?
- A. Trivalent**
 - B. Pentavalent
 - C. Intrinsic
 - D. Extrinsic
22. What is the purpose of a pentavalent impurity?
- A. To reduce the conductivity of silicon
 - B. To increase the number of holes
 - C. To create minority carriers
 - D. To increase number of free electrons**
23. What are the majority carriers in an n-type semiconductor?
- A. Valence electrons
 - B. Conduction electrons**
 - C. Protons
 - D. Holes
24. What are holes in n-type semiconductor?
- A. Majority carriers that are thermally produced.
 - B. Minority carriers that are thermally produced.**
 - C. Majority carriers that are produced by doping.
 - D. Minority carriers that are produced by doping.

25. How is pn junction formed?
- A. By the boundary of p-type and n-type material**
 - B. By ionization
 - C. By collision of proton and neutron in the nucleus
 - D. By the recombination process
26. What creates the depletion region?
- A. Ionization
 - B. Diffusion
 - C. Recombination
 - D. All of the choices**
27. What are in the depletion region?
- A. Positive and negative ions**
 - B. Minority carriers
 - C. Majority carriers
 - D. All of the choices
28. What does the term bias mean?
- A. The amount of current across the junction.
 - B. The ratio of majority to minority carriers.
 - C. The dc voltage applied to control the operation of the devices.**
 - D. All of the choice
29. How to forward bias a pn junction diode?
- A. By applying an external voltage that is positive to the anode and negative to the cathode
 - B. By applying an external voltage that is positive at the p-region and negative at the n-region
 - C. By applying an external voltage that is negative at the anode and positive to the cathode.
 - D. Either A and B above.**
30. What happens when the pn junction is forward-biased?
- A. The current is produced by both holes and electrons**
 - B. Hole current is the only current
 - C. Electron current is only the current.
 - D. Majority carriers produced the only current.

31. What causes a very small current in reversed-bias condition?
- A. Majority carriers
 - B. Minority carriers**
 - C. Forward current
 - D. Reverse current
32. What is typically the forward-bias voltage for a silicon diode?
- A. Greater than 0.7 V**
 - B. Lesser than 0.7 V
 - C. Greater than 0.3 V.
 - D. Lesser than 0.3 V
33. When does a diode conduct current?
- A. When applied with a voltage
 - B. When forward-biased**
 - C. When reverse-biased
 - D. When power is on
34. What voltage is read by the voltmeter when connected across a forward-biased diode?
- A. The diode barrier potential**
 - B. The bias battery voltage
 - C. The total circuit voltage
 - D. 0 V
35. If the positive lead of an ohmmeter is connected to the anode of a diode and the negative lead to the cathode then the diode is
- A. reversed-biased
 - B. opened
 - C. shorted
 - D. forward-biased**
36. What is the ideal dc output of a capacitor filter?
- A. Equal to the rms value of the rectified voltage
 - B. Equal to the average value of the rectified voltage**
 - C. Equal to the peak value of the rectified voltage
 - D. Equal to the peak-to-peak value of the input voltage

37. If the load resistance of a capacitor-filtered full-wave rectifier is reduced, the ripple voltage
- A. increases**
 - B. decreases
 - C. has a different frequency
 - D. is not affected
38. What is the output of full-wave bridge-type rectifier when one of the diodes opens?
- A. 0 V
 - B. A half-wave rectified voltage**
 - C. A 120-Hz voltage
 - D. One fourth the amplitude of the input voltage
39. A virtual ground is a ground for
- A. voltage but not for current**
 - B. current but not for voltage
 - C. both current and voltage
 - D. neither current nor voltage
40. Normally in a zener voltage regulator the cathode is
- A. more negative than the anode
 - B. more positive than the anode**
 - C. at +0.7 V
 - D. grounded
41. What determines line regulation?
- A. The load resistance
 - B. The load current
 - C. The changes in load resistance and output voltage
 - D. The changes in the output voltage and input voltage**
42. What determines load regulation?
- A. The changes in load current and input voltage
 - B. The changes in load current and output voltage**
 - C. The changes in load resistance and input voltage
 - D. The changes in zener current and load current

43. What is a no-load condition?
- A. The load has infinite resistance.
 - B. The load has zero resistance.
 - C. The output terminals are open.
 - D. Both A and C.**
44. What is the maximum efficiency of a full-wave rectifier?
- A. 40.6%
 - B. 20.3%
 - C. 90%
 - D. 81.2%**
45. The dc output of the bridge type rectifier is nearly _____ than that of center tap circuit for a given transformer.
- A. thrice
 - B. twice**
 - C. four times
 - D. three times
46. In a center-tap circuit, _____ transformer secondary voltage is utilized.
- A. one-half**
 - B. full
 - C. one-third
 - D. one-eight
47. What is the maximum efficiency of a half-wave rectifier?
- A. 20.3%
 - B. 80.6%
 - C. 50%
 - D. 40.6%**
48. What rectifier circuit in which a transformer is essential?
- A. Bridge type
 - B. Half-wave
 - C. Center-tap**
 - D. Full-wave

49. In a full-wave rectifier, if ac supply is 50 Hz, then what is the ac ripple in the output?
- A. 50 Hz
 - B. 100 Hz**
 - C. 25 Hz
 - D. 200 Hz
50. How many diodes are used by a bridge type rectifier?
- A. Two
 - B. Four**
 - C. Three
 - D. Five
51. For the same dc output, center-tap circuit should have _____ PIV as compare to bridge type circuit.
- A. same
 - B. smaller
 - C. higher**
 - D. not comparable
52. What rectifier is used for high voltage applications?
- A. Center-tap
 - B. Bridge type**
 - C. Half-wave
 - D. Full-wave
53. What filter is generally employed in the power supply of a radio receiver?
- A. Choke filter
 - B. Capacitor input**
 - C. Resistance
 - D. Inductor input
54. What capacitor is generally used in filter circuits?
- A. Mica
 - B. Paper
 - C. Air
 - D. Electrolytic**

55. In a half-wave rectifier, if ac supply is 50 Hz, then what is the ac ripple?
A. 100 Hz
B. 50 Hz
C. 25 Hz
D. 12.5 Hz
56. The dc output of a bridge type circuit is _____ that equivalent center-tap circuit.
A. the same as
B. more than
C. less than
D. smaller
57. The values of L and C in filter circuits for a half-wave rectifier are _____ as compared to that of full-wave rectifier.
A. same
B. more
C. less
D. not related
58. What is provided by transformer coupling?
A. Impedance matching
B. Good frequency response
C. Step-up in voltage
D. Simplicity and economy
59. Germanium photodiodes have dark currents typically of the order of _____ mA.
A. 10
B. 15
C. 20
D. 25
60. How many filaments are there for a mercury vapor discharge tube for domestic lighting?
A. 2
B. 3
C. 4
D. 5

61. What is the typical value of slew rate of an operational amplifier?
- A. 1 V/ μ s**
 - B. 2 V/ μ s
 - C. 3 V/ μ s
 - D. 4 V/ μ s
62. What is the typical frequency range about the center frequency of a tunable magnetron?
- A. $\pm 1\%$
 - B. $\pm 3\%$
 - C. $\pm 4\%$
 - D. $\pm 5\%$**
63. The largest computers commonly use a word size of how many bits?
- A. 32
 - B. 64**
 - C. 128
 - D. 256
64. What is the maximum number of degrees of freedom of any solid object?
- A. 3
 - B. 4
 - C. 5
 - D. 6**
65. A microprocessor can communicate with other devices in the system of _____ buses.
- A. 2
 - B. 3**
 - C. 4
 - D. 5
66. The repeatability of a servo-controlled robot is within _____ mm rather than a fraction of a mm.
- A. 1
 - B. 2**
 - C. 3
 - D. 4

67. The Kuka spot welding robot has how any degrees of freedom?
- A. 2
 - B. 3
 - C. 4
 - D. 6**
68. A negative resistance region evidenced in the E_p - I_p characteristic of a tetrode when dc screen voltage exceeds dc plate voltage. The negative slope of the plate current curve is due to the screens attractive secondary electrons from the plate when screen voltage exceeds plate voltage and the attendant reduction of plate current during the interval. What effect is mentioned above?
- A. Tetrode effect
 - B. Magnetron effect
 - C. Compton effect
 - D. Dynatron effect**
69. The reception and reproduction of radio signals by ordinary pieces of metal in contact with each other, such as sections of stovepipes. This occurs when rusty bolts, faulty welds, or mechanically loose connections within strong radiated fields near transmitter and produce intermodulation interference. The mechanically poor connections serve as nonlinear diodes. What effect is mentioned above?
- A. Singing-stovepipe effect**
 - B. Dynatron effect
 - C. Compton effect
 - D. Malter effect
70. The elastic scattering of photons by electron. Since the total energy and total momentum are conserved in the collisions, the wavelength of the scattered radiation is changed by an amount that depends on the angle of scattering, and part of the photon energy is transferred to electrons. This effect is called
- A. Compton effect**
 - B. Hall effect
 - C. Malter effect
 - D. Thomson effect

71. The generation of acoustic waves, consisting of alternate regions of compression and rarefaction one half-wavelength apart, by a piezoelectric crystal vibrating in a longitudinal mode in a liquid. When a parallel beam of light sent through the liquid in a tank having plate-glass walls, the acoustic waves act as a diffraction grating that can be used to determine the velocity of sound in the liquid. This effect is called
- A. Damon effect
 - B. Debye-Sears effect**
 - C. Thomson effect
 - D. Malter effect
72. When light falls on a light surface of an intermetallic semiconductor located in a magnetic field that is parallel to the surface, excess hole electron pairs are created. Those carriers diffuse in the direction of the light but are deflected by the magnetic field to give a current flow through the semiconductor that is at right angles to both the light rays and magnetic field. This is known as the
- A. Photoelectromagnetic effect**
 - B. Conductive effect
 - C. Photo effect
 - D. Light effect
73. What determines the identity of an element?
- A. The number of protons in the nucleus**
 - B. The number of electrons in the orbit
 - C. The number of neutrons in the nucleus
 - D. The atomic mass
74. Who coined the term hypertext?
- A. Ted Nelson**
 - B. Tim Berners-Lee
 - C. Larry Roberts
 - D. Vannevar Bush
75. Who is known as the Father of the ARPANET?
- A. Ted Nelson
 - B. Tim Berners-Lee
 - C. Larry Roberts**
 - D. Vannevar Bush

76. Who coined the term nanotechnology?

- A. Norio Taniguchi**
- B. Aibo Nintendo
- C. Yakura Tamaguchi
- D. Sato Mikado

77. What do you call waves of electrons traveling along the surface of metals?

- A. Plasmons**
- B. Isotopes
- C. Nucleons
- D. Nanomons

78. Who invented Ethernet?

- A. Bob Metcalfe**
- B. Douglas Engelbart
- C. Tim Berners-Lee
- D. Larry Roberts

79. Who is the inventor of the mouse?

- A. Bob Metcalfe
- B. Douglas Engelbart**
- C. Tim Berners-Lee
- D. Larry Roberts

80. Who developed the internet browser called Mosaic?

- A. Marc Andreessen**
- B. Paul Baran
- C. Larry Roberts
- D. Bob Metcalfe

81. Who created the World Wide Web?

- A. Bob Metcalfe
- B. Douglas Engelbart
- C. Tim Berners-Lee**
- D. Larry Roberts

