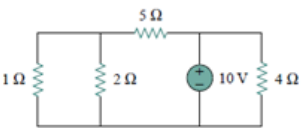
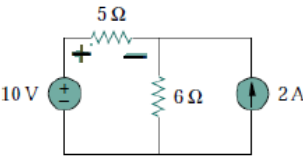
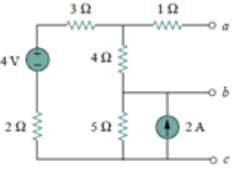
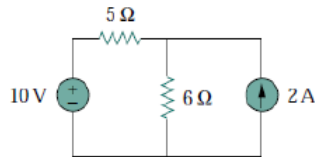


Comprehensive Question Preview

Questions	Choices
Which of the following circuit components opposes the change in the circuit voltage?	1. Resistances 2. Capacitors 3. Inductors 4. Switch
Which of the following quantities the same in all parts of the parallel circuit?	1. Current 2. Voltage 3. Power 4. Resistance
Three resistances R_1 , R_2 , and R_3 are in series such that $R_1 > R_2 > R_3$, Then	1. Power consumption in R_1 will be maximum ($P = I^2 R$) 2. Power consumption in R_2 will be maximum 3. Power consumption in R_3 will be maximum 4. Power consumption in all the resistors will be same
A delta connected system has three resistances of value $R\Omega$ each. The resistance in one of the three arms of the equivalent star system is	1. $R/3$ 2. $3R$ 3. $R/2$ 4. $3R/2$

<p>A 2Ω resistor carrying 2A current will dissipate power equal to</p>	<ol style="list-style-type: none"> 4 W 5 W 8 W 16 W
<p>Determine, No. of meshes, No. of nodes and No. of branches for the following circuit.</p> 	<ol style="list-style-type: none"> 3, 4, 5 4, 3, 5 4, 5, 3 3, 5, 4
<p>Find out voltage across 5 ohm for the following circuit</p> 	<ol style="list-style-type: none"> 1.9V -1.9V 0.9V -0.9V
<p>Determine Thevenin resistance across b-c terminals.</p> 	<ol style="list-style-type: none"> 5 Ω 3.21 Ω 5.21 Ω 9 Ω

Find out voltage across 6 ohm for the following circuit

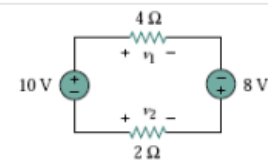


1. 11.9 V
2. -11.9 V
3. 10.9 V
4. 8.9 V

Consider a circuit, which is energised by 10V and three resistors ($R_1 = 2$, $R_2 = 3$ and R_3) are connected in series with the source. Design the R_3 such that it absorbs half of the power delivered by source.

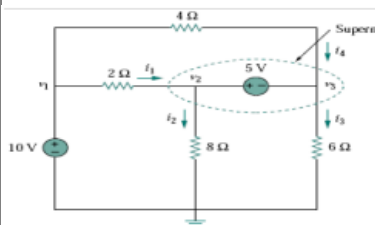
1. 2 Ω
2. 3 Ω
3. 4 Ω
4. 5 Ω

The KVL equation for the Figure is:

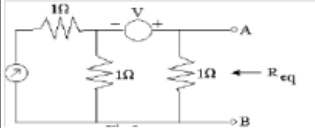


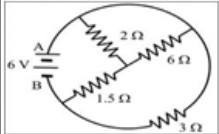
1. $10 - 2I - 4I = 8$
2. $4I - 8 - 2I - 10 = 0$
3. $2I + 4I + 8 = -10$
4. $2I + 4I = 10 + 8$

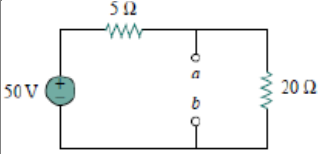
Write the equation for the super node given in the circuit using Kirchhoff's voltage law



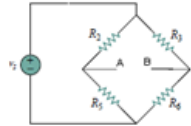
1. $v_2 + 5 + v_3 = 0$
2. $-v_2 + 5 + v_3 = 0$
3. $-v_2 - 5 + v_3 = 0$
4. $-v_2 + 5 - v_3 = 0$

<p>Find the Norton's equivalent resistance (across A & B) of the circuit shown in the Fig.</p> 	<div><div>1.</div><div>1/3</div></div> <div><div>2.</div><div>1/2</div></div> <div><div>3.</div><div>1/4</div></div> <div><div>4.</div><div>3</div></div>
<p>The operating point of the amplifier represents-----</p>	<div><div>1.</div><div>The values of IC and VCE when signal is applied</div></div> <div><div>2.</div><div>The magnitude of the signal</div></div> <div><div>3.</div><div>Zero signal values of IC and VCE</div></div> <div><div>4.</div><div>Maximum values of IC and VCE</div></div>
<p>The stabilization of operating point in self -bias method is provided by</p>	<div><div>1.</div><div>Emitter resistor</div></div> <div><div>2.</div><div>Collector resistor</div></div> <div><div>3.</div><div>Base resistor</div></div> <div><div>4.</div><div>Supply Voltage</div></div>
<p>A network's Norton's current and Thevenins resistance are 0.025A and 200 Ω respectively, the current through the 500Ω load is</p>	<div><div>1.</div><div>10 mA</div></div> <div><div>2.</div><div>7.14 mA</div></div> <div><div>3.</div><div>-10 mA</div></div> <div><div>4.</div><div>-7.14 mA</div></div>

At saturation the value of VCE is nearly _____, and IC = _____	<div>1. zero, zero</div> <div>2. VCC, IC(sat)</div> <div>3. zero, I(sat)</div> <div>4. VCC, zero</div>
The constraint for maximizing the power transfer from the source to the load is	<div>1. $R_{TH} < R_L$</div> <div>2. $R_{TH} > R_L$</div> <div>3. $R_{TH} = 2 R_L$</div> <div>4. $R_{TH} = R_L$</div>
In the voltage-divider biased npn transistor circuit, if R1 opens, the transistor is	<div>1. saturated</div> <div>2. cutoff</div> <div>3. active</div> <div>4. Reverse active</div>
A 2Ω resistor carrying 2A current will dissipate power equal to 	<div>1. 4 W</div> <div>2. 8 W</div> <div>3. 16 W</div> <div>4. 32 W</div>

<p>A common-emitter amplifier has _____ voltage gain and _____ input impedance.</p>	<p>1. High, low 2. Low, high 3. High, high 4. Low, low</p>
<p>A network N is to be connected to load of 500 ohms. If the Thevenin's equivalent voltage and Norton's equivalent current of N are 5 Volts and 10mA respectively, the current through the load will be</p>	<p>1. 2.5 mA 2. 5 mA 3. 7.5 mA 4. 10 mA</p>
<p>When the bypa capacitor is removed from a common source amplifier, the voltage gain</p>	<p>1. increases 2. decreases 3. Has no effect 4. Has very little effect</p>
<p>Norton's resistance across the terminals 'a' and 'b' of the circuit in Fig.</p> 	<p>1. 2 Ohms 2. 4 Ohms 3. 22 Ohms 4. 12 Ohms</p>
<p>The input controlling variable for a _____ is a current level and a voltage level for a _____.</p>	<p>1. BJT, FET 2. FET, BJT 3. SCR, FET 4. BJT, SCR</p>

In the Fig., find the Thevenin's resistance across the terminals A & B.
 $R_2=R_3=10\Omega$, $R_5= R_6 = 20 \Omega$.



1. 6.66Ω **Ans is 40/3**
2. 0Ω
3. 15Ω
4. Infinite Ω

Which of the following is true?

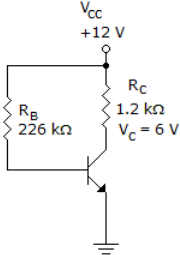
1. $I_B = \beta I_C$
2. $I_B = \beta + 1 / I_C$
3. **$I_B = I_C / \beta$**
4. $I_B = I_C / \beta - 1$

The frequency range of 1GHz to 30 GHz are referred to as

1. Sound waves
2. **Microwaves**
3. Mini waves
4. None of these

.The thermal runaway is avoided in a self bias because_____

1. of its independence of β
2. of the positive feedback produced by the emitter resistor
3. **of the negative feedback produced by the emitter resistor**
4. of its dependence of β

What is the unit of magnetic charge?	<ol style="list-style-type: none"> 1. A-m 2. Coulomb 3. Ampere 4. A-m²
Which of the following is the fastest switching device?	<ol style="list-style-type: none"> 1. JFET 2. BJT 3. Triode 4. MOSFET
One of the following is not a source of Magnetostatics field:	<ol style="list-style-type: none"> 1. A dc current in a wire: 2. A permanent magnet 3. An accelerated charge 4. The electric field linearly changing with time.
<p>Calculate value of I_C</p> 	<ol style="list-style-type: none"> 1. 100 mA 2. 10 mA 3. 50 mA 4. 5 mA

The equivalent resistance of the circuit in Fig.



1. **$4\text{ k}\Omega$**
2. $7\text{ k}\Omega$
3. $8\text{ k}\Omega$
4. $9\text{ k}\Omega$

To analyze the common-emitter amplifier, what must be done to determine the dc equivalent circuit?

1. leave circuit unchanged
2. **Open circuit the coupling and bypass capacitors**
3. Short circuit the coupling and bypass capacitors
4. replace VCC with ground

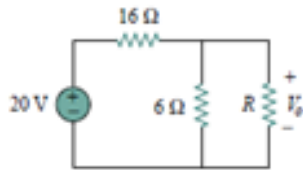
A transistor with $\beta = 120$ is biased to operate at a dc collector current of 1.2 mA . Find the value of g_m

1. 12 mA/V
2. 24 mA/V
3. 36 mA/V
4. **48 mA/V**

The signal to be amplified is current signal and the output desired is a voltage signal. Which of the following amplifier can perform this task?

1. Voltage amplifier
2. Current amplifier
3. Transconductance amplifier
4. **Transresistance amplifier**

The value of R in Fig. 4 if $V_0 = 4\text{ V}$

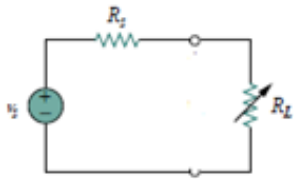


1. $10\ \Omega$
2. $11\ \Omega$
3. $12\ \Omega$
4. $14\ \Omega$

The velocity of an EM wave

1. Inversely proportional to β
2. inversely proportional to α
3. directly proportional to β
4. Directly proportional to α

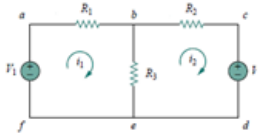
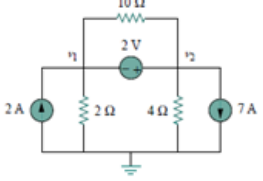
In Fig., $R_s = 25\ \Omega$ & $V_s = 50\text{ V}$. Find the maximum power delivered to the R_L .

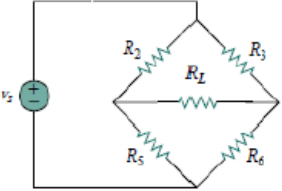


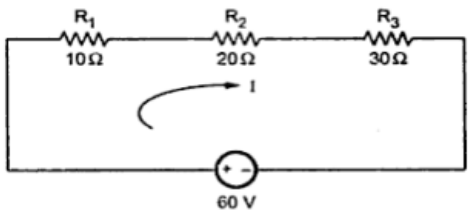
1. 25 W
2. 50 W
3. 250 W
4. 125 W

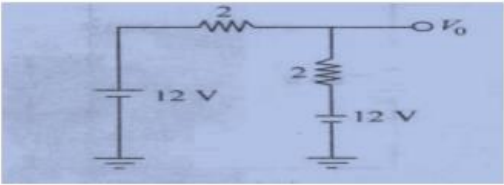
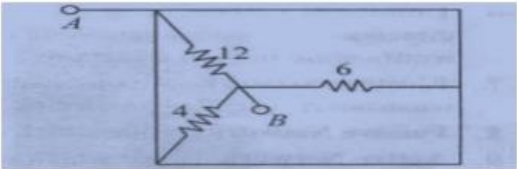
The magnitude of the thermal voltage is given by

1. k/Tq
2. k/qT
3. q/Kt
4. Tk/q

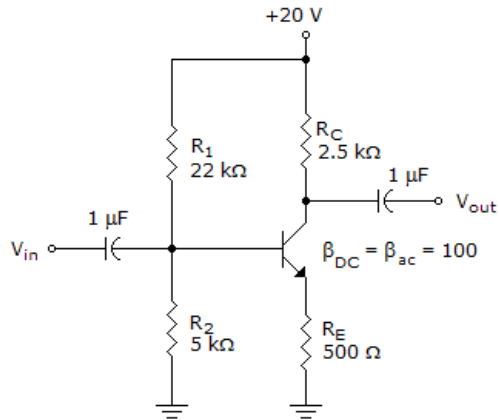
<p>For the Fig given below 'abcdefa' is</p> 	<ol style="list-style-type: none"> 1. loop 2. mesh 3. loop and mesh 4. independent mesh
<p>The major difference between ground and virtual ground is that virtual ground is only a</p>	<ol style="list-style-type: none"> 1. voltage reference 2. current reference 3. power reference 4. difference reference
<p>In the Fig given below the current flowing through 4ohm resistor is</p> 	<ol style="list-style-type: none"> 1. Directly proportional to 10 Ω resistor 2. Indirectly proportional to 10 Ω resistor 3. Indirectly proportional to square root of 10 Ω resistor 4. Independent of 10 Ω resistor
<p>With negative feedback, the returning signal</p>	<ol style="list-style-type: none"> 1. aids the input signal 2. is proportional to output current 3. opposes the input signal 4. is proportional to differential voltage gain

<p>In Fig. ,if $R_2=R_5=10\Omega$, $R_3= R_6 = 20 \Omega$ maximum power will be</p>  <p>delivered to the load when</p>	<ol style="list-style-type: none"> 1. 10Ω 2. 15Ω 3. 20Ω 4. 30Ω
<p>The direction of propagation of EM wave is obtained from</p>	<ol style="list-style-type: none"> 1. \vec{H} 2. \vec{E} 3. $\vec{E} \bullet \vec{H}$ 4. $\vec{E} \times \vec{H}$
<p>If $ADM = 3500$ and $ACM = 0.35$, the CMRR is</p>	<ol style="list-style-type: none"> 1. 1225 2. 10000 [Adm/Acm] 3. 40dB 4. 50dB
<p>The unit for Real power is</p>	<ol style="list-style-type: none"> 1. kW 2. VA 3. KVA 4. KWh

The expression to find three phase real power is	<ol style="list-style-type: none"> 1. $\sqrt{3} V_{ph} I_{ph} \cos\Phi$ 2. $\sqrt{3} V_L I_L \cos\Phi$ 3. $\sqrt{3} V_L I_L \sin\Phi$ 4. $\sqrt{3} V_L I_L \cos\Phi \sin\Phi$
If wet soil has $\sigma = 10^{-2}$ mho/m, $\epsilon_r = 15$, $\mu_r = 1$, $f = 60$ Hz, it is a	<ol style="list-style-type: none"> 1. good dielectric 2. Good conductor 3. semi- conductor 4. magnetic material
The CC configuration has an input resistance_____	<ol style="list-style-type: none"> 1. 500kΩ 2. 750kΩ 3. 600kΩ 4. 400kΩ
Find the voltage across the 20 resistance shown in the fig. 	<ol style="list-style-type: none"> 1. 10 V 2. 15 V 3. 20 V 4. 30 V

<p>The application of a CC configured transistor is _____</p>	<ol style="list-style-type: none"> 1. voltage multiplier 2. level shifter 3. Rectification 4. impedance matching
<p>The velocity factor of a transmission line depends on</p>	<ol style="list-style-type: none"> 1. Temperature Doppler effect 2. skin effect 3. Relative permittivity of dielectric 4. Doppler effect
<p>In the parallel circuit of Fig.1, the value of is volt.</p> 	<ol style="list-style-type: none"> 1. 12 V 2. -12 V 3. 0 V 4. None of the options
<p>What is the equivalent resistance in ohms between points A and B of fig. all resistances are in ohms.</p> 	<ol style="list-style-type: none"> 1. 12 Ω 2. 112 Ω 3. 212 Ω 4. None of the options

Find the value of I_E in the circuit



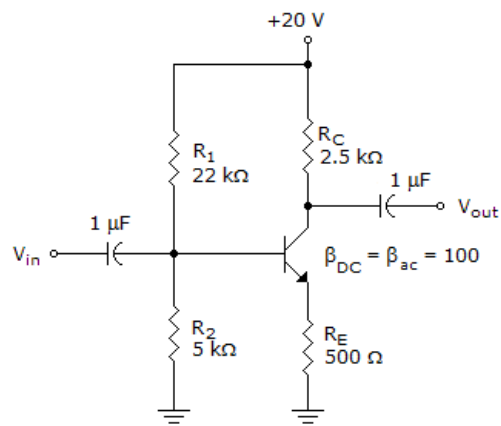
1. 2 mA
2. 4 mA
3. 5 mA
4. 6 mA

A heater is rated as 230 V, 10 kW, A.C. The value 230 V refers to

1. average voltage
2. peak voltage
3. rms voltage
4. exponential voltage

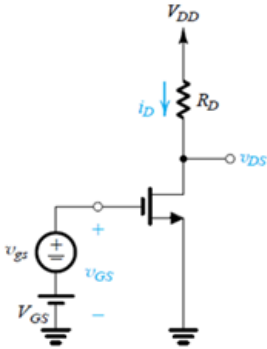
If an emitter bypass capacitor is installed, what would the new A_v be?

1. 4.96
2. 125
3. 398
4. 600



If two sine waves of the same frequency have a phase difference of π radians, then

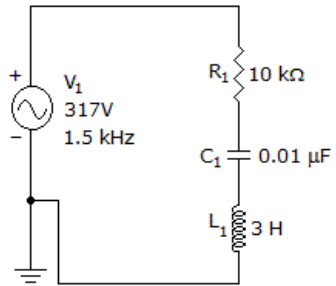
1. both will reach their minimum values at the same instant
2. both will reach their maximum values at the same instant
3. when one wave reaches its maximum value, the other will reach its minimum value
4. when one wave reaches its minimum value, the other will reach its minimum value

<p>For an EM wave transmitted in a good dielectric having $\frac{\sigma}{\omega\epsilon} \gg 1$, the attenuation constant α and phase shift factor β are given by</p>	<p>1. $\alpha = \frac{\sigma}{2} \sqrt{\frac{\mu}{\epsilon}}; \beta = \omega \sqrt{\mu\epsilon}$</p> <p>2. $\alpha = \frac{\sigma}{2} \sqrt{\frac{\mu}{\epsilon}}; \beta = \sqrt{\omega\mu\epsilon}$</p> <p>3. $\alpha = \sqrt{\frac{\mu}{\epsilon}}; \beta = \sqrt{\frac{\omega\mu}{\epsilon}}$</p> <p>4. $\alpha = \sqrt{\frac{\epsilon}{\mu}}; \beta = \sqrt{\frac{1}{\omega\mu\epsilon}}$</p>
<p>Consider the amplifier circuit shown below. The transistor is specified to have $V_t = 0.4\text{ V}$, $k_n = 0.4\text{ mA/V}^2$, $W/L = 10$ and $\lambda = 0$. Also, let $V_{DD} = 1.8\text{ V}$, $R_D = 17.5\text{ k}\Omega$, $V_{GS} = 0.6\text{ V}$ and $v_{gs} = 0\text{ V}$. Find I_D.</p> 	<p>1. 0.08 mA</p> <p>2. 0.16 mA</p> <p>3. 0.4 mA</p> <p>4. 0.8 mA</p>
<p>The power consumed in a circuit element will be least when the phase difference between the current and voltage is</p>	<p>1. 180°</p> <p>2. 90°</p> <p>3. 45°</p> <p>4. 360°</p>

What is the frequency of the astable multivibrator with $R_A = 1\text{ k}\Omega$, $R_B = 3\text{ M}\Omega$ and $C = 1\text{ nF}$	1. 241 Hz 2. 178 Hz 3. 78 Hz 4. 8 Hz
Form Factor is the ratio of	1. average value/r.m.s. value 2. average value/peak value 3. r.m.s. value/average value 4. r.m.s. value/2*average value
An infinite length of uniform line charge has $\rho_l = 10\text{ pC/m}$ and it lies along the z-axis. Determine the electric field E at $(4, 3, 3)$	1. $18\text{ }\mu\text{mV/m}$ 2. $1.8\text{ }\mu\text{mV/m}$ 3. $280\text{ }\mu\text{mV/m}$ 4. $180\text{ }\mu\text{mV/m}$
Power factor of an electrical circuit is equal to	1. R/Z 2. cosine of phase angle difference between current and voltage 3. kW/kVA 4. all options are true

If the gain of a closed-loop inverting amplifier is 3.9, with an input resistor value of 1.6 kilohms, what value of feedback resistor is necessary?	1. 6240 ohms 2. 2.4 kilohms 3. 410 ohms 4. 0.62 kilohms
A point charge, $Q = 10\text{nC}$ is at the origin. The estimated potential difference at A (1,0,0) with respect to B (2,0,0) is	1. 45 V 2. 50 V 3. 30 V 4. -45 V
Poor power factor reduces load handling capability of electrical system	1. results in more power losses in the electrical system 2. results in low power losses in the electrical system 3. overloads alternators, transformers and distribution lines 4. results in more voltage drop in the line
Increase in collector emitter voltage from 5V to 8V causes increase in collector current from 5mA to 5.3mA. Determine the dynamic output resistance.	1. 20k Ω 2. 10k Ω [$r_o = \Delta V_{CE} / \Delta I_C$ $= 3 / 0.3\text{m} = 10\text{k}\Omega$.] 3. 50k Ω 4. 60k Ω

What is the impedance of the circuit?



1. 12.2 k Ω
2. 14.5 k Ω
3. 20.3 k Ω
4. 33.3 k Ω

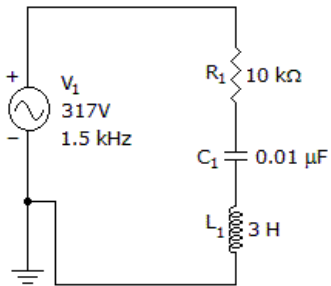
A change in 300mV in base emitter voltage causes a change of 10 μA in the base current. Determine the dynamic input resistance.

1. 20k Ω
2. 10k Ω
3. 30k Ω
4. 60k Ω

Given that $\vec{H} = 0.5e^{-0.1x} \sin(10^6 t - 2x) \hat{a}_z$ A/m, which of these statements are incorrect?

1. $\alpha = 0.1 \text{ Np/m}$
2. $\beta = -2 \text{ rad/m}$
3. $\omega = 10^6 \text{ rad/s}$
4. The wave travels along \hat{a}_x

What is the voltage across R1, C1, and L1?



