Answers: ECE Paper-2: (Full Test 1) Dated.25.05.15

1. (B) It is simple OR gate and diode has voltage drop of 0.6 Volt
2. (B) It is full wave voltage doubler circuit
3. (C) Maximum value of v_i=3 volt in Positive half D is ON and V_C=3Volt& V_o=0 Volt
   In negative half D is OFF and voltage across capacitor remains constant
   So here
   $V_0 = 1 + 2\sin\omega t - 3 = -2 + 2\sin\omega t$ Here $< V_0 >= -2\,\text{Volt}$
4. (A) It is current mirror circuit
   $$25 = I_{C_1} + 2I_{B_2} = I_{C_2} + \frac{2I_{C_2}}{\beta} \Rightarrow I_{C_2} = \frac{25\times 25}{27} = 23.15\ \mu\text{A}$$
5. (C) It is astable circuit followed by integrator. Output of astable is square wave and integrator will convert it into triangular wave.
6. (B) $\frac{100}{10} = \frac{R}{15} \Rightarrow R = 150\,\text{Kohm}$
7. (A) It is Open loop opamp which has finite value of gain
   $$\frac{V_0}{V_i} = \frac{1+\frac{R_f}{R_1}}{1+\left(\frac{1+\frac{R_f}{R_1}}{A_{OL}}\right)}$$
8. (B) It is low frequency C-V characteristics
9. (B) $2 = 100I_B + V_{BE} \Rightarrow I_B = 0.01\text{mA}$
   $I_E = (\beta+1)I_B = 50\times 0.01\text{mA} = 0.5\text{mA}$
   $r_e = \frac{V_T}{I_E} = \frac{25\text{mV}}{0.5\text{mA}} = 50\Omega$
   $h_{ie} = \beta r_e = 49\times 50 = 2.45\,\text{K}\Omega$
   Here $R_i = h_{ie} = 2.45\ \text{K}\Omega$
10. (A) Here
    $I_1 = 0 = V_1Y_{11} + V_2Y_{12}$
    $Y_{11} = 0\ \&\ Y_{12} = 0$
11. (C) $h_{fe} > 23 + 4K + \frac{29}{K}$ $(\because K = 1) \Rightarrow h_{fe} > 23 + 4 + 29$
12. (A) $g_m \propto K \propto \frac{W}{L}$
13. (A)
14. (B) Bessel has zero ripple in Pass band and zero ripple in stop band
15. (A)

16. (B)
17. (D) Just solve by use of Laplace transform and calculate its transfer function
$\frac{V_0}{V_i} = \frac{1}{sRC}$
18. (D) Here I_L is independent of Load value and power supply hence it is working as constant current source
19. (A)
20. (B) For LED glow all should be connected properly and it must work like '1'
21. (B)
22. (A) $Y_1 = AB + \bar{A}\bar{B} \& Y_2 = \bar{A}B + A\bar{B}$ Both are complement to each other so output of EXNOR will be Zero
23. (A)
24. (C)
25. (D) $(r-1)$ complement system will always have two representation of zeros where r is the base
26. (D) Tricky and logical question
27. (A) Three input majority circuit has output AB+BC+AC
28. (D)
29. (D)
30. (B) For Chip to be selected output of NAND gate must be zero
$A_{15}A_{14}A_{13}A_{12}A_{11}A_{10}A_9A_8A_7A_6A_5A_4A_3A_2A_1A_0$
1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
1 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1
31. (B) It is standard circuit of MOD-8 Down counter
32. (D) Power dissipation in case of ECL is high because it has high speed and product of speed and power dissipation remains constant.
33. (B) Both FF and Latch are Bistable system
34. (B) $n \times 10 + 50 = 100$
$\Rightarrow n = 5$
35. (C) Economical combinational circuit for MOD-11 will be either 3 input NAND gate or 3 input OR gate
36. (C)
37. (A)
38. (B) Max^m CLK freq $= 100 \times 50\text{Hz} = 5\text{KHz}$
39. (B) It is not necessary that feed back will always improve stability it depends upon type of feed back
40. (C)
41. (D)
42. (D) Adding zero means phase lead system and in phase lead steady state error is never decreased
43. (A)
44. (B) It is changing phase in both positive and negative direction.

45. (A) Statement (3) is not correct. If encirclement is there means N=1 Z is not equal to zero
46. (C) ± 6 dB/octave= ± 20 dB/decade
47. (D)
48. (D)
49. (C)
50. (A)
51. (B) $t_p = \frac{n\pi}{\omega_d} \quad n = 2 \rightarrow 1st\ under\ shoot$
52. (D) There will be no real value of GCF so PM will be infinite.
53. (B)
54. (D)
55. (B)
56. (D)
57. (C) There is no pole and root locus is terminating at zero
58. (D)
59. (D) $\frac{S}{N} = m_a^{\ 2} \times \frac{C}{N}$
60. (C) $f = 4KHz + 10KHz$
61. (B) Entropy is measurement of bits $Entropy = 12 \times 512 \times 3\ bits$
62. (D)
63. (D) $H = \log_2 M = \log_2 8 = 3$ It will be its maximum value
64. (D) $C = B\log_2\left(1 + \frac{S}{N}\right) \quad here\ \frac{S}{N}\ is\ very - 2\ low$
65. (C)
66. (D) Rectangular has F.T of Sinc function so triangular will have convolution of two rectangular and hence it will be $Sinc^2$
67. (A) It is basically Band pass sampling theorem
68. $f_D = f_u - f_l, \quad K = \frac{f_u}{f_D}, f_s = \frac{2f_u}{K}$
69. (A)
70. (B)
71. (C) For Diagonal clipping $RC \le \frac{1}{f_m} \rightarrow For\ \ Diagonal\ clipping$
72. (D)
73. (A)
74. (D)
75. (C)
76. (A)
77. (A)
78. (D)

79. (A)
80. (A)
81. (A)
82. (D)
83. (A)
84. (A)
85. (A)
86. (D)
87. (C)
88. (B)
89. (A)
90. (A)
91. (A)
92. (B)
93. (D)
94. (A)
95. (B)
96. (D)
97. (A)
98. (C)
99. (D) If CMP R is used then No of machine cycles are 1 but for CMP M no of machine cycles are 2 But in case of CPI machine cycles are always equal to 2.
100. (B) output of clock frequency is 3/2=1.5 MHz so duration of 1 T state is $\frac{1}{1.5\times10^{6}} = 0.67\mu\text{sec}$
101. (D) Instruction of both processors must be same.
102. (A) Assemblers provide macro facilties also.
103. (B)
104. (C)
105. (B) Active hub is part of CPU which actively participates in various operation of controlling in CPU
106. (B) Micro program is set of instructions and other method is hardwired control system.
107. (C) 108. (C) 109. (C) 110. (A) 111. (D) 112. (B) 113. (C)
114. (A) 115. (B) 116. (B) 117. (B) 118. (B) 119. (B) 120. (D)