Sample Questions

Instrumentation

1. On which of the following principles does pneumatic load cell work?

    a. Force counter balance
    b. Force balance principle
    c. Magneto-elastic principle
    d. Electromechanical principle

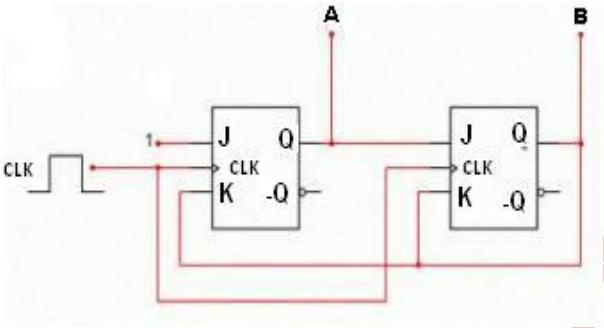
2. In which of the following registers does the microcontroller automatically set the TFx bit, when a timer overflows from its highest value back to 0?

    a. TH0
    b. TL0
    c. TCON
    d. TH1

3. The output transform of the first-order systems for unit-impulse response is

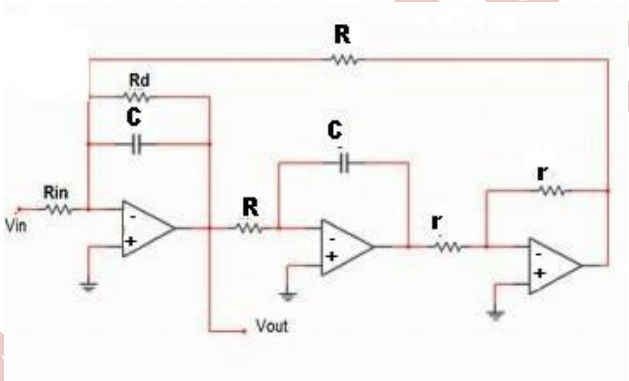
    a. $Y(s) = 1/ \{s^2 (sT+1)\}$
    b. $Y(s) = 1/ \{s (sT+1)\}$
    c. $Y(s) = 1/(sT + 1)$
    d. $Y(s) = 1/(sT)$

4. Find out the duty cycle of output B in the given circuit.



a. 25%
b. 33.33%
c. 50%
d. 6.66%

5. What kind of filter does the given Op-amp-RC circuit realize?



a. LPF
b. BPF
c. HPF
d. Notch filter
e. All pass filter

6. For the Assertion (A) and Reason (R) given below, choose the correct alternative from the following

   A. Both 'A' and 'R' are true and R is the correct explanation of A.
   B. Both 'A' and 'R' are true and 'R' is not the correct explanation of A.
   C. 'A' is true but 'R' is false.
   D. 'A' is false but 'R' is true.
   E. Both are false.

   Assertion: Karl Fisher method is based on the reaction: $2H_2O + SO_2 + I_2 = H_2SO_4 + 2HI$

   Reason: This reaction is used because there is a measurable change in color when water reacts with the added chemical agents.

   a. A
   b. B
   c. C
   d. D
   e. E

7. For the Assertion (A) and Reason (R) given below, choose the correct alternative from the following

   A. Both 'A' and 'R' are true and R is the correct explanation of A.
   B. Both 'A' and 'R' are true and 'R' is not the correct explanation of A.
   C. 'A' is true but 'R' is false.
   D. 'A' is false but 'R' is true.
   E. Both are false.

   Assertion: Piezoelectric transducers are well suited for static or dc applications.

   Reason: The electrical charge produced in piezoelectric transducers decays with time due to the internal impedance of the transducer and the input impedance of the signal conditioning circuits.

   a. A
   b. B
   c. C
   d. D
   e. E

8. Butterworth filter falls in the category of _____.

    a. Infinite impulse response filters
    b. Finite impulse response filters
    c. Non-recursive digital filters
    d. None of these

9. Z parameters of a two port network are Z_{11} = 10Ω, Z_{22} = 20Ω and Z_{12} = Z_{21} = 5Ω. What are the corresponding ABCD parameters?

    a. A=2 B=30Ω C=1.2℧ D=4
    b. A=12 B=30Ω C=0.2℧ D=5
    c. A=12 B=35 Ω C=1.2℧D=5
    d. A=2 B=35Ω C=0.2℧D=4