MOCK BOARD EXAMINATION IN ELECTRONICS ENGINEERING (C)

June 3, 2009

1. Semiconductor memory matrix storing digital data.
   a. ROM
   b. EPROM
   c. EEPROM
   d. RAM

2. The rate at which computer processes information.
   a. Baud rate
   b. Throughput
   c. Bandwidth
   d. Processing speed

3. Uses laser to change spin of electrons.
   a. Plate
   b. Laser gun
   c. Quantum coupler
   d. Cathode ray tube

4. Uses laser instead of electric current
   a. Optical mouse
   b. Optical fiber
   c. Optical storage
   d. Optical computer

5. Mechanism for read/write on disk.
   a. Access arm
   b. Spinner
   c. Optical reader
   d. Step motor

6. Time to spin within a particular disk sector.
   a. Spin time
   b. Latency time
   c. Period
   d. Spin second

7. Format used for commercial tape recording.
   a. 18-track format
   b. 12-track format
   c. 9-track format
   d. 6-track format

8. Forces between atomic moments.
   a. Momentum
   b. Magnetism
   c. Ferromagnetism
   d. Attraction

9. Instrument for measuring oxygenation of blood via the earlobe.
   a. Blood oxymeter
   b. Oxymeter
   c. Oxygen meter
   d. Blood meter

10. Coined “robotics” in his novel Runaround, 1942
    a. Karl Capek
    b. George Devol
    c. Joseph Engelberger
    d. Isaac Asimov

11. A robot arm is a/an _____.
    a. Manipulator
    b. End effector
    c. Actuator
    d. Link

12. A robot hand is a/an _____.
    a. Manipulator
    b. End effector
    c. Actuator
    d. Link

13. The terminal voltage first increases then decreases.
    a. Series-wound motor at constant speed
    b. Series-wound generator at constant speed
    c. Parallel-wound motor at constant speed
    d. Parallel-wound generator at constant speed

14. Uses multiple saturable–core reactors; low fidelity, time lag, not for high frequencies
    a. Class A amplifier
    b. Class C amplifier
    c. Magnetic amplifier
    d. Class B amplifier

15. This results when the countertorque of a synchronous motor is exceeded.
    a. Stalling
    b. Reverse motion
    c. Forward motion
    d. Overspeeding

16. This varies armature resistance, flux/pole, and voltage.
    a. Armature current
    b. Controlling voltage of a DC motor
    c. Armature voltage
    d. Controlling current of an AC motor

17. Motor starter with variable speed control.
    a. Brush
    b. Controller
    c. Starting resistor
    d. None of these

18. The magnitude of angular momentum vector
    a. Azimuthal quantum number

b. Angular velocity
c. Momentary angle
d. None of these

19. This moves while paper/page is fed into the printer.
a. From feed
b. Feed form
c. Feeder
d. Stepper motor

20. A type of device that writes on screen
a. Pointing device
b. Screen pen
c. Light pen
d. None of these

21. A signal that external device wants to send data to computer
a. Handshake
b. Token
c. Interrupt
d. None of these

22. Permanent ROM programming
a. Firmware
b. Software
c. Hardware
d. Tupperware

23. Contains BIOS memory
a. XPOS memory
b. WIN memory
c. RAM
d. OS memory

24. Treatment with electric current.
a. Current therapy
b. Voltage therapy
c. Electrotherapy
d. Pantotherapy

25. Cell used as reference cell in large laboratories.
a. Laboratory cell
b. Weston saturated cell
c. Bridge cell
d. House cell

26. Also known as throw-away factor
a. Lay-down factor
b. Waste factor
c. Sacrifice factor
d. None of these

27. Double charge; easily stopped wave
a. Alpha
b. Beta
c. Gamma
d. X-ray

28. No change; no ionization; biological damage
a. Alpha
b. Beta
c. Gamma
d. X-ray

29. Selenium → Material used for photovoltaic cells
a. Silicon
b. Wafer
c. Selenium
d. Gallium arsenide

30. In volt meter 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

31. What sensor provides a dc voltage approximately 1 V at 10 mW?
a. Diode sensor
b. Thermocouple sensor
c. Thermal sensor
d. Thermistor sensor

32. An oscilloscope provides easy measurement of _____ values.
a. Instantaneous
b. Rms
c. peak to peak
d. average

33. An element in electronics which serves as a protection against overload?
a. Resistor
b. Transistor
c. Semiconductor
d. Fuse