1. $V_R = 156\text{ V}$, $V_C = 165\text{ V}$, $V_L = 441\text{ V}$
2. $V_R = 178\text{ V}$, $V_C = 187\text{ V}$, $V_L = 503\text{ V}$
3. $V_R = 219\text{ V}$, $V_C = 232\text{ V}$, $V_L = 619\text{ V}$
4. $V_R = -219\text{ V}$, $V_C = -232\text{ V}$, $V_L = -619\text{ V}$

In a bipolar – transistor at room temperature, if the emitter current is doubled, the voltage across its base – emitter junction

1. Doubles
2. Halves
3. Increases by about 20 mV
4. Decreases by about 20 mV

Two sinusoidal currents are given by $i_1 = 10 \sin(\omega t + \pi/3)$ and $i_2 = 15 \sin(\omega t - \pi/4)$. Phase difference between them is

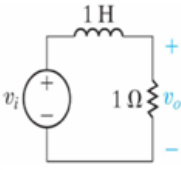
1. 150°
2. 105°
3. 135°
4. 50°

Stokes theorem relates _____ integral to a _____ integral.

1. volume, surface
2. surface, line
3. line, surface
4. Surface, volume

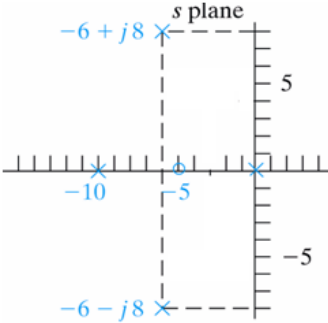
In any ac circuit always	<ol style="list-style-type: none"> 1. Apparent power is more than the actual power 2. Apparent power is equal to the actual power 3. Actual power is more than the reactive power 4. Reactive power is more than the apparent power
Single-time-constant (STC) networks are those networks that are composed of, or can be reduced to	<ol style="list-style-type: none"> 1. One reactive component (L or C) and a resistance (R) 2. Only capacitive component (C) and resistance (R) 3. Only inductive component (L) and resistance (R) 4. Reactive components (L, C or both L and C) and resistance (R)
In an ac circuit, a low value of KVAR compared with KW indicates	<ol style="list-style-type: none"> 1. Maximum load current 2. Low efficiency 3. High p.f 4. Low p.f

If the flux density is 10 Wb/ m ² and the area of the coil is 2m ² , the flux is	1. 40 Wb 2. 10 Wb 3. 20 Wb [flux density=flux/area] 4. 1 Wb
In a purely inductive circuit	1. Reactive power is zero 2. Apparent power is zero 3. Actual power is zero 4. Actual power is unity
General representation of the frequency response curve is called	1. Bode Plot 2. Miller Plot 3. Thevenin Plot 4. Bandwidth Plot
What is the applied voltage for a series RLC circuit when $I_T = 3$ mA, $V_L = 30$ V, $V_C = 18$ V, and $R = 1000$ ohms?	1. 3.00 V 2. 12.37 V 3. -12.37 V 4. 34.98 V

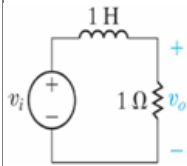
Capacitive reactance is more when	1. capacitance is less and frequency of supply is less 2. capacitance is less and frequency of supply is more 3. capacitance is more and frequency of supply is less 4. capacitance is more and frequency of supply is more
What is the transfer function of the circuit? 	1. $s + 1$ 2. $s - 1$ 3. $\frac{1}{s - 1}$ 4. $\frac{1}{s + 1}$
Maxwell's fourth equation is given by	1. $\nabla \times B = H$ 2. $\nabla \times H = B$ 3. $\nabla \times H = J$ 4. $\nabla \times J = H$
What is the level of the voltage between the input terminals of an op-amp?	1. 0 V 2. 5 V 3. 5 mV 4. 0.5 V

Commented [1]: TF = R/(R+Ls+1/CS)

Which of the following circuit components acts as open circuit to dc signal?	1. Resistances 2. Capacitors 3. Inductors 4. Capacitor and Inductors
The electric susceptibility of a dielectric is 4, its permittivity is	1. 2.2610^{-9} F/m 2. 4.4210^{-7} F/m 3. 5 F/m 4. 1.2610^{-3} F/m
An op-amp has an open-loop gain of 75,000 and a cutoff frequency of 100 Hz. At 1 kHz the open-loop gain is down by	1. 10 dB 2. 6 dB 3. 20 dB 4. 3 dB
What is the integral of dc step signal ?	1. Step signal 2. Ramp signal 3. Pulse signal 4. Parabolic signal

<p>What is the transfer function of the system from the s-plane?</p> 	<p>1. $\frac{(s+5)}{(s+10)(s)(s+6-j8)(s+6+j8)}$</p> <p>2. $\frac{(s-5)}{(s+10)(s)(s+6-j8)(s+6+j8)}$</p> <p>3. $\frac{(s+5)}{(s-10)(s)(s+6-j8)(s+6+j8)}$</p> <p>4. $\frac{(s-5)}{(s-10)(s)(s+6-j8)(s+6+j8)}$</p>
<p>Plane $z = 10\text{m}$ carries charge 20nC/m^2. The electric Field intensity at the origin is</p>	<p>1. -10az V/m</p> <p>2. $-18\pi \text{ az V/m}$</p> <p>3. $-72\pi \text{ az V/m}$</p> <p>4. $-360\pi \text{ az}$</p>
<p>The _____ amplifier configuration has the highest input impedance and the lowest output impedance of the four basic op-amp configurations.</p>	<p>1. non-inverting</p> <p>2. inverting</p> <p>3. voltage-follower</p> <p>4. differential</p>

What is the filter type of the circuit?



1. **LPF**
2. HPF
3. BPF
4. BEF

If two sinusoids of the same frequency but of different amplitudes and phase angles are subtracted, the resultant is

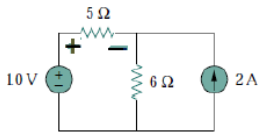
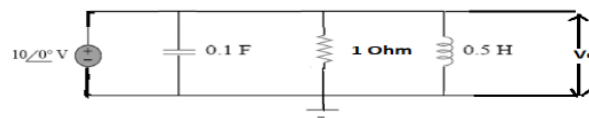
1. **a sinusoid of the same frequency**
2. a sinusoid of half the original frequency
3. a sinusoid of double the frequency
4. a sinusoid of triple the frequency

What is the impedance function of the 2 H inductor?

1. **$j\omega 2$ Ohms**
2. $-j\omega 2$ Ohms
3. $j\omega 2$ H
4. $-j\omega 2$ H

The maximum rate of change of the output voltage in response to a step input voltage is the _____ of an op-amp.

1. time constant
2. maximum frequency
3. **slew rate**
4. static discharge

<p>What is the Thevenin voltage across 6 ohm for the following circuit?</p> 	<p>1. 5.45 V</p> <p>2. -5.45 V</p> <p>3. 12 V</p> <p>4. -12 V</p>
<p>What are the units of admittance?</p>	<p>1. Ohms</p> <p>2. Henry</p> <p>3. Farads</p> <p>4. Siemens</p>
<p>What is the cutoff frequency of an op-amp if the unity-gain frequency is 1.5 MHz and the open-loop gain is 100,000?</p>	<p>1. 5 Hz</p> <p>2. 15 Hz</p> <p>3. 10 Hz</p> <p>4. 20 Hz</p>
<p>What is the voltage across 0.5 H inductor in the following circuit?</p> 	<p>1. 3.33 V</p> <p>2. 5 V</p> <p>3. 7 V</p> <p>4. 10 V</p>

Commented [2]: Voltage is same in parallel circuit

<p>How many op-amps are required to implement this equation?</p> $V_o = - \left(\frac{R_f}{R_1} V_1 + \frac{R_f}{R_2} V_2 + \frac{R_f}{R_3} V_3 \right)$	<p>1. <input checked="" type="radio"/></p> <p>2. <input type="radio"/></p> <p>3. <input type="radio"/></p> <p>3. <input type="radio"/></p> <p>2. <input type="radio"/></p> <p>4. <input type="radio"/></p> <p>4. <input type="radio"/></p>
<p>Voltage – current relations in different types of circuit elements are given below. Find out the wrong relation.</p>	<p>1. <input checked="" type="radio"/> $i = C * (dv/dt)$</p> <p>2. <input type="radio"/> $i = G * v$</p> <p>3. <input type="radio"/> $i = L * \int v dt + i(0)$</p> <p>4. <input type="radio"/> $v = (1/C) * \int i dt + v(0)$</p>
<p>In the Colpitts oscillator, the frequency is determined by _____</p>	<p>1. <input type="radio"/> resistance only</p> <p>2. <input type="radio"/> inductance only</p> <p>3. <input type="radio"/> capacitance only</p> <p>4. <input checked="" type="radio"/> both inductance and a capacitance</p>
<p>The voltage drop across a 5 µF capacitor is 100 V. What is the energy stored in the capacitor</p>	<p>1. <input checked="" type="radio"/> 0.025 Joules [$\frac{1}{2} CV^2$]</p> <p>2. <input type="radio"/> 0.25 Joules</p> <p>3. <input type="radio"/> 2.5 Joules</p> <p>4. <input type="radio"/> 25 Joules</p>

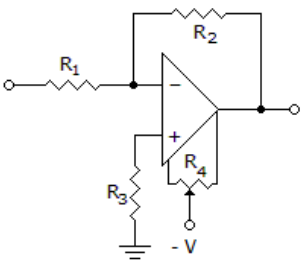
Of the following, the incorrect relation is	1. $D = \epsilon E$ 2. $B = \mu H$ 3. $J = \sigma E$ 4. $B = \mu B$
A Schmitt trigger is	1. a comparator with only one trigger point 2. a comparator with hysteresis 3. a comparator with three trigger points 4. a comparator without hysteresis
A feedback amplifier has a _____ upper 3-dB frequency and a _____ lower 3-dB frequency compared to an amplifier without feedback.	1. smaller, higher 2. higher, smaller 3. smaller, smaller 4. higher, higher
A delta connected system has three resistances of value $72\ \Omega$ each. The resistance in one of the three arms of the equivalent star system is	1. $12\ \Omega$ ANSWER is $24\ \Omega$ 2. $92\ \Omega$ 3. $108\ \Omega$ 4. $216\ \Omega$

What circuit produces an output that approximates the area under the curve of an input function?	1. integrator 2. differentiator 3. summing amplifier 4. comparator
Rectangular Waveguide behaves as	1. Low pass filter 2. All pass filter 3. High pass filter 4. Waveguide cant behave as filter
A $2\ \Omega$ resistor dissipates 8 W power. What is the current through the resistor?	1. 4 A 2. 3 A 3. 2 A 4. 1 A
Voltage feedback connections tend to _____ the output impedance. Current feedback connections tend to _____ the output impedance.	1. decrease, increase 2. increase, decrease 3. increase, increase 4. decrease, decrease

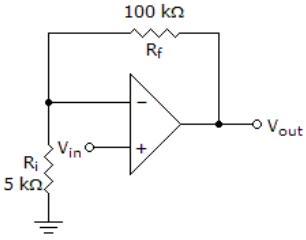
In a comparator with output bounding, what type of diode is used in the feedback loop?	<ol style="list-style-type: none"> 1. Schottky 2. junction 3. zener 4. varactor
Find out the wrong statement	<ol style="list-style-type: none"> 1. Current leads voltage in a capacitor 2. Current leads voltage in an inductor 3. Voltage leads current in an inductor 4. Voltage and current are in phase in a resistor
Transistors are biased in ----- for class B operation	<ol style="list-style-type: none"> 1. Active mode 2. Reverse active mode 3. Cut off 4. saturation
Two resistors $R_1=30\ \Omega$ and $R_2=10\ \Omega$ are connected in series to a DC voltage source of 10 V. What is the voltage across R_2 ?	<ol style="list-style-type: none"> 1. 10 V 2. 5 V 3. 2.5 V 4. -5 V

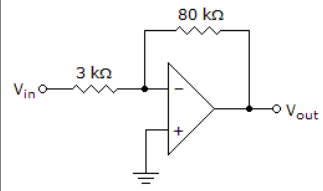
With most monostable multivibrators, what is the Q output when no input trigger has occurred?	<div>1. LOW</div> <div>2. +5 V</div> <div>3. SET</div> <div>4. HIGH</div>
The electric field component of a wave in free space is given by $\vec{E} = 10 \cos(10^7 t + kz) \hat{a}_y$, it can be inferred that	<div>1. The wave propagates along \hat{a}_y</div> <div>2. The wavelength $\lambda = 188.5$</div> <div>3. The wave amplitude is 20 V/m</div> <div>4. The wave number $k = 0.33 \text{ rad/m}$</div>
Consider a Class AB circuit with $V_{CC}=15\text{V}$, $I_Q=2\text{mA}$ and $R_L=100\Omega$. Determine V_{BB} given $I_S=10^{-13} \text{ A}$.	<div>1. 1.186 V</div> <div>2. 2.8 V</div> <div>3. 5.3 V</div> <div>4. 4.2 V</div>
The RMS value of an alternating waveform $v = 200 \sin(314t - 45^\circ)$ is	<div>1. 127.2 V</div> <div>2. 141.4 V</div> <div>3. 282.8 V</div> <div>4. 314.4 V</div>

Commented [3]: $V_{bb} = 2 \cdot V_t \cdot \ln(I_p/I_s) = 1.26\text{V}$

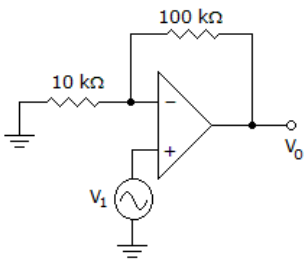
<p>If the value of R_1 decreases in the circuit, the voltage gain will _____ and the input impedance will _____.</p> 	<ol style="list-style-type: none"> 1. increase, increase 2. increase, decrease 3. decrease, decrease 4. decrease, increase
<p>The electric flux density $D = 2x^3 a_x$ C/m². The volume charge density at P(3mm,-2mm,4mm) is</p>	<ol style="list-style-type: none"> 1. 54 C/m³ 2. 54 mC/m³ 3. 54 mC/m³ 4. 54 nC/m³
<p>An op-amp has an open-loop gain of 100,000 and a cutoff frequency of 40 Hz. Find the open-loop gain at a frequency of 30 Hz.</p>	<ol style="list-style-type: none"> 1. 800 2. 8,000 3. 80,000 4. 100,000
<p>An alternating current varying sinusoidally, with a frequency of 50 Hz, has an RMS value of 15 A. The time domain representation is</p>	<ol style="list-style-type: none"> 1. 15 Sin(50t) 2. 15 Cos(314t) 3. 21.2 Cos(50t) 4. 21.2 Sin(314t)

Plane $y = 0$ carries a uniform current of $30\mathbf{a}_z$ mA/m. At $(1,10,-2)$, the magnetic field intensity is _____	1. $-15\mathbf{a}_y$ mA/m 2. $15\mathbf{a}_x$ mA/m 3. $15\mathbf{a}_y$ mA/m 4. $-15\mathbf{a}_x$ mA/m
Calculate the efficiency of a class B amplifier for a supply voltage of $V_{CC} = 20$ V with peak output voltage of $V_{L(p)} = 18$ V. Assume $R_L = 16\Omega$.	1. 78.54% 2. 75% 3. 70.66% 4. 50%
Voltage $v = 10 \sin(314t)$ and current $i = 10 \sin(314t)$ in a load. What is the power consumed?	1. 100 W 2. 50 W 3. 20 W 4. 12.5 W
The voltage across a circuit branch is given by $v = 282.8 \sin 314t$ and current through the branch is given by $i = 14.14 \sin(314t - 60^\circ)$; The impedance in the branch is	1. $19.97 \sin(314t - 60^\circ)$ 2. $20 \sin(314t + 60^\circ)$ 3. $20 \sin(314t)$ 4. $19.97 \sin(314t)$

<p>A dc input signal of -50 mV is applied to the circuit. You would measure _____ from the inverting input to ground.</p> 	<ol style="list-style-type: none"> 1. 50 mV 2. 1.05 V 3. -1.05 V 4. -50 mV
<p>Emitter follower is a circuit</p>	<ol style="list-style-type: none"> 1. Voltage feedback 2. Current feedback 3. Both voltage and current feedback 4. None of the above
<p>In which direction is the plane wave $E=50 \sin (10^8 t + 2z) \hat{a}_y$ v/m.(where \hat{a}_y is unit vector in y-direction),traveling?</p>	<ol style="list-style-type: none"> 1. Along y-direction 2. Along -y-direction 3. Along z-direction 4. Along -z-direction
<p>The admittance of a circuit is $(0.05 - j 0.08)$ Siemens. The impedance of the circuit is</p>	<ol style="list-style-type: none"> 1. $(5.6 - j 8.98)\text{ Ohm}$ 2. $(5.6 + j 8.98)\text{ Ohm}$ 3. $(20 - j 12.5)\text{ Ohm}$ 4. $(20 + j 12.5)\text{ Ohm}$

What would be the computational value of feedback voltage in a negative feedback amplifier with $A = 100$, $\beta = 0.03$ and input signal voltage = 30 mV?	<div>1. 0.03 V</div> <div>2. 0.06 V</div> <div>3. 0.09 V</div> <div>4. 0.15 V</div>
Find the midrange gain of the amplifier circuit shown 	<div>1. 26.7</div> <div>2. -26.7</div> <div>3. 27.7</div> <div>4. -27.7</div>
What is the slew rate of an op-amp if the output voltages change from 2 V to 3 V in 0.2 ms?	<div>1. 5 V/ms</div> <div>2. 3 V/ms</div> <div>3. 2 V/ms</div> <div>4. 1 V/ms</div>
For lossless line,	<div>1. $\alpha=0, \beta=0$</div> <div>2. $\alpha=0, \beta\neq 0$</div> <div>3. $\alpha\neq 0, \beta=0$</div> <div>4. $\alpha\neq 0, \beta\neq 0$</div>

Commented [4]: $A_v = -R_2/R_1$

Which among the following is an output provided by transresistance amplifier?	<ol style="list-style-type: none"> 1. Output current proportional to signal voltage 2. Output voltage proportional to signal current 3. Output voltage proportional to input voltage 4. Output current proportional to signal current
A series RLC circuit has $R = 10\ \Omega$, $L = 0.5\text{H}$ and $C = 50\ \mu\text{F}$. What is the resonant frequency	<ol style="list-style-type: none"> 1. 40 KHz 2. 33.3 KHz 3. 31.83 KHz $[f=1/[2*\pi*\sqrt{L*C}]]$ 4. 99.99 Hz
The current through a series RLC circuit at resonance is 5A. The current at cut-off frequencies is	<ol style="list-style-type: none"> 1. 0 A 2. 2.5 A 3. 3.53 A 4. 5 A
Calculate the input voltage when $V_o = 11\text{ V}$. 	<ol style="list-style-type: none"> 1. 1.1 V 2. -1.1 V 3. 1 V 4. -1 V

The input impedance of a $\lambda/2$ transformer is	1. terminal impedance 2. terminal admittance 3. characteristics impedance 4. Wave impedance
The quality factor of a series resonant circuit is 50. It is connected to an alternating source $v = 10 \sin 314t$. What is the maximum voltage across the capacitor at resonance	1. 50 V 2. 70.7 V 3. 500 V 4. 707 V
The characteristic impedance Z_0 of a transmission line is given by, (where R, L, G, C are the unit length parameters)	1. $(R + j\omega L)/(G + j\omega C)$ 2. $(R + j\omega L)(G + j\omega C)$ 3. $(R + j\omega L)^2 / (G + j\omega C)$ 4. $[(R + j\omega L) / (G + j\omega C)]^{1/2}$
Quiescent power is the power dissipation of a transistor	1. With no signal input 2. With no load. 3. Under full load. 4. Along the dc load line.

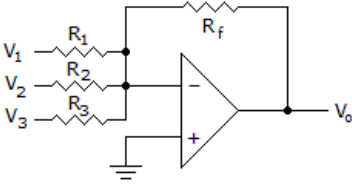
Identify the pair which is not a dual, from the following :	1. Current – Voltage 2. Loop – Node 3. Short circuit – Open circuit 4. Resistance – Capacitance
A network graph contains 5 nodes and 8 branches. How many number of loop it contain?	1. 2 2. 3 3. 4 [l = b – n + 1] 4. 5
The reflection coefficient over the normalized Z_l	1. $(Z_l - 1) / (Z_l + 1)$ 2. $(Z_l + 1) / (Z_l - 1)$ 3. $(Z_s - 1) / (Z_s + 1)$ 4. none of these
Cross over distortion behaviour is characteristic of	1. Class A output stage 2. Class B output stage 3. Class AB output stage 4. Common base output stage

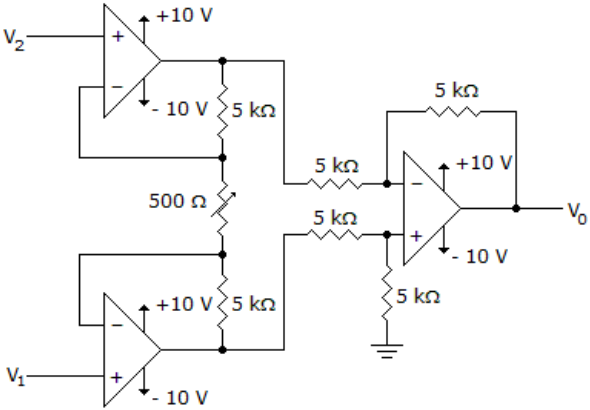
A 60 ohm resistive load is connected to a practical voltage source of 40 V. The source resistance can be tuned between 20 ohm and 80 ohm. Calculate the maximum power delivered by the source.	1. 15 W 2. 13.33 W 3. 6.65 W 4. 3.5 W
Travel to length $\lambda/2$ over the line corresponds to rotation over smith chart by	1. 180° 2. 360° 3. 90° 4. 270°
If an op-amp comparator has a gain of 100,000, an input difference of 0.2 mV above reference, and a supply of 12 V, the output will be	1. 20 V 2. 12 V 3. 10 V 4. 15 V
What will be oscillator frequency, if phase shift network of RC phase shift oscillator contains a capacitor of 7nF and a resistance of 10k?	1. 928 Hz 2. 1 kHz 3. 1.2 kHz 4. 895 Hz

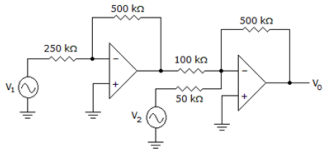
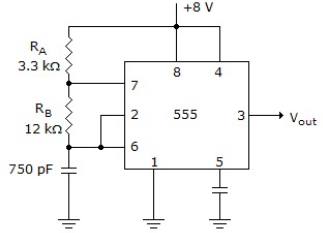
Commented [5]: With 20ohm as internal resistance,
 $P_{out} = R_L \cdot i^2$

What is the function of the comparators in the 555 timer circuit?	<ol style="list-style-type: none"> 1. to compare the output voltages to the internal voltage divider 2. to compare the input voltages to the internal voltage divider 3. to compare the output voltages to the external voltage divider 4. to compare the input voltages to the external voltage divider
In circular waveguide the dominant mode is	<ol style="list-style-type: none"> 1. TE₁₀ 2. TE₁₁ 3. TE₂₀ 4. TE₂₁
What will be the oscillator frequency of Hartley oscillator if inductance L ₁ , L ₂ are equal to 1 mH and 2 mH respectively and capacitor C is 10 nF. (Neglect mutual inductance)	<ol style="list-style-type: none"> 1. 50 kHz 2. 57 kHz 3. 40 kHz 4. 1 MHz
Poynting vector gives	<ol style="list-style-type: none"> 1. Rate of energy flow 2. direction of polarization 3. electric field 4. magnetic field.

