(Answer ALL questions)

56. Which of the following ions is not transported across the cell membrane by a primary active transport mechanism?
    1. Na
    2. Cl
    3. K
    4. Ca

57. Shoulder joint belongs to the following variety of joint
    1. Sellar joint or Saddler joint
    2. Hinge joint
    3. Ball and socket joint
    4. Pivot joint

58. In the CNS, the membrane that wraps around the myelinated neurons are those of
    1. Schwann cells
    2. Oligodendroglia
    3. Endothelial cells
    4. Astrocytes

59. Cerebrospinal fluid is formed by
    1. Choroid plexus
    2. Arachnoid villi
    3. Dural venous sinus
    4. Subfornical organ

60. Which of the following is the energy yielded from oxidation to triacyglyceride stores
    1. 1 kcal/g
    2. 2 kcal/g
    3. 4 kcal/g
    4. 9 kcal/g

61. Which of the following enzymes is deficient in Mcardle's disease?
    1. Hepatic hexokinase
    2. Muscle glycogen synthetase
    3. Muscle phosphorylase
    4. Muscle hexokinase

62. The monosaccharide most rapidly absorbed from the intestine is
    1. Glucose
    2. Fructose
    3. Mannose
    4. Galactose

63. The conversion of one molecule of glucose to two molecules of pyruvate results in the net formation of
    1. Six molecules of water
    2. Two molecules of ATP
    3. Three molecules of ATP
    4. Thirty-eight molecules of ATP

64. Resistance of a wire is r ohms. The wire is stretched to double its length, then its resistance in ohms is
    1. r/2
    2. 4 r
    3. 2 r
    4. r/4

65. KCL works on the principle of which of the following
    1. Law of conservation of charge
    2. Law of conservation of energy
    3. Both
    4. None of the above

66. If a resistor is connected across the voltage source and the frequency of voltage and current wave form is 50 Hz, then what is frequency of instantaneous power?
    1. 0 Hz
    2. 100 Hz
    3. 50 Hz
    4. 150 Hz

67. Mesh analysis is applicable for
    1. planar networks
    2. non planar networks
    3. both planner and non planner networks
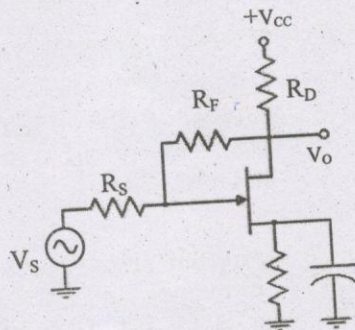   4. neither planner nor non planner networks

68. Calculate I_L and I_Z.
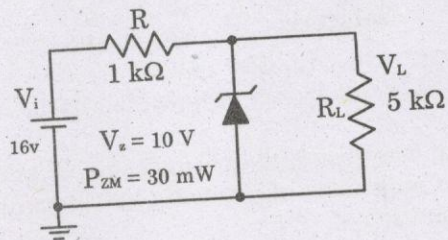
    1. 2 mA, 0 mA
    2. 4 mA, 2 mA
    3. 2 mA, 2 mA
    4. 2 mA, 4 mA

69. The transconductance g_m _____ as the Q-point moves from V_p to I_{DSS}.
    1. decreases
    2. remains the same
    3. increases
    4. none of the above

70. Referring to this figure, calculate the voltage gain without feedback for the following circuit values :
    $R_D = 4 k\Omega, R_S = 1 k\Omega, R_F = 15 k\Omega$, and $g_m = 5000 \mu S$.

    1. − 20.0
    2. − 21.5
    3. − 23.5
    4. − 25.5

71. The Q-point in a voltage amplifier is selected in the middle of the active region because
    1. it gives better stability
    2. the circuit needs a small
    3. the biasing circuit then need less number of resistors
    4. it gives distortions less output

72. A universal logic gate is one, which can be used to generate any logic function. Which o the following is a universal logic gate?
    1. OR
    2. AND
    3. XOR
    4. NAND

73. The output of a JK flipflop with asynchrono preset and clear inputs is '1'. The output c be changed to '0' with one of the followi conditions.
    1. By applying J = 0, K = 0 and using clock
    2. By applying J = 1, K = 0 and using clock
    3. By applying J = 1, K = 1 and using clock
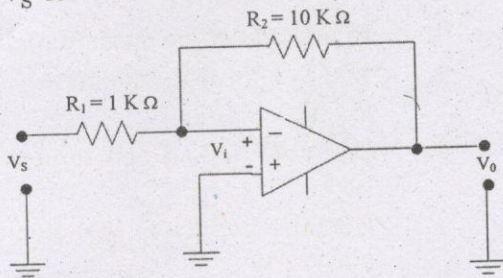   4. By applying a synchronous preset in