82. Who wrote the Transmission Control Protocol (TCP) for internet?
- A. Vinton Cerf
 - B. Bob Khan
 - C. Tim Berners-Lee
 - D. Both A and B**
83. Who wrote the Hypertext Transfer Protocol (HTTP), the language computer could use to communicate hypertext documents over the internet?
- A. Vinton Cerf
 - B. Bob Khan
 - C. Tim Berners-Lee**
 - D. Larry Roberts
84. What effect refers to a leakage current that flow over a surface path between the collector and emitter in some types of transistors?
- A. Channel effect**
 - B. Collector follower effect
 - C. Leakage effect
 - D. Emitter effect
85. An effect about the change that the susceptibility of a ferrite undergoes under the influence of high RF powder.
- A. Change effect
 - B. Damon effect**
 - C. Dead-end effect
 - D. Barnett effect
86. An outward-curving distortion of lines of force near the edges of two parallel metal plates that form a capacitor.
- A. Change effect
 - B. Edge effect**
 - C. Dead-end effect
 - D. Skin effect
87. The extension of the electrostatic field of an air capacitor outside the space between its plates.
- A. Fringe effect**
 - B. Edge effect
 - C. Extension effect
 - D. Flywheel effect

88. The sudden, large increase in current that occurs when a particular value of reverse voltage is reached, and which is due to ionization by the high intensity electric field in the depletion region in reverse-biased pn junction.
- A. Zener effect**
 - B. Avalanche effect
 - C. Radiation effect
 - D. Burst effect
89. The liberation or absorption of heat when an electric current flows from a warmer to a cooler part of a conductor.
- A. Zener effect
 - B. Skin effect
 - C. Surface effect
 - D. Thomson effect**
90. The piercing of a barrier in a semiconductor by a particle that does not have sufficient energy to go over the barrier.
- A. Channel effect
 - B. Damon effect
 - C. Tunnel effect**
 - D. Barrier effect
91. The development of a voltage across the junction of two dissimilar materials.
- A. Photovoltaic effect**
 - B. Hall effect
 - C. Piezoelectric effect
 - D. Flywheel effect
92. The increase in the effective grid-cathode capacitance of a vacuum tube due to the charge induced electrostatically on the grid by the anode through the grid-anode capacitance.
- A. Hall effect
 - B. Barnett effect
 - C. Damon effect
 - D. Miller effect**

93. The development of a voltage between the two edges of a current-carrying metal strip whose faces are perpendicular to a magnetic field.
- A. Hall effect**
 - B. Barnett effect
 - C. Miller effect
 - D. Damon effect
94. A magnetic field when applied to a right angles to the direction of a temperature gradient in a conductor, a temperature difference is produced at right angles both to the direction of temperature gradient and the direction of the magnetic field.
- A. Hallwachs effect
 - B. Island effect
 - C. Isotope effect
 - D. Leduc effect**
95. The ability of a resonant circuit to maintain oscillation at an essentially constant frequency when fed with short pulses of energy at constant frequency and phase.
- A. Flywheel effect**
 - B. Leduc effect
 - C. Hall effect
 - D. Thomson
96. The development of a DC voltage between two regions of a photoconductive semiconductor when one of the regions is illuminated by diffusion of an optically generated hole and electron pairs away from the illuminated region.
- A. Destriau effect
 - B. Isotope effect
 - C. Dember effect**
 - D. Hawks effect
97. Phenomenon of a current flowing between two unequal illuminated electrodes of a certain type when they are immersed in an electrolyte.
- A. Bequerel effect**
 - B. Destriau effect
 - C. Dember effect
 - D. Hawks effect

98. The restriction of emission from the cathode of an electron tube to a certain small areas of the cathode when the grid voltage is lower than a certain value.

A. Island effect

B. Isotope effect

C. Damon effect

D. Hawks effect

99. The tendency for layer of semiconductor having a high secondary emission ratio to become positively charged when bombarded by electrons. This occurs when a thin insulator separates the semiconductor from the metal plates. The insulator must be very thin on the order of 10^{-7} meters. This results in a potential difference of up to about 100 volts.

A. Mateucci effect

B. Malter effect

C. Destriau effect

D. Hall effect

100. The magnetic force between adjacent current-carrying conductors is referred to as

A. motor effect

B. edge effect

C. proximity effect

D. generator effect

TEST YOURSELF – EXAM 7

1. What is anything that has weight had occupied space which may be a solid, liquid or gas?
 - A. Alloy
 - B. Matter**
 - C. Amalgam
 - D. Compound
2. What is the capacitive reactance of a 33 microfarad capacitor at 6500 Hz?
 - A. 0.74 ohms**
 - B. 7.4 ohms
 - C. 96 ohms
 - D. 1122 ohms
3. Which of the following materials refers to as a recipient of impurity element?
 - A. Phosphorous
 - B. Antimony
 - C. Arsenic
 - D. Gallium**
4. In the operation of dry cells, we normally refer to the supply of current to load resistance where its current neutralizes the separated charges at the electrodes.
 - A. Aligning the cells
 - B. Charging the cells
 - C. Discharging the cells**
 - D. Polarizing the cells
5. They are special class C amplifiers that are biased at 3 to 10 times the normal cutoff and used to generate frequency that is a harmonic of a lower frequency.
 - A. Frequency generators
 - B. Frequency stabilizers
 - C. Frequency multipliers**
 - D. Frequency amplifiers
6. In voltmeter, the purpose of series resistor is to _____.
 - A. increase speed of meter movement
 - B. decrease the current range
 - C. decrease the voltage range
 - D. increase the voltage range**

7. ICs that are combinations of monolithic and film of discrete components or any combinations thereof to allow flexibility in circuits.
- A. Hybrid IC**
 - B. Micro IC
 - C. Mixed IC
 - D. Combined IC
8. An instrument used to record the electric potentials associated with the electrical currents that traverse the heart.
- A. Electrograph
 - B. Electrolysis
 - C. Electroencephalograph
 - D. Electrocardiograph**
9. SUBTRACT: $11001(\text{subscript } 2) - 1001(\text{subscript } 2)$.
- A. 10001
 - B. 10100
 - C. 10010
 - D. 10000**
10. What is the name of an electrode found in a pentode but not in a tetrode?
- A. Control grid
 - B. Screen grid
 - C. Signal grid
 - D. Suppressor grid**
11. What is the magnetic equivalent to electrical voltage?
- A. Flux
 - B. Reluctance
 - C. Magnetomotive force**
 - D. Magnetic field
12. The effect of 60 Hz AC 40-100 mA or DC 160-300 mA on the human body.
- A. Muscular failure
 - B. Reflex action
 - C. Surprise
 - D. Respiratory failure**

13. How many junctions are there in a semiconductor diode?
- A. Two
 - B. One**
 - C. None
 - D. Four
14. A transformer composed of two or more coils which are wound around a non metallic core.
- A. Metallic core transformer
 - B. Free core transformer
 - C. Iron core transformer
 - D. Air core transformer**
15. How many half wave rectifiers will make up a half wave voltage doubler?
- A. 6
 - B. 2**
 - C. 8
 - D. 4
16. What materials are meter pointers normally made?
- A. Copper
 - B. Iron
 - C. Zinc
 - D. Aluminum**
17. In NPN transistor, when emitter junction is forward biased and collector junction is reversed biased, the transistor will operate in
- A. cut off region**
 - B. saturation region
 - C. active region
 - D. inverted region
18. An instrument used to detect presence, sign and in some configurations the magnitude of an electric charge by the mutual attraction or repulsion of metal foils or pith balls.
- A. Electroscope**
 - B. Electrometer
 - C. Electron microscope
 - D. Electrograph

19. What is the term we use to refer to the instructions we give a computer to perform?
- A. Processor
 - B. Program**
 - C. Hardware
 - D. Software
20. The total number of magnetic lines force leaving or entering the pole of a magnet.
- A. Potential field
 - B. Magnetic field
 - C. Magnetic space
 - D. Magnetic flux**
21. How do you call an eight element vacuum tube?
- A. Pentode
 - B. Hexode
 - C. Octode**
 - D. Septode
22. What is the lightest kind of atom or element?
- A. Oxygen
 - B. Hydrogen**
 - C. Titanium
 - D. Helium
23. Materials that can be easily magnetized in both direction
- A. High hysteresis magnetic materials
 - B. Low hysteresis magnetic materials
 - C. Hard magnetic materials
 - D. Soft magnetic materials**
24. Which of the following statement is true in semiconductor application?
- A. An ohmmeter test across a diode shows high resistance in both polarity of test
 - B. An ohmmeter test across the base-collector of a transistor should show high resistance in the opposite polarity**
 - C. An ohmmeter test across the base- collector of a transistor should show low resistance for both polarity
 - D. Triac is one direction semiconductor

25. A motor- generator unit in which is built to convert low voltage direct current to high voltage direct current, both use the same field windings and share armature.
- A. Vibrator
 - B. Dynamotor**
 - C. Gen- set
 - D. Electric generator
26. In order to have a good conductor material, such material shall have _____ valence electrons.
- A. more than ten
 - B. five
 - C. one**
 - D. twenty one
27. What causes damped oscillation in oscillator circuits?
- A. The resistance of the coil and inductor**
 - B. Due to time
 - C. The increase in frequency
 - D. The absence of voltage
28. How can electrical current be induced with a coil and a magnet?
- A. Holding the coil and the magnet perfectly stationary
 - B. Moving either the magnet or the coil**
 - C. Placing the coil parallel to the magnetic field
 - D. Placing the coil at right angles with the magnetic field
29. In microelectronics, it reduces weight and eliminates point-to-point wiring
- A. Harness
 - B. Printed circuit board (PCB)**
 - C. Chassis
 - D. Module
30. What is the name given to a synchro system that transmits data at two different speeds?
- A. Bi- speed synchro system
 - B. Dual or double speed synchro system**
 - C. Double- speed synchro system
 - D. Two- speed synchro system

31. A gate that produces an output when it does not receive a pulse
- A. AND Gate
 - B. NOT Gate
 - C. NAND Gate
 - D. NOR Gate**
32. It takes place when armature current causes the armature to become an electromagnet, the armature field disturbing the field from the pole pieces resulting in the shift of the neutral plane in the direction of rotation.
- A. Motor reaction
 - B. Armature coupling
 - C. Armature de- coupling
 - D. Armature reaction**
33. Find the meaning of the term beta culoff frequency with regard to a bipolar transistor.
- A. That frequency at which the grounded collector current gained decreased to 0.7 of that obtainable at 1 kHz in a transistor
 - B. That frequency at which the grounded base current gain has decreased to 0.7 of that obtainable at 1 kHz in a transistor
 - C. That frequency at which the grounded emitter current gain has decreased to 0.7 of that obtainable at 1 kHz in a transistor**
 - D. That frequency at which the grounded date current gain has decreased to 0.7 of that obtainable at 1 kHz in a transistor
34. It consists of elements inseparably associated and formed on or within a single substrate
- A. Integrated Circuit (IC)**
 - B. Microsoft
 - C. Module
 - D. Micro circuit
35. A system in which the precise movement of a large load is controlled by a relatively weak signal.
- A. Synchro
 - B. Electro
 - C. Hydraulic
 - D. Servo**