The output of the astable circuit _____.	1. constantly switches between two states 2. is LOW until a trigger is received 3. is HIGH until a trigger is received 4. floats until triggered
Low frequency oscillators have a frequency range of	1. 20 Hz-20 kHz 2. 20 Hz-100 kHz 3. 1 Hz-20 kHz 4. 50 Hz-100 kHz
Which mode of operation is being used when a 555 timer chip has two external resistors and an external capacitor?	1. monostable 2. pulse stretching 3. Schmitt triggering 4. astable
For a phase-shift oscillator, the gain of the amplifier stage must be greater than _____.	1. 19 2. 29 3. 30 4. 1

<p>An amplifier has an open loop gain of 100 and its upper and lower cut-off frequency of 100 Hz and 100 kHz respectively. A feedback network with a feedback factor of 0.99 is connected to the amplifier. The new lower and upper cut-off frequencies are at _____ and _____.</p>	<ol style="list-style-type: none"> 1. 10 Hz and 10 MHz. 2. 1 Hz and 10 MHz. 3. 1 Hz and 100 MHz. 4. 1 Hz and 100 MHz.
<p>What is the major factor for determining whether a medium is a free space, lossless dielectric, lossy dielectric or good conductor?</p>	<ol style="list-style-type: none"> 1. Attenuation Constant 2. Complex permittivity 3. Loss tangent 4. Reflection Coefficient
<p>Calculate the output voltage in the circuit shown, if $R_1 = R_2 = R_3 = 100\ \Omega$, $R_f = 1\text{ k}\Omega$, and $V_1 = V_2 = V_3 = 50\text{ mV}$.</p> 	<ol style="list-style-type: none"> 1. -1.5 V 2. 1.5 V 3. 0.5 V 4. -0.5 V
<p>Two thin parallel wires are carrying current along the same direction. The force experienced by one due to other is</p>	<ol style="list-style-type: none"> 1. Only open loop 2. only closed loop 3. both open and closed loop 4. Back loop

<p>The total electric flux through any closed surface surrounding charges is equal to the amount of the charge enclosed". The above statement is associated with</p>	<ol style="list-style-type: none"> 1. Coulomb's square law 2. Gauss's law 3. Maxwell's first law 4. Maxwell's second law
<p>Calculate the output voltage for this circuit when $V_1 = 2.5\text{ V}$ and $V_2 = 2.25\text{ V}$.</p> 	<ol style="list-style-type: none"> 1. -5.25 V 2. 2.5 V 3. 2.25 V 4. 5.25 V
<p>The thevenin impedance of a circuit is $5.47 \cos(4t-85.4^\circ)$ Ohms. The value of a pure resistive load for maximum power transfer condition is :</p>	<ol style="list-style-type: none"> 1. 5.45 ohm 2. 0.44 ohm 3. 0 Ohm 4. 5.47 ohm

<p>Calculate the output voltage if $V_1 = 300 \text{ mV}$ and $V_2 = 700 \text{ mV}$.</p> 	<ol style="list-style-type: none"> 0 V -12 V 12 V -4 V
<p>A $100 \mu\text{F}$ capacitor (initially relaxed) is connected to a 10 V DC source with internal resistance of 2 ohm. The initial current through the capacitor (immediately after the instant of connection) is</p>	<ol style="list-style-type: none"> 10 A 5 A 1 A 0.5 A
<p>A capacitor of $100 \mu\text{F}$ (initially relaxed) is connected to a battery of 10 V at time $t=0$; The current through the capacitor reaches the steady state value of 0 A in 100mS. What is the time constant of the circuit</p>	<ol style="list-style-type: none"> 100 mSec 50 msec 30 msec 20 sec It should be 20ms
<p>What is the duty cycle of the waveform at the output of the circuit given below?</p> 	<ol style="list-style-type: none"> 78% 56% 50% 44%

Five resistors of equal value are connected in parallel to a 12V battery. If one of the resistors is open circuited	1. The current in individual branches increase 2. The currents in individual branches decrease 3. The total current drawn from the battery increase 4. The total current drawn from the battery decrease
What is the difference output voltage of any signals applied to the input terminals?	1. The differential gain times the difference input voltage. 2. The common-mode gain times the common input voltage 3. The sum of the differential gain times the difference input voltage and the common-mode gain times the common input voltage. 4. The difference of the differential gain times the difference input voltage and the common-mode gain times the common input voltage.
A potentiometer in series with a fixed resistance of value 100 Ohm is connected to a DC voltage source of 5V. The current in the resistor combination is 10 mA . The resistance setting of potentiometer is	1. 4000 Ohm 2. 400 Ohm 3. 40 Ohm 4. 4 Ohm

Which of these formulas is wrong

1.
 $B_{1n} = B_{2n}$
2.
 $B_2 = \sqrt{B_{2n}^2 + B_{2t}^2}$
3.
 $H_1 = H_{1n} + H_{2n}$
4.
 $a_{n21} \times (\bar{H}_1 - \bar{H}_2) = \bar{K}$

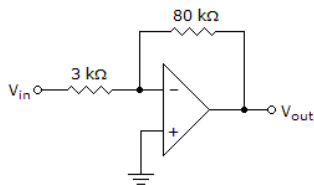
At what input voltage level does the output voltage level become numerically equal to the value of the differential gain of the amplifier?

1.
 $V_{i1} = -V_{i2} = 0.25 \text{ V}$
2.
 $V_{i1} = -V_{i2} = 0.50 \text{ V}$
3.
 $V_{i1} = -V_{i2} = 0.75 \text{ V}$
4.
 $V_{i1} = -V_{i2} = 1.00 \text{ V}$

An alternating periodic waveform is sampled at equal time intervals over one period. The sampled values are 0, 2, 4, 6, 10, 12, 10, 6, 4, 2 respectively. What is the RMS value of the waveform is

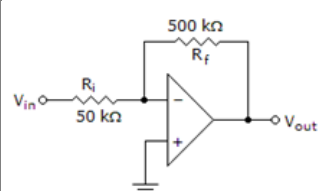
1.
5.6
2.
6.75
3.
7.11
4.
6.22

The op-amp has a unity-gain bandwidth of 3 MHz. Determine the BW of the circuit

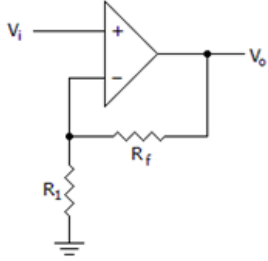


1.
3 MHz
2.
30 kHz
3.
112.4 kHz
4.
infinite in width

Commented [6]: BW = Fc/Q-factor
=> BW = 3M/(80k/3k)
= 112.4kHz

An inductive load draws 9A and 1 KW from a 220V, 60 Hz AC supply. What is the value of resistance in the load?	1. 24.4 Ohms 2. 12.3 Ohms 3. 6.3 Ohms 4. 3 Ohms
What is the scale multiplier (factor) of a basic integrator?	1. R / C 2. C / R 3. -RC 4. -1 / RC
Consider the following statements on a network at resonance 1. The impedance is maximum 2. The power factor of the network is unity irrespective of the network 3. The Q of the network is independent of R Of these statements	1. 1 and 3 are correct 2. 1 and 2 are correct 3. 2 and 3 are correct 4. 1 alone is correct
If an input signal of -0.5 V were applied, determine the output voltage.  (Inverting Amp)	1. -5 V 2. 5 V (Gain=V _{in} /V _{out} =-R ₂ /R ₁) 3. 10 V 4. -10 V

Commented [7]: At resonance: $X_L = X_C$ and $Z_{net} = R$
 $\cos(\phi) = 1$ as $\phi = 0$
(neither leading nor lagging)

<p>A 230 V 60 Hz supply is connected to a capacitor of value $20\text{ }\mu\text{F}$. The reactance of the capacitor is</p>	<ol style="list-style-type: none"> 1. 32.62 Ω 2. 833.2 Ω 3. 7.54 mΩ 4. 1.2 mΩ
<p>Calculate the input voltage if $R_1 = 100\text{ }\Omega$, $R_f = 1\text{ k}\Omega$, and $V_{out} = 550\text{ mV}$</p> 	<ol style="list-style-type: none"> 1. -50 mV 2. -5 mV 3. 550 mV 4. 50 mV
<p>The impedance of a circuit is $(20+j12.5)\text{ ohm}$. The power factor is</p>	<ol style="list-style-type: none"> 1. 32o 2. -32o 3. 0.848 (lag) 4. 0.848 (lead)
<p>An amplifier has an $R_{in} = 1.2\text{ k}\Omega$. The coupling capacitor is $1\text{ }\mu\text{F}$. Determine the approximate lower cutoff frequency.</p>	<ol style="list-style-type: none"> 1. 133 Hz 2. 1.33 kHz 3. 13.3 kHz 4. 133 kHz

Commented [8]: $Pf = \cos(\phi) = R/Z$
 $= 0.848 / _32.005\text{ deg}$

In an unbalanced star load $Z_R = 10 \Omega$ $Z_Y = j10 \Omega$ AND $Z_B = 5 \Omega$. Z_{RY} in the equivalent delta circuit is	1. 40Ω 2. $(20 + j10) \Omega$ 3. $(5 + j10/3) \Omega$ 4. $(10 + j30) \Omega$
An amplifier has an output voltage of 7.6 V p-p at the midpoint of the frequency range. What is the output at f_c ?	1. 3.8 V p-p 2. 3.8 V _{rms} 3. 5.4 V _{rms} 4. 5.4 V p-p
A 3-phase symmetrical star load consumes P watts of power from a balanced supply. If the same load is connected in delta to the same supply, the power consumption will be	1. P 2. $P\sqrt{3}$ 3. $3P$ 4. $2P$
An infinite length of uniform line charge has $\rho_l = 10 \text{ pC/m}$ and it lies along the z axis. Determine the electric field E at (4, 3, 3)	1. $18 \text{ } \mu\text{mV/m}$ 2. $1.8 \text{ } \mu\text{mV/m}$ 3. $180 \text{ } \mu\text{mV/m}$ 4. $280 \text{ } \mu\text{mV/m}$

An amplifier rated at 30-W output is connected to a 5Ω speaker. Calculate the input voltage for the rated output if the amplifier voltage gain is 20 dB.	<ol style="list-style-type: none"> 1. 1.225 mV 2. 12.25 mV 3. 122.5 mV 4. 1.225 V
A filter attenuates all frequencies between 10 KHz and 15KHz. It's a	<ol style="list-style-type: none"> 1. Low pass filter 2. High pass filter 3. Band pass filter 4. Band elimination filter
When a multistage amplifier is to amplify d.c. signal, then one must use coupling	<ol style="list-style-type: none"> 1. RC 2. Transformer 3. Direct 4. None of the above
Practical voltage sources differ from the ideal voltage source because of	<ol style="list-style-type: none"> 1. Low internal impedance in parallel 2. Low internal impedance in series 3. High internal impedance in parallel 4. High internal impedance in series

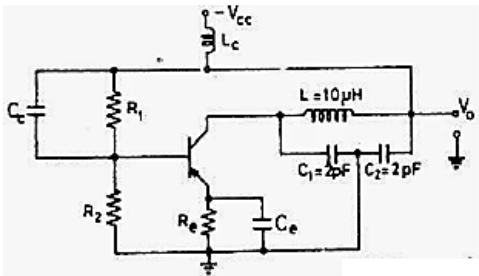
<p>If a three-stage amplifier has individual stage gains of 10 dB, 5 dB and 12 dB, then total gain in dB is</p>	<ol style="list-style-type: none"> 1. 600 dB 2. 24 dB 3. 14 dB 4. 27dB
<p>Two resistors R1(=10 Ohm) and R2(=5 Ohm) are connected in parallel to a 3A current source. What is the current through R2</p>	<ol style="list-style-type: none"> 1. 1 A 2. 2 A 3. 2.5 A 4. 3 A
<p>A multistage amplifier employs five stages each of which has a power gain of 30. What is the total gain of the amplifier in db. If a negative feedback of 10 dB is employed, find the resultant gain</p>	<ol style="list-style-type: none"> 1. 73.85 dB and 63.85 dB 2. 147.7 dB and 137.7 dB 3. 7.38 dB and 17.38 dB 4. 17.38 dB and 7.38 dB
<p>Two coils with self inductance 4 H are connected in series (aiding). The mutual inductance is 2 H. What is the effective inductance of the series combination is</p>	<ol style="list-style-type: none"> 1. 8 H 2. 10 H 3. 12 H 4. 6 H

In an amplifier, the output power is 1.5 watts at 2 kHz and 0.3 watt at 20 Hz, while the input power is constant at 10 mW. Calculate by how many decibels gain at 20 Hz is below that at 2 kHz?	1. 3.2 dB 2. 4.5 dB 3. 6.99 dB 4. 7.2 dB
An amplifier has an open-circuit voltage gain of 70 dB and an output resistance of 1.5 kΩ. Determine the minimum value of load resistance so that voltage gain is not more than 67 dB.	1. 4.65 Ω 2. 7.80 kΩ 3. 5.7 Ω 4. 3.65 kΩ
The voltage drop across a resistor is 112.5 V when a current of 1.62 A is passing through the resistor. The power dissipation of the resistor is	1. 112.25 W 2. 152.25 W 3. 182.25 W 4. 282.25 W
Rectangular Waveguide behaves as	1. High pass filter 2. Low pass filter 3. All pass filter 4. Waveguide can't behave as filter

Negative feedback in a closed loop system does not	1. Reduce the overall gain 2. Reduce bandwidth 3. Improve disturbance rejection 4. Reduce sensitivity to parameter variation
In full sunlight, a solar cell has a short circuit current of 75 mA and a current of 70 mA for a terminal voltage of 0.6 V with a given load. The Thevenin resistance of the solar cell is	1. 240 Ohms 2. 120 Ohms 3. 60 Ohms 4. 24 Ohms
An amplifier without feedback has a voltage gain of 50, input resistance of 1 k Ω and output resistance of 2.5 k Ω . The input resistance of the current-shunt negative feedback amplifier using the above amplifier with a feedback factor of 0.2 is	1. 1/11 k Ω 2. 1/5 k Ω 3. 5 k Ω 4. 11 k Ω
A 100 Ω , 1 W resistor and a 800 Ω , 2 W resistor are connected in series . The maximum dc voltage that can be applied continuously to the series circuit without exceeding the power limit of any of the resistor is	1. 40 V 2. 45 V 3. 80 V 4. 90 V

Introduction of feedback in an amplifier increases the input impedance from 1 k Ω to 40 k Ω . It is due to	1. Positive feedback 2. Shunt-current negative feedback 3. Series-current negative feedback 4. Shunt-voltage negative feedback
Which statement is false for Admittance Smith chart.	1. Left of the smith chart is open circuit end 2. Right of the smith chart is short circuit end 3. VSWR at centre of smith chart is 2 4. Reflection coefficient at centre of smith chart is 1
An amplifier has a voltage gain of 1000 and an upper cut-off frequency of 160 kHz. Above its cut-off frequency the response falls at upto 6 decibels per octave. Negative feedback is applied to extend the bandwidth to 1 MHz. The new gain will be	1. 16 dB 2. 24 dB 3. 44 dB 4. 55 dB

The following circuit shown in the figure is

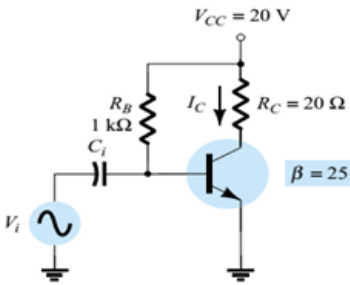


1. Hartley Oscillator with $f_{osc} = 79.6 \text{ MHz}$
2. Colpitts Oscillator with $f_{osc} = 79.6 \text{ MHz}$
3. Hartley Oscillator with $f_{osc} = 159.2 \text{ MHz}$
4. Colpitts Oscillator with $f_{osc} = 159.2 \text{ MHz}$

Commented [9]: Actual ans is colpitts 50.32 but in exam mark 159.2MHz

Commented [10]: Ye sab kyu aata hai bhai tujhe?

Calculate the input power and output power of the amplifier circuit for an input voltage that results in a base current of 10 mA peak.



1. 9.6 W and 6.25 W
2. 96 W and 6.25 W
3. 9.6 W and 625 W
4. 9.6 W and 0.625 W

Which mode is known as the dominant mode for Rectangular waveguide?

1. TM₁₀ and TE₁₀
2. TM₁₀
3. TM₁₁
4. TE₁₀

Which of these transmission line supports Quasi-TEM mode	1. Strip line 2. Parallel Plate waveguide 3. Microstrip line and Stripline Both 4. Microstrip line
What is the theoretical range of VSWR (Voltage Standing Wave Ratio)	1. $-\infty$ to $+\infty$ 2. 0 to 1 3. 1 to ∞ 4. -1 to 1
What is the range of magnitude of the reflection coefficient due to passive load	1. 1 to $+\infty$ 2. 0.5 to 1 3. 0 to ∞ 4. -1 to 1
How many RC pairs will be present in a second order low pass filter?	1. 1 2. 2 3. 3 4. 4

Which of these transmission lines supports Quasi-TEM mode	1. Microstrip line 2. Strip line 3. Microstrip line and Stripline Both 4. Parallel Plate waveguide
What is the band of frequencies where there is maximum attenuation of the signal?	1. Pass band 2. Transition band 3. Transmission band 4. Stop band
A distortion less line has	1. Non vanishing attenuation constant 2. Constant velocity 3. Constant real characteristic impedance 4. all of these
What is the other name of 3 dB frequency?	1. Gain cross-over frequency 2. Phase cross-over frequency 3. Corner frequency 4. Band pass frequency

<p>The wavelength of a wave with a propagation constant = $0.1\pi + j 0.2\pi$</p> <p>(propagation constant= $\alpha + j \beta$, $\beta = 2\pi/\lambda$)</p>	<p>1. 10 m</p> <p>2. 20 m</p> <p>3. 30 m</p> <p>4. 40 m</p>
<p>Both ϵ_0 and χ_e are dimensionless: The statement is _____ and _____ respectively</p>	<p>1. True and False</p> <p>2. False and True</p> <p>3. True and True</p> <p>4. False and False.</p>
<p>The magnetic field intensity (in A/m) at the centre of a circular coil of diameter 1 metre and carrying a current of 2 A is</p> <p>(Magnetic field intensity at centre of circular coil = $I/2R$.)</p>	<p>1. 8</p> <p>2. 4</p> <p>3. 3</p> <p>4. 2</p>
<p>Show the status of CY, AC and P flags after the addition of 9CH and 64H in the following instructions:</p> <p>MOV A, #9CH</p> <p>ADD A, #64H</p>	<p>1. CY =1, P=0, AC=1</p> <p>2. CY =1, P=1, AC=1</p> <p>3. CY =0, P=00, AC=1</p> <p>4. CY =1, P=0, AC=0</p>

Find the period of the machine cycle when crystal frequency is 16 MHz for 8051	1. 1.085μs 2. 2.0.75μs 3. 1.385μs 4. 1.25μs
For an 8051 system of 11.0592 MHz, how long does it take to execute the instruction -MUL AB	1. 1.085μs 2. 2.17μs 3. 4.34μs 4. 3.36μs
Find the size of the delay in the following program if the crystal frequency is 11.0592 MHz DELAY: MOV R3, #200-----1 M/C HERE: DJNZ R3, HERE-----2 M/C RET-----2M/C	1. 236μs 2. 136μs 3. 336μs 4. 436μs
What percentage of duty cycle is generated by the following code: SETB P1.3 LCALL DELAY LCALL DELAY CLR P1.3 LCALL DELAY SJMP BACK	1. 25% 2. 75% 3. 66% 4. 50%
What is the addressing mode for the following instruction: MOV R0, #40H	1. Indirect Mode 2. Direct Mode 3. Immediate Mode 4. Index Mode

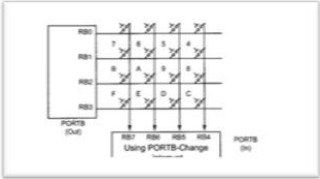
The internal RAM memory of the 8051 is:	1. 32 bytes 2. 64 bytes 3. 128 bytes 4. 256 bytes
This program code will be executed continuously: STAT: MOV A, #01H JNZ STAT	1. Yes 2. No 3. Not enough information 4. Not always
The 8051 has _____ 16-bit counter/timers.	1. 1 2. 2 3. 3 4. 4
The 8051 can handle _____ interrupt sources.	1. 3 2. 4 3. 5 4. 6

MOV A, @ R1 will:	<ol style="list-style-type: none"> 1. copy R1 to the accumulator 2. copy the accumulator to R1 3. copy the contents of memory whose address is in R1 to the accumulator 4. copy the accumulator to the contents of memory whose address is in R1
When the 8051 is reset and the \overline{EA} line is HIGH, the program counter points to the first program instruction in the:	<ol style="list-style-type: none"> 1. Internal code memory 2. External code memory 3. Internal data memory 4. External data memory
An alternate function of port pin P3.4 in the 8051 is:	<ol style="list-style-type: none"> 1. Timer 0 2. Timer 1 3. Interrupt 0 4. Interrupt 1
The I/O ports that are used as address and data for external memory are:	<ol style="list-style-type: none"> 1. Ports 1 and 2 2. Ports 1 and 3 3. Ports 0 and 2 4. Ports 0 and 3

The total external data memory that can be interfaced to the 8051 is:	1. 32K 2. 64K 3. 128K 4. 256K
Which of the following instructions will load the value 35H into the high byte of timer 0?	1. MOV TH0, #35H 2. MOV TH0, 35H 3. MOV T0, #35H 4. MOV T0, 35H
Bit-addressable memory locations are:	1. 10H through 1FH 2. 20H through 2FH 3. 30H through 3FH 4. 40H through 4FH
The contents of the accumulator after this operation MOV A,#0BH ANL A,#2CH will be	1. 11010111 2. 11011010 3. 00001000 4. 00101000

The start-conversion on the ADC0804 is done by using the:	1. WF 2. CS line 3. INTR line 4. $V_{ref/2}$ line
Which of the following commands will move the value at port 3 to register 2?	1. MOV P2, R3 2. MOV R3, P2 3. MOV 3P, R2 4. MOV R2, P3
The contents of the accumulator after this operation MOV A,#2BH ORL A,00H will be	1. 1BH 2. 2BH 3. 3BH 4. 4BH
Which of the following commands will copy the contents of RAM whose address is in register 0 to port 1?	1. MOV @ P1, R0 2. MOV @ R0, P1 3. MOV P1, @ R0 4. MOV P1, R0

The ADC0804 has _____ resolution.	1. 4 bit 2. 8 bit 3. 16 bit 4. 32 bit
With XTAL = 11.0592MHz, find the TH1 value needed to have a baud rate of 9600	1. 5 2. 12 3. 24 4. 6
If the crystal frequency is 22MHz, what will be the baud rate if TH1=-12 with SMOD=0	1. 19,093 2. 38,156 3. 4,773 4. 9,546
Show the instructions to enable the serial interrupt, timer 0 interrupt and external hardware interrupt(EX1).	1. MOV IE, #10011110 B 2. MOV IE, #10110010 B 3. MOV IE, #10000111 B 4. MOV IE, #10010110 B