34. Two pn silicon diodes are connected in series opposing. A 5V voltage is impressed upon them. Find the voltage across each junction at room temperature when $nV_T = 0.052$ V.
a. 0.236V , 3.2V
b. 4.764V , 0.236V
c. 0.036V , 4.964V
d. 3.21V , 1.79V

35. When a factor of a junction transistor is 0.98, the factor would be equivalent to _____ value of transistor's beta.
a. 49
b. 60
c. 20
d. 38

36. A manufacturer quotes in his specifications that a germanium diode conducts 50 mA at 1 volt. Determine its bulk resistance
    a. 100 ohms
    b. 60 ohms
    c. 14 ohms
    d. 20 ohms

37. In semiconductor technology, the characteristic of a transistor in cut-off refers to a condition when _____.
    a. the transistor is at its operating point
    b. no current flows from emitter to collector
    c. there is no base current
    d. maximum current flows from emitter to collector

38. Which is the principal characteristic 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

39. A computer language constructed of ones and zeros using binary codes that were stored in the computer memory system as groups of instructions called programs.
    a. assembler language
    b. assembly language
    c. machine language
    d. FORTRAN language

40. Probably the easiest programming language to learn
    a. FORTRAN
    b. ALGOL
    c. BASIC
    d. COBOL

41. Written and developed by Bill Gates for the Altair 8800 computer.
    a. Basic Language Interpreter
    b. PASCAL
    c. CISC
    d. MS DOS

42. If memory is addressed, the address bus contains a memory address, which does not vary in width with the different versions of microprocessors.
    a. True
    b. False
    c. Cannot be determined
    d. None of these

43. If I/O is addressed, the address bus contains a 16 bit memory address
    a. True
    b. False
    c. Cannot be determined
    d. None of these

44. The first truly successful and widespread programming language for business applications.
    a. DBASE III+
    b. COBOL
    c. FOXPRO
    d. RPG

45. Transfers information between the microprocessor and its memory and I/O address space.
    a. Address bus
    b. Data bus
    c. Control bus
    d. USB

46. 1 kilo byte refers to _____.
    a. 1000 bits
    b. 976 bits
    c. 1024 bits
    d. 1000 bytes

47. A 4-bit wide memory location
    a. Byte
    b. nibble
    c. bit
    d. word

48. Generally an 8-bit wide binary number
    a. Byte
    b. nibble
    c. bit
    d. memory address

49. A program that converts an instruction written in a high-level language into machine code.
    a. Assembler
    b. Interpreter
    c. Compiler
    d. Translator

50. How many pins that a 555 timer has?
    a. 6
    b. 10
    c. 8
    d. 12

51. Pin 1 of 555 timer.
    a. ground
    b. output
    c. trigger

d. reset

52. Pin 2 of 555 timer.
    a. Ground
    b. Output
    c. Trigger
    d. Reset

53. Pin 3 of 555 timer.
    a. Ground
    b. Output
    c. Trigger
    d. Reset

54. Pin 4 of 555 timer.
    a. Ground
    b. Output
    c. Trigger
    d. Reset

55. Invented bar codes in 1974.
    a. Yu, Cady and Tantraporn
    b. Magnavox
    c. Ad Hoc Committee of Grocery Industry
    d. Hart and Slob

56. Invented the VHS recorder in 1975.
    a. Yu, Cady and Tantraporn
    b. JVC
    c. Ad Hoc Committee of Grocery Industry
    d. IBM

57. Invented laser printer in 1975.
    a. Yu, Cady and Tantraporn
    b. JVC
    c. Ad Hoc Committee of Grocery Industry
    d. IBM

58. Invented Betamax Video Recorder in 1975.
    a. Sony
    b. JVC
    c. Ad Hoc Committee of Grocery Industry
    d. IBM

59. Invented pocket TV receiver in 1977.
    a. Sony
    b. JVC
    c. Sinclair Radionics
    d. IBM

60. Invented compact disc laser optical recording.
    a. Sony
    b. Philips
    c. Sinclair Radionics
    d. IBM

61. Invented fiber optics submarine cable in 1981.
    a. Sony
    b. Philips
    c. Sinclair Radionics
    d. Standard Telephoned and Cables.

