Exame Exemplo

Nota: Este é o mesmo exame do que o de 2019/2020 época normal, mas apresentado de maneira diferente.

1. Pergunta 1

   e.

2. Pergunta 2

   a.

3. Pergunta 3

   b.

4. Pergunta 4

   c.

5. Pergunta 5

   b.

6. Pergunta 6

   b.

7. Pergunta 7

   b.

8. Pergunta 8

   a.

9. Pergunta 9

   c.

10. Pergunta 10

    b.

11. Pergunta 11

    $R = 2Mbit/s = 2 \cdot 10^6 bits/s$

    $T_p = 250ms = 0.250s$

    $L = 250Bytes = 2000bits$

    $BER = 10^{-4}$

    $FER = 1 - (1 - BER)^L = 1 - (1 - 10^{-4})^{2000} = 0.181277$

    $T_f = \frac{L}{R} = \frac{2000}{2 \cdot 10^6} = 0.001$

    $a = \frac{T_p}{T_f} = \frac{0.250}{0.001} = 250$

    $W_{max} = \frac{M}{2} = \frac{64}{2} = 32$

    $S = \frac{W \cdot (1 - FER)}{1 + 2a} = \frac{32 \cdot (1 - 0.181277)}{1 + 2 \cdot 250} = 0.052294 = 5.1\%$

    $R_{max} = S \cdot R = 0.052294 \cdot 2 \cdot 10^6 = 104587 bits/s = 105kbits/s$

12. Pergunta 12

    $1 = \frac{W}{1 + 2a} \iff W = 501$

    $W_{max} = 512$

13. Pergunta 13

$L' = 1.3 \cdot L = 1.3 \cdot 2000 = 2600$

$FER' = 5\%$

$T'_f = \frac{L}{R} = \frac{2600}{2 \cdot 10^6} = 0.0013$

$a' = \frac{T_p}{T'_f} = \frac{0.250}{0.0013} = 192.308$

$S' = \frac{W \cdot (1 - FER')}{1 + 2a'} = \frac{32 \cdot (1 - 0.05)}{1 + 2 \cdot 192.308} = 0.078835$

$R'_{max} = S' \cdot R = 0.078835 \cdot 2 \cdot 10^6 = 157670 bits/s = 158 kbits/s$

14. Pergunta 14

$\lambda = 600$

$L = 1500$ bytes $= 12000$ bits

$\rho = 100\% - 40\% = 0.6$

$N = \frac{\rho}{1 - \rho} = \frac{0.6}{1 - 0.6} = 1.5$

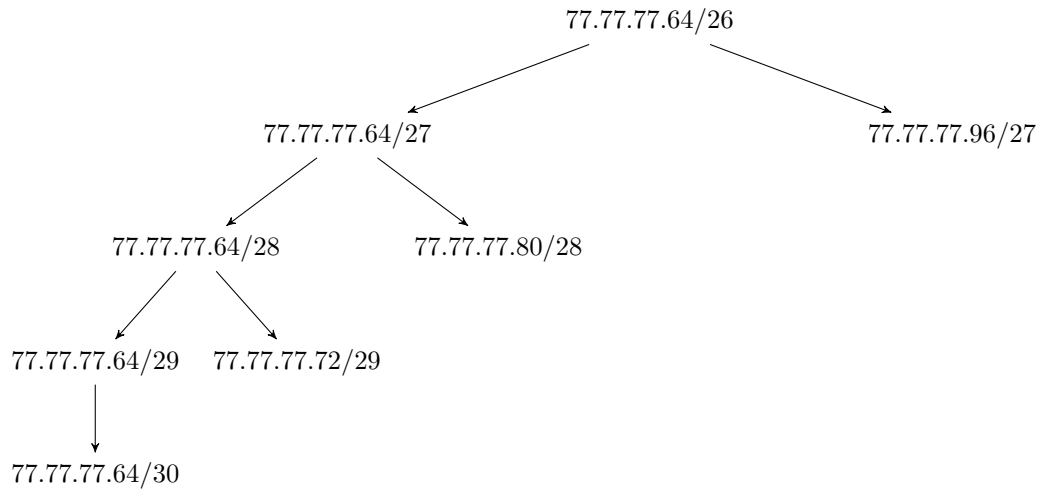$T = \frac{N}{\lambda} = \frac{1.5}{600} = 0.0025$ s $= 2.5$ ms

15. Pergunta 15

$P(1) = \frac{(1 - \rho)\rho^B}{1 - \rho^{B+1}} = \frac{(1 - 0.6)0.6}{1 - 0.6^2} = 0.375$

16. Pergunta 16

$N_w = \rho \cdot N = 0.6 \cdot 1.5 = 0.9$

17. Pergunta 17

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                          77.77.77.64/26
                         /              \
              77.77.77.64/27        77.77.77.96/27
               /          \
      77.77.77.64/28    77.77.77.80/28
        /        \
77.77.77.64/29  77.77.77.72/29
     |
77.77.77.64/30
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77.77.77.96/27

18. Pergunta 18

77.77.77.95

19. Pergunta 19

77.77.77.78

20. Pergunta 20

77.77.77.65