The correct value of TMOD to operate in Mode 1 Timer 1 is:	<div>1. 10H</div> <div>2. 01H</div> <div>3. 20H</div> <div>4. 02H</div>
If we push data onto the stack then the stack pointer	<div>1. increases with every push</div> <div>2. decreases with every push</div> <div>3. none of the mentioned</div> <div>4. both of the mentioned</div>
The E pin requires what kind of plus to latch in information at the data pins of the LCD.	<div>1. High</div> <div>2. Low</div> <div>3. Low to high</div> <div>4. High to low</div>
<div>In the given figure, to detect the key press, which of the following is grounded?</div> <div></div>	<div>1. All rows</div> <div>2. One row at a time</div> <div>3. All columns</div> <div>4. One column at a time</div>

<p>Consider the following registers:</p> <ol style="list-style-type: none"> 1. Accumulator and flag register 2. B and C register 3. D and E register 4. H and L register <p>Which of these 8-bit registers of 8085 microprocessor can be paired together to make a 16-bit register?</p>	<ol style="list-style-type: none"> 1. 1, 3 and 4 2. 2, 3 and 4 3. 1, 2 and 3 4. 1, 2 and 4
<p>In an intel 8085A microprocessor, why is READY signal used?</p>	<ol style="list-style-type: none"> 1. To indicate to user that the microprocessor is working and is ready for use. 2. To provide proper WAIT states when the microprocessor is communicating with a slow peripheral device. 3. To slow down a fast peripheral device so as to communicate at the microprocessor's device. 4. None of the above.
<p>consider the following</p> <p>I) Sign flag II) Trap flag III) Parity flag IV) Auxiliary carry flag</p> <p>Which one of the above flags is/are present in 8085 microprocessor?</p>	<ol style="list-style-type: none"> 1. (I) only 2. (I) & (II) 3. (II) & (III) 4. (I), (II) & (IV)
<p>Consider the following statements:</p> <p>In 8085 microprocessor, data-bus and address bus are multiplexed in order to</p> <ol style="list-style-type: none"> I) Increase the speed of microprocessor. II) Reduce the number of pins. III) Connect more peripheral chips. <p>Which of these statements is/are correct?</p>	<ol style="list-style-type: none"> 1. (I) only 2. (II) only 3. (II) & (III) 4. (I), (II) & (III)

ALU (Arithmetic and Logic Unit) of 8085 microprocessor consists of	<ol style="list-style-type: none"> 1. Accumulator, temporary register, arithmetic and logic circuits 2. Accumulator, arithmetic, logic circuits and five flags 3. Accumulator, arithmetic and logic circuits 4. Accumulator, temporary register, arithmetic, logic circuits and five flags
In intel 8085A microprocessor ALE signal is made high to	<ol style="list-style-type: none"> 1. Enable the data bus to be used as low order address bus 2. To latch data D0-D7 from data bus 3. To disable data bus 4. To achieve all the functions listed above
Which of the following statements for Intel 8085 is correct?	<ol style="list-style-type: none"> 1. Program Counter (PC) specifies the address of the instruction last executed 2. PC specifies the address of the instruction being executed 3. PC specifies the address of the instruction to be executed 4. PC specifies the number of instructions executed so far

Processor status word of 8085 microprocessor has five flags. They are	1. S, Z, AC, P, CY 2. S, OV, AC, P, CY 3. S, Z, OV, P, CY 4. S, Z, AC, P, OV
In 8085 name of the 16 bit registers is	1. stack pointer 2. program counter 3. both A and B 4. none of these
Which instruction is required to rotate the content of accumulator one bit right along with carry?	1. RLC 2. RAL 3. RRC 4. RAR
Temporary registers in 8085 are	1. B and C 2. D and E 3. H and L 4. W and Z
The 16 bit flag of 8086 microprocessor is responsible to indicate _____.	1. the condition of result of ALU operation 2. the condition of memory 3. the result of addition 4.

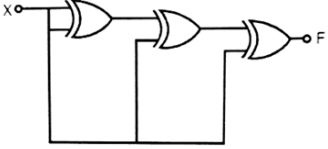
	the result of subtraction
The register AX is formed by grouping _____.	1. AH & AL 2. BH & BL 3. CH & CL 4. DH & DL
8086 have _____ of segment registers	1. 2 2. 4 3. 6 4. 8
8086 can be operated in two modes:they are _____ and _____.	1. Minimum, Maximum 2. External, internal 3. Mode1, Mode2 4. Data, address

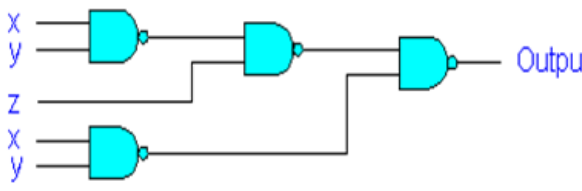
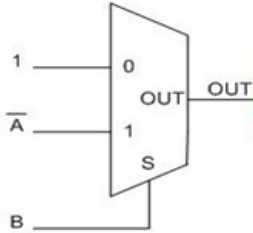
If there are two operands, the _____ operand appears first.	1. destination 2. mnemonic 3. source 4. label
8086 processor has _____ address pins out of which _____ number of pins are used as data pins	1. 16,8 2. 16,14 3. 20,16 4. 20,8
Data storage in stack is designed in _____ method.	1. First in first out 2. last in last out 3. first in last out 4. last in first out
_____ flag is used in 8086 for string manipulation instructions	1. DF 2. AF 3. OF 4. PF

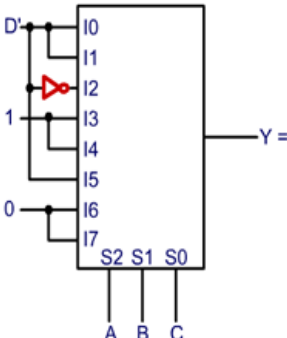
BHE of 8086 microprocessor signal is used to interface the	<ol style="list-style-type: none"> 1. Even bank memory 2. Odd bank memory 3. I/O 4. DMA
In 8086 microprocessor one of the following statements is not true.	<ol style="list-style-type: none"> 1. Coprocessor is interfaced in MAX mode 2. Coprocessor is interfaced in MIN mode 3. I/O can be interfaced in MAX / MIN mode 4. Supports pipelining
In 8086 the overflow flag is set when	<ol style="list-style-type: none"> 1. The sum is more than 16 bits 2. Signed numbers go out of their range after an arithmetic operation 3. Carry and sign flags are set 4. During subtraction

What is the processor used by ARM7?	1. 8-bit CISC 2. 8-bit RISC 3. 32-bit CISC 4. 32-bit RISC
What is the instruction set used by ARM7?	1. 16-bit instruction set 2. 32-bit instruction set 3. 64-bit instruction set 4. 8-bit instruction set
How many registers are there in ARM7?	1. 35 register(28 GPR and 7 SPR) 2. 37 registers(28 GPR and 9 SPR) 3. 37 registers(31 GPR and 6 SPR) 4. 35 register(30 GPR and 5 SPR)
ARM7DI operates in which mode?	1. Big Endian 2. Little Endian 3. Both big and little Endian 4. Neither big nor little Endian
In which of the following ARM processors virtual memory is present?	1. ARM7DI 2. ARM7TDMI-S 3. ARM7TDMI 4. ARM7EJ-S

In the ARM, PC is implemented using ____	<div>1. Caches</div> <div>2. Heaps</div> <div>3. General purpose register</div> <div>4. Stack</div>															
The additional duplicate register used in ARM machines are called as _____	<div>1. Copied-registers</div> <div>2. Banked registers</div> <div>3. EXtra registers</div> <div>4. Extential registers</div>															
The banked registers are used for _____	<div>1. Switching between supervisor and interrupt mode</div> <div>2. Extended storing</div> <div>3. Same as other general purpose registers</div> <div>4. None of the mentioned</div>															
<div>The simplest equation which implements the K-map shown</div> <div><table><tr><td></td><td>\bar{C}</td><td>C</td></tr><tr><td>$\bar{A} \bar{B}$</td><td>0</td><td>0</td></tr><tr><td>$\bar{A} B$</td><td>1</td><td>1</td></tr><tr><td>A B</td><td>1</td><td>1</td></tr><tr><td>A \bar{B}</td><td>0</td><td>1</td></tr></table></div>		\bar{C}	C	$\bar{A} \bar{B}$	0	0	$\bar{A} B$	1	1	A B	1	1	A \bar{B}	0	1	<div>1. $X = AC + B$</div> <div>2. $X = AB'$</div> <div>3. $X = ABC' + ABC + AB'C$</div> <div>4. $X = AB + AB'$</div>
	\bar{C}	C														
$\bar{A} \bar{B}$	0	0														
$\bar{A} B$	1	1														
A B	1	1														
A \bar{B}	0	1														

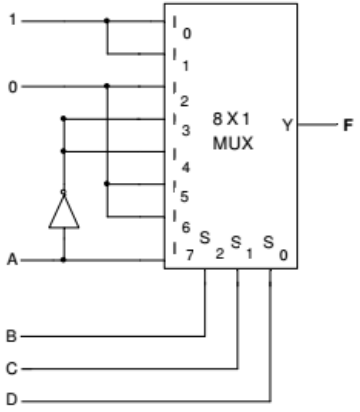
How many 1-of-16 decoders are required for decoding a 7-bit binary number?	1. 5 2. 6 3. 7 4. 8
Convert BCD 0001 0111 to binary.	1. 10101 2. 10010 3. 10001 4. 11000
2's complement representation of a 16 bit number (one sign bit and 15 magnitude bits) is FFFF. Its magnitude in decimal representation is	1. 0 2. 1 3. 65535 4. 32767
Find the output for the circuit given below 	1. X 2. X' 3. 1 4. 1

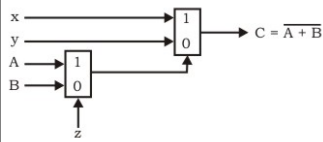
<p>The function in the following circuit is</p> 	<ol style="list-style-type: none"> 1. $xy+z$ 2. $x+y+z$ 3. $x'z'+y'z'$ 4. $x'+y'+z'$
<p>Use Boolean algebra to find the most simplified SOP expression for $F = ABD + CD + ACD + ABC + ABCD$.</p>	<ol style="list-style-type: none"> 1. $F = ABD + ABC + CD$ 2. $F = CD + AD$ 3. $F = BC + AB$ 4. $F = AC + AD$
 <p>Find OUT = ?</p>	<ol style="list-style-type: none"> 1. AND Gate 2. NAND Gate 3. OR Gate 4. XOR Gate

<p>Determine the Boolean function implemented by the 8*1 Digital switch</p> 	<ol style="list-style-type: none"> 1. $\sum(0,2,5,6,7,8,9,10)$ 2. $\sum(1,3,4,11,12,13,14,15)$ 3. $\sum(1,3,5,7,9,11, 13,14,15)$ 4. None of the above
<p>Which of the following best describes how to construct a 1-line to 8-line de-multiplexer from a 3-line to 8-line decoder:</p> <p>Note: CBA – inputs, D – data line, Y – output, W - enable</p>	<ol style="list-style-type: none"> 1. Connect the decoder input select lines CBA to D 2. Connect the decoder enable input to D 3. Connect the decoder input data lines to Di 4. Connect the decoder output to Di
<p>Which of the following is not true about operators?</p>	<ol style="list-style-type: none"> 1. A logical “or” is performed by writing “C = A B;” 2. ‘!’ performs logical negation while ‘~’ performs bitwise negation. 3. The two types of “or” operators are “logical” and “bitwise.” 4.

	<p>The "shift right" (>>) operator inserts zeros on the left end of its argument.</p>
$(m_i)' + M_i = ?$	<ol style="list-style-type: none"> 1 0 M_i m_i
A hexadecimal odometer displays F 52 F. The next reading will be	<ol style="list-style-type: none"> F52E G52F F53F F530
Digital Technologies being used now – a –days are	<ol style="list-style-type: none"> DTL and EMOS TTL, ECL, CMOS, and RTL TTL, ECL and CMOS TTL,ECL, CMOS and DTL

STTL uses	1. Multi Emitter transistors 2. Multi Collector Transistor 3. Multi Base Transistor 4. Multi Emitter or Collector Transistor
As compared to TTL, CMOS logic has	1. Higher speed of operation 2. Higher power dissipation 3. Smaller physical size 4. All the above
In a 7 segment display the segments a,c,d,f,g are lit. the decimal number displayed will be	1. 9 2. 5 3. 4 4. 2
What is the minimum number of gates required to implement the Boolean function $(AB+C)$ if we have to use only 2-input NOR gates?	1. 2 2. 3 3. 4 4. 5

<p>Give the minterms for the following circuit diagram</p> 	<ol style="list-style-type: none"> 1. $\sum m(0,1,3,4,8,9,15)$ 2. $\prod M(0,1,3,4,8,9,15)$ 3. $\sum m(0,1,2,4,8,10,12,16)$ 4. $\prod M(0,1,2,4,8,10,12,16)$
<p>Which of the following respectively represent commutative law, Associative law and Distributive law ?</p> <p>I. $A.(B.C)=(A.B).C$</p> <p>II. $A.(B+C)=A.B+A.C$</p> <p>III. $A + B = B + A$</p> <p>CODES</p>	<ol style="list-style-type: none"> 1. I, III and II 2. II, I and III 3. III, II and I 4. III, I and II
<p>A digital system is required to amplify a binary encoded audio signal. The user should be able to control the gain of the amplifier from a minimum to a maximum in 100 increments. The minimum number of bits required to encode in a straight binary is</p>	<ol style="list-style-type: none"> 1. 8 2. 6 3. 7 4. 5

<p>Consider an eight-bit ripple-carry adder for computing the sum of A and B, where A and B are integers represented in 2's complement form. If the decimal value of A is one, the decimal value of B that leads to the longest latency for the sum to stabilize is</p> <p>_____</p>	<div>1. 1</div> <div>2. 2</div> <div>3. -2</div> <div>4. 1</div>
<p>The circuit shown below implements a 2-input NOR gate using two 2-4 MUX (control signal 1 selects the upper input). What are the values of signals x, y and z?</p> 	<div>1.1,0,B</div> <div>2.1,0,A</div> <div>3.0,1,A</div> <div>4.0,1,B</div>
<p>Consider a carry lookahead adder for adding two n-bit integers, built using gates of fan-in at most two. The time to perform addition using this adder is</p>	<div>1.O(1)</div> <div>2.O(log n)</div> <div>3.O(n)</div> <div>4.O(√n)</div>
<p>Without any additional circuitry an 8:1 MUX can be used to obtain</p>	<div>1. Some but not all Boolean functions of 3 variables</div> <div>2. All function of 3 variables but none of 4 variables</div> <div>3. All functions of 3 variables and some but not all of 4 variables</div> <div>4. All functions of 4 variables</div>

What is the minimum number of NAND gates required to implement a 2-input EXCLUSIVE-OR function without using any other logic gate?	1.2 2. 3 3.5 4.6
One application of a digital multiplexer is to facilitate:	1. Data Generation 2. Code conversion 3. Parallel to serial data conversion 4. Parity Checker
A circuit that responds to a specific set of signals to produce a related digital signal output is called a(n):	1.BCD matrix 2. Encoder 3.Display Driver 4.Decoder
The time required for a pulse to change from 10 to 90 percent of its maximum value is called	1. Rise time 2. Decay time 3. Propagation time 4. Operating speed
Which one of the following set of gates are best suited for 'parity' checking and 'parity' generation	1.AND,OR , NOT Gates 2. XOR and XNOR Gates 3.NAND Gates 4.NOR Gates

Which of the following adders can add three or more numbers at a time ?	1. Ripple Carry Adder 2. Carry Look Ahead Adder 3. Carry Save Adder 4. All the above
A basic S-R flip-flop can be constructed by cross-coupling of which basic logic gates?	1. AND or OR gates 2. XOR or XNOR gates 3. NOR or NAND gates 4. AND or NOR gates
Whose operations are faster among the following?	1. Combinational circuits 2. Sequential circuits 3. Latches 4. Flip-flops
The basic latch consist of	1. Two comparators 2. Two inverters 3. Two amplifiers 4. Two AND gates

When is a flip-flop said to be transparent?	1. When the Q output is opposite the input 2. When the Q output follows the input 3. When you can see through the IC packaging 4. None of the Mentioned
According to Moore circuit, the output of synchronous sequential circuit depend/s on _____ of flip flop	1.Past output 2.Next output 3.Present output 4.External inouts
In J-K flip-flop, “no change” condition appears when	1. J = 1, K = 1 2. J = 1, K = 0 3. J = 0, K = 1 4. J = 0, K = 0
S-R type flip-flop can be converted into D type flip-flop if S is connected to R through	1. OR Gate 2. Inverter 3. AND Gate 4. XOR Gate

How can parallel data be taken out of a shift register simultaneously?	<ol style="list-style-type: none"> 1. Use the Q output of the first FF 2. Use the Q output of the last FF 3. Tie all of the Q outputs together 4. Use the Q output of each FF
Which is not characteristic of a shift register?	<ol style="list-style-type: none"> 1. Serial in/parallel in 2. Serial in/parallel out 3. Parallel in/serial out 4. Parallel in/parallel out
To operate correctly, starting a ring shift counter requires:	<ol style="list-style-type: none"> 1. Clearing all the flip-flops 2. Presetting one flip-flop and clearing all others 3. Clearing one flip-flop and presetting all others 4. Presetting all the flip-flops
Once an up-/down-counter begins its count sequence, it	<ol style="list-style-type: none"> 1. Starts counting 2. Can be reversed 3. Can't be reversed 4. None of the Mentioned

What does the triangle on the clock input of a J-K flip-flop mean?	1. Level enabled 2. Edge triggered 3. Both a & b 4. Level triggered
What does the circle on the clock input of a J-K flip-flop mean?	1. Level enabled 2. Positive edge triggered 3. negative edge triggered 4. Level triggered
The terminal count of a typical modulus-10 binary counter is	1. 000 2. 1010 3. 1001 4. 1111
How many flip-flops are required to construct a decade counter?	1. 4 2. 5 3. 8 4. 10

The characteristic equation of S-R latch is	1. $Q(n+1) = (S + Q(n))R$ 2. $Q(n+1) = SR + Q(n)R$ 3. $Q(n+1) = S'R + Q(n)R$ 4. $Q(n+1) = S'R + Q'(n)R$
In a counter Modulus refers to	1. A method used to fabricate decade counter units 2. The modulus of elasticity, or the ability of a circuit to be stretched from one mode to another 3. An input on a counter that is used to set the counter state, such as UP/DOWN 4. The maximum number of states in a counter sequence
Master slave flip flop is also referred to as	1. Level triggered flip flop 2. Edge triggered flip flop 3. Pulse triggered flip flop 4. None of the above
A sequence of equally spaced timing pulses may be easily generated by which type of counter circuit?	1. Ring shift 2. Clock 3. Johnson 4. Binary

Three cascaded decade counters will divide the input frequency by	1. 10 2. 20 3. 100 4. 1000
In Moore machine, output is produced over the change of:	1. transitions 2. States 3. Both 4. None of the mentioned
The minimum number of states required to recognize an octal number divisible by 3 are/is	1. 1 2. 3 3. 5 4. 7
The behaviour of synchronous sequential circuit can be predicted by defining the signals at ____.	1. discrete instants of time 2. continuous instants of time 3. sampling instants of time 4. at any instant of time

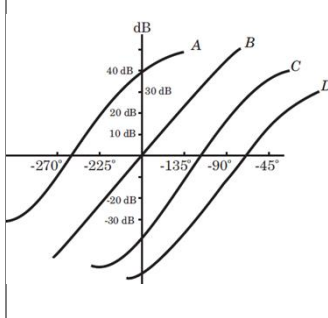
In a ripple counter	<ol style="list-style-type: none"> 1. whenever a flipflop sets to 1, the next higher FF toggles 2. whenever a flipflop sets to 0, the next higher FF remains unchanged 3. whenever a flipflop sets to 1, the next higher FF faces race condition 4. whenever a flipflop sets to 0, the next higher FF faces race condition
Which memory elements are utilized in an asynchronous & clocked sequential circuits respectively?	<ol style="list-style-type: none"> 1. Time- delay devices & registers 2. Time- delay devices & flip-flops 3. Time- delay devices & counters 4. Time-delay devices & latches
Synchronous counters eliminate the delay problems encountered with asynchronous (ripple) counters because the:	<ol style="list-style-type: none"> 1. input clock pulses are applied only to the last stage 2. input clock pulses are applied only to the first and last stages 3. input clock pulses are applied simultaneously to each stage 4. input clock pulses are not used to activate any of the counter stages

One of the major drawbacks to the use of asynchronous counters is that:	<p>1. low-frequency applications are limited because of internal propagation delays</p> <p>2. Asynchronous counters do not have major drawbacks and are suitable for use in high- and low-frequency counting applications</p> <p>3. Asynchronous counters do not have propagation delays, which limits their use in high-frequency applications.</p> <p>4. high-frequency applications are limited because of internal propagation delays</p>
A ripple counter's speed is limited by the propagation delay of:	<p>1. each flip-flop</p> <p>2. all flip-flops and gates</p> <p>3. the flip-flops only with gates</p> <p>4. only circuit gates</p>
A J-K flip-flop with $J = 1$ and $K = 1$ has a 20 kHz clock input. The Q output is	<p>1. Constantly LOW</p> <p>2. Constantly HIGH</p> <p>3. A 20 kHz square wave</p> <p>4. A 10 kHz square wave</p>

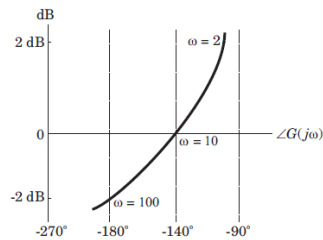
On a positive edge-triggered S-R flip-flop, the outputs reflect the input condition when _____	1. The clock pulse is LOW 2. The clock pulse is HIGH 3. The clock pulse transitions from LOW to HIGH 4. The clock pulse transitions from HIGH to LOW
Consider a serial in serial out (SISO) shift register with four flip flops. The output fourth flip flop in the SISO is inverted and fed back as input of the first flip flop. Assume that initial state of all the flip flops are '0'. What will be the output of each flip flop after 5 clock cycles	1. 0000 2. 0011 3. 0111 4. 1111
The phenomenon of interpreting unwanted signals on J and K while clock pulse is HIGH is called	1. Parity error checking 2. Ones catching 3. Digital discrimination 4. Digital filtering
Four J-K flip-flops are cascaded with their J-K inputs tied HIGH. If the input frequency (f_{in}) to the first flip-flop is 32 kHz, the output frequency (f_{out}) is _____	1. 1kHz 2. 2kHz 3. 4kHz 4. 16kHz

With a 200 kHz clock frequency, eight bits can be serially entered into a shift register in	1. 4 μ s 2. 40 μ s 3. 400 μ s 4. 400 ms
A bidirectional 4-bit shift register is storing the nibble 1101. Its input is HIGH. The nibble 1011 is waiting to be entered on the serial data-input line. After three clock pulses, the shift register is storing _____	1. 1101 2. 0111 3. 0001 4. 1110
A 5-bit asynchronous binary counter is made up of five flip-flops, each with a 12 ns propagation delay. The total propagation delay ($t_{p(\text{total})}$) is	1. 12 ms 2. 24 ns 3. 48 ns 4. 60 ns
The total number of states and transitions required to form a moore machine that will produce residue mod 3.	1. 3 and 6 2. 3 and 5 3. 2 and 4 4. 2 and 5

A JK flip flop has $t_{pd} = 12$ ns. The largest modulus of a ripple counter using these flip flops and operating at 10 MHz is	1. 16 2. 64 3. 128 4. 256
What is the maximum delay that can occur if four flip-flops are connected as a ripple counter and each flip-flop has propagation delays of $t_{PHL} = 22$ ns and $t_{PLH} = 15$ ns?	1. 15 ns 2. 22 ns 3. 60 ns 4. 88 ns
An 8-bit serial in/serial out shift register is used with a clock frequency of 150 kHz. What is the time delay between the serial input and the Q3 output?	1. 1.67 s 2. 26.67 s 3. 26.7 ms 4. 26.67 μ s
Which digital system translates coded characters into a more intelligible form?	1. Decoder 2. Encoder 3. Counter 4. Multiplexer

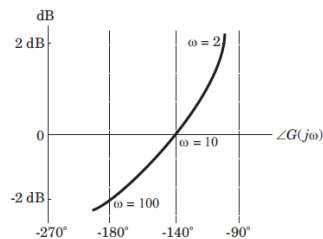
<p>For the transfer function</p> $G(s)H(s) = \frac{1}{s(s+1)(s+0.5)}$ <p>the phase cross-over frequency is</p>	<ol style="list-style-type: none"> 0.5 rad/sec 0.707 rad/sec 1.732 rad/sec 2 rad/sec
<p>The gain-phase plots of the open-loop transfer function of four different systems are shown in the following figure. The correct sequence of the increasing order of stability of these four systems will be</p> 	<ol style="list-style-type: none"> D, C, B, A A, B, C, D B, C, A, D A, D, B, C

Consider the gain-phase plot shown in the following figure.