62. Type of power-line frequency meter composed of vibrating iron reeds placed in alternating magnetic field.
    a. Induction type
    b. Electrodynamic type
    c. Resonant type
    d. Vibrating reed type

63. Type of power line frequency meter device utilizing a principle of balancing and indicator needle at center of a scale using magnetic fields (resistive and inductive) opposing each other.
    a. magnetic type
    b. resistive type
    c. resonant type
    d. electrodynamic type

64. It is composed of a moving coil which is free to rotate in reaction the magnetic field generated by passing current through 2 stationary field coils.
    a. Ferromagnetic
    b. Electrodynamometer
    c. D' Arsonval
    d. iron vane

65. Electrodynamometer can be used to measure
    a. AC
    b. AC and DC
    c. DC
    d. dynamic resistance

66. An electrodynamic meter used to measure power
    a. hook-on type voltmeter
    b. multi-meter
    c. wattmeter
    d. watt-hour meter

67. How do you measure the current in a circuit without an ammeter?
    a. By computing the values of resistance
    b. Divide total circuit resistance by the total circuit load
    c. Measure the voltage drop across the tube
    d. Measure the voltage across known resistor

68. The ideal internal resistance of an ammeter should be…
    a. equal to the circuit's resistance
    b. higher than the circuit resistance
    c. zero
    d. infinity

69. 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 1.4 kilo ohms.
    a. 2.0
    b. 7.5
    c. 3.76
    d. 4.76

70. The output transformer used in a power amplifier is a transformer.
    a) 1:1 ratio
    b) Step-down
    c) Step-up
    d) Auto

71. A memory device which holds a fixed set of data in a circuit is called _____. ____
    a. RAM
    b. ROM
    c. Buffer
    d. Register

72. Transformer coupling can be used in amplifiers.
    a) Only power
    b) Only voltage
    c) Either power or voltage
    d) Only current

73. When a voltage of 100 volts at 50 Hertz is applied to a choking coil A, the current is 8 amperes and the power is 120 watts. When applied to a coil B, the current is 10 amperes and the power is 500 watts. What power will be taken when 100 volts is applied to the two coils connected in series.
    a) 4727 watts
    b) 70 watts
    c) 140 watts
    d) 1454 watts

74. The most important consideration in power amplifiers is
    a) Collector Efficiency
    b) Biasing the circuit
    c) To keep the transformer cool
    d) Amplifier Distortion

75. The current needed to operate a soldering iron which has a rating of 600 watts at 110 volts is
    a) 5.455 amperes
    b) 66 amperes
    c) 18.2 amperes
    d) 0.182 ampere

76. An AF transformer is shielded to
    a) Keep the amplifier cool
    b) Prevent induction due to stray magnetic fields
    c) Protect from rusting
    d) To maintain secrecy

77. An interval required to address and read out memory word is called
    a) Propagation Delay
    b) Setting Time
    c) Transit Time
    d) Access Time

78. Amplitude distortion is also called ____ distortion.
    a) Intermodulation
    b) Harmonic
    c) Phase
    d) Resonant

79. _____ is a term applied when a logic circuit rejects an unwanted signal.
    a) Logic Levels
    b) Noise Margin
    c) Power Consumption
    d) Propagation Delay

80. Transformer coupling introduces _____ distortion.
    a) Amplitude
    b) Intermodulation
    c) Frequency
    d) Jitter

81. _____ 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

82. A pulsating DC applied to power amplifiers causes _____
    a) Burning of Transistors
    b) Hum in the Circuit
    c) Excessive Forward Voltage
    d) Both (a) and (c)

83. A hexadecimal digital number systems has_____ symbols.
    a) 16
    b) 8

c) 2
d) 32
e) 60

84. The disadvantage of impedance matching is that it _____.
a. Gives Distorted Output
b. Requires a Transformer
c. Gives Low Power Output
d. Both (b) and (c)

85. The binary equivalent of decimal number 47 is
a. 11011
b. 110111
c. 111101
d. 101111

86. If the gain versus frequency curve of a transistor is not flat, then there is ___ distortion.
a) Amplitude
b) Frequency
c) Intermodulation
d) Both (a) and (c)

87. 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 input only when all inputs are low?
a. AND Gate
b. OR Gate
c. NOR Gate
d. NAND Gate

88. The most costly method of coupling
a. RC coupling
b. Direct
c. Transformer
d. Impedance

89. Which of the following is NOT a dynamic test instrument?
a. Oscilloscope
b. Logic Monitor
c. Logic Analyzer
d. Logic Probe

90. The signal generator generally used in laboratories is _____ oscillator.
a. Crystal
b. Wien Bridge
c. Hartley
d. Phase Shift