36. The phrase which means people acquired enough understanding of common technical terms so they are not intimidated by computer jargon to make better use a home or workplace computer.
- A. Computer literacy**
 - B. Computer know- how
 - C. Computer savvy
 - D. Computer logic
37. A program which is not included in the industrial robot user- program categories is called _____.
- A. point-to-multipoint programs
 - B. continuous-path programs**
 - C. positive-stop programs
 - D. point-to-point programs
38. What instrument is used to measure the direction of earth's magnetic line of force in respect to the plane of the horizon?
- A. Inclinator**
 - B. GPS
 - C. Indicator
 - D. Altimeter
39. What is referred to as the variation in output voltages as the load changes expressed as a percentage?
- A. Voltage regulation**
 - B. Voltage variance
 - C. Voltage difference
 - D. Voltage change
40. What type of bias opposes the pn junction barrier?
- A. No bias
 - B. Reverse bias
 - C. Direct bias
 - D. Forward bias**
41. Which of the following refers to electric power?
- A. Joule
 - B. Walt second
 - C. Volt coulomb
 - D. Volt ampere**

42. What is the first mass- produced computer built by Eckert and Mauchly Computer Company in Philadelphia USA in 1950.
- A. IBM- 701
 - B. CRAY- 1
 - C. UNIVAC**
 - D. ENIAC
43. What is the property of a material which opposes creation of magnetic flux?
- A. Resistance
 - B. Permeance
 - C. Reluctance**
 - D. Conductance
44. What is the first commercial computer that was introduced in 1953 that used valves?
- A. IBM-701**
 - B. ENIAC
 - C. IBM-1400
 - D. UNIVAC
45. What composes all matter whether a liquid, solid or gas?
- A. Atom**
 - B. Electrons
 - C. Protons
 - D. Neutrons
46. A higher- power, lower- frequency diode is normally _____ than low- power high- frequency diode
- A. larger**
 - B. smaller
 - C. heavier
 - D. smoother
47. What does a dynamic memory normally contain?
- A. Column decoders only
 - B. Row decoders only
 - C. No decoders
 - D. Both column and row decoders**

48. What is the term for the number of times per second that a tank circuit energy is stored in the inductor or capacitor?
- A. Resonant frequency**
 - B. Non-resonant frequency
 - C. Circuit frequency
 - D. Broadcast frequency
49. What type of actuator of industrial robots has a great force capability and great holding strength when stopped?
- A. Pneumatic
 - B. Steam
 - C. Electric
 - D. Hydraulic**
50. What is a physical combination of compounds or elements NOT chemically combined that can be separated by physical means?
- A. Molecule
 - B. Atom
 - C. Substance
 - D. Mixture**
51. What is a thin polished slice of a semiconductor crystal on which integrated circuit can be fabricated often in duplicate for cutting into individual dice?
- A. Silicon
 - B. Indium
 - C. Gallium
 - D. Wafer**
52. A scanning device using thin, fan- shaped x-ray beam producing a cross sectional view of tissue within the human body
- A. Thermograph
 - B. Mamograph
 - C. Computerized Tomography (CT) or Computerized Axial Tomography (CAT)**
 - D. Polygraph

53. Which device uses the principle that light striking a PN junction knocks bound electrons out their “sockets” and thus greatly increases the reverse leakage current?
- A. LED
 - B. Phototransistor**
 - C. Thyatron
 - D. All of the above
54. What area of technology is associated with electronic systems designed with extremely small parts or elements?
- A. Micro- electronics**
 - B. Macro- electronics
 - C. Electronic circuits
 - D. Mini- electronics
55. Which of the following statements is not true?
- A. Edison cell is storage type
 - B. The NiCd cell is primary type**
 - C. Output of solar cell is normally 0.5V
 - D. Primary cells can be charged
56. It exists in the space surrounding a magnet
- A. Magnetic field**
 - B. Magnetic pole
 - C. Magnetic space
 - D. Potential space
57. What gyro characteristic for property provides the basis of the operation of a rate gyro?
- A. Rigidity
 - B. Selectivity
 - C. Precession**
 - D. Sensitivity
58. A control synchro device accurately governing some type of power amplifying device that is used to move heavy equipment
- A. Control transmitter
 - B. Differential transmitter
 - C. Control translator
 - D. Control transformer**

59. What is the purpose of the fetch cycle in a computer?
- A. To obtain instruction**
 - B. To obtain input data
 - C. To obtain memory data
 - D. To implement a specific data
60. The process of reversing the current flow through the battery to restore the battery to its original condition
- A. Electrolysis
 - B. Ionization
 - C. Reverse flow
 - D. Battery charge**
61. Semi-conductors which are doped with either N or P types of impurities are called _____.
- A. Intrinsic
 - B. P-type
 - C. Extrinsic**
 - D. N-type
62. Which of the basic timing circuits produces sharp trigger pulses directly?
- A. Blocking circuits
 - B. Integrators
 - C. Astable multi-vibrators**
 - D. Differentiators
63. What is a three-terminal resistor with one or more sliding contacts which functions as an adjustable voltage divider?
- A. Voltage divider
 - B. Rheostat
 - C. Potentiometer**
 - D. Bleeder resistor
64. How does synchro stator receive its voltage?
- A. Self-induction
 - B. Direct power source
 - C. Thermal board
 - D. By magnetic coupling from the rotor**

65. This method of monolithic IC production, elements do not penetrate the substrate.
- A. Diffusion
 - B. Evaporation
 - C. Epitaxial**
 - D. Cathode spluttering
66. A major component of a computer that communicates results to computer user in printers, screens (CRT), and discs is called _____
- A. Input device
 - B. Central unit
 - C. Storage
 - D. Output device**
67. How can a series-positive limiter be modified to limit unwanted negative portion of the input signal?
- A. Negative biasing**
 - B. Positive biasing
 - C. Biasing
 - D. Forward biasing
68. What is the purpose of using a differential synchro instead of regular synchro?
- A. Handles more signals only
 - B. Performs addition and subtraction functions only
 - C. Handles two signals only
 - D. Differentials synchros can handle more signal and also perform addition and subtraction functions**
69. The intensity of a magnetic field directly related to the magnetic force exerted by the field.
- A. Field intensity**
 - B. Magnetic flux
 - C. Magnetic force
 - D. Magnetic field
70. IC production method to prevent unwanted interaction between elements within a chip.
- A. Evaporation
 - B. Cathode spluttering
 - C. Isolation**
 - D. Diffusion

71. Analysis of the spectrum of light or other form of electromagnetic radiation emitted or absorbed by a substance in order to investigate its structure.

- A. Fluoroscopy
- B. Calligraphy
- C. Spectroscopy**
- D. Spectography

72. Which of the following items are elements of a computer operating system?

- i. Control over input/output device
- ii. Organization and control of files
- iii. Control of program execution
- iv. Control of memory allocation to different programs.
- v. Only b, c and d
- vi. Only a, c and d**
- vii. Only a, b and c
- viii. a, b, c and d

73. Which of the following are advantages of non-servo controlled robot?

- i. High repeatedly
- ii. High speed operation
- iii. Low cost

- iv. Only a and b
- v. Only b and c**
- vi. a, b and c
- vii. Only a and c

74. Its purpose is to counteract armature reaction

- A. Armature windings
- B. Commutators
- C. Field windings
- D. Interpoles and compensating windings**

75. What type of servo system whose goal is to control the position of the load?

- A. Accelerator servo
- B. Velocity servo
- C. Time servo
- D. Position servo**

76. A new concept in commercial aircraft where computers monitor aircraft systems reporting on their status only if requested by the pilot or if something is wrong and displayed on the screen when necessary.
- A. Virtual cockpit
 - B. Real cockpit
 - C. Glass cockpit**
 - D. The cockpit
77. A basic requirement of a closed loop system (not present in open-loops) that enables present load position to be sensed.
- A. Input
 - B. Overload
 - C. Error signal
 - D. Feedback**
78. Which is not a function of register in digital circuit?
- A. Data storage device
 - B. Sequence generators
 - C. Use in counters
 - D. Use to block signal**
79. Which of the following material possesses permeabilities slightly less than that of free space?
- A. Diamagnetic**
 - B. Paramagnetic
 - C. Ferromagnetic
 - D. Non-magnetic
80. An assembly of microcircuits or combination of microcircuits and discrete components packaged as replacement.
- A. Electronic module
 - B. Microcircuit module**
 - C. PCB
 - D. Minielectronics

81. An electronic oscillator which is similar to Hartley oscillator except a minor modification instead of a tapped coil, a variable capacitor is used instead across a common conductor.
- A. Crystal oscillator
 - B. Armstrong oscillator
 - C. R-C phase shift oscillator
 - D. Colpitts oscillator**
82. The most unstable biasing method in the basic transistor amplifier.
- A. Limited bias
 - B. Combination bias
 - C. Base current bias of fixed bias**
 - D. Self bias
83. Physical phenomena where forces acting in the medium produce motion in exact proportion.
- A. Non-reciprocity effects
 - B. Linearity**
 - C. Reciprocity
 - D. Non-linear effects
84. CMRR for an operational amplifier should be
- A. As large as possible**
 - B. Close to zero
 - C. Close to unit
 - D. As small as possible
85. Sinusoidal oscillator that are turned on and off for a specific time duration to produce outputs at a predetermined frequency for an indefinite period of time.
- A. Pulsed oscillator**
 - B. Phase shift oscillator
 - C. Crystal oscillator
 - D. Basic oscillator
86. Type of MOSFET that can be independently controlled by two separate signals.
- A. JFET
 - B. Dual-gate MOSFET**
 - C. Induced channel MOSFET
 - D. IGFET

87. What physical effect will a two parallel wires and with the same direction of current flowing over them?
- A. Maintain position
 - B. Repel each other
 - C. No physical effect
 - D. Attract each other**
88. What direction is the magnetic field about a conductor when current is flowing?
- A. In a direction opposite to the current flow
 - B. In all direction; omnidirectional
 - C. In the same direction of the current
 - D. In a direction determined by the left hand rule**
89. The primary difference between the PNP and NPN amplifier
- A. Capacity
 - B. Type of input
 - C. Type of bias
 - D. Polarity of source voltage**
90. What is the purpose of an external plate-lead resistor in an amplifier circuit?
- A. To provide signal variations in plate voltage
 - B. To provide screen guide voltage
 - C. To provide higher amplification factor of the tube**
 - D. To provide required bias voltage
91. An application of an operational amplifier in which the output signal is determined by the sum of the input signals multiplied by the gain: $E_{out} = \text{Gain} (E_1 + E_2 + \dots)$
- A. Magnetic amplifier
 - B. Summing amplifier**
 - C. Difference amplifier
 - D. Scaling amplifier
92. Refers to a design of a system taking into account environmental and electronic characteristics, access and maintainability.
- A. System handling
 - B. System packaging**
 - C. Packaging
 - D. Packaging levels