1. -2 dB, 40°
2. 2 dB, 40°
3. 2 dB, 140°
4. -2 dB, 140°

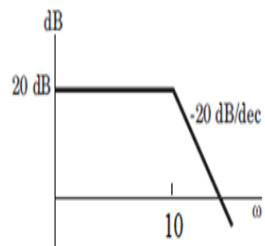
Consider the gain-phase plot shown in the following figure,
The gain crossover and phase crossover frequency are respectively.



1. 10 rad/sec, 100 rad/sec
2. 100 rad/sec, 10 rad/sec
3. 10 rad/sec, 2 rad/sec
4. 100 rad/sec, 2 rad/sec

<p>Regarding the system consider the statements</p> <p>1. Open-loop system is stable</p> <p>2. Closed-loop system is unstable</p> <p>3. One closed-loop poles is lying on the RHP</p> <p>The correct statements are</p>	<p>1. 1 and 2</p> <p>2. 1 and 3</p> <p>3. only 2</p> <p>4. All</p>
<p>The gain margin of the unity feedback system</p> <p>$G(s)H(s) = \frac{2}{(s+1)(s+2)}$ is</p>	<p>1. 1.76 dB</p> <p>2.3.5 dB 3. -0.5 dB</p> <p>4. -1.76 dB</p>
<p>In the Bode-plot of a unity feedback control system, the value of phase of $G(j\omega)$ at the gain crossover frequency is -120°. The phase margin of the system is</p>	<p>1. -120°</p> <p>2. 60°</p> <p>3. -60°</p> <p>4. 120°</p>

Bode plot of a stable system is shown in the following figure. The open-loop transfer function of the unity feedback system is



1. $\frac{100}{(s+10)}$
2. $\frac{10}{(s+10)}$
3. $\frac{1}{(s+10)}$
4. $\frac{100}{(s+100)}$

A system with gain margin close to unity or a phase margin close to zero is

1. highly stable
2. oscillatory.
3. relatively stable
4. unstable.

The system with the open loop transfer function

$$G(s)H(s) = \frac{1}{s(s^2 + s + 1)}$$

Has a gain margin of

1. -6 dB
2. 0 dB
3. 3.5dB
4. -6 dB

A system is said to be _____ if every state can be completely identified by measurements of the outputs at the finite time interval.	1. Controllable 2. Observable 3. Cannot be determined 4. Controllable and observable
The type 2 system has _____ at the origin.	1. No net pole 2. net pole 3. Two pole 4. simple pole
Kalman's test is for _____	1. Observability 2. Controllability 3. Optimality 4. Observability and controllability
The transient response, with feedback system	1. rises slowly 2. rises quickly 3. decays slowly 4. decays quickly
Static error co- efficient are used as a measure of the effectiveness of closed loop system for specified _____ input signal	1. Acceleration 2. Velocity 3. Position 4. All of the above

State model representation is possible using _____	1. Physical variables 2. Phase variables 3. Canonical state variables 4. All of the mentioned
Steady state accuracy specified in terms of:	1. Steady state error 2. Damping ratio 3. The natural frequency of damping 4. All of the mentioned
State space analysis is applicable even if the initial conditions are _____	1. Zero 2. Non-Zero 3. Equal 4. Not equal
Which point on root locus specifies the meeting or collision of two poles?	1. Centroid 2. Break away point 3. Stability point 4. Anti-break point

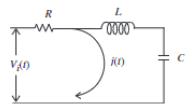
The output of a feedback control system must be a function of	<ol style="list-style-type: none"> 1. output and feedback signal 2. reference and output 3. reference and input 4. input and feedback signal
A car is running at a constant speed of 50 km/h, which of the following is the feedback element for the driver	<ol style="list-style-type: none"> 1. Clutch 2. Eyes 3. Needle of the speedometer 4. Steering wheel
The transfer function of a linear system is the	<ol style="list-style-type: none"> 1. ratio of the output, $V_0(t)$ and input $V_i(t)$. 2. ratio of the derivatives of the output and the input. 3. ratio of the Laplace transform of the output and that of the input with all initial conditions zeros 4. none of these
Mass, in force-voltage analogy, is analogous to	<ol style="list-style-type: none"> 1. charge 2. Current 3. Inductance 4. resistance

The relationship between the force $f(t)$ and the displacement $x(t)$ of a spring-mass system (with mass M , viscous damping D and spring constant K) is $M \frac{d^2x(t)}{dt^2} + D \frac{dx(t)}{dt} + Kx(t) = f(t)$.

With $M = 0.1$, $D = 2$, $K = 10$ in appropriate units, the transfer function $G(s) = \frac{X(s)}{F(s)}$ is

1. $\frac{10}{s^2 + 20s + 100}$
2. $\frac{10}{s^2 - 20s - 100}$
3. $s^2 + 20s + 100$
4. $s^2 - 20s - 100$

For the network shown in Figure below $V_i(s)$ is the input and $i(s)$ is the output, the transfer function $I(s)/V(s)$ of the network is



1. $\frac{s}{LCs^2 + RCs + 1}$
2. $\frac{Cs}{LCs^2 + Cs + 1}$
3. $\frac{Cs}{LCs^2 + RCs + 1}$
4. $\frac{Cs}{LCs^2 + Ls + 1}$

A unity feedback system has open loop transfer function $\frac{2s+1}{s^2}$. The closed loop transfer function is

1. $\frac{s^2}{2s+1}$
2. $\frac{2s}{s^2 + 2s + 1}$
3. $\frac{5s}{s^2 + 2s + 1}$
4. $\frac{2s^2}{s^2 + 2s + 2}$

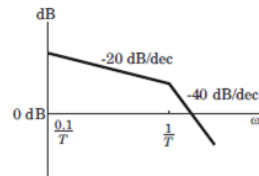
<p>The open-loop DC gain of a unity negative feedback system with closed loop transfer Function $\frac{s+4}{s^2+7s+13}$ is</p>	<p>1. 4/13</p> <p>2. 4/9</p> <p>3. 4</p> <p>4. 13</p>
<p>Signal flow graphs:</p>	<p>1. They apply to linear systems</p> <p>2. The equation obtained may or may not be in the form of cause or effect</p> <p>3. Arrows are not important in the graph</p> <p>4. They cannot be converted back to block diagram</p>
<p>Loop which do not possess any common node are said to be _____ loops.</p>	<p>1. Forward gain</p> <p>2. Touching Loops</p> <p>3. Non Touching Loops</p> <p>4. Feedback gain</p>

The transfer function of a system is given by

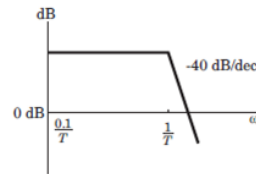
$$G(s) = \frac{K}{s(sT + 1)}; K < \frac{1}{T}$$

The Bode plot of this function is

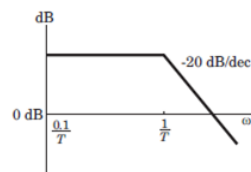
1.



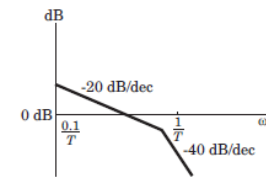
2.



3.



4.



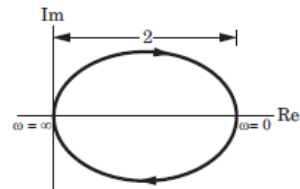
<p>The Nyquist plot of an open-loop transfer function $G(j\omega)H(j\omega)$ of a system encloses the $(-1, j0)$ point. The gain margin of the system is</p>	<ol style="list-style-type: none"> 1. less than zero 2. greater than zero 3. Zero 4. Infinity
<p>If the gain margin of a certain feedback system is given as 20 dB, the Nyquist plot will cross the negative real axis at the point</p>	<ol style="list-style-type: none"> 1. $s = -0.05$ 2. $s = -0.2$ 3. $s = -0.1$ 4. $s = -0.01$

The transfer function of an open-loop system is

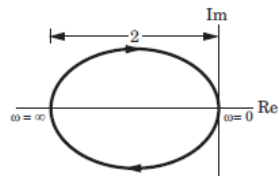
$$G(s)H(s) = \frac{(s + 2)}{(s + 1)(s - 1)}$$

The Nyquist plot will be of the form

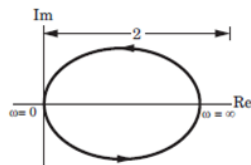
1.



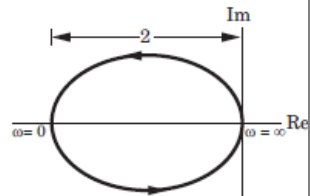
2.



3.



4.



The phase margin of a system with the open loop transfer function

$$G(s)H(s) = \frac{(1 - s)}{(1 + s)(3 + s)}$$

1.

68.3°

2.

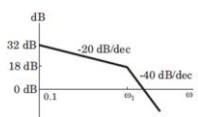
90°

3.

0

4.

infinity

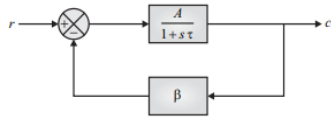
<p>A unity feedback system has open-loop transfer Function</p> $G(s) = \frac{1}{s(2s + 1)(s + 1)}$ <p>The phase crossover and gain crossover frequencies are</p>	<ol style="list-style-type: none"> 1.414 rad/sec, 0.57 rad/sec 1.414 rad/sec, 1.38 rad/sec 0.707 rad/sec, 0.57 rad/sec 0.707 rad/sec, 1.38 rad/sec
<p>Consider the Bode plot of a unity feedback system shown in following figure</p>  <p>The steady state error corresponding to a ramp input is</p>	<ol style="list-style-type: none"> 0.25 0.4 0 infinity
<p>The gain margin of the system 0 dB. It represents a</p>	<ol style="list-style-type: none"> Stable System Unstable System Conditionally Stable System Marginally Stable System
<p>The Phase margin of the system 0°. It represents a</p>	<ol style="list-style-type: none"> Stable System Conditionally Stable System Unstable System Marginally Stable System

At gain cross over frequency	<p>1. $G(j\omega)H(j\omega) = 0 \text{ dB}$</p> <p>2. $G(j\omega)H(j\omega) = 1 \text{ dB}$</p> <p>3. $G(j\omega)H(j\omega) = -20 \text{ dB}$</p> <p>4. $G(j\omega)H(j\omega) = 20 \text{ dB}$</p>
For second order linear system, setting time is	<p>1. 1/4 of the time constant</p> <p>2. 1/2 of the time constant</p> <p>3. 4 of the time constant</p> <p>4. 2 of the time constant</p>
For a second-order system with the closed-loop transfer function $F(s) = \frac{9}{s^2 + 4s + 9}$, the settling time for 2-percernt band, in seconds, is	<p>1. 1.5</p> <p>2. 2</p> <p>3. 3</p> <p>4. 4</p>
The characteristic polynomial of system $q(s) = 2s^5 + s^4 + 4s^3 + 2s^2 + 2s + 1$ The system is	<p>1. stable</p> <p>2. marginally stable</p> <p>3. unstable</p> <p>4. oscillatory</p>

Consider a system with the transfer function $G(s) = \frac{s+6}{Ks^2+s+6}$, its damping ratio will be 0.5 when the value of K is

1. $\frac{2}{6}$
2. $\frac{1}{6}$
3. 3
4. 6

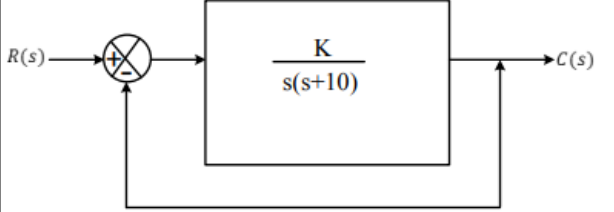
In the feedback scheme shown in figure, the time-constant of the closed system will be



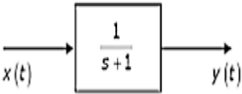
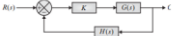
1. $A\beta\tau$
2. τ
3. $(1+A\beta\tau)$
4. $\frac{\tau}{(1+A\beta)}$

The addition of open loop zero pulls the root loci towards:

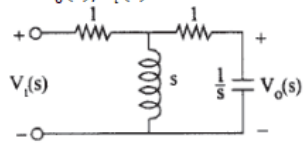
1. The left and therefore system becomes more stable
2. The right and therefore system becomes unstable
3. Imaginary axis and therefore system becomes marginally stable
4. The left and therefore system becomes unstable

<p>A unit feedback system has open-loop poles at $s = -2 \pm j 2$, $s = -1$, and $s = 0$; and a zero at $s = -3$. The angles made by the root-locus asymptotes with the real axis, and the point of intersection of the asymptotes are, respectively,</p>	<p>1. $(60^\circ, -60^\circ, 180^\circ) \text{ and } -\frac{3}{2}$</p> <p>2. $(60^\circ, -60^\circ, 180^\circ) \text{ and } -\frac{2}{3}$</p> <p>3. $(45^\circ, -45^\circ, 180^\circ) \text{ and } -\frac{2}{3}$</p> <p>4. $(45^\circ, -45^\circ, 180^\circ) \text{ and } -\frac{4}{3}$</p>
<p>The unity feedback system shown in figure has:</p> 	<p>1. Zero steady state position error</p> <p>2. Zero steady state velocity error</p> <p>3. Steady state position error $K/10$ units</p> <p>4. Steady state velocity error $K/10$ units</p>
<p>The unit impulse response of a linear time invariant system is the unit step function $u(t)$. for $t > 0$, the response time of the system to an excitation $e^{-at}u(t), a > 0$ will be</p>	<p>1. $a e^{-at}$</p> <p>2. $a(1 - e^{-at})$</p> <p>3. $\frac{1}{a}(1 - e^{-at})$</p> <p>4. $(1 - e^{-at})$</p>

<p>A certain system exhibited an overshoot of 16% when subjected to an input of $2u(t)$, where $u(t)$ is a step input. The damping ratio and decay ratio respectively are</p>	<ol style="list-style-type: none"> 1. (0.8, 0.0810) 2. (0.5, 0.02256) 3. (1.0, 0.1626) 4. (1.1, 0.0089)
<p>Despite the presence of negative feedback, control systems still have problems of instability because the</p>	<ol style="list-style-type: none"> 1. Components used have non-linearity. 2. Dynamic equations of the subsystems are not known exactly. 3. Mathematical analysis involves approximations. 4. System has large negative phase angle at high frequencies.
<p>Consider the following statements regarding a linear system</p> <ol style="list-style-type: none"> 1. $f(x_1 + x_2) = f(x_1) + f(x_2)$ 2. $f[x(t + T)] = f[x(t)] + f[x(T)]$ 3. $f(Kx) = K f(x)$ <p>Of these statements</p>	<ol style="list-style-type: none"> 1. 1, 2, 3 are correct 2. 1 & 2 are correct 3. 1 & 3 are correct 4. 3 alone is correct
<p>Consider the following statements regarding advantages of closed loop negative feedback control systems over open loop systems</p> <ol style="list-style-type: none"> 1. The overall reliability of the closed loop system is more than that of open loop system. 2. The transient response in a closed loop system decays more quickly than in open loop system. 	<ol style="list-style-type: none"> 1. 1 and 2 2. 1 and 3 3. 2 and 4 4. 1 and 4

<p>3. In an open loop system, closing of the loop increases the overall gain of the system.</p> <p>4. In the closed loop system, the effect of variation of</p>	
<p>In the system shown below, $x(t) = \sin tu(t)$, In steady-state the output $y(t)$</p> 	<p>1. $\frac{1}{\sqrt{2}} \sin\left(t + \frac{\pi}{4}\right)$</p> <p>2. $\frac{1}{\sqrt{2}} \sin\left(t - \frac{\pi}{4}\right)$</p> <p>3. $\frac{1}{\sqrt{2}} e^{-t} \sin t$</p> <p>4. $\frac{1}{\sqrt{2}} (\sin t + \cos t)$</p>
<p>A feedback control system with high gain K_h is shown in the figure below.</p>  <p>Then the closed loop transfer function is</p>	<p>1. Sensitive to perturbations in $G(s)$ and $H(s)$.</p> <p>2. Sensitive to perturbations in $G(s)$ but not to perturbations in $H(s)$.</p> <p>3. Sensitive to perturbation in $H(s)$ but not to perturbations in $G(s)$.</p> <p>4. Insensitive to perturbations in $G(s)$ and $H(s)$.</p>

Find $V_o(s)/V_i(s)$



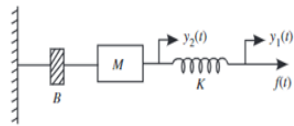
1.
$$\frac{s}{2s^2 + 2s + 1}$$

2.
$$\frac{s}{2s^2 - 2s + 1}$$

3.
$$\frac{s}{2s^2 + 2s - 1}$$

4.
$$\frac{s}{s^2 + 2s + 1}$$

For the mechanical system, shown in Figure below, the system is described as:



1.
$$M \frac{d^2 y_2(t)}{dt^2} - B \frac{dy_1(t)}{dt} = K[y_1(t) - y_2(t)]$$

2.
$$M \frac{d^2 y_2(t)}{dt^2} + B \frac{dy_1(t)}{dt} = K[y_1(t) + y_2(t)]$$

3.
$$M \frac{d^2 y_2(t)}{dt^2} + B \frac{dy_1(t)}{dt} = K[y_1(t) + y_2(t)]$$

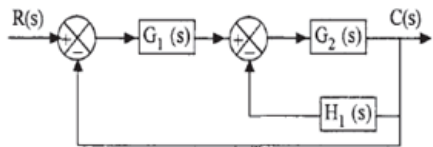
4.
$$M \frac{d^2 y_2(t)}{dt^2} + B \frac{dy_2(t)}{dt} = K[y_1(t) - y_2(t)]$$

For the system in the given figure. The transfer function $C(s)/R(s)$ is



1. $G_1 + G_2 + 1$
2. $G_1 + G_2 + 1$
3. $G_1 G_2 + G_2 + 1$
4. $G_1 G_2 + G_1 + 1$

Find the transfer function $C(s)/R(s)$



1. $\frac{G_2}{1 + G_2 H_1 + G_1 G_2}$
2. $\frac{G_1 G_2}{1 + G_2 H_1 + G_1 G_2}$
3. $\frac{G_1}{1 + G_2 H_1 + G_1 G_2}$
4. $\frac{G_1 G_2}{1 + G_2 + G_1}$

A transfer function has two zeroes at infinity. Then the relation between the numerator(N) and the denominator degree(M) of the transfer function is:

1. $N=M+2$
2. $N=M-2$
3. $N=M+1$
4. $N=M-2$

The open-loop frequency response of a unity feedback system is given in the following table

ω	$ G(j\omega) $	
2	8.5	
3	6.4	
4	4.8	
5	2.56	
6	1.4	
8	1.00	
10	0.63	

The gain margin and phase margin of the system are

In the Bode-plot of a unity feedback control system, the value of magnitude of $G(j\omega)$ at the phase crossover frequency is 0.5. The gain margin is

The open-loop transfer function of a system is

$$G(s)H(s) = \frac{K}{s(1+2s)(1+3s)}$$

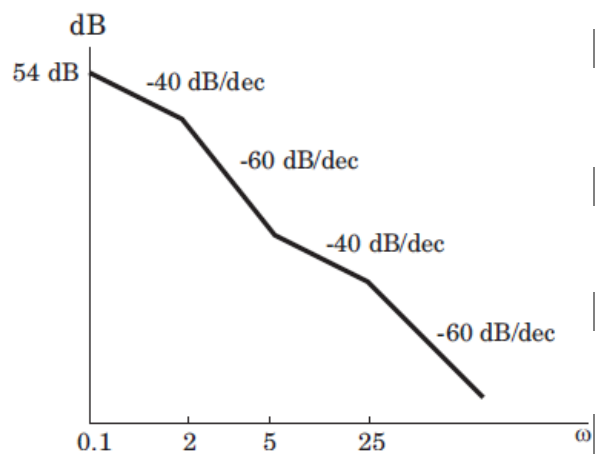
The phase crossover frequency is

1. 2 dB, 80°
2. 2 dB, -172°
3. 4 dB, 80°
4. 4 dB, -172°

1. 2
2. 0.5
3. 0.333
4. 3

1. 6 rad/sec
2. 2.46 rad/sec
3. 0.41 rad/sec
4. 3.23 rad/sec

The asymptotic approximation of the log-magnitude versus frequency for a certain system is shown in the following figure. Its transfer function is



1.
$$\frac{50(s+5)}{s^2(s+2)(s+25)}$$

2.
$$\frac{20(s+5)}{s^2(s+2)(s+25)}$$

3.
$$\frac{10s^2(s+5)}{(s+2)(s+25)}$$

4.
$$\frac{20(s+5)}{s(s+2)(s+25)}$$

Consider a unity feedback system
$$G(s) = \frac{K}{s(1+sT_1)(1+sT_2)(1+sT_3)}$$

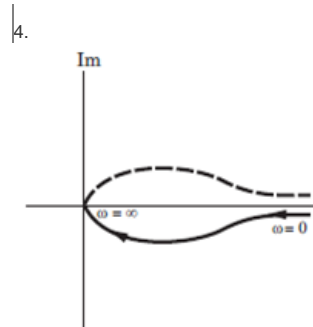
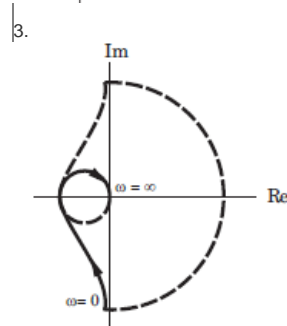
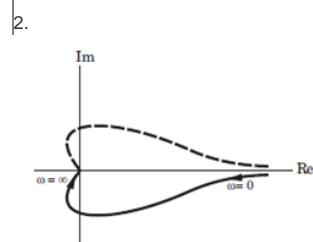
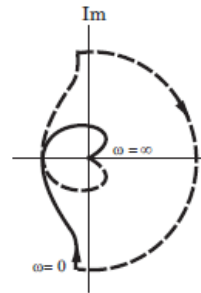
The angle of asymptote, which the Nyquist plot approaches as $\omega \rightarrow \infty$, is

1. -90°
2. 90°
3. 180°
4. 45°

Consider a unity feedback system whose open^{1.}
function is

$$G(s) = \frac{K}{s(s^2 + 2s + 2)}$$

The Nyquist plot for this system is

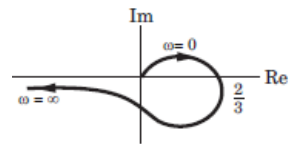


A unity feedback system has open-loop transfer Function

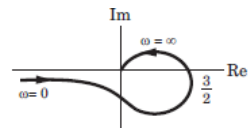
$$G(s) = \frac{1}{s(2s+1)(s+1)}$$

The Nyquist plot for the system is

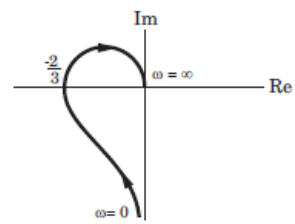
1.