74. How many Flip-Flops are required for 16 counter?
    1. 5
    2. 6
    3. 3
    4. 4

75. The simplification of the Boolean expr $\left(\overline{\overline{AB}\overline{C}}\right) + \left(\overline{A\overline{B}}C\right)$ is
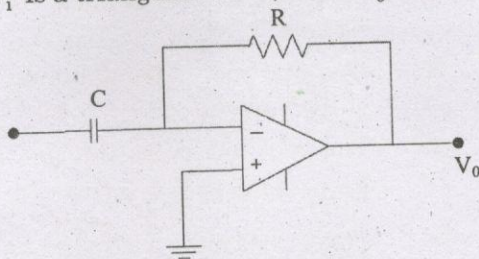   1. 0
    2. 1
    3. A
    4. BC

76. The inverting op-amp shown in the figure has an open-loop gain of 100. The closed-loop gain V_0/V_S is

1. -8
2. -9
3. -10
4. -11

77. Assume that the op-amp of the figure is ideal. If V_i is a triangular wave, then V_0 will be

1. Square wave
2. Triangular wave
3. Parabolic wave
4. Sine wave

78. A weighted resistor digital to analog converter using N bits requires a total of
1. N precision resistors
2. 2N precision resistors
3. N + 1 precision resistors
4. N − 1 precision resistors

79. The conversation speed of an analog to digital converter is maximum with the following technique.
1. Dual slope AD converter
2. Serial comparator AD converter
3. Successive approximation AD converter
4. Parallel comparator AD converter

80. In an 8085 microprocessor, which one of the following instructions changes the content of the accumulator?
1. MOV B, M
2. PCHL
3. RNZ
4. SBI BE H

81. In an 8085 based system, the maximum number of input output devices can be connected using I/O mapped I/O method is
1. 64
2. 512
3. 256
4. 65536

82. In 8086 microprocessor one of the following statements is not true?
1. Coprocessor is interfaced in max mode
2. I/O can be interfaced in max / min mode
3. Coprocessor is interfaced in min mode
4. Supports pipelining

83. SP of 8051 is of ————— wide and it is loaded with the default value of ————— after reset.
1. 2 byte, 08 H
2. 8 bit, 07 H
3. 1 byte, 09 H
4. 8 bit, 06 H

84. The system $y(t) = 2x(t + 3)$ is
1. Causal system
2. Non-causal system
3. partly (1) and partly (2)
4. None of these

85. The Z transform of $\delta(n - m)$ is
1. z^{-n}
2. z^{-m}
3. $1/z - n$
4. $1/z - m$

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86. Convolution is used to find
   1. Amount of similarity between the signals
   2. Response of the system
   3. Multiplication of the signals
   4. Fourier transform

87. The Laplace transform of $u(t)$ is
   1. 1/s
   2. s^2
   3. $1/s^2$
   4. s

88. Which of the IIR Filter design method is antialiasing method?
   1. The method of mapping of differentials
   2. Impulse invariant method
   3. Bilinear transformation
   4. Matched Z – transformation technique

89. Out of the given IIR filters the following filter is the efficient one
   1. Circular filter
   2. Elliptical filter
   3. Rectangular filter
   4. Chebyshev filter

90. The poles of Butterworth filter lies on
   1. Sphere
   2. Circle
   3. Ellipse
   4. Parabola

91. The magnitude response of the following filter decreases monotonically as frequency increases
   1. FIR Filter
   2. Chebyshev type – 1
   3. Chebyshev type – 2
   4. Butterworth Filter

92. An open loop system represented by transfer function $G(s) = (s-1)/(s+2)(s -$ is
   1. Stable and of the minimum phase ty
   2. Stable and of the non-minimum ph type
   3. Unstable and of the minimum ph type
   4. Unstable and of the non-minim phase type

93. The open loop transfer function $G(s)$ o unity feedback control system is given
   $$G(s) = \left[k(s + 2/3)/s^2(s + 2)\right]$$
   From the root locus, it can be inferred t when k tends to positive infinity,

   1. Three roots with nearly equal r parts exist on the left half of t s-plane
   2. One real root is found on the right h of the s-plane
   3. The root loci cross the $j\omega$ axis fo finite value of $k; k \neq 0$
   4. Three real roots are found on the rig half of the s-plane