93. What law in electronics where an induced current will be in such a direction that its own magnetic field will oppose the magnetic field that produces the same?
- A. Electromagnetic law
 - B. Norton's law
 - C. Lenz's law**
 - D. Maxwell's law
94. Semi-conductor chip with electrodes (leads) extended beyond the wafer
- A. DICE
 - B. Flip chip
 - C. Beam-lead chip**
 - D. DIP
95. What is skin effect?
- A. The phenomenon where RF current flows in a thinner layer of the conductor, close to the surface, as frequency decreases.
 - B. The phenomenon where RF current flows in a thinner layer of the conductor, close to the surface, as frequency increases.**
 - C. The phenomenon where thermal effects on the surface of the conductor increases the impedance.
 - D. The phenomenon where thermal effects on the surface of the conductor decreases the impedance.
96. What do you call the ratio between the intensity of magnetization produced in a substance, to the source of magnetizing force?
- A. Magnetic resistivity
 - B. Magnetic conductivity
 - C. Magnetic susceptibility**
 - D. Magnetic reluctance
97. What do you call the non-metallic material that has ferromagnetic properties?
- A. Ferrite**
 - B. Ferromagnetic
 - C. Diamagnetic
 - D. Paramagnetic

98. Process by which a magnetic substance becomes a magnet when it is placed near a magnet.

A. Electromagnetic induction

B. Magnetic reflection

C. Influx of density

D. Magnetic induction

99. Which class of amplifier provides the highest efficiency?

A. Class A

B. Class AB

C. Class C

D. Class B

100. Fine wires connecting the bonding pad to the chip to the external lead of the package.

A. Harness

B. Cables

C. Bonding wires

D. Leads

TEST YOURSELF –EXAM 8

1. What is the term given to arranging data records in a predefined sequence or order?
A. Sorting
B. Arranging
C. Sequencing
D. Ordering
2. What computer language was developed for mathematical work?
A. MATIMATICA
B. BASIC
C. MATHTYPE
D. FORTRAN
3. What IF frequencies are normally used in radar receivers?
A. 30 or 60 MHz
B. 60 or 80 MHz
C. 30 or 40 MHz
D. 60 or 70 MHz
4. Mechanical rotation frequency is measured using a device called ____.
A. Frequency counter
B. Accelerometer
C. Frequency meter
D. Tachometer
5. Electrical-output frequencies of ac generators can be measured by ____.
A. Vibrating-reed devices or tuned circuits
B. Accelerometer
C. Frequency meter
D. Tachometer
6. Audio frequencies can be measured by a process known as ____.
A. Frequency counting
B. Beating
C. Zero beating
D. Mixing

7. What is another term for zero beating?
- A. Frequency counting
 - B. Beating
 - C. Heterodyning**
 - D. Mixing
8. What wavemeter is used for measuring frequencies in the microwave range?
- A. Frequency counter
 - B. Cavity wavemeter**
 - C. Bolometer
 - D. Absorption wavemeter
9. What is the process of matching an unknown signal with a locally generated signal of the same frequency obtained from a calibrated high-precision oscillator?
- A. Frequency beating
 - B. Beating
 - C. Zero beating**
 - D. Mixing
10. What device that sweeps over a band of frequencies to determine what frequencies are being produced by a specific circuit under test and the amplitude of each frequency component?
- A. Frequency counter
 - B. Cavity wavemeter
 - C. Bolometer
 - D. Spectrum analyzer**
11. What is commonly used for the analysis of waveforms generated by electronic equipment?
- A. Frequency counter
 - B. Cavity wavemeter
 - C. Cathode-ray oscilloscope(CRO or O-SCOPE)**
 - D. Bolometer
12. What is device used to measure frequencies above the audio range?
- A. Frequency counter
 - B. Cavity wavemeter
 - C. Bolometer
 - D. Electronic frequency counter**

13. What are calibrated resonant circuits used to measure frequency?
- A. Frequency counter
 - B. Cavity wavemeter
 - C. Wavemeters**
 - D. Spectrum analyzer
14. What is the difference in frequency between the oscillator frequency and the unknown frequency?
- A. Beat frequency**
 - B. Image frequency
 - C. IF
 - D. Signal frequency
15. The rotation frequency of recording devices and teletypewriter motors can be measured by the use of a ____.
- A. Tachometer
 - B. Frequency counter
 - C. Oscilloscope
 - D. Stroboscope**
16. What is an instrument that allows you to view rotating or reciprocating objects intermittently and produces the optical effect of a slowing down or stopping motion?
- A. Tachometer
 - B. Frequency counter
 - C. Oscilloscope
 - D. Stroboscope**
17. What is an electronic flash device in which the flash duration is very short, a few millionths of a second and can measure very rapid motion?
- A. Tachometer
 - B. Frequency counter
 - C. Strobotac**
 - D. Stroboscope
18. What is a combination of watch and revolution counter?
- A. Chronometric tachometer**
 - B. Frequency counter
 - C. Strobotac
 - D. Stroboscope

19. What type of bolometer is characterized by an increase in resistance as the dissipated power rises?
- A. Chronometric tachometer
 - B. Barretter**
 - C. Strobotac
 - D. Stroboscope
20. What type of bolometer is characterized by decrease in resistance as the power increases?
- A. Chronometric tachometer
 - B. Barretter
 - C. Strobotac
 - D. Thermistor**
21. What instrument is used for measuring radio frequency (rf) power?
- A. Thermocouple ammeter**
 - B. Barretter
 - C. Strobotac
 - D. Thermistor
22. When using strobotac, at what speed is “flicker” becomes a problem because the human eye can retain successive images long enough to create the illusion of continuous motion?
- A. 600 rpm**
 - B. 1200 rpm
 - C. 500 rpm
 - D. 300 rpm
23. What is the approximate life of the strobotron lamp if used at flashing speeds of less than 5,000 rpm?
- A. 250 hours**
 - B. 1200 hours
 - C. 500 hours
 - D. 300 hours
24. What is the approximate life of the strobotron lamp if used at flashing speeds of more than 5,000 rpm?
- A. 250 hours
 - B. 100 hours**
 - C. 500 hours
 - D. 300 hours

25. What are used as filters for the passage or rejection of specific frequencies?
- A. Tuned circuits**
 - B. Band pass filter
 - C. Filter circuits
 - D. High pass filter
26. An elementary, single coil, dc generator will have an output voltage with how many pulsations per revolution?
- A. One
 - B. Three
 - C. Two**
 - D. Four
27. How many commutator segments are required in a two-coil generator?
- A. One
 - B. Three
 - C. Two
 - D. Four**
28. How can field strength be varied in a practical dc generator?
- A. By varying the input voltage to the field coils**
 - B. By varying the output voltage to the field coils
 - C. By increasing the number of field windings
 - D. By decreasing the number of field windings
29. Are dc generators that are designed to act as high-gain amplifier.
- A. Amplidynes**
 - B. Dynamos
 - C. Synchros
 - D. Servos
30. The power output of the amplidynes may be up to ___ times larger than the power input to its control windings.
- A. 100,000
 - B. 1,000
 - C. 10,000**
 - D. 100

31. What generators have both series field windings and shunt field windings?
- A. Universal generators
 - B. Series-wound dc generators
 - C. Parallel-wound dc generators
 - D. Compound-wound dc generators**
32. The substrate of an N-channel MOSFET is made of what material?
- A. P-type material**
 - B. Intrinsic material
 - C. N-type material
 - D. Extrinsic material
33. In a MOSFET, which element is insulated from the channel material?
- A. The source terminal
 - B. The gate terminal**
 - C. The substrate terminal
 - D. The drain material
34. What type of MOSFET can be independently controlled by two separate signals?
- A. The single-gate MOSFET
 - B. The four-gate MOSFET
 - C. The dual-gate MOSFET**
 - D. The dual-drain MOSFET
35. What is the purpose of the spring or wire around the leads of a new MOSFET?
- A. To prevent damage from static electricity**
 - B. To prevent damage from dynamic electricity
 - C. To prevent damage from intense pressure
 - D. To prevent damage from intense temperature
36. What is a typical light-to-dark resistance ratio for photocell?
- A. 1:1000**
 - B. 1:2000
 - C. 1:10000
 - D. 1:20000

37. What semiconductor device produces electrical energy when exposed to light?
- A. Photoelectronic cell
 - B. Photovoltaic cell**
 - C. Photoelectric cell
 - D. Optoelectronic device
38. The UJT has how many PN junctions?
- A. One**
 - B. Three
 - C. Two
 - D. Four
39. The area between base 1 and base 2 in a UJT acts as what type of common circuit component?
- A. Variable inductor
 - B. Variable resistor**
 - C. Variable capacitor
 - D. Fixed resistor
40. The sequential rise in voltage between the two bases of the UJT is called what?
- A. A voltage spike
 - B. A voltage peak
 - C. A voltage gradient**
 - D. A voltage surge
41. What is the normal current path for a UJT?
- A. From base 1 to the emitter**
 - B. From base 1 to base 2
 - C. From base 2 to the emitter
 - D. From the input to output
42. What is one of the primary advantages of the FET when compared to the bipolar transistor?
- A. Low input impedance
 - B. High input impedance**
 - C. Low output impedance
 - D. High output impedance

43. The SCR is primarily used for what function?
- A. The SCR is primarily used for amplifying
 - B. The SCR is for both switching and amplifying
 - C. The SCR is primarily used for switching power on or off**
 - D. The SCR is for any electronic application
44. When an SCR is forward biased, what is needed to cause it to conduct?
- A. A drain signal
 - B. A source signal
 - C. A anode signal
 - D. A gate signal**
45. What is the only way to cause an SCR to stop conducting?
- A. The forward bias must be reduced below the minimum conduction level**
 - B. The forward bias must be increased above the minimum conduction level
 - C. The forward bias must be equal to the minimum conduction level
 - D. The reverse bias must be reduced below the minimum conduction level
46. The TRIAC is similar in operation to what device?
- A. SCS
 - B. SCR**
 - C. UJT
 - D. DIAC
47. When used for ac current control, during which alternation of the ac cycle does the TRIAC control current flow?
- A. During both alternations**
 - B. With only one alternation
 - C. During positive alternation only
 - D. During negative alternation only
48. What type of bias is required to cause an LED to produce light?
- A. Forward bias**
 - B. Either a of b
 - C. Reverse bias
 - D. Neither a nor b

49. When compared to incandescent lamps, what is the power requirement of an LED?
- A. Very high
 - B. Very low**
 - C. High
 - D. Low
50. The varactor displays what useful electrical property?
- A. Variable resistance
 - B. Variable capacitance**
 - C. Variable inductance
 - D. Variable frequency
51. When a PN junction is forward biased, what happens to the depletion region?
- A. The depletion region decreases**
 - B. The depletion region increases
 - C. The depletion region disappears
 - D. The depletion region remains the same
52. When the reverse bias on a varactor is increased, what happens to the effective capacitors?
- A. Capacitance increases
 - B. Capacitance decreases**
 - C. Capacitance remains the same
 - D. Temperature coefficient increases
53. In a reverse biased PN-junction, which current carriers cause leakage current?
- A. The majority carriers
 - B. The minority carriers**
 - C. The majority and minority carriers
 - D. Either the majority or minority carriers
54. The action of a PN-junction during breakdown can be explained by what two theories?
- A. Zener effect and avalanche effect**
 - B. Zener and flywheel effects
 - C. Avalanche and flywheel effects
 - D. Zener and miller effects

