Raosaheb Wangde Master Charitable Trust's

DNYANSHREE

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B+ NAAC 1st Cycle

Written Test for Degree Engineering Interview

Date: 20/07/2024 Time:1 hr Marks:20

Note: All questions are carry equal marks

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1. If silicon diode is operating in forward bias in a circuit with 12 V supply and 240 Ω series resistance, then what is the voltage drop across the diode.

   A. 1.5 V B. 0.4 V C. 1.1 V D. 0.7 V

2. In feedback control system shown in Figure 1 below $G(s) = \dfrac{6}{s(s+1)(s+2)}$, where $R(s), Y(s), \& E(s)$ are Laplace transform of $r(t), y(t), \& e(t)$ respectively, if the input $r(t)$ is a unit ramp function then ——

   A. $\lim_{t\to\infty} e(t) = 0$ B. $\lim_{t\to\infty} e(t) = \dfrac{1}{3}$ C. $\lim_{t\to\infty} e(t) = \dfrac{1}{4}$ D. $\lim_{t\to\infty} e(t)$ does not exist, $e(t)$

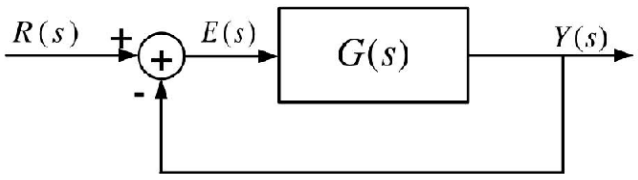

Figure 1: Q.No.2

   is oscillatory.

3. What is the z-transform of the following finite duration signal? $x[n] = \{2, 4, \underset{\uparrow}{5}, 7, 0, 1\}$

   A. $2 + 4z + 5z^2 + 7z^3 + z^4$ B. $2 + 4z + 5z^2 + 7z^3 + z^5$ C. $2 + 4z^{-1} + 5z^{-2} + 7z^{-3} + z^{-5}$
   D. $2z^2 + 4z + 5 + 7z^{-1} + z^{-3}$

4. The BJT as a switch is is operated in one of the following: A. Only saturation region B. Active region C. Only cut off region D. Both saturation and cut off region

5. A DC power supply has no load voltage of 30 V and full load voltage of 25 V at full load current of 1 A. Its output resistance and load regulation respectively are.

   A. 5Ω and 20% B. 25Ω and 20% C. 5Ω and 16.7% D. 25Ω and 16.7%

6. A 500 W carrier signal is amplitude modulated modulation percentage of 60%. The total power in the modulated signal if the form amplitude modulation used is the double sideband AM with full carrier(A3E).

   A. 590 W B. 534 W C. 125 W D. 300 W

7. What will be the o/p of the given logic gate of Figure 2?

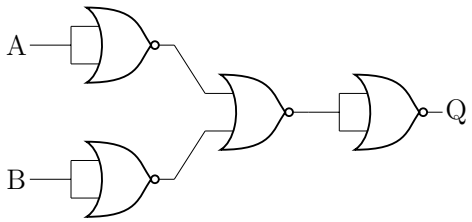

Figure 2: Q.No.7

A. NOR B. NAND C. AND D. OR

8. Let $\hat{i}$ and $\hat{j}$ be the unit vectors along x and y axes respectively, and let A be the positive constant. Which one of the following is true for vector fields $\bar{F}_1 = A(\hat{i}y + \hat{j}x)$, $\bar{F}_2 = A(\hat{i}y - \hat{j}x)$

A. Both $\bar{F}_1$ and $\bar{F}_2$ are electrostatic fields. B. Only $\bar{F}_1$ is an electrostatic fields.
C. Only $\bar{F}_2$ is an electrostatic fields. D. Neither $\bar{F}_1$ nor $\bar{F}_2$ are electrostatic fields.

9. The current I_y flowing through 660Ω resistance is (Refer Figure 3):

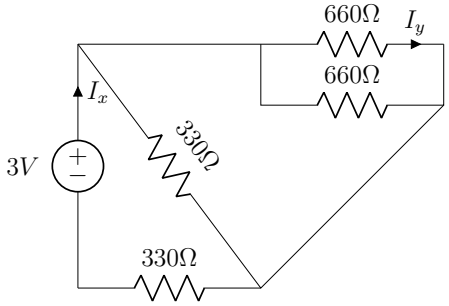

Figure 3: Q.No.9

A. I_x B. $I_x/2$ C. $I_x/4$ D. $I_x/3$

10. In the circuit shown below, P and Q are the inputs. The logical function realized by the circuit shown Figure 4 below is:

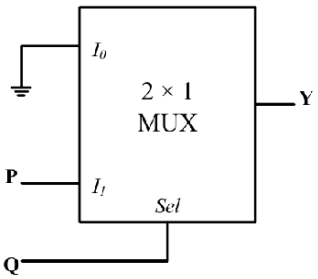

Figure 4: Q.No.10

A. $Y = PQ$ B. $Y = P + Q$ C. $Y = \overline{PQ}$ D. $Y = \overline{P + Q}$