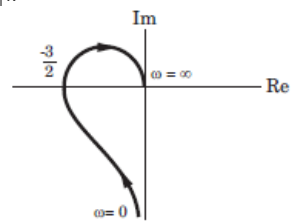
2.



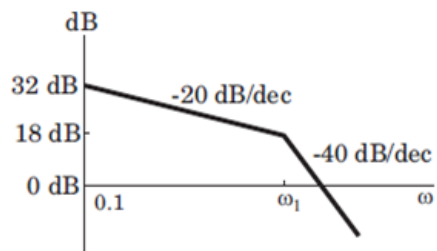
3.



4.



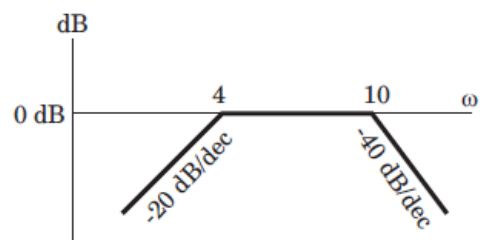
Consider the Bode plot of a unity feedback system shown in following figure



The damping ratio is

1. 0.063
2. 0.179
3. 0.483
4. 0.639

For the Bode plot shown in the following figure, the transfer function is



1. $\frac{100}{(s+4)(s+10)}$
2. $\frac{100(s+4)}{s(s+10)^2}$
3. $\frac{100}{(s+4)(s+12)}$
4. $\frac{100}{s(s+4)(s+10)}$

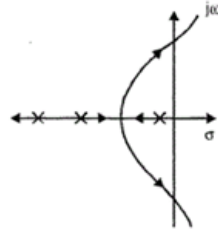
The open-loop transfer function of a ufl system is

$$G(s) = \frac{(1 + s)}{s(1 + 0.5s)}$$

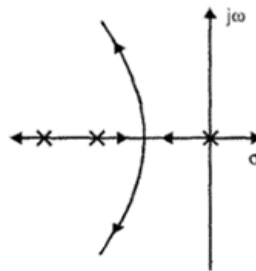
The corner frequencies are

1.
0 and 2
2.
0 and 1
3.
0 and -1
4.
1 and 2

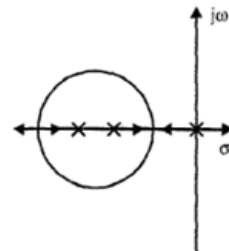
Given a Unity feedback system with open loop transfer function¹.
 $G(s) = \frac{K}{s(s+1)(s+2)}$, The root locus plot of the system is of the form.



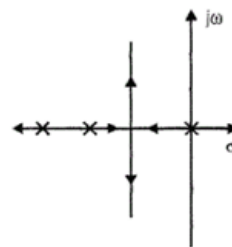
2.



3.



4.



A system has a complex pole pair of $(-1 \pm j 2)$ and a zero of (-3) . The steady state output to a unit step input is 2. The transfer function of the system is

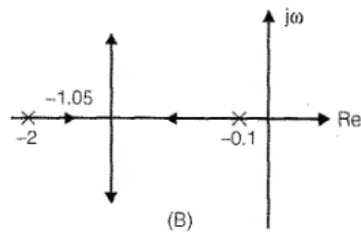
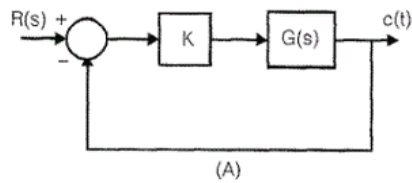
1. $\frac{10}{3} \left(\frac{s+3}{s^2+2s+5} \right)$

2. $\frac{10}{7} \left(\frac{s+3}{s^2+3s+5} \right)$

3. $\frac{10}{7} \left(\frac{s+3}{s^2+4s+5} \right)$

4. $\frac{10}{7} \left(\frac{s-3}{s^2+3s+5} \right)$

Consider a closed loop system shown in fig. (a) below. The root locus for it is shown in fig. (b). the closed loop transfer function for the system is



1. $\frac{K}{1+(0.5s+1)(10s+1)}$

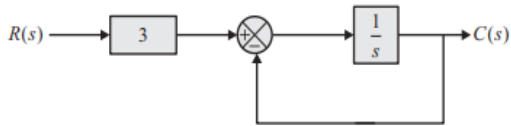
2. $\frac{K}{(s+2)(s+0.1)}$

3. $\frac{K}{K+0.2(0.5s+1)(10s+1)}$

4. $\frac{K}{1+K(0.5s+1)(10s+1)}$

<p>An open loop transfer function $G(s)$ of a system is $G(s) = \frac{K}{s(s+1)(s+2)}$, for a unity feedback system, the breakaway of the root loci on the real axis occurs at,</p>	<p>1. -1.58 2. -0.42 and -1.58 3. -0.422 4. -1.26</p>
<p>Given $A = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$, the state transition matrix e^{-At} is given by</p>	<p>1. $\begin{bmatrix} 0 & e^{-t} \\ e^{-t} & 0 \end{bmatrix}$ 2. $\begin{bmatrix} 0 & e^t \\ e^t & 0 \end{bmatrix}$ 3. $\begin{bmatrix} e^t & 0 \\ 0 & e^t \end{bmatrix}$ 4. $\begin{bmatrix} e^{-t} & 0 \\ 0 & e^{-t} \end{bmatrix}$</p>
<p>The second order dynamic system $\frac{dx}{dt} = PX + Qu$, $Y = RX$ has the matrices P,Q and R as follows : $P = \begin{bmatrix} -1 & 1 \\ 0 & -3 \end{bmatrix}$, $Q = \begin{bmatrix} 0 \\ 1 \end{bmatrix}$, $R = [0 \quad 1]$ The system has the following controllability and observability properties:</p>	<p>1. Controllable and observable 2. Not controllable but observable 3. Controllable but not observable 4. Not controllable and not observable</p>

The matrix of any state space equations for the transfer function $\frac{C(s)}{R(s)}$ of the system shown below is



1. $\begin{bmatrix} -1 & 0 \\ 0 & -1 \end{bmatrix}$

2. $\begin{bmatrix} 1 & 1 \\ 0 & -1 \end{bmatrix}$

3. $[-1]$

4. $[3]$

A state space representation for the transfer function

$\frac{Y(s)}{U(s)} = \frac{s+6}{s^2+5s+6}$ is $\dot{x} = Ax + Bu$ and $y = Cx$. Where $A =$

$\begin{bmatrix} 0 & 1 \\ -6 & -5 \end{bmatrix}$, $B = \begin{bmatrix} 0 \\ 1 \end{bmatrix}$. The value of C will be

1. $\begin{bmatrix} 1 \\ 2 \end{bmatrix}$

2. $\begin{bmatrix} 6 & 1 \end{bmatrix}$

3. $\begin{bmatrix} 1 & 2 \\ -1 & 0 \end{bmatrix}$

4. $\begin{bmatrix} 1 & 6 \end{bmatrix}$

Consider a second order system whose state space representation is of the form $\dot{x} = Ax + Bu$ $x_1(t) = x_2(t)$, then the system is

1. Controllable

2. uncontrollable

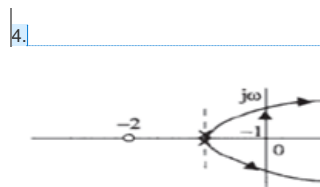
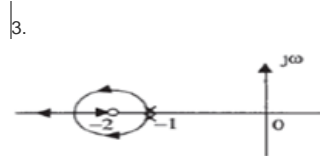
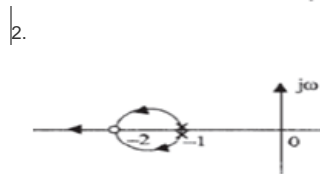
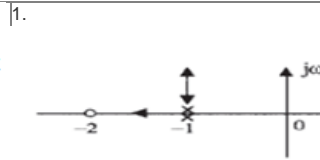
3. Observable

4. unstable

Commented [11]: $X=AX+BU$
 $Y=CX+DU$

Y
 $- = C * [I*s - A] * B + D$
 U
Solve and get.

A unity feedback system has an open loop Transfer function $\frac{K(s+2)}{(s+1)^2}$. The root Locus plot is



Commented [12]: No. of Poles = 2 [-1,-1]
No. of Zeros = 1 [-2]
No. of branches = p-z = 1
location of RL => in between -2 and -1
Centroid = 0
Breakaway point = -1
intersection with jw = $\pm j\sqrt{3}$

A system described by the following differential equation

$$\frac{d^2 y}{dt^2} + 3 \frac{dy}{dt} + 2y = x(t)$$

is initially rest. For the input $x(t) = 2u(t)$, the output $y(t)$

1.

$$(1 - 2e^{-t} + e^{-2t})u(t)$$

2.

$$(1 + 2e^{-t} + e^{-2t})u(t)$$

3.

$$(1 - 2e^{-t} - e^{-2t})u(t)$$

4.

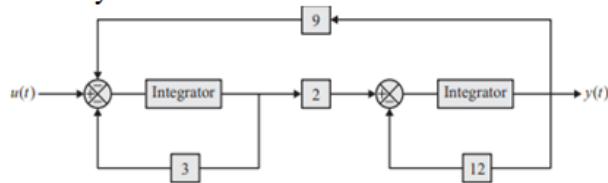
$$(1 - 2e^{-t} + e^t)u(t)$$

Commented [13]: Characteristic Equation:
 $D^2 + 3D + 2 = 0$
 $\Rightarrow D = -1, -2$
 $\Rightarrow Ae^{-t} + Be^{-2t}$
After this form Particular Integral and find gen eq.

The block diagram of a control system is as

shown in figure. The transfer function $G(s) = \frac{Y(s)}{U(s)}$

of the system is



1.

$$\frac{1}{27\left(1-\frac{s}{6}\right)\left(1-\frac{s}{9}\right)}$$

2.

$$\frac{1}{27\left(1+\frac{s}{6}\right)\left(1+\frac{s}{9}\right)}$$

3.

$$\frac{2}{27(1+6s)(1+9s)}$$

4.

$$\frac{2}{27(1-6s)(1-9s)}$$

When deriving the transfer function of a linear element

1.

Both initial conditions and loading are taken into account

2.

Initial conditions are taken into account but the element is assumed to be not loaded

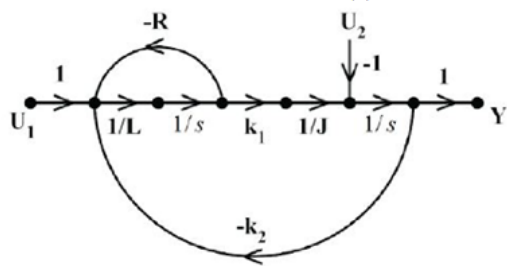
3.

Initial conditions are assumed to be zero but loading is taken into account

4.

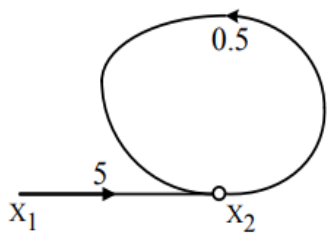
Initial conditions are assumed to be zero and the element is assumed to be not loaded

In the system whose signal flow graph is shown in the figure, $U_1(s)$ and $U_2(s)$ are inputs. The transfer function $\frac{Y(s)}{U_1(s)}$



1. $\frac{k_1}{jLs^2 + JRs + k_1k_2}$
2. $\frac{k_1}{jLs^2 - JRs + k_1k_2}$
3. $\frac{k_2}{jLs^2 + JRs + k_1k_2}$
4. $\frac{k_1}{jLs^2 + Jk_1s + k_1k_2}$

In the signal flow graph shown in figure $X_2 = TX_1$ where T, is equal to



- 1.
- 2.5
- 2.
- 5.5
- 3.
- 5
- 4.
- 10

Commented [14]: Self loop: $S21/(1-S22)$

The relationship between an input and output variable of a signal flow graph is given by the net gain between the input and output node is known as the overall _____

1. Overall gain of the system
2. Stability
3. Bandwidth
4. speed

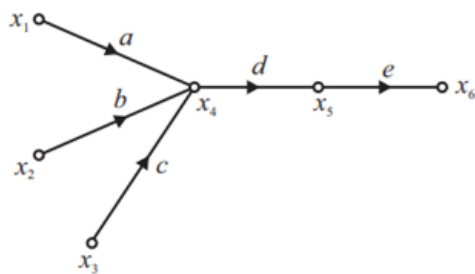
The unit-step response of a system starting from rest is given by $c(t) = 1 - e^{-2t}$, $t > 0$, the transfer function of the system is

1. $\frac{1}{1+2s}$
2. $\frac{1}{2+s}$
3. $\frac{2}{2+s}$
4. $\frac{2}{2-s}$

The unit impulse response of a system is $h(t) = e^{-t}$, $t \geq 0$. For this system, the steady-state value of the output for unit step input is equal to

1. -1
2. 0
3. 1
4. infinity

From the signal flow graph shown in the figure, the value of x_6 is



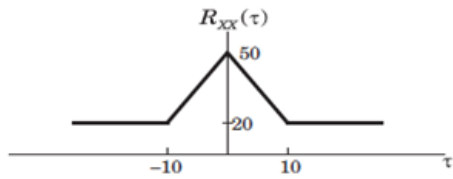
1. $de(ax_1 + bx_2 + cx_3)$
2. $(d+e)(ax_1 + bx_2 + cx_3)$
3. $(ad+be)(ax_1 + bx_2 + cx_3)$
4. $(d-e)(ax_1 + bx_2 + cx_3)$

<p>The forward path transfer function of a unity feedback system is</p> $G(s) = \frac{1000}{(s + 20)(s^2 + 4s + 10)}$ <p>For input of $60u(t)$ steady state error is</p>	<p>1. 0</p> <p>2. 300</p> <p>3. Infinity</p> <p>4. 10</p>
<p>Which one of the following is the most likely reason for large overshoot in a control system</p>	<p>1. High gain in a system</p> <p>2. Presence of dead time delay in a system</p> <p>3. High positive correcting torque</p> <p>4. High retarding torque</p>
<p>If the outcomes of a discrete random variable follow a Poisson distribution, then their_____.</p>	<p>1. Mean equals the variance</p> <p>2. Mean equals the standard deviation</p> <p>3. Median equals the variance</p> <p>4. Median equals the standard deviation</p>
<p>The continuous random variable X has pdf given by</p> $f(x) = \begin{cases} ax & , -3 \leq x \leq 3 \\ 0 & , \text{otherwise} \end{cases}$ <p>where a is a constant. The value of 'a' is _____?</p>	<p>1. 0</p> <p>2. 1/3</p> <p>3. 1/9</p> <p>4. 1</p>

Commented [15]: $\lim_{s \rightarrow 0} \{s \cdot R(s) / [1 + G(s) \cdot H(s)]\}$

Process in which trials are statistically independent and each trial of event has only two outcomes is classified as_____.	<div>1. Bernoulli process</div> <div>2. Bayes process</div> <div>3. Functional process</div> <div>4. Independent limited process</div>
$var(aX + bY) = ?$	<div>1 $a^2\sigma_X^2 + b^2\sigma_Y^2$</div> <div>2 $a^2\sigma_X^2 + 2ab\sigma_{XY} + b^2\sigma_Y^2$</div> <div>3. $\sigma_{XY} + \mu_X\mu_Y$</div> <div>4. $a\sigma_X^2 + b\sigma_Y^2$</div>
A random process is defined by $X(t) + A$ where A is continuous random variable uniformly distributed on (0,1). The auto correlation function and mean of the process is _____.	<div>1. 1/2 & 1/3</div> <div>2. 1/3 & 1/2</div> <div>3. 1 & 1/2</div> <div>4. 1/2 & 1</div>

The auto correlation function of a stationary ergodic random process is shown below, The mean value $E[X(t)]$ is _____.



1.
50

2.

$$\sqrt{50}$$

3.

$$\sqrt{20}$$

4.

20

Which of the following signal is the example for deterministic signal?

1.
step

2.
Exponential

3.
Thermal Noise

4.
Both (a) and (b)

What is the even component of a discrete-time signal?

1.

$$x_e(t) = \frac{1}{2} [x(t) - x(-t)]$$

2.

$$x_e(t) = \frac{1}{2} [x(t) + x(-t)].$$

3.

$$x_e(n) = \frac{1}{2} [x(n) + x(-n)]$$

4.

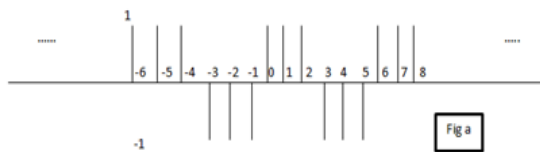
$$x_e(n) = \frac{1}{2} [x(n) - x(-n)]$$

Is the following signal an energy signal?

$$x(t) = u(t) - u(t - 1)$$

1. YES
2. NO
3. Information is not sufficient to Judge
4. Neither energy nor power signal

What is the fundamental frequency of discrete –time wave shown in fig a?

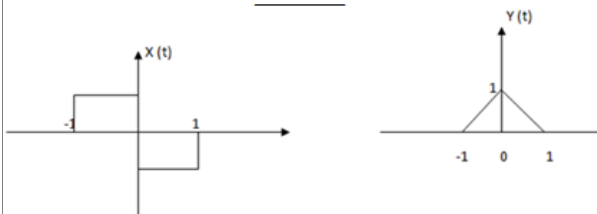


1. $\pi/6$
2. $\pi/3$
3. $2\pi/8$
4. π

In discrete signal, if $y[n] = x[k * n]$ and $k > 1$ then

1. Some samples are lost from $x[n]$
2. Some samples are added to $x[n]$
3. It has no effect on sample
4. Samples will be increased w

The given pair of signals $x(t)$ and $y(t)$ are related by _____



1. $y(t) = \frac{d}{dt} x(t)$

2.

$y(t) = x(t) + 1$

3.

$y(t) = \int x(t) dt$

4.

Not related

Which of the following systems is time invariant?

1.

$y(t) = x(2t) + x(t)$

2.

$y(t) = x(t) + x(1 - t)$

3.

$y(t) = -x(t) + x(1 - t)$

4.

$y(t) = x(t) + x(t - 1)$

Which block of the discrete time systems requires memory in order to store the previous input?

1.

Adder

2.

Signal Multiplier

3.

Unit Delay

4.

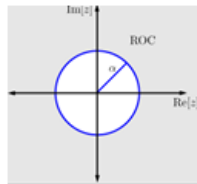
Unit Advance

<p>Determine the nature of the given system: $y(t) = x(\sin t)$</p>	<p>1. Causal, Non-linear</p> <p>2. Causal, Linear</p> <p>3. Non-Causal, Non-linear</p> <p>4. Non-causal, Linear</p>
<p>$y[n] = r^n x[n]$ is _____ system.</p>	<p>1. Linear time invariant</p> <p>2. Time varying</p> <p>3. Linear and time varying</p> <p>4. Causal and time invariant</p>
<p>If the input-output relationship is given by $y(t) = 2x(t) \frac{d x(t)}{dx}$ What kind of system it represents?</p>	<p>1. Linear system</p> <p>2. <u>Non linear system</u></p> <p>3. LTI system</p> <p>4. Linear but time-invariant system</p>

Should real time instruments like oscilloscopes be time invariant?	1. YES 2. Some times 3. Never 4. They have no relation with time variance
If $f(t) = 1$, then its Laplace Transform is given by	1. s 2. 1/s 3. 1 4. Does not exist
Find the transfer function of a system given by equation $\frac{d^2}{dt^2} y(t - a) + x(t) + 5 \frac{d}{dt} y(t) = x(t - a)$	1. $\frac{[e^{-as} - s]}{[1 + e^{-as} s^2]}$ 2. $\frac{[e^{-as} - 5s]}{[e^{-as} s^2]}$ 3. $\frac{[e^{-as} - s]}{[2 + e^{-as} s^2]}$ 4. $\frac{[e^{-as} - 5s]}{[1 + e^{-as} s^2]}$

Find the poles of transfer function given by system $\frac{d^2}{dt^2}y(t) - \frac{d}{dt}y(t) + y(t) - \int_0^t x(t)dt = x(t)$	1. 0, 0.7 ± 0.466 2. 0, 2.5 ± 0.866 3. 0, 0.5 ± 0.866 4. 0, 1.5 ± 0.876
What is the set of all values of z for which X(z) attains a finite value?	1. Region of convergence 2. Radius of divergence 3. Feasible solution 4. None of the mentioned (radius of convergence)
What is the z-transform of the finite duration signal $x(n) = \{2, 4, 5, 7, 0, 1\}$ <div style="text-align: center;"> \uparrow </div>	1. $2 + 4z + 5z^2 + 7z^3 + z^4$ 2. $2 + 4z + 5z^2 + 7z^3 + z^5$ 3. $2 + 4z^{-1} + 5z^{-2} + 7z^{-3} + z^{-5}$ 4. $2z^2 + 4z + 5 + 7z^{-1} + z^{-3}$

Which of the following series has an ROC as mentioned below?



1.
 $\alpha^{-n}u[n]$

2.
 $\alpha^n u[n]$

3.
 $\alpha^{-n}u[n-]$

4.
 $\alpha^n u[n]$

How does Fourier series make it easier to represent periodic signals?

1.
Harmonically related

2.
Periodically related

3.
Sinusoidally related

4.
Exponentially related

If the signal $x(t)$ is real and odd, what will be the Fourier series coefficients?

1.
Real and even

2.
Odd

3.
Even only

4.
real and even

What is the equation of the Fourier series coefficient of non-periodic signal?