94. A phase lag lead network introduces in t output
   1. Lag at all frequencies
   2. Lag at high frequencies and lead at l frequencies
   3. Lag at low frequencies and lead at hi frequencies
   4. none of the above

95. The steady-state value of the unit st response of the system is equal to
   1. 1.0
   2. 0.25
   3. 0.5
   4. 0

96. In delta modulation, the usage of larger step size leads to ——————.
   1. increases slope overload error
   2. won't affect the noise
   3. decreases slope overload error
   4. decreases granular noise

97. In a communication link, the receiver is able to receive the signal with strength of 1024 mW over the channel having bandwidth of 1 MHz and noise spectral density of 1 nW/Hz. The maximum data rate that can be achievable is ——————.
   1. 1 Mbps
   2. 10 Mbps
   3. 100 Mbps
   4. 100 Kbps

98. A band-limited signal with a maximum frequency of 5 kHz is to be sampled. According to the sampling theorem, the sampling frequency which is not valid is ——————.
   1. 5 kHz
   2. 12 kHz
   3. 15 kHz
   4. 20 kHz

99. Huffman coder is a ——————.
   1. Lossless source coder
   2. Channel coder with rate of 1
   3. Lossy source coder
   4. Channel coder with rate of 0

100. To reduce electrical resistance between the skin and electrode, use of —————— between the electrode surface and skin is recommended.
   1. Earth ring
   2. Non-inverting electrode terminals
   3. Inverting electrode terminals
   4. Saline soaked felt pads

101. If the heart rate of an adult is 70 bpm and the stroke volume is 70 ml, the cardiac output is
   1. 1 ml
   2. 4.9 ml
   3. 4.9 lts
   4. 5 lts

102. ECG Leads V1 through V6 are called the —————— leads
   1. Unipolar chest leads
   2. Unipolar limb leads
   3. Bipolar limb leads
   4. Augmented limb leads

103. The —————— pressure is indicated by the onset of Korotkoff sounds.
   1. Systolic
   2. Diastolic
   3. Lung
   4. Cerebrospinal fluid

104. The blood cell counter that works on the principle of conductivity is
   1. Coulter counter
   2. Holter counter
   3. Geiger Muller Counter
   4. Proportional counter

105. One of the main parts of a heart lung machine is
   1. Roller pump
   2. Dialyzing agent
   3. Temperature monitor
   4. Bennet valve

106. Minimal threshold for 'Let go' current is _____.

    1.   100 mA
    2.   6 mA
    3.   6 A
    4.   50 mA

107. The normal range of operating frequency for surgical diathermy unit is 1-3 MHz so that _____.

    1.   High current is produced
    2.   Stimulation of tissue is avoided
    3.   Heat is produced
    4.   None of the above

108. CT number for water is _____.

    1.   0
    2.   1
    3.   −1
    4.   1000

109. X-ray is a harmful radiation due to its

    1.   Penetrating power
    2.   EM spectrum
    3.   Ionization characteristics
    4.   Non ionization characteristics

110. The order of imaging methods (from worst to best) with respect to visibility of detail (resolution) is

    1.   Camera, Fluroscopy, CT
    2.   Ultrasound, Fluroscopy, Radiography
    3.   Gamma Camera, Fluroscopy, MRI
    4.   Radiography, Fluroscopy, MRI

111. The relationship between axial resolution and frequency of the ultrasound is

    1.   Frequency increase & Axial resolution decreases
    2.   Frequency decrease & Axial resolution decreases
    3.   Frequency increase & Axial resolution increases
    4.   Frequency decrease & Axial resolution increases

112. If the Reynold's number is greater than 10,000, the flow is known as

    1.   Laminar flow
    2.   Fluid flow
    3.   Turbulent flow
    4.   Transition from laminar to turbulent flow

113. Maxwell model for a viscoelastic fluid material has

    1.   Spring and dashpot in series
    2.   Dashpot alone
    3.   Spring and dashpot in parallel
    4.   Spring alone

114. How much torque is produced at the elbow by the biceps brachii inserting at an angle of θ on the radius when the tension the muscle F_m Newtons assuming that the muscle attachment to the radius is x mt. from the centre of rotation at the elbow joint

    1. $F_m(\sin\theta)x\,\text{Nm}$
    2. $F_m(\cos\theta)x/2\,\text{Nm}$
    3. $F_m(\theta)x\,\text{Nm}$
    4. $F_m(\theta/2)x/2\,\text{Nm}$

115. The distinguishing characteristic cancellous bone is its

    1.   Viscosity
    2.   Porosity
    3.   Viscoelasticity
    4.   Brittle nature