91. A commercial power supply has ____ voltage regulation.
a) 10% and above
b) Within 1%
c) 15% and above
d) 10%

92. _____ is a fixed frequency oscillator.
a. Phase Shift
b. Colpitts
c. Hartley
d. Crystal

93. An electronic transfer from one stage to the next is called _____.
a. Coupling
b. Swamping
c. Doping
d. Mixing

94. An important limitation of crystal oscillator is
a) Its low output
b) Its high Q
c) Less availability of quartz crystal
d) Its high output

95. _____ is analogous to permeance.
a. Admittance
b. Elastance
c. Conductance
d. Resistance

96. For microwave frequencies, a ___ oscillator is required.
a. Klystron
b. Wien Bridge
c. Hartley
d. Colpitts

97. A point contact diode is commonly used
a) As a constant current source
b) As a constant voltage source
c) As an RF detector
d) As a high voltage rectifier

98. In an LC oscillator, if the value of L is increased four times, then frequency of oscillation is
a) Halved
b) Decreased 4 times
c) Doubled
d) Quadrupled

99. Which of the following is NOT a secondary type cell?
a. Lithium
b. Lead-acid
c. All of these
d. Silver-Cadmium

100. When shock-excited, a crystal will produce alternating EMF longer than an LC circuit because crystal
a. Has greater mechanical strength
b. Has lesser losses
c. Is small-sized
d. Is lightweight

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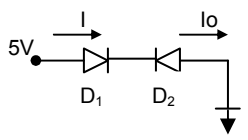
ANSWERS

1. A ROM
2. B throughput
3. C quantum coupler
4. D optical computer
5. A access arm
6. B latency time
7. C 9-track format
8. C ferromagnetism
9. B oxymeter
10. D Isaac Asimov
11. A manipulator
12. B end-effector
13. B series-wound generator at constant speed
14. C magnetic amplifier
15. A stalling
16. B controlling voltage of a DC motor
17. B controller
18. A azimuthal quantum number
19. A form feed
20. C light pen
21. C interrupt
22. A firmware
23. D OS memory
24. C electrotherapy
25. B Weston saturated cell
26. C sacrifice factor
27. A alpha
28. C gamma
29. C selenium
30. D increase the voltage range
31. A Diode sensor
32. C peak to peak
33. D Fuse
34. C 0.036 V, 4.964 V

    Solution:

    Circuit



$I = I_O$

From: $I = I_O(e^{(v1/nVT)} - 1)$

$I / I_O = e^{(v1/nVT)} - 1$

$1 + 1 = e^{(v1/nVT)}$

$2 = e^{(v1/nVT)}$

Taking the natural logarithm in both side

$\ln 2 = (v_1/nV_T) \ln e$

$0.693 = V_1 / nV_T$

Since $nV_T = 0.052$

$V_1 = (0.693)(0.052)$

$V_1 = 0.036V$

$\therefore$ The voltage across D_2 is

$V_2 = 5 - 0.036$

$V_2 = 4.964V$

35. A 49

    Solution:

    $\beta = \alpha / (1 - \alpha) = 0.98 / (1 - 0.98)$

    $\beta = 49$

36. C 14 ohms

    Solution:

    $r_B = (V - V_T) / I = (1 - 0.3\ V) / 50mA$

    Where: V – supply voltage

    V_T – 0.3V for Ge

    $r_B = 14\Omega$ - the actual resistance of the semiconductor

37. B no current flows from emitter to collector
38. D A negative resistance region
39. C machine language
40. C basic
41. A basic language interpreter
42. B false
43. B false
44. B cobol
45. B data bus
46. C 1024 bits
47. B nibble
48. A byte
49. C complier
50. C 8
51. A ground
52. C trigger
53. B output
54. D reset
55. C Ad Hoc Committee of Grocery Industry
56. B JVC
57. D IBM
58. A Sony
59. C Sinclair Radionics
60. B Philips
61. D Standard Telephoned and Cables
62. D Vibrating reed type
63. A magnetic type
64. B electrodynamometer
65. B AC and DC
66. C wattmeter
67. D Measure the voltage across known resistor
68. C zero
69. D. 4.76
70. B
71. B
72. C
73. C
74. A
75. A
76. B
77. D
78. B
79. B
80. C
81. D

82. B
83. A
84. A
85. D
86. B
87. B
88. C
89. B
90. B
91. B
92. D
93. A
94. A
95. C
96. A
97. C
98. A
99. A
100. B

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