1.

$$\frac{1}{T_p} \int_0^{t_0+T_p} x(t) e^{-j2\pi k F_0 t} dt$$

2.

$$\frac{1}{T_p} \int_{-\infty}^{+\infty} x(t) e^{-j2\pi k F_0 t} dt$$

3.

$$\frac{1}{T_p} \int_{t_0}^{t_0+T_p} x(t) e^{-j2\pi k F_0 t} dt$$

4.

$$\frac{1}{T_p} \int_{t_0}^{t_0+T_p} x(t) e^{j2\pi k F_0 t} dt$$

Which of the following relations are true if $x[n]$ is real?

1.

$$X(\omega) = X(-\omega)$$

2.

$$X(\omega) = -X(-\omega)$$

3.

$$X^*(\omega) = X(\omega)$$

4.

$$X^*(\omega) = X(-\omega)$$

If $X(\omega)$ is the Fourier transform of the signal $x(n)$,
then what is the Fourier transform of the signal
 $x(n - k)$?

1.
 $e^{j\omega k} X(-\omega)$
2.
 $e^{j\omega k} X(\omega)$
3.
 $e^{-j\omega k} X(\omega)$
4.
 $e^{-j\omega k} X(-\omega)$

According to Parseval's Theorem for non-periodic
signal,

$$\int_{-\infty}^{+\infty} |x(t)|^2 dt = \underline{\hspace{2cm}}.$$

1.
 $\int_{-\infty}^{+\infty} |X(F)|^2 dt$
2.
 $\int_{-\infty}^{+\infty} |X^*(F)|^2 dt$
3.
 $\int_{-\infty}^{+\infty} |X(F) \cdot X^*(F)|^2 dt$
4.
All of the mentioned

The initial value of continuous-time signal in frequency domain is__

1.

$$X(0) = \frac{1}{2\pi} \int_{-\infty}^{\infty} x(t) d\omega$$

2.

$$X(0) = \int_{-\infty}^{+\infty} x(t) dt$$

3.

$$X(0) = \int_0^{\infty} x(t) dt$$

4.

$$X(0) = \frac{1}{2\pi} \int_{-\infty}^{\infty} x(j\omega) dt$$

If the Fourier transform of the signal $e^{|t|}$ is $\frac{2}{1+\Omega^2}$, then the Fourier transform of the signal $\frac{2}{1+t^2}$, using duality property is_____.

1.

$$2\pi e^{|j\Omega|}$$

2.

$$2\pi e^{-|j\Omega|}$$

3.

$$2\pi(-j\Omega)$$

4.

$$2\pi(j\Omega)$$

If $x(t)$ and $X(\Omega)$ are Fourier transform pair, then the Fourier transform of $x(t) \sin \Omega_0 t$ is_____.

1.

$$\frac{1}{2j} [X(\Omega - \Omega_0) - X(\Omega + \Omega_0)]$$

2.

$$\frac{1}{2} [X(\Omega - \Omega_0) - X(\Omega + \Omega_0)]$$

3.

$$\frac{1}{2j} [X(\Omega - \Omega_0) + X(\Omega - \Omega_0)]$$

4.

$$\frac{1}{2} [X(\Omega - \Omega_0) + X(\Omega - \Omega_0)]$$

The Fourier transform $x(t)$ exists only if _____.

1. $\int_0^{\infty} x(t) dt < \infty$

2. $\int_{-\infty}^{+\infty} x(t) dt > 0$

3. $\int_{-\infty}^{+\infty} x(t) e^{j\Omega t} dt < \infty$

4.

$\int_{-\infty}^{+\infty} x(t) dt < \infty$

The signal $x(t) = 6u(t)$ has the Fourier transform of _____.

1. $\frac{1}{j\Omega} + 6\pi\delta(\Omega)$

2.

$\frac{6}{j\Omega} + 6\pi\delta(\Omega)$

3.

$\frac{1}{j\Omega} + \pi\delta(\Omega)$

4.

$\frac{1}{j6\Omega} + \pi\delta(6\Omega)$

<p>If Fourier transform of $x_1(t) = \frac{a}{\Omega - a}$, and Fourier transform of $x_2(t) = \frac{a}{\Omega + a}$, then $\mathcal{F}\{x_1(t) * x_2(t)\}$ is _____.</p>	<p>1. $\frac{\Omega - a}{\Omega + a}$</p> <p>2. $\frac{\Omega + a}{\Omega - a}$</p> <p>3. $\frac{a^2}{\Omega^2 - a^2}$</p> <p>4. $\frac{a^2}{\Omega^2 + a^2}$</p>
<p>What is the average power of the discrete time periodic signal $x[n]$ with period ?</p>	<p>1. $\frac{1}{N} \sum_{n=0}^N x[n]$</p> <p>2. $\frac{1}{N} \sum_{n=0}^{N-1} x[n]$</p> <p>3. $\frac{1}{N} \sum_{n=0}^N x[n] ^2$</p> <p>4. $\frac{1}{N} \sum_{n=0}^{N-1} x[n] ^2$</p>
<p>Which of the following represents the phase associated with the frequency component of discrete-time Fourier series (DTFS)?</p>	<p>1. $e^{j2\pi kn/N}$</p> <p>2. $e^{-j2\pi kn/N}$</p> <p>3. $e^{j2\pi knN}$</p> <p>4. None of the mentioned</p>

<p>If two LTI systems with impulse response $h_1(t)$ and $h_2(t)$ are connected in parallel then output is given by _____</p> <p>a) $y(t) = x(t) * (h_1(t) + h_2(t))$ b) $y(t) = x(t) + (h_1(t) + h_2(t))$ c) $y(t) = x(t) * (h_1(t) h_2(t))$ d) $y(t) = (x(t) * h_1(t)) + h_2(t)$</p>	<p>1. $y(t) = x(t) * (h_1(t) + h_2(t))$</p> <p>2. $y(t) = x(t) + (h_1(t) + h_2(t))$</p> <p>3. $y(t) = x(t) * (h_1(t) \cdot h_2(t))$</p> <p>4. $y(t) = (x(t) * h_1(t)) + h_2(t)$</p>
<p>If $x[n]$ is a real sequence, then what is the value of $X_{imag}(\omega)$?</p>	<p>1. $\sum_{n=-\infty}^{\infty} x[n] \sin \omega n$</p> <p>2. $-\sum_{n=-\infty}^{\infty} x[n] \sin \omega n$</p> <p>3. $\sum_{n=-\infty}^{\infty} x[n] \cos \omega n$</p> <p>4. $-\sum_{n=-\infty}^{\infty} x[n] \cos \omega n$</p>
<p>If $h(n)$ is the real valued impulse response sequence of an LTI system, then what is the phase of $H(\omega)$ in terms of $H_R(\omega)$ and $H_I(\omega)$?</p>	<p>1. $\tan^{-1} \left(\frac{H_R(\omega)}{H_I(\omega)} \right)$</p> <p>2. $\tan^{-1} \left(\frac{H_R(\omega)}{H_I(\omega)} \right)$</p> <p>3. $\tan^{-1} \left(\frac{H_I(\omega)}{H_R(\omega)} \right)$</p> <p>4. $-\tan^{-1} \left(\frac{H_I(\omega)}{H_R(\omega)} \right)$</p>

<p>If $x[n] \leftrightarrow X(\omega)$ is DTFT pair, then the DTFT of $x^*[-n]$ is __.</p>	<p>1. $X^*(\omega)$</p> <p>2. $X^*(-\omega)$</p> <p>3. $-X^*(\omega)$</p> <p>4. $\frac{1}{2\pi}X^*(\omega)$</p>
<p>The convolution integral is given as</p>	<p>1. $y(t) = \int_{-\infty}^{\infty} x(-\tau)h(t-\tau)d\tau$</p> <p>2. $y(t) = \int_{-\infty}^{\infty} x(\tau)h(t-\tau)d\tau$</p> <p>3. $y(t) = \int_{-\infty}^{\infty} x(\tau)h(\tau-t)d\tau$</p> <p>4. $y(t) = \int_{-\infty}^{\infty} x(t)h(t-\tau)d\tau$</p>
<p>The convolution sum of two sequences $x(n) = \{1, 2, 1, 3\}$ and $h(n) = \{1, 2, 1, 1\}$ is _____.</p>	<p>1. $y(n) = \{1, 4, 6, 7, 8, 4, 3\}$</p> <p>2. $y(n) = \{1, 4, 6, 9, 8, 4, 4\}$</p> <p>3. $y(n) = \{1, 4, 6, 8, 9, 4, 3\}$</p> <p>4. $y(n) = \{1, 4, 6, 8, 9, 3, 3\}$</p>

<p>The correlation between the following two sequences</p> $x(n) = \delta(n) + 2\delta(n-1) + \delta(n-2),$ $h(n) = 2\delta(n) + \delta(n-1) + 3\delta(n-2)$ <p>is _____.</p>	<p>1. {2,5,7,7,3}</p> <p>2. {2,5,7,5,2}</p> <p>3. {3,7,7,5,2}</p> <p>4. {3,7,5,7,2}</p>
<p>If X is uniform random variable distributed between -2 and 3, then what is its mean and variance?</p>	<p>1. 0.25 and 2.08333</p> <p>2. 0.5 and 2.08333</p> <p>3. 0.5 and 4.1666</p> <p>4. 1 and 2.08333</p>
<p>If X is Gaussian with mean 3 and standard deviation 2, then what is the $Prob\{X \leq 5.5\} = ?$</p>	<p>1. 0.75</p> <p>2. $\int_{-\infty}^{1.25} \frac{1}{\sqrt{2\pi}} e^{-\frac{t^2}{2}} dt$</p> <p>3. 0.5</p> <p>4. $\int_{1.25}^{\infty} \frac{1}{\sqrt{2\pi}} e^{-\frac{t^2}{2}} dt$</p>

Probability of head in a biased coin tossing experiment is $\frac{1}{3}$. What is the probability of getting 3 heads out of 5 tossing?	1. 0.1646 2. 0.01646 (I think ans=1st option) 3. 0.9876 4. 0.0370
If a random variable X has a variance of 4 and a random variable Y has a variance of 3, and covariance between X and Y is $C_{XY} = 2$, then what is the variance of $Z = X + Y$	1. 5 2. 6 3. 7 4. 11
If a white noise having the power spectral density $S_{XX}(\omega) = \frac{N_0}{2}$ is passed as an input to the LTI system, having an impulse response $h(t) = \frac{1}{RC} e^{-\frac{t}{RC}} u(t)$, then what is the power spectral density of response of the system?	1. $\frac{1}{1 + j\omega RC} \times \frac{N_0}{2}$ 2. $\frac{1}{1 + \omega^2 R^2 C^2} \times \frac{N_0}{2}$ 3. $\frac{RC}{1 + j\omega RC} \times \frac{N_0}{2}$ 4. $\frac{j\omega RC}{1 + j\omega RC} \times \frac{N_0}{2}$

<p>What is the cross-correlation function corresponding to the cross-power density spectrum</p> $S_{XY}(\omega) = \frac{8}{(\alpha + j\omega)^3}$	<p>1.</p> $R_{XY}(\tau) = 4u(\tau)\tau^2 e^{a\tau}$ <p>2.</p> $R_{XY}(\tau) = 4e^{-a\tau}$ <p>3.</p> $R_{XY}(\tau) = 4u(\tau)\tau^2 e^{-a\tau}$ <p>4.</p> $R_{XY}(\tau) = 4u(\tau)\tau^3 e^{-a\tau}$
<p>Energy signals are the signals with (E and P are average energy and power of the signal $x(t)$ or $x[n]$)</p>	<p>1.</p> $0 < E < \infty, P = 0$ <p>2.</p> $0 < E < \infty, P = \infty$ <p>3.</p> $0 < P < \infty, E = \infty$ <p>4.</p> $0 < P < \infty, E = 0$
<p>Periodic signals are</p>	<p>1.</p> $x(t + T) = x(t)$ <p>2.</p> $x(t - T) = x(t)$ <p>3.</p> $x(n + mN) = x[n]$ <p>4.</p> <p>All the above</p>

Find the even and odd component of $x(t) = e^{jt}$	<div>1.</div> $\cos t$ and $j \sin t$ <div>2.</div> $\sin t$ and $\cos t$ <div>3.</div> $j \sin t$ and $\cos t$ <div>4.</div> $\sin t$ and $j \cos t$
What is the period of $x(t) = \sin\left(\frac{2\pi}{3}t\right)$	<div>1.</div> <div>2.</div> <div>2.</div> <div>3.</div> <div>1</div> <div>4.</div> <div>4</div>
What is the energy contained in the signal $x[n] = (-0.5)^n u[n]$	<div>1.</div> <div>1/3</div> <div>2.</div> <div>2/3</div> <div>3.</div> <div>4/3</div> <div>4.</div> <div>Not an energy signal</div>

Commented [16]: E= Integration -> $(x(n))^2 dt$
 $E = \int_{-\infty}^{\infty} 0.25^n$
 $= a/(1-r)$
 Solve.

$\int_{-\infty}^{\infty} \phi(t) \delta'(t) dt = ?$	1. $\delta(t)$ 2. $\phi(t)$ 3. $\frac{d\phi(t)}{dt}$ 4. $\frac{d\phi(t)}{dt}$ with $t = 0$
Which system is non-causal system	1. $y(t) = x(t + 1)$ 2. $y(t) = x(t - 1)$ 3. $y(t) = x(t) + c$ 4. $y(t) = x(t - 1) + c$
Systems with memory can be characterised by	1. Linear equation 2. Differential Equation 3. Difference Equation 4. (b) and (c)

Which of the following is an invertible system	1. $y(t) = x(t) + 5$ 2. $y(t) = x^2(t)$ 3. $y(t) = \int_{-\infty}^t x(\lambda) d\lambda$ 4. (a) and (c)
If T represents a continuous time linear time invariant system, then $T\{e^{st}\} = ?$ Where s is a complex variable and λ is a complex constant	1. $e^{\lambda t}$ 2. λe^{st} 3. $\lambda e^{\lambda st}$ 4. e^{st}
A system has the input output relation given by, $y[n] = nx[n]$. Then $y[n]$ is	1. Causal, Time invariant, Memoryless, Linear 2. Causal, Time variant, Memoryless, Linear 3. Non-causal, Time invariant, memory, Linear 4. Non causal, Time variant, memoryless, Non Linear

An LTI system is said to be causal, if

1.
$$h[n] = 0; n < 0$$

2.
$$h[n] = 0; n \geq 0$$

3.
$$\sum_{-\infty}^{\infty} h[n] < \infty$$

4.
$$h[-n] = 0; n < 0$$

Laplace transform of $-te^{-at}u(-t)$

1.
$$s^2$$

2.
$$\frac{1}{(s+a)^2}$$

3.
$$\frac{1}{s+a}$$

4.
$$\frac{1}{s^2 + a^2}$$

$x(t) \leftrightarrow X(s)$, If unilateral Laplace transform is applied, then what will be the transform of $\frac{d^2 x(t)}{dt^2}$	1. $s^2 X(s)$ 2. $s^2 X(s) - sx(0^-)$, where 0^- represent initial condition 3. $s^2 X(s) - sx'(0^-)$, where 0^- represent initial condition 4. $s^2 X(s) - sx(0^-) - x'(0^-)$, where 0^- represent initial condition
The solution of the second-order linear differential equation $y''(t) + 5y'(t) + 6y(t) = x(t)$ with initial conditions $y(0) = 2$, $y'(0) = 1$ and $x(t) = e^{-t}u(t)$	1. $y(t) = \frac{1}{2}e^{-t} + 6e^{-2t} + \frac{9}{2}e^{-3t}$ 2. $y(t) = \frac{1}{2}e^{-t} + 6e^{-2t}$ 3. $y(t) = \frac{1}{2}e^{-t} + 6e^{-2t} - \frac{9}{2}e^{-3t}$ 4. $y(t) = \frac{1}{2}e^{-t} - \frac{9}{2}e^{-3t}$
In Z transform, can the region of convergence contain a pole	1. No, cannot contain a pole 2. Cannot contain a single pole, but, can contain a poles of multiple order 3. Yes, if the poles are complex 4. None of the mentioned

Commented [17]: Characteristic Eq. = $D^2 + 5D + 6 = 0$
 $D = -3, -2$
Solve and get

What is the z-transform of $a^n u(n)$

1.

$$\frac{1}{1+z^{-1}}; |z| > |a|$$

2.

$$\frac{1}{1-z^{-1}}; |z| > |a|$$

3.

$$\frac{z}{z+a}; |z| > |a|$$

4.

$$\frac{z}{z-a}; |z| > |a|$$

If $x[n] = a^{|n|}$; $a > 0$, then what is its Z transform

1.

$$\frac{a^2 - 1}{a} \times \frac{z}{\left(z + \left(\frac{1}{a}\right)\right)(z + a)}$$

2.

$$\frac{a^2 - 1}{a} \times \frac{z}{\left(z - \left(\frac{1}{a}\right)\right)(z - a)}$$

3.

$$\frac{a^2 + 1}{a} \times \frac{z}{\left(z - \left(\frac{1}{a}\right)\right)(z - a)}$$

4.

$$\frac{a}{a^2 - 1} \times \frac{z}{\left(z - \left(\frac{1}{a}\right)\right)(z - a)}$$

When is the Fourier series representation of a signal $x(t)$ possible?	<p>1. If $x(t)$ is absolutely integrable</p> <p>2. If $x(t)$ has finite number of maxima and minima within one period</p> <p>3. If $x(t)$ has finite number of discontinuous points within one time period</p> <p>4. All of the above</p>
Power contained in the periodic signal $x(t)$ is given by	<p>1. $\sum_{k=-\infty}^{\infty} a_k ^2$ where a_ks are coefficients of $x(t)$</p> <p>2. $\sum_{k=0}^{\infty} a_k ^2$ where a_ks are the coefficients of $x(t)$</p> <p>3. $\sum_{k=-\infty}^{\infty} a_k^2$ where a_ks are the Fourier series coefficients of $x(t)$</p> <p>4. Cannot be found from the Fourier series coefficients of $x(t)$</p>

Commented [18]: Power = $\sum_{n=-N}^N |x(n)|^2$

Find the Fourier series coefficient a_k of $\sin \omega_0 t$?

1.

$$a_{-1} = \frac{1}{2j}, a_1 = -\frac{1}{2j}$$

2.

$$a_1 = \frac{1}{2j}, a_{-1} = -\frac{1}{2j}$$

3.

$$a_1 = \frac{1}{2}, a_{-1} = -\frac{1}{2}$$

4.

$$a_1 = -\frac{1}{2}, a_{-1} = \frac{1}{2}$$

If $x(t) \leftrightarrow X(j\omega)$, is the transform pair, then
 $x(at) \leftrightarrow ?$
 where a is a positive real number.

1.

$$\frac{1}{a} X\left(\frac{j\omega}{a}\right)$$

2.

$$\frac{1}{|a|} X^*\left(\frac{j\omega}{a}\right)$$

3.

$$\frac{1}{|a|} X(j\omega a)$$

4.

$$\frac{1}{|a|} X\left(\frac{j\omega}{a}\right)$$

If $X(e^{j\omega})$ is the Fourier transform of the signal $x(n)$,
 then what is the Fourier transform of the
 signal $e^{j\omega_0 n} x(n)$?

1.
 $X(e^{j(\omega+\omega_0)})$

2.
 $e^{j\omega k} X(\omega)$

3.
 $X(e^{j(\omega-\omega_0)})$

4.
 $e^{-j\omega k} X(-\omega)$

Fourier transform of $x(t) = e^{-a|t|}$

1.
 $X(j\omega) = \frac{2a}{\omega^2 - a^2}$

2.
 $X(j\omega) = \frac{a}{\omega^2 + a^2}$

3.
 $X(j\omega) = \frac{2j\omega}{\omega^2 + a^2}$

4.
 $X(j\omega) = \frac{2a}{\omega^2 + a^2}$

If a continuous time LTI system is described by
 $y'(t) + 2y(t) = x(t)$,
Then what is the frequency response of the system

1.
 $H(\omega) = \frac{j\omega}{2 + j\omega}$

2.
 $H(\omega) = \frac{1}{2 + j\omega}$

3.
 $H(\omega) = \frac{2}{1 + j\omega}$

4.
 $H(\omega) = \frac{1}{2 - j\omega}$

What is the Fourier transform of $x(t) = e^{-j\omega_0 t}$

1.
 $2\pi\delta(\omega - \omega_0)$

2.
 $2\pi\delta(\omega + \omega_0)$

3.
 $2\pi\delta\left(\frac{\omega}{\omega_0}\right)$

4.
 $2\pi\delta\left(\frac{\omega_0}{\omega}\right)$

Let $x(t)$ be real valued band limited signal specified

by $X(\omega) = 0$; $|\omega| > \omega_M$.

Let $x_s(t)$ be defined by

$$x_s(t) = x(t) \sum_{k=-\infty}^{\infty} \delta(t - kT_s)$$

What is the Fourier transform $X_s(\omega)$ of $x_s(t)$?

1.

$$X_s(\omega) = \frac{1}{T_s} \sum_{k=-\infty}^{\infty} X(\omega - k\omega_s)$$

2.

$$X_s(\omega) = \frac{1}{T_s} \sum_{k=-\infty}^{\infty} X(\omega - k\omega_s)$$

3.

$$\frac{1}{T_s} X(\omega - \omega_s)$$

4.

$$\frac{1}{T_s} X(\omega + \omega_s)$$

If $x(t) \leftrightarrow X(j\omega) = \frac{1}{a+j\omega}$ and $y(t) \leftrightarrow Y(j\omega) = \frac{1}{b+j\omega}$,
then what is the convolution between $x(t)$ and $y(t)$?

1.

$Aau(t) + Bbu(t)$, where A and B are the partial fraction coefficients

2.

$-Ae^{-at}u(-t) + Be^{-bt}u(-t)$, where A and B are the partial fraction coefficients

3.

$Ate^{-at}u(t) + Bte^{-bt}u(t)$, where A and B are the partial fraction coefficients

4.