55. Which breakdown theory explains the action that takes place in a heavily doped PN-junction with a reverse bias of less than 5 volts?
- A. Miller effect
 - B. Zener effect**
 - C. Avalanche effect
 - D. Flywheel effect
56. In SCR, the anode current is made up of
- A. Electrons**
 - B. Holes
 - C. Electrons and holes
 - D. Positive ions
57. What is the most popular oscillator configuration for audio application?
- A. Wien bridge oscillator**
 - B. Hartley oscillator
 - C. Colpitt's oscillator
 - D. Tuned oscillator
58. The suppressor grid is added to a tetrode to reduce what undesirable characteristic of tetrode operation?
- A. Primary emission
 - B. Secondary emission**
 - C. Tertiary emission
 - D. Quaternary emission
59. What type of bias requires constant current flow through the cathode circuit of a triode?
- A. Anode biasing
 - B. Cathode biasing**
 - C. Fixed biasing
 - D. Self biasing
60. How are computers classified?
- A. Technology
 - B. Purpose
 - C. Data they handle
 - D. All of the choices**

61. Mechanical computers are considered to be of what type?
- A. Analog**
 - B. Special
 - C. Digital
 - D. General
62. In a general-purpose computer, the ability to perform a wide variety of operations is achieved at the expense of what capabilities?
- A. Speed and accuracy
 - B. Speed and memory capacity
 - C. Speed and efficiency**
 - D. Speed and versatility
63. All analog computers are what type of computers?
- A. Special-purpose**
 - B. Mechanical
 - C. Electromechanical
 - D. First generation
64. What are analog computers designed to measure?
- A. Electrical quantities
 - B. Physical quantities
 - C. Natural quantities
 - D. Continuous electrical or physical conditions**
65. Early analog computers were what type of devices?
- A. Mechanical or electromechanical**
 - B. Solid state type
 - C. Vacuum type
 - D. Electrical
66. What are computers called that combine the functions of both analog and digital computers?
- A. Versatile computers
 - B. Hybrid computers**
 - C. Analog computers
 - D. Mainframe computers

67. Which one is the first generation of IC op-amps?
- A. Fair child 709**
 - B. Texas instrument 709
 - C. Motorola 709
 - D. National semiconductor 709
68. What is the most basic type of filter?
- A. The capacitor filter**
 - B. Inductor filter
 - C. LC filter
 - D. Mechanical filter
69. What is the range of values usually chosen for a choke?
- A. From 20 to 100 H
 - B. From 1 to 20 H**
 - C. From 1 to 10 H
 - D. From 10 to 20 H
70. What is the ripple frequency of a full-wave rectifier with an input frequency of 60 Hz?
- A. 120 Hz**
 - B. 60 Hz
 - C. 240 Hz
 - D. 360 Hz
71. A standard programming language of the U.S. defence department similar to Pascal.
- A. Ada**
 - B. C++
 - C. BASIC
 - D. RPG
72. The electron tube replaces what component in an electron tube voltage regulator?
- A. Variable inductor
 - B. Variable resistor
 - C. Variable capacitor
 - D. Transistor**

73. Which of the following is referred to as organized data?
- A. Source
 - B. Input
 - C. Information**
 - D. Output
74. What is the common mode rejection ratio of an ideal differential amplifier?
- A. Infinity
 - B. Less than unity
 - C. Unity
 - D. Zero**
75. The type of feedback used to improve the fidelity of an amplifier and to increase its frequency response.
- A. Fidelity feedback
 - B. Positive feedback
 - C. Unwanted feedback
 - D. Negative feedback**
76. A negatively charge atom is sometimes called ____.
- A. Electron
 - B. Anion**
 - C. Cation
 - D. Ion
77. If the magnitude of the potential difference is generated by a single conductor passing through a magnetic field, which of the following statements is false?
- A. The potential difference depends on the speed with which the conductor cuts the magnetic field
 - B. The potential difference depends on the length of the conductor that cuts the magnetic field
 - C. The potential difference depends on the magnetic field density that is present
 - D. The potential difference depends on the diameter of the conductor that cuts the magnetic field**
78. LEDs normally work on a voltage from
- A. 1 to 2 V**
 - B. 10 to 20 V
 - C. 2 to 5 V
 - D. 3 to 6 V

79. Which of the following statements is true?
- A. An ideal current source cannot be in parallel with a short circuit
 - B. An ideal voltage source can be in parallel with an open circuit**
 - C. An ideal current source can be in series with an open circuit
 - D. An ideal voltage source cannot be in series with an ideal current source
80. What is the average power dissipated by an electric heater with resistance of $50\ \Omega$ drawing a current of $20\sin(30t)$ A?
- A. 0 kW
 - B. 14.14 kW
 - C. 10 kW**
 - D. 20 kW
81. What measurements are required to determine the phase angle of a single-phase circuit?
- A. The power in watts consumed by the circuit
 - B. The frequency, capacitance and inductance
 - C. The power in watts, voltage and current**
 - D. The resistance, current and voltage
82. The conductance and inductive susceptance of a circuit have the same magnitude. What is the power factor of the circuit?
- A. 1
 - B. 0.5
 - C. 0.707**
 - D. 0.866
83. A circuit has a resonant frequency of 455 kHz and a bandwidth of 57.2 kHz. Find the Q of the circuit.
- A. 795
 - B. 0.795
 - C. 79.5
 - D. 7.95**
84. A semiconductor logic output which pulls neither to a high nor a low voltage state.
- A. Logic 1
 - B. Logic 0
 - C. Floating state**
 - D. Limbo

85. An intrinsic semiconductor has some holes in it at room temperature. What causes these holes?
- A. Doping process
 - B. Thermal energy**
 - C. Ionization
 - D. Radiant flux
86. Refers to a field surrounding electrons and protons at stationary period indicating a stored energy.
- A. Magnetic field
 - B. Electron field
 - C. Electrostatic field**
 - D. Electrodynamic field
87. The time required to complete one cycle of a waveform.
- A. Wavetime
 - B. Frequency
 - C. Wavelength
 - D. Period**
88. Lines of flux that do not follow the intended path
- A. Flux loss
 - B. Inductance leakage
 - C. Leakage flux**
 - D. Hysteresis loss
89. What consist of elements inseparably associated and formed on a single substrate?
- A. Micro-circuit
 - B. Module
 - C. Integrated circuit**
 - D. PCB
90. What determines whether a substance is an insulator or a conductor?
- A. Number of protons
 - B. Number of photons
 - C. Number of valence electrons**
 - D. Number of neutrons

91. What do you call the space between and around charged bodies?
- A. Magnetic field
 - B. Electromagnetic field
 - C. Electromotive field
 - D. **Electrostatic field**
92. What electrical quantity is measured by a watt-hour meter?
- A. Current
 - B. Voltage
 - C. **Energy**
 - D. Power
93. What do you call the process of converting chemical energy into electrical energy in a cell?
- A. Electron flow
 - B. Polarization
 - C. Electrolysis
 - D. **Electrochemical action**
94. A transformer has 500 turns in the primary and 1500 in the secondary, assuming no losses, if 45 V is applied to the primary, what is the voltage developed in the secondary?
- A. 13.5 V
 - B. **135 V**
 - C. 180 V
 - D. 90 V
95. What do you call the maintenance of oscillation in a circuit in the intervals between pulses of excitation energy?
- A. Auto-oscillation
 - B. **Flywheel effect**
 - C. Damping
 - D. Feedback
96. Which one of the following can be used to generate a pulse whenever triggered?
- A. Flip flop
 - B. **Monostable multivibrator**
 - C. Stable multivibrator
 - D. Schmitt trigger

97. What is energy of motion called?

- A. Potential energy
- B. Pneumatics
- C. Kinematics
- D. Kinetic energy**

98. A fully charged lead-acid battery will indicate a specific gravity reading between ____.

- A. 1.175 to 1.200
- B. 1.225 to 1.250
- C. 1.200 to 1.225
- D. 1.275 to 1.300**

99. An effect about microwave oscillation that occurs in a small block of N-type gallium arsenide when a constant DC voltage above a critical value is applied to contact on opposite faces.

- A. Gunn effect**
- B. Edison effect
- C. Mossbauer effect
- D. Miller effect

100. What is the most influential factor in the switching speed of saturated bipolar transistor?

- A. Charge storage**
- B. h_{te}
- C. Collector current
- D. h_{ie}

TEST YOURSELF –EXAM 9

1. What is a precision piece of test equipment used to compare an unknown voltage with an internal reference voltage and to indicate the difference in their values?
 - A. Integral voltmeter
 - B. Digital voltmeter
 - C. Differential voltmeter**
 - D. Comparator
2. What is the primary advantage of power-amplifier transmitters over keyed-oscillator transmitter?
 - A. Frequency stability**
 - B. Practicality
 - C. Power capability
 - D. Availability
3. What is the name given to a variety of rotary electromechanical, position sensing devices?
 - A. Sychros**
 - B. Servos
 - C. Gyros
 - D. Rotors
4. What is a system in which the precise movement of large load is controlled by a relatively weak control signal?
 - A. Sychro
 - B. Servo**
 - C. Gyro
 - D. Rotor
5. What type of capacitor with a usual range in values from 1 picofarad to 0.01 microfarad and may be used with voltages as high as 30,000 volts?
 - A. Mylar
 - B. Paper capacitor
 - C. Ceramic capacitor**
 - D. Electrolytic capacitor

6. A material that removes oxides from surfaces to be joined by soldering or welding
- A. Sandpaper
 - B. Rust converter
 - C. Acid
 - D. Flux**
7. What type of radar transmitter power is measured over a period of time?
- A. Average power**
 - B. Peak envelope power (PEP)
 - C. RMS power
 - D. Apparent power
8. What is a mechanical device containing a spinning mass that is universally mounted?
- A. Sychro
 - B. Servo
 - C. Gyroscope**
 - D. Rotor
9. What type of tube best meets the requirements of a modulator switching element?
- A. Thyatron**
 - B. Klystron
 - C. Magnetron
 - D. TWT
10. In what manner are current-measuring instruments connected to a circuit?
- A. Series-parallel
 - B. Series**
 - C. Parallel-series
 - D. Parallel
11. What refers to the ability of a gyro to keep its axis fixed in space?
- A. Precession
 - B. Stability
 - C. Rigidity**
 - D. Flexibility

12. Most meggers you will use are rated at what voltage?
- A. 1000
 - B. 100
 - C. 300
 - D. 500**
13. Power transformer normally operates at ___ alternating current.
- A. 60 Hz or 400 Hz**
 - B. 30 Hz or 60 Hz
 - C. 60 Hz or 50 Hz
 - D. 60 Hz or 120 Hz
14. What type of maintenance is used to isolate troubles by means of test techniques and practices that realign or readjust equipment or otherwise bring the equipment back up to proper performance?
- A. Maintenance
 - B. Preventive maintenance
 - C. Corrective and preventive
 - D. Corrective maintenance**
15. The magnesium-manganese dioxide cell has a voltage of approximately how many volts?
- A. 2 V**
 - B. 1.5 V
 - C. 1.2 V
 - D. 1.35 V
16. In a gyro, a vector representing the rotary motion applied to change the direction of the rotor axis is called ___.
- A. Torque vector**
 - B. Rotary vector
 - C. Horizontal vector
 - D. Torque gyro

17. The strength of the magnetic field of the coils is dependent upon

- a. The number of turns of the wire in the coil
- b. The amount of current in the coil
- c. The ratio of the coil length to the coil width
- d. The type of material in the core

A. A, B and C

B. A,B,C and D

C. B,C and D

D. D, A and C

18. What is the frequency range of magnetron oscillator?

A. 600 to 30 GHz

B. 600 to 30 THz

C. 600 to 30 MHz

D. 600 to 30 PHz

19. Which of the basic timing circuits produces sharp trigger pulses directly?

A. 555 timer

B. Pulsed oscillator

C. Blocking oscillator

D. Keyed oscillator

20. When taking resistance reading with a VOM, you will obtain the most accurate readings at or near what part of the scale?

A. Midscale

B. End scale

C. Full scale

D. Quarter scale

21. Medium 1 range is designed to check what resistance values?

A. 10 to 50 k Ω

B. 100 to 500 k Ω

C. 50 to 10 k Ω

D. 10 to 1000 k Ω

22. What does the Greek word “gyro” means?
- A. Revolution**
 - B. Rotation
 - C. Cycle
 - D. Spin
23. What maximum voltage level can be attained in the pulse generator section by adjusting the LEVEL control?
- A. 2.5 V
 - B. 10 V
 - C. 1.5 V
 - D. 5 V**
24. What frequencies are provided through the back-panel BNC?
- A. 1 MHz and 10 MHz**
 - B. 10 MHz and 15 MHz
 - C. 5 MHz and 10 MHz
 - D. 20 MHz and 30 MHz
25. What is the direction of the magnetic field around a vertical conductor when the current flows upward?
- A. Counterclockwise**
 - B. Forward
 - C. Backward
 - D. Clockwise
26. What term is used to describe the ability of a radar system to distinguish between targets that are close together?
- A. Target marking
 - B. Target resolution**
 - C. Target locking
 - D. Target range
27. What is the typical frequency range about the center frequency of a tunable magnetron?
- A. $\pm 5\%$**
 - B. $\pm 1\%$
 - C. $\pm 10\%$
 - D. $\pm 15\%$

28. The maximum voltage that can be steadily applied to the capacitor without the capacitor breaking down (shorting) is called ___ of the capacitor.
- A. Safe voltage
 - B. Working voltage**
 - C. Breakdown voltage
 - D. Dielectric voltage
29. What refers to the number of axes about which a gyro is free to process?
- A. Gyroscopic axis
 - B. Freedom axis
 - C. Degree of freedom**
 - D. Axis of space
30. What type of switches is used as duplexers?
- A. Mechanical
 - B. Electrical
 - C. Electronics**
 - D. Digital
31. In a dc position servo system, the _____ and _____ of a dc error signal respectively are used to determine the amount and direction the load will be driven?
- A. amplitude, polarity**
 - B. polarity, phase
 - C. amplitude, frequency
 - D. polarity, frequency
32. What rule is used to determine the polarity of a coil when the direction of the electron current flow in the coil is known?
- A. use the left-hand rule for coils**
 - B. use the right-hand rule for coils
 - C. use the cork-screw rule for coils
 - D. either the right or left hand rules for coils
33. What radar subsystem supplies timing signals to coordinate the operation of the complete system?
- A. Synchronizer**
 - B. Transmitter
 - C. Duplexer
 - D. Diplexer

34. In what direction will a gyro precess in response to an outside force?
- A. perpendicular to the force**
 - B. parallel to the force
 - C. forward direction
 - D. reverse direction
35. What is the power source of synchros?
- A. DC
 - B. Generator
 - C. AC**
 - D. DC/AC
36. A carbon resistor has a resistance of 50 ohms and a tolerance of 5 percent. What are the colors of bands one, two, three and four, respectively?
- A. green, green, black and gold
 - B. green, black, green and gold
 - C. green, black, black and gold**
 - D. green, green, brown and gold
37. What is the resistance of one unit of volume of a substance?
- A. specific resistance
 - B. intrinsic resistance
 - C. resistivity
 - D. both A and C**
38. A chart used to find the time constant of a circuit if the impressed voltage and the values of R and C or R and L are known.
- A. UTC chart**
 - B. Transient chart
 - C. Resonance chart
 - D. Either B or C
39. What type of capacitor is made of flat thin strips of metal foil conductors that are separated by waxed paper (the dielectric material)?
- A. ceramic capacitor
 - B. mylar capacitor
 - C. paper capacitor**
 - D. electrolytic

40. The working voltage of a _____ capacitor rarely exceeds 600 volts.
- A. paper**
 - B. ceramic
 - C. electrolytic
 - D. mica
41. What is the main advantage of a series motor?
- A. high torque (turning force) at low speed**
 - B. low torque (turning force) at low speed
 - C. high torque (turning force) at high speed
 - D. low torque (turning force) at low speed
42. What is the electrolyte of a lead-acid cell?
- A. sulfuric acid**
 - B. hydrochloric acid
 - C. sulfuric acid and water
 - D. hydroxide
43. In what year did Leon Foucault coin the word gyroscope?
- A. 1950
 - B. 1952
 - C. 1850
 - D. 1852**
44. What is a rotary, electromechanical device used to perform trigonometric computations by varying the magnetic couplings between its primary and secondary windings?
- A. revolver**
 - B. rotor
 - C. circulator
 - D. gyroscope
45. What is the electrolyte of a nicad cell?
- A. potassium hydroxide and water**
 - B. hydrochloric acid and water
 - C. sulfuric and water
 - D. hydroxide and water

46. What is the stationary member of a synchro that consists of a cylindrical structure of a slotted laminations on which three Y-connected coils are wound with their axes 120 apart?
- A. revolver
 - B. rotor
 - C. stator**
 - D. gyroscope
47. What is the process of adjusting a synchro to its electrical zero position?
- A. initializing
 - B. zeroing**
 - C. setting
 - D. starting
48. A synthetic mixture of rosins that is flexible and used as an insulating material. Generally used as an insulator for low- and medium-range voltages.
- A. Teflon
 - B. PE
 - C. PVC
 - D. Thermoplastic**
49. A step-transmitter is a modification of what electrical device?
- A. rotary switch**
 - B. stepper rotor
 - C. mechanical switch
 - D. stepper transformer
50. In the ac position servo system, the _____ and _____ of the ac error signal determine the amount and direction the load will be driven.
- A. amplitude, polarity
 - B. polarity, phase
 - C. amplitude, phase**
 - D. polarity, frequency
51. What is(are) the general source(s) of mechanical drift?
- A. unbalance
 - B. inertia of Gimbals
 - C. bearing friction
 - D. all of the choices**

52. What are the three types of nonmetallic insulating materials that can be used in a high-temperature environments?
- A. FEP
 - B. silicone rubber
 - C. extruded polytetrafluoroethylene
 - D. all of the choices**
53. In what directions will the compass needle point when the compass is placed in the magnetic field surrounding a wire?
- A. the south pole of the compass will point in the direction of the magnetic lines of force
 - B. the north pole of the compass will point in the direction of the current
 - C. the south pole of the compass will point in the direction of the current
 - D. the north pole of the compass will point in the directions of the magnetic lines of force**
54. What are used when power from a conventional servo amplifier is too small to drive large servo motors (either ac or dc)?
- A. power amplifiers
 - B. prime movers
 - C. magnetic amplifiers**
 - D. additional servo amplifiers
55. The amount of precession that results from a given force is determined by what quantity?
- A. elasticity
 - B. rigidity**
 - C. flexibility
 - D. viscosity
56. The IC sychros or Interior Communication sychros are sometimes called as _____.
- A. reverse sychros**
 - B. forward sychros
 - C. flexible sychros
 - D. fixed sychros
57. What factors determine the rigidity of a gyro?
- A. rotor speed
 - B. shape
 - C. weight
 - D. all of the choices**

58. What is the capacity of the battery for a specific rate of discharge?
- A. rating**
 - B. cycling
 - C. discharging
 - D. battery life
59. The motions of a gyroscope can be analyzed in accordance to what basic quantity(ies)?
- A. spin
 - B. precession
 - C. torque
 - D. all of the choices**
60. How are servo systems classified?
- A. according to their functions**
 - B. according to their sizes
 - C. according to their weights
 - D. according to their load capacity
61. Which of the following is (are) the form(s) of servo systems?
- A. electromechanical
 - B. hydraulic
 - C. pneumatic
 - D. all of the choices**
62. What is another name for a servo system?
- A. closed-loop control system**
 - B. digital control system
 - C. analog control system
 - D. open-loop control system
63. The noise signal can cause _____ to the servo system and must be eliminated.
- A. damage
 - B. error
 - C. malfunctions
 - D. roughness**

64. What is combined with the error signal in the proper ratio to obtain the desired servo operation with reduced overshooting and minimum time tag?
- A. correction voltage**
 - B. swamp voltage
 - C. feedback voltage
 - D. trigger voltage
65. What are the major differences of the dc rate generator and the dc generator?
- A. size
 - B. load
 - C. prime mover
 - D. both A and C**
66. What is the Barkhausen criteria for sustained oscillations?
- A. $A\beta = 1$**
 - B. $A\beta = -1$
 - C. $A\beta = 0$
 - D. $\beta = 1/A\beta$
67. What is the cathode of a lead-acid cell?
- A. sponge lead**
 - B. lead peroxide
 - C. sulfuric acid and water
 - D. hydroxide
68. What is a Miller integrator?
- A. sweep generator**
 - B. function generator
 - C. low distortion audio generator
 - D. RF generator
69. What system provides instant response to an error signal but results in the load oscillating about the point of synchronization?
- A. overdamped system
 - B. critically damped system
 - C. underdamped system**
 - D. all of the choices

70. What are the ways to prevent polarization?
- A. vent the cell
 - B. use a material that will absorb hydrogen
 - C. add a material rich in oxygen
 - D. all of the choices**
71. What is the simplest form of damping?
- A. overdamping
 - B. underdamping
 - C. error-rate damping
 - D. friction clutch damping**
72. What is the production of hydrogen gas caused by a portion of the charge current breaking down the water in the electrolyte?
- A. charging
 - B. gassing**
 - C. condensing
 - D. evaporating
73. What is the most suitable oscillator circuit for generating 1 MHz?
- A. Colpitt's oscillator**
 - B. Hartley oscillator
 - C. tuned collector oscillator
 - D. Wien bridge oscillator
74. A circuit has a source voltage of 100 volts and two 50-ohm resistors connected in series. If the reference point for this circuit is placed between the two resistors, what would be the voltage at the reference point?
- A. 10 V
 - B. 40 V
 - C. 30 V
 - D. 50 V**
75. What amplifiers are biased so that collector current is zero (cutoff) for a portion of one alternation of the input signal?
- A. class AB**
 - B. class A
 - C. class C
 - D. class B

76. What amplifiers are biased so that the collector current is cut off during one-half of the input signal?
- A. class A
 - B. class B
 - C. class C**
 - D. class AB
77. What serves as the cathode in a common type of dry cell?
- A. carbon electrode
 - B. steel cover
 - C. zinc container**
 - D. nickel terminal
78. Which of the following types of resistors will overcome the disadvantage of a carbon resistor?
- A. rheostat
 - B. molded composition
 - C. potentiometer
 - D. wirewound resistor**
79. To flush a hydrometer, which of the following liquids should be used?
- A. sulfuric acid
 - B. salt water
 - C. fresh water**
 - D. a solution of baking soda and water
80. The space between and around charged bodies in which their influence is felt. This is also called electric field of force or an electrostatic field.
- A. magnetic field
 - B. air gap
 - C. free space
 - D. dielectric field**
81. What switch is one in which the movement of the switch contacts is relatively independent of the actuator movement?
- A. fast-acting switch
 - B. knife switch
 - C. snap-acting switch**
 - D. toggle switch

82. A _____ is an accurate snap-acting switch and the operating point is preset and very accurately known.
- A. fast-acting switch
 - B. knife switch
 - C. snap-acting switch
 - D. microswitch**
83. The power consumed in a conductor in realigning the atoms which setup the magnetic field is known as what type of loss?
- A. hysteresis loss**
 - B. field loss
 - C. magnetic loss
 - D. heat loss
84. A magnetic shield or screen used to protect a delicate instrument should be made of which of the following materials?
- A. plastic
 - B. soft iron**
 - C. copper
 - D. aluminum
85. The communication stations or terminals in local area network are usually linked by cable and are within _____ feet of each other.
- A. 1000**
 - B. 500
 - C. 1500
 - D. 2000
86. The number of record stored in a record block.
- A. density
 - B. blocking factor**
 - C. capacity
 - D. capability
87. _____ in a dc motor can be accomplished by reversing the field connections or by reversing the armature connections.
- A. series reversal
 - B. shunt reversal
 - C. armature reaction
 - D. motor reversal**

88. What is the distortion of the main field in a motor by the armature field?
- A. armature distortion
 - B. armature loss
 - C. armature reaction**
 - D. armature noise
89. The evaluation of the performance of an equipment compared to your knowledge of how the equipment should operate with the way it is actually performing is known as _____.
- A. maintenance
 - B. troubleshooting**
 - C. test evaluation
 - D. diagnosing
90. What is a data processing system designed to provide a standardized system for the recall and scheduling of test, measurement and diagnostic equipment into calibration facilities?
- A. MEASURE
 - B. DIAGNOSTIC
 - C. CALIBRATE**
 - D. TROUBLESHOOTING
91. What are the three hazards that could create damage to electrical measuring instrument?
- A. mechanical shock
 - B. excessive current flow
 - C. exposure to magnetic field
 - D. all of the choices**
92. The possibility of electrical shock can be reduce by ensuring all motors, generators and other electronic equipments are at _____.
- A. reference potential
 - B. ground potential**
 - C. 110 V
 - D. 220 V
93. What are the types of power losses in an inductor?
- A. copper loss
 - B. eddy-current loss
 - C. hysteresis loss
 - D. all of the choices**

94. What is the property existing between two coils so positioned that flux from one coil cuts the windings of the other coil?
- A. coupling
 - B. induction
 - C. mutual inductance**
 - D. Faraday's law
95. When were mnemonic instruction codes and symbolic addresses developed?
- A. in the early 1950's**
 - B. 1970s
 - C. 1960s
 - D. 1980s
96. If disks are stored horizontally, how many can be stacked?
- A. no more than 20
 - B. no more than 10**
 - C. no more than 30
 - D. no more than 40
97. What is the temperature range within which a disk will operate?
- A. 10 to 50 degrees Celsius**
 - B. 20 to 40 degrees Celsius
 - C. 50 to 100 degrees Celsius
 - D. 10 to 20 degrees Celsius
98. The data cell had a storage capacity of how many characters?
- A. over 200 million
 - B. over 100 million**
 - C. over 50 million
 - D. over 300 million
99. Technological advancement is measured by what, in the electronic computer world?
- A. generations**
 - B. processor speeds
 - C. IC integration
 - D. softwares

100. A set of program instructions, a microprogram, permanently stored in read-only memory.

A. OS

B. firmware

C. BIOS

D. Software

TEST YOURSELF –EXAM 10

1. What is the maximum number of electrons in a subshell?
A. 2
B. 6
C. 10
D. 14
2. The repeatability of a servo-controlled robot is within _____ mm rather than a fraction of a mm.
A. 2
B. 4
C. 3
D. 5
3. What is the principal quantum number of a Q shell?
A. 6
B. 5
C. 4
D. 7
4. What time when the voltage across L will be equal to the voltage across R in a series RL transient circuit where $E = 24 \text{ V}$, $R = 10 \text{ } \Omega$ and $L = 1 \text{ H}$?
A. 69.3 ms
B. 69.3 s
C. 6.93 ms
D. 6.93 s
5. What is the hysteresis loss at a frequency of 60 cycles per second of an audio transformer magnetic core which has a maximum flux density of 10,000 gaussess? The volume of solid iron of this core is 66.8 cubic cm and the hysteresis coefficient (a constant that depends upon grade and quality of iron) is 5.35×10^{-4} .
A. 0.5386 W
B. 53.86 W
C. 5.386 W
D. 5386 W

6. When two coils of equal inductances are connected in series with coefficient of coupling and their fields in phase, find the total inductance of two coils.
- A. $2L_A$
 - B. $2L_A (1+k)$**
 - C. $2kL_A$
 - D. $L_A (2 + k)$
7. A $2 \mu\text{F}$ capacitor with initial charge $q_0 = 100 \mu\text{C}$, is connected across a 100Ω resistor at $t = 0$. Calculate the time in which the transient voltage across the resistor drops from 40 to 10 V.
- A. 2.77 s
 - B. 0.277 ms**
 - C. 2.77 ms
 - D. 0.277 s
8. What do you call a small D.C generator built into alternators to provide excitation current to field windings?
- A. prime mover
 - B. excitor**
 - C. commutator
 - D. load
9. What is the condition of the diode in a parallel-limiter when the output is developed?
- A. Shunted**
 - B. Conducting
 - C. Cut-off
 - D. Shorted
10. What is the payload of the industrial robot AEA IRb-60?
- A. 60kg**
 - B. 80kg
 - C. 50kg
 - D. 70kg
11. Which of the following robot is primarily used for machining processes?
- A. Cincinatti T1
 - B. Cincinatti T3**
 - C. Cincinatti T2
 - D. Cincinatti T4

12. The Kuka spot welding robot has how many degrees of freedom?
A. 4
B. 6
C. 5
D. 7
13. What system in industrial electronics has the ability to monitor certain variable in the industrial processes, the same can perform self-correcting action?
A. Coal-slurry system
B. Closed-loop system
C. Open-loop system
D. Feed forward control system
14. What is the property of a gyro so that the axis of rotation or spin axis tends to remain in a fixed direction in space if no force is applied to it?
A. Selectivity
B. Precession
C. Rigidity
D. Sensitivity
15. In a series RLC circuit with $R=200\Omega$ $L=0.1\text{ H}$ and $C=5\mu\text{F}$, find the transient current after the switch is closed at $t=0$ applying a 200V source.
A. $2e^{-1000t}\sin 1000t$
B. $2e^{-1000t}\cos 1000t$
C. $2e^{-100t}\sin 100t$
D. $2e^{-100t}\cos 100t$
16. A $0.09\mu\text{F}$ capacitor is charged to 220V. How long in milliseconds will it discharge to a level of 110V if the discharge resistor has a resistance of $20\text{k}\Omega$?
A. 1.25
B. 12.5
C. 125
D. 0.125
17. What are the heavy particles that include the proton and the neutron?
A. Mesons
B. Baryons
C. Leptons
D. Quarks
18. What particles have rest masses ranging down to about 0.1amu ?
A. Leptons
B. Baryons
C. Quarks
D. Mesons

19. By definition, what is the individual angular momentum of the neutron proton and electron?
- A. $h/4\pi$**
 - B. $h/2\pi$
 - C. h/π
 - D. $4\pi h$
20. In the hysteresis loop, what do you call the product of the residual magnetic flux and coercive field strength?
- A. Effectivity product**
 - B. Hysteresis coefficient
 - C. Residual-coercive product
 - D. Steinmetz's product
21. Programming of a continuous-path robot is normally carried out by a method called _____ through.
- A. See
 - B. Walk**
 - C. Pull
 - D. Push
22. What do you call the strong magnetism that occurs in certain ceramic compounds such as ferrites?
- A. Ferromagnetism
 - B. Ferrimagnetism**
 - C. Diamagnetism
 - D. Paramagnetism
23. What characteristic is determined by the time required for a voltage wave to travel from the input end of an electrical transmission line to the output end and back again?
- A. Pulse position
 - B. Pulse line
 - C. Pulse width**
 - D. Pulse code
24. A disturbance similar to brownout but of shorter duration that occurs when the line voltage drops below 80-85% of its rated voltage by one or more cycles.
- A. Sag or dip**
 - B. Chronic overvoltage
 - C. Spike
 - D. Transient

25. What term is given to the positions of the rotors of a synchro transmitter and the synchro receiver when both rotors are on a 0 degree displaced from 0 degree by the same angle?

A. Correspondence

B. Overlap

C. Fine tune

D. Stability

26. What ac voltage defect refers to a high voltage (up to 6000V or more) peak lasting approximately 100 μ s to one-half cycle?

A. Sag or dip

B. Spike

C. Chronic overvoltage

D. Transient

27. The largest computers commonly use a word size of _____ bits.

A. 32

B. 128

C. 64

D. 256

28. What do you call the ratio of the safe load to the nameplate load of an electrical motor?

A. Service factor

B. Load factor

C. Efficiency

D. Service life

29. Covalent bond energy in germanium is about ____ eV.

A. 1.5

B. 7.4

C. 3.0

D. 4.7

30. The service factors of motors vary from _____ to _____.

A. 2.5 to 2.9

B. 1.15 to 1.4

C. 1.1 to 1.3

D. 3.1 to 5.5

31. How many voltage are available from two-phase, three wire alternator?
A. One
B. Three
C. Two
D. Four
32. At what frequency does the RC circuit of an amplifier reduce the voltage gain to 70.7 percent of its midrange value?
A. Resonant
B. Cutoff
C. Critical
D. Natural
33. What is the operating temperature of class A motor under motor classification?
A. 105°C
B. 130°C
C. 155°C
D. 180°C
34. What particular motor class in which the operating temperature is 180°C?
A. Class H
B. Class F
C. Class A
D. Class B
35. What are the basic components of a harmonic drive used in robot transmission system?
A. Wave generator
B. Flexspline
C. Circular spline
D. All of the choices
36. What is the operating temperature of class B motor?
A. 200°C
B. 155°C
C. 130°C
D. 180°C
37. What is the width of the pulse radiated by a fire control tracking radar?
A. Very thick
B. Narrow
C. Thick
D. Very narrow

38. If the operating temperature is 155°C then it falls under what motor classification?
- A. Class F**
 - B. Class B
 - C. Class H
 - D. Class A
39. How much percent is stray losses in dc machines?
- A. 1%**
 - B. 2%
 - C. 5%
 - D. 10%
40. What are considered standard minimum distance between components on a chip?
- A. 4 and 5 μm
 - B. 5 and 10 μm
 - C. 2 and 3 μm**
 - D. 1 and 2 μm
41. For an advanced chip, the minimum distance between components is
- A. 1 μm**
 - B. 2 μm
 - C. 3 μm
 - D. 4 μm
42. What are used to apply or remove power and to select a function or a circuit within a device?
- A. Switch
 - B. Relay
 - C. Circuit control devices**
 - D. Breaker
43. What do you call a register on the CPU used for the temporary storage of data during arithmetic or logic operations?
- A. Flip-flop
 - B. Accumulator**
 - C. Memory
 - D. RAM

44. What parameter specifies the value of voltage from cathode to cathode at which the SCR breaks into the avalanches region and begins to conduct heavily as in the pn junction diode?
- A. Forward-breakover voltage**
 - B. Reverse-breakover voltage
 - C. Break-over voltage
 - D. Stop-over voltage
45. What type of servo system based on the same principle of error-signal generation where velocity is sensed, and the load is moving at the desired velocity?
- A. Velocity servo**
 - B. Rate servo
 - C. Speed servo
 - D. Controlled servo
46. What is the term for the switch that disconnects the circuit completely at one position before the connection of the next position made?
- A. Break-before-make
 - B. Make-before-break**
 - C. Break-before-break
 - D. Make-before-make
47. What is the identifying feature of a colpitts oscillator?
- A. Split inductor
 - B. Split resistor
 - C. Split transformer
 - D. Split capacitor**
48. What instrument is used to measure the amount of active ingredients in the electrolyte of a battery?
- A. Hygrometer
 - B. Voltmeter
 - C. Electrometer
 - D. Hydrometer**
49. What is the typical frequency range about the center frequency of a tunable magnetron?
- A. $\pm 5\%$**
 - B. $\pm 2\%$
 - C. $\pm 4\%$
 - D. $\pm 6\%$

50. What is a gaseous tube that uses a pool of liquid mercury at its cathode?
- A. Thyatron
 - B. Phanotron
 - C. Klystron
 - D. Ignitron**
51. What is the science of interaction or interconversion of electrical and acoustic phenomena?
- A. Electrodynamics
 - B. Electrography
 - C. Electroanalysis
 - D. Electroacoustics**
52. What do you call the graphic record or the curve traced by the electrical activity of the brain as recorded by the electroencephalograph?
- A. Electroform
 - B. Electrograph
 - C. Electrocardiogram
 - D. Electroencephalogram**
53. What imaging technique produces clear view of flowing blood or its blockage in narrow vessels?
- A. Blood collation
 - B. Chemotography
 - C. Blood chemistry
 - D. Digital subtraction angiography**
54. What tube in a duplexer has the primary function of disconnecting the receiver?
- A. Klystron tube
 - B. Magnetron tube
 - C. Thyatron tube
 - D. TR tube**
55. What requirement for a vacuum tube that does not exist for semiconductor?
- A. Filament or heater voltage**
 - B. Envelope
 - C. Grid
 - D. Screen

56. An internal component of a klystron oscillator which modulates the velocity of the electrons.
- A. the pair of buncher grids
 - B. The pair of plates
 - C. The pair of catcher grids**
 - D. The collector plate
57. Given a power supply with a no load voltage of 12 volts and a full load voltage of 10 volts, what is the percentage of voltage regulation?
- A. 17%
 - B. 20%**
 - C. 80%
 - D. 83%
58. A 50- μ A meter movement has an internal resistance of 2k Ω . What applied voltage is required to indicate half-scale deflection?
- A. 0.01volt
 - B. 0.10volt
 - C. 0.005volt
 - D. 0.05volt**
59. The expression “voltage regulation” as it applies to a shunt-wound DC generator operating at a constant frequency refers to
- A. Voltage output efficiency
 - B. Voltage in the secondary compared to the primary
 - C. Voltage fluctuations from load to no-load**
 - D. Rotor winding voltage
60. The expression “voltage regulation” as it applies to a generator operating at a constant frequency refers to
- A. Full load to no load**
 - B. Limited load to peak load
 - C. Source input supply frequency
 - D. Field frequency

61. When an emergency transmitter uses 325 watts and a receiver uses 50 watts, how many hours can a 12.6 volt, 55 ampere-hour battery supply full power to both units?
- A. 6hours
 - B. 3hours
 - C. 1.8hours**
 - D. 1.2hours
62. What is the total voltage when 12 nickel-cadmium batteries are connected in series?
- A. 12volts
 - B. 12.6volts
 - C. 15volts**
 - D. 72volts
63. The turn ratio of a transformer is 1:20. When a 120 volt ac source is connected to its primary winding, the secondary voltage is
- A. 120volts
 - B. 1200volts
 - C. 600volts
 - D. 2400volts**
64. A power transformer has a single primary winding and three secondary windings producing 5.0 volts, 12.6 volts, and 150 volts. Which of the three secondary windings will have the highest measured DC resistance
- A. The 12.6 volt winding
 - B. The 5.0 volt winding
 - C. The 150 volt winding**
 - D. All will have equal resistance values
65. A special type of power supply filter choke inductance is inversely proportional to the amount of current flowing through it is a
- A. AF choke
 - B. RF choke
 - C. Smoothing choke
 - D. Swinging choke**
66. What is the most suitable oscillator circuit for generating 1kHz?
- A. Hartley oscillator**
 - B. Colpitt's oscillator
 - C. Wien bridge oscillator
 - D. Tuned collector oscillator

67. How many the range of a thermocouple ammeter be increased?
- A. By using a current transformer
 - B. By using a capacitor shunt
 - C. By using a current transformer and a capacitor shunt**
 - D. By using a resistor shunt
68. By what factor must the voltage of an ac circuit, as indicated on the scale of an ac voltmeter, be multiplied to obtain the average voltage value?
- A. 0.707
 - B. 0.9**
 - C. 1.414
 - D. 3.14
69. What special type of diode is capable of both amplification and oscillation?
- A. Point contact diodes
 - B. Zener diodes
 - C. Tunnel diodes**
 - D. Junction diodes
70. What is a common use of hot-carrier diode?
- A. As balanced inputs SSB
 - B. As a variable capacitance in a automatic frequency control circuit
 - C. As a constant voltage reference in a power supply
 - D. As VHF and UHF mixers and detectors**
71. What is the normal operating voltage and current for a light-emitting diode?
- A. 60 volts and 20 mA
 - B. 5 volts and 50 mA
 - C. 1.7 volts and 20 mA**
 - D. 0.7 volts and 60 mA
72. What type of bias is required for an LED to produce luminescence?
- E. Reverse bias
 - A. Forward bias**
 - B. Zero bias
 - C. Inductive bias

73. What is the name of the semi-conductor IC that has a fixed pattern of digital data stored in its memory matrix?
- A. RAM—Random-Access Memory
 - B. ROM—Read-Only Memory**
 - C. Register
 - D. Latch
74. What would be the bandwidth of a good crystal lattice band-pass filter for a double-sideband phone emission?
- A. 1 kHz at -6 dB
 - B. 500 Hz at -6 dB
 - C. 6 kHz at -6 dB**
 - D. 15 kHz at -6 dB
75. What technique can be used to construct low cost, high performance crystal lattice filters?
- A. Splitting and tumbling
 - B. Tumbling and grinding
 - C. Etching and splitting
 - D. Etching and grinding**
76. What term defines a series of overshoots in a servo system?
- A. Positioning
 - B. Variation
 - C. Hunting**
 - D. Oscillating
77. What is the acceptable ratio of back-to-forward resistance for a diode?
- A. 2 to 1.5
 - B. Greater than 10 to 1**
 - C. Less than 10 to 1
 - D. 3 to 2
78. Packaging is required for what reason in IC production?
- A. To meet storage requirement
 - B. To increase shelf-life
 - C. To dissipate heat
 - D. Ease of handling and protection from damage**

79. In radioactivity, what is the unit to measure the biological damage caused by radiation?
- A. rem
 - B. rad
 - C. lumen
 - D. reb
80. What do you call the fine wires connecting the bonding pad to the chip to the external lead of the package?
- A. Harness
 - B. Cables
 - C. Bonding wires
 - D. Leads
81. What do you call the ratio between the intensity of magnetization produced in a substance, to the source of magnetizing force?
- A. Magnetic resistivity
 - B. Magnetic conductivity
 - C. Magnetic susceptibility
 - D. Magnetic reluctivity
82. What is a semi-conductor chip with electrodes (leads) extended beyond the wafer?
- A. DICE
 - B. Flip chip
 - C. Beam-lead chip
 - D. DIP
83. What do you call an assembly of microcircuits or a combination of microcircuits and discrete components packaged as replacement?
- E. Electronic module
 - F. Microcircuit module
 - G. PCB
 - H. Minielectronics
84. In the operation of dry cells, we normally refer to the supply of current to load resistance where its current neutralizes the separated charges at the electrodes as _____>.
- A. aligning the cells
 - B. charging the cells
 - C. discharging the cells
 - D. polarizing the cells

85. What are the special class C amplifiers that are biased at 3 to 10 times the normal cutoff and used to generate frequency that is a harmonic of a lower frequency?
- A. Frequency generators
 - B. Frequency stabilizers
 - C. Frequency multipliers**
 - D. Frequency amplifiers
86. Which of the following capacitors costs more per μF of capacitance?
- A. Plastic
 - B. Mica
 - C. Paper
 - D. Electrolytic**
87. What capacitors are suitable for dc filter circuits?
- A. Mica
 - B. Electrolytic**
 - C. Ceramic
 - D. Plastic
88. What is the other name or relative permittivity?
- E. Dielectric strength
 - F. Breakdown voltage
 - G. Specific inductive capacity**
 - H. Potential gradient
89. In RF amplifier with optimum coupling, what method provides the widest bandpass?
- A. A parallel circuit
 - B. A swamping resistor**
 - C. A parallel variable resistor
 - D. A dc coupling capacitor
90. What is the operating condition of a circuit when no input signal is being applied to the circuit?
- A. Neutral
 - B. Quantum
 - C. Quiescence**
 - D. No load condition

91. What is the reading of a fully charged lead-acid battery?
- A. 1.025-1.075
 - B. 1.200-1.500
 - C. 1.050-1.350
 - D. 1.280-1.300**
92. Which of the following are the basic elements in a 555 timer IC?
- a) Two comparators
 - b) A flip-flop
 - c) A discharge transistor
 - d) A resistive voltage divider
- A. A, B and D only
 - B. A, B and C only
 - C. B, C and D only
 - D. A, B, C and D**
93. In a sawtooth generator, increasing gate does what to linearity?
- A. Nothing
 - B. Increases linearity
 - C. Blocks linearity
 - D. Decreases linearity**
94. Why are digital multimeters well suited for testing sensitive devices?
- A. High current flow
 - B. It is portable and ruggedized
 - C. Because of its sensitivity
 - D. Current flows through the component is limited to 1 mA**
95. Compensation to an op-amp means _____ bandwidth and _____ slew rate.
- A. reduced, increased**
 - B. reduced, reduced
 - C. increased, reduced
 - D. increased, increased

96. Boolean algebra is based on the assumption that most quantities have _____ possible states.
- A. four
 - B. two**
 - C. three
 - D. single
97. Which of the following are types of resonant LC oscillators?
- A. Colpitts
 - B. Clapp
 - C. Hartley
 - D. Armstrong
 - E. Crystal-controlled
- A. A, B, C and E only
 - B. A, B, C and D only
 - C. B, C, D and E only
 - D. A, B, C, D and E**
98. What does the base or radix of a number system tell you about the system?
- A. Number of units used in the system
 - B. Number of items used in the system
 - C. Number of symbols used in the system**
 - D. Number of numerals used in the system
99. The specific gravity of a lead-acid battery is a measure of its _____
- A. battery life
 - B. operating temperature
 - C. state of charge**
 - D. rate of discharge
100. In active filter, what type of filter passes a range of frequency and a certain higher frequency?
- A. Band-stop
 - B. High pass
 - C. Low pass
 - D. Band-pass**