$Ae^{-at}u(t) + Be^{-bt}u(t)$, where A and B are the partial fraction coefficients

Commented [19]: Laplace of $\exp(-at) = 1/(a+j\omega)$

The signal $x(t) = \begin{cases} 1; & t \geq 0 \\ -1; & t < 0 \end{cases}$ has the Fourier transform of

1. $\frac{1}{j\Omega} + \pi\delta(\Omega)$

2. $\frac{1}{j\Omega} - \pi\delta(\Omega)$

3. $\frac{2}{j\omega}$

4. $\frac{1}{j\Omega} + \pi\delta(\Omega)$

Commented [20]: I = -Inf-to-0 integral of (-1)*exp(-j\omega t).dt
+
0-to-Inf integral of (1)*exp(-j\omega t).dt
Solve

Fourier transform of a Gaussian pulse signal $x(t) = e^{-at^2}; a > 0$ is

1. $X(\omega) = e^{-\frac{\omega^2}{4a}}$

2. $X(\omega) = e^{-\frac{\omega}{4a}}$

3. $X(\omega) = e^{\frac{\omega^2}{4a}}$

4. $X(\omega) = e^{-4a\omega}$

Discrete time Fourier series is dual, if

1. $c[n] \leftrightarrow N_0 x[k]$

2. $c[n] \leftrightarrow x[k]$

3. $c[n] \leftrightarrow x[k]$

4. $c[n] \leftrightarrow \frac{1}{N_0} x[-k]$

Fourier transform of a discrete-time sequence $x[n]$ is

1.
$$\sum_{n=-\infty}^{\infty} x[n]e^{-j\Omega n}$$

2.

$$\sum_{n=-\infty}^{\infty} x[n]e^{j\Omega n}$$

3.

$$\sum_{n=-\infty}^{\infty} e^{-j\Omega n}$$

4.

$$\sum_{n=-\infty}^{\infty} x[n]$$

Let the set of complex exponential sequences

be $\Psi_k[n] = e^{jk(\frac{2\pi}{N})n}$; $k = 0, 1, \dots, N-1$. Then what is $\sum_{n=-\infty}^{\infty} \Psi_m[n]\Psi_k^*[n]$

1.

$$= \begin{cases} N; & m = k \\ 0; & m \neq k \end{cases}$$

2.

$$= \begin{cases} 0; & m \neq k \\ N; & m = k \end{cases}$$

3.

$$= \begin{cases} \frac{1}{N}; & m = k \\ 0; & m \neq k \end{cases}$$

4.

$$= \begin{cases} 0; & m = k \\ \frac{1}{N}; & m \neq k \end{cases}$$

What is discrete Fourier series coefficients of
 $x[n] = \sum_{k=-\infty}^{\infty} \delta(n - 4k)$

1.
 $c_k = 1$
2.
 $c_k = 1/4$
3.
 $c_k = 4$
4.
 $c_k = -4$

Consider a discrete time LTI system with impulse
response $h[n] = \frac{\sin(\frac{\pi n}{4})}{\pi n}$, then what is its frequency
response?

1.

$$H(\Omega) = \begin{cases} 1 & ; \quad |\Omega| \leq \frac{3\pi}{4} \\ 0 & ; \quad \frac{3\pi}{4} < |\Omega| \leq \pi \end{cases}$$
2.

$$H(\Omega) = \begin{cases} 1 & ; \quad |\Omega| \leq \frac{\pi}{2} \\ 0 & ; \quad \frac{\pi}{2} < |\Omega| \leq \pi \end{cases}$$
- 3.
4.

$$H(\Omega) = \begin{cases} 0 & ; \quad |\Omega| \leq \frac{\pi}{4} \\ 1 & ; \quad \frac{\pi}{4} < |\Omega| \leq \pi \end{cases}$$

If $x[n] \leftrightarrow X(\omega)$ is DTFT pair, then the DTFT of $nx[n]$ is

1.

$$\frac{-jdX(\Omega)}{d\Omega}$$

2.

$$X^*(-\omega)$$

3.

$$-X^*(\omega)$$

4.

$$\frac{1}{2\pi} X^*(\omega)$$

The correlation between $x(t)$ and $y(t)$ is given as

1.

$y(t) = x(t) * y(t)$, where $*$ is the convolution operator

2.

$y(\tau) = x(t) * y(-t)$, where $*$ is the convolution operator

3.

$$y(\tau) = \int_{-\infty}^{\infty} x(\tau)h(\tau - t)dt$$

4.

$$y(\tau) = \int_{-\infty}^{\infty} x(t)h(t - \tau)dt$$

What is $x[n] * u[n]$, where $u[n]$ is unit step signal

1.

$$x[n]$$

2.

$$\sum_{k=-\infty}^{\infty} x[k]$$

3.

$$\sum_{k=-\infty}^n x[k]$$

4.

$$\sum_{k=0}^n x[k]$$

The convolution between $x(t) = \begin{cases} 1; & -1 \leq t \leq 1 \\ 0; & \text{otherwise} \end{cases}$ and $y(t) = \begin{cases} 1; & -1 \leq t \leq 1 \\ 0; & \text{otherwise} \end{cases}$ is

1.

$$= \begin{cases} 2-t; & -2 \leq t \leq 0 \\ 2+t; & 0 \leq t \leq 2 \\ 0; & \text{otherwise} \end{cases}$$

2.

$$= \begin{cases} t; & -2 \leq t \leq 0 \\ t; & 0 \leq t \leq 2 \\ 0; & \text{otherwise} \end{cases}$$

3.

$$= \begin{cases} 2+t; & -2 \leq t \leq 0 \\ 2-t; & 0 \leq t \leq 2 \\ 0; & \text{otherwise} \end{cases}$$

4.

None of the above

Commented [21]: Page:2 of

<http://metalab.uniten.edu.my/~zainul/images/Signals&Systems/lecture10b>

Commented [22]: Either 1 or 3, not sure.

The number of layers in Internet protocol stack	<ol style="list-style-type: none"> 1. 5 2. 6 3. 7 4. 3
This layer is an addition to OSI model when compared with TCP IP model	<ol style="list-style-type: none"> 1. Application layer 2. Presentation layer 3. Transport layer 4. Session layer and presentation layer
Application layer is implemented in	<ol style="list-style-type: none"> 1. NIC 2. Ethernet 3. End system 4. None of the mentioned
The number of layers in ISO OSI reference model	<ol style="list-style-type: none"> 1. 5 2. 7 3. 6 4. 3

In TCP IP Model, when data is sent from device A to device B, the 5th layer to receive data at B is	<ol style="list-style-type: none"> 1. Application layer 2. Transport layer 3. Link layer 4. Physical layer
In this topology there is a central controller	<ol style="list-style-type: none"> 1. mesh 2. star 3. bus 4. ring
This topology requires multipoint connection	<ol style="list-style-type: none"> 1. mesh 2. Star 3. bus 4. Ring
A list of protocols used by a system, one protocol per layer, is called	<ol style="list-style-type: none"> 1. Protocol architecture 2. Protocol stack 3. Protocol suit 4. None of the mentioned

Network congestion occurs	<ol style="list-style-type: none"> 1. when connection between any node terminates 2. when a system terminates 3. when connection between two nodes terminates 4. in case of traffic overloading
Which one of the following extends a private network across public networks?	<ol style="list-style-type: none"> 1. local area network 2. virtual private network 3. enterprise private network 4. storage area network
For a 10Mbps Ethernet link, if the length of the packet is 32bits, the transmission delay is (in milliseconds)	<ol style="list-style-type: none"> 1. 32 2. 3.2 3. 0.32 4. 0.24
In the transfer of file between server and client, if the transmission rates along the path is 10Mbps, 20Mbps, 30Mbps, 40Mbps. The throughput is usually	<ol style="list-style-type: none"> 1. 20Mbps 2. 40Mbps 3. 30Mbps 4. 10Mbps

<p>If end to end delay is given by $d_{end-end} = N(d_{proc} + d_{trans} + d_{prop})$ is a non congested network. The number of routers between source and destination is</p>	<ol style="list-style-type: none"> 1. $N/2$ 2. N 3. $N-1$ 4. $2N$
<p>In a network, If P is the only packet being transmitted and there was no earlier transmission, which of the following delays could be zero</p>	<ol style="list-style-type: none"> 1. Propagation delay 2. Queuing delay 3. Transmission delay 4. Processing delay
<p>The time required to examine the packet's header and determine where to direct the packet is part of</p>	<ol style="list-style-type: none"> 1. Propagation delay 2. Queuing delay 3. Transmission delay 4. Processing delay
<p>Which transmission media has the highest transmission speed in a network?</p>	<ol style="list-style-type: none"> 1. coaxial cable 2. Twisted pair cable 3. Optical fibre cable 4. UTP

Wireless transmission can be done via	<ol style="list-style-type: none"> 1. Radio waves 2. microwaves 3. Infrared waves 4. All of the above mentioned
multiple access protocol	<ol style="list-style-type: none"> 1. CSMA/CD 2. CSMA/CA 3. CSMA/CD & CSMA/CA 4. none
Automatic repeat request error management mechanism is provided by	<ol style="list-style-type: none"> 1. logical link control sublayer 2. media access control sublayer 3. network interface control sublayer 4. PDU layer
Header of a frame generally contains	<ol style="list-style-type: none"> 1. synchronization bytes 2. addresses 3. frame identifier 4. All of the above

Most packet switches use this principle	<ol style="list-style-type: none"> 1. Stop and wait 2. Cut and plugin 3. Store and forward 4. None of the mentioned
As the resouces are reserved between two communicating end systems in circuit switching, this is achieved	<ol style="list-style-type: none"> 1. authentication 2. guaranteed constant rate 3. Store and forward 4. Stop and wait
If there are N routers from source to destination, total end to end delay in sending packet P(L->number of bits in the packet R-> transmission rate)	<ol style="list-style-type: none"> 1. N 2. L/R 3. $(2N*L)/R$ 4. $(N*L)/R$
The technique of temporarily delaying outgoing outgoing acknowledgements so that they can be hooked onto the next outgoing data frame is called	<ol style="list-style-type: none"> 1. piggybacking 2. cyclic redundancy check 3. fletcher's checksum 4. Haming codeword

Which one of the following task is not done by data link layer?	1. framing 2. error control 3. flow control 4. channel coding
Go back N ARQ protocol is working on Bandwidth(BW) 10Mbps, Round trip time(RTT) is 50μsec and frame size given 25bits then calculate window size and no.of sequence bits required?	1. 10 and 4 2. 20 and 5 3. 15 and 5 4. 15 and 4
Consider a wireless link, where the probability of packet error is 0.6. To transfer data across the links, Stop and Wait protocol is used. The channel condition is assumed to be independent from transmission to transmission. The average number of transmission attempts required to transfer x packets is 500. The value of x is	1. 100 2. 150 3. 200 4. 220
Mention the port number for HTTPs	1. 80 2. 84 3. 20 4. 88

Commented [23]: P(error)=0.6
P(succ)=0.4
 $0.4 * n$ (n=no.ofTx)
 $0.4 * 500 = 200$

Which of the following protocol uses loop free topology	1. IEEE802.3a 2. IEEE802.4d 3. IEEE802.3c 4. IEEE802.1d
What is the efficiency of Stop and Wait ARQ protocol, given that propagation time is 2 msec and transmission time is 2 msec	1. 50% 2. 33% 3. 55% 4. 40%
The 4 byte IP address consists of	1. network address 2. host address 3. both network address & host address 4. none
In virtual circuit network each packet contains	1. full source and destination address 2. only source address 3. only destination address 4. a short VC number

Multidestination routing	<ol style="list-style-type: none"> 1. data is not sent by packets 2. contains the list of all destinations 3. End system 4. is same as broadcast routing
A subset of a network that includes all the routers but contains no loops is called	<ol style="list-style-type: none"> 1. spider structure 2. spanning tree 3. source routing 4. spider tree
The network layer protocol of internet is	<ol style="list-style-type: none"> 1. hypertext transfer protocol 2. ethernet 3. internet protocol 4. Hdlc protocol
First address in a block is used as network address that represents the	<ol style="list-style-type: none"> 1. Class Network 2. Organization 3. Codes 4. Entity

Which of this is not a class of IP address?	<ol style="list-style-type: none"> 1. Class E 2. Class A 3. Class F 4. ClassB
Which field helps to check rearrangement of the fragments?	<ol style="list-style-type: none"> 1. offset 2. flag 3. TTL 4. Identifier
Which of these is not applicable for IP protocol?	<ol style="list-style-type: none"> 1. Connectionless 2. Offer reliable service 3. Offer unreliable service 4. None of the mentioned
Network addresses are very important concepts of	<ol style="list-style-type: none"> 1. routing 2. mask 3. IP addressing 4. Synchronization

If you wanted to have 12 subnets with a Class C network ID, which subnet mask would you use?	1. 255.255.255.252 2. 255.255.255.240 3. 255.255.255.224 4. 255.255.255.255
Which of the following is the broadcast address for a Class B network ID using the default subnet mask?	1. 72.16.10.255 2. 255.255.255.255 3. 172.16.255.255 4. 172.255.255.255
_____ is another kind of fiber optic network with an active star for switching.	1. S/NET 2. SW/NET 3. NET/SW 4. FW/NET
You have an IP address of 172.16.13.5 with a 255.255.255.128 subnet mask. What is your class of address, subnet address, and broadcast address?	1. Class A, Subnet 172.16.13.0, Broadcast address 172.16.13.127 2. Class B, Subnet 172.16.13.0, Broadcast address 172.16.13.127 3. Class B, Subnet 172.16.13.0, Broadcast address 172.16.13.255 4. Class B, Subnet 172.16.0.0, Broadcast address 172.16.2=55.255

Mention the range of private IP address	1. 192.168.1.0 2. 127.1.12.0 3. 100.12.10.0 4. 224.200.100.0
ATM uses the	1. asynchronous frequency division multiplexing 2. asynchronous time division multiplexing 3. asynchronous space division multiplexing 4. None of the mentioned
Frame relay has error detection at the	1. data link layer 2. physical layer 3. network layer 4. transport layer
ATM standard defines _____ layers.	1. 2 2. 4 3. 5 4. 3

Mention the port number for HTTP	<ol style="list-style-type: none"> 1. 88 2. 8 3. 80 4. 888
Mention the port number for FTP	<ol style="list-style-type: none"> 1. 25 2. 20 3. 60 4. 28
TCP groups a number of bytes together into a packet called	<ol style="list-style-type: none"> 1. segments 2. packets 3. frames 4. Stack
In this topology there is a central controller or hub	

In segment header, sequence number and acknowledgement number field refers to	<ol style="list-style-type: none"> 1. Byte number 2. Buffer number 3. sequence number 4. Ring number
The value of acknowledgement field in a segment defines	<ol style="list-style-type: none"> 1. Number of previous bytes to receive 2. Number of next bytes to receive 3. Total number of bytes to receive 4. None of the mentioned
Default administrative distance of Static Route	<ol style="list-style-type: none"> 1. 0 2. 2 3. 10 4. 1
Default administrative distance of RIP	<ol style="list-style-type: none"> 1. 0 2. 120 3. 90 4. 110

Suppose a TCP connection is transferring a file of 1000 bytes. The first byte is numbered 10001. What is the sequence number of the segment if all data is sent in only one segment	1. 10000 2. 10001 3. 100000 4. 11001
As a system administrator, you want to debug IGRP but are worried that the "debug IP IGRP transaction" command will flood the console. What is the command that you should use?	1. Debug Int IGRP event 2. Debug IP IGRP events 3. Debug IP summary 4. debug Int IGRP- events
You are a system administrator on a NetWare network, you are running NetWare 4.11 and you cannot communicate with your router. What is the likely problem?	1. NetWare 4.11 defaults to 802.2 encapsulation 2. NetWare 4.11 defaults to 802.3 encapsulation 3. NetWare 3.11 defaults to 802.2 encapsulation 4. NetWare 3.11 defaults to 802.3 encapsulation
Where we should use default routing	1. Which have more than one exit path out of the network 2. On stub networks- which have only one exit path out of the network 3. Minimum five exit paths out of the network 4.

	Minimum four exit paths out of the network
In asymmetric key cryptography, the private key is kept by	<ol style="list-style-type: none"> 1. sender 2. all the connected devices to the network 3. receiver 4. router
In cryptography, what is cipher?	<ol style="list-style-type: none"> 1. algorithm for performing encryption and decryption 2. encrypted message 3. decrypted message 4. None of the mentioned
What is data encryption standard	<ol style="list-style-type: none"> 1. block cipher 2. bit cipher 3. stream cipher 4. Carvy cipher

Ethernet frame consists of	<ol style="list-style-type: none"> 1. IP address 2. Port address 3. Logical address 4. Physical address
High speed ethernet works on	<ol style="list-style-type: none"> 1. coaxial cable 2. utp 3. optical fiber 4. STP
Common gateway interface is used to	<ol style="list-style-type: none"> 1. stream videos 2. generate executable files from web content by web server 3. stream audios 4. none of the mentioned
URL stands for	<ol style="list-style-type: none"> 1. uniform resource locator 2. uniform reference label 3. unique resource locator 4. unique reference label

IPsec is designed to provide the security at the	<ol style="list-style-type: none">1. Transport layer2. Network layer3. Access layer4. Session layer
Pretty good privacy (PGP) is used in	<ol style="list-style-type: none">1. Browser security2. FTP security3. Email security4. HTTP security
The computation of the shortest path in OSPF is usually done by	<ol style="list-style-type: none">1. Bellman-ford algorithm2. Dijkstra's algorithm3. Distance vector routing4. None of the mentioned
Each LSA has its own age timer. By default, how long does an LSA wait before requiring an update?	<ol style="list-style-type: none">1. 60 minutes2. 30 minutes3. 40 seconds4. 3 seconds

Which multicast address does the OSPF Hello protocol use?	<ol style="list-style-type: none"> 1. 224.0.0.4 2. 224.0.0.7 3. 224.0.0.6 4. 224.0.0.5
Which protocol should you select if the network diameter is more than 17 hops?	<ol style="list-style-type: none"> 1. EIGRP 2. RIPv1 3. RIPv2 4. IGRP
You want to enable both arpa and snap encapsulation on one router interface. How do you do this?	<ol style="list-style-type: none"> 1. Enable Novell-ether to run multiple encapsulation types 2. Assign two network numbers one for each encapsulation type 3. Both arpa and snap are enabled by default so you don't have to configure anything 4. The interface can handle multiple encapsulation types with no extra configuration
Which connector STP uses?	<ol style="list-style-type: none"> 1. RJ-45 2. BNC 3. RJ-59 4. RJ-599

Dual-stack approach refers to	<ol style="list-style-type: none"> 1. Implementing Ipv4 with 2 stacks 2. Node has both IPv4 and IPv6 support 3. implementing Ipv6 with 2 stacks 4. Ring stacks
IPv6 does not use _____ type of address	<ol style="list-style-type: none"> 1. Broadcast 2. multicat 3. unicast 4. anycast
The size of IP address in IPv6 is	<ol style="list-style-type: none"> 1. 4bytes 2. 44 bytes 3. 16bytes 4. 64 bytes
A DNS client is called	<ol style="list-style-type: none"> 1. DNS resolver 2. DNS updater 3. DNS handler 4. None

The physical layer concerns with	<ol style="list-style-type: none"> 1. process to process delivery 2. bit-by-bit delivery 3. Node to node delivery 4. application to application delivery
In asynchronous serial communication the physical layer provides	<ol style="list-style-type: none"> 1. start and stop signalling 2. flow control 3. error control 4. both start & stop signalling and flow control
Internet Control Message Protocol(ICMP) has designed to compensate	<ol style="list-style-type: none"> 1. Error-correction 2. Error-reporting 3. Host and management queries 4. All of the mentioned
Multiplexing technique that shifts each signal to a different carrier frequency	<ol style="list-style-type: none"> 1. FDM 2. TDM 3. WDM 4. SDM

Data communication system spanning states, countries, or the whole world is	<ol style="list-style-type: none"> 1. LAN 2. WAN 3. MAN 4. GAN
The sharing of a medium and its link by two or more devices is called _____	<ol style="list-style-type: none"> 1. Fully duplexing 2. Both Fully duplexing and Multiplexing 3. Multiplexing 4. Half duplexing
Which address identifies a process on a host?	<ol style="list-style-type: none"> 1. physical address 2. Logical address 3. IP address 4. Port address
Which of the following is not applicable for IP?	<ol style="list-style-type: none"> 1. Handle addressing conventions 2. Error reporting 3. Packet handling 4. Datagram format

A proxy firewall filters at?	<ol style="list-style-type: none"> 1. Application layer 2. Presentation layer 3. Transport layer 4. Session layer and presentation layer
If an Ethernet port on a router were assigned an IP address of 172.16.112.1/25, what would be the valid subnet address of this host?	<ol style="list-style-type: none"> 1. 172.16.255.0 2. 172.16.0.0 3. 172.16.112.0 4. 172.16.192.0
You need to subnet a network that has 5 subnets, each with at least 16 hosts. Which classfull subnet mask would you use?	<ol style="list-style-type: none"> 1. 255.255.255.192 2. 255.255.255.224 3. 255.255.255.240 4. 255.255.255.248
In uniform quantization process	<ol style="list-style-type: none"> 1. The step size remains same 2. Step size varies according to the values of the input signal 3. The quantizer has linear characteristics 4. Both a and c are correct

The process of converting the analog sample into discrete form is called	<ol style="list-style-type: none"> 1. Modulation 2. Multiplexing 3. Quantization 4. Sampling
The sequence of operations in which PCM is done is	<ol style="list-style-type: none"> 1. Sampling, quantizing, encoding 2. Sampling, encoding, quantizing 3. Quantizing, sampling, encoding 4. None of the above
In Delta modulation,	<ol style="list-style-type: none"> 1. One bit per sample is transmitted 2. All the coded bits used for sampling are transmitted 3. The step size is fixed 4. Both a and c are correct
In digital transmission, the modulation technique that requires minimum bandwidth is	<ol style="list-style-type: none"> 1. Delta modulation 2. PCM 3. DPCM 4. PAM

Granular noise occurs when	<ol style="list-style-type: none"> 1. Step size is too small 2. Step size is too large 3. There is interference from the adjacent channel 4. Both a and b are correct
Polar coding is a technique in which	<ol style="list-style-type: none"> 1. 1 is transmitted by a positive pulse and 0 is transmitted by negative pulse 2. 1 is transmitted by a positive pulse and 0 is transmitted by zero volts 3. 1 is transmitted by alternative positive and negative pulse and 0 is transmitted by zero volt 4. None of the above
Pseudo ternary signalling format is a technique in which	<ol style="list-style-type: none"> 1. 1 is transmitted by a positive pulse and 0 is transmitted by negative pulse 2. 1 is transmitted by a positive pulse and 0 is transmitted by zero volts 3. 1 is transmitted by alternative positive and negative pulse and 0 is transmitted by zero volt 4.

	None of the above
Orthonormal set is a set of all vectors that are	1. Mutually orthonormal and are of unit length 2. Mutually orthonormal and of null length 3. Both a & b 4. None of the above
In On-Off keying, the carrier signal is transmitted with signal value '1' and '0' indicates	1. No carrier 2. Half the carrier amplitude 3. Amplitude of modulating signal 4. All of the above
The probability of error of QPSK is _____ than that of BPSK	1. Higher 2. Lower 3. Same 4. Equal

In Binary Phase Shift Keying system, the binary symbols 1 and 0 are represented by carrier with phase shift of	<ol style="list-style-type: none"> 1. $\pi/2$ 2. $\pi/4$ 3. π 4. 2π
QPSK system modulates at the rate of	<ol style="list-style-type: none"> 1. 1 bit/ symbol 2. 2 bit/ symbol 3. 3 bit/ symbol 4. 4 bit/ symbol
The binary waveform used to generate BPSK signal is encoded in	<ol style="list-style-type: none"> 1. Manchester coding 2. Bipolar NRZ format 3. Differential coding 4. Polar NRZ format
The coherent modulation techniques are	<ol style="list-style-type: none"> 1. BPSK 2. QPSK 3. MSK 4. All of the above

Antipodal signal sets are those vectors that can be illustrated as	1. Two 90 opposing vector 2. Two 180 opposing vector 3. Two 360 opposing vector 4. none
The data rate of QPSK is _____ of BPSK.	1. Thrice 2. Four times 3. Twice 4. Same
QPSK system uses a phase shift of	1. $\pi/2$ 2. $\pi/4$ 3. π 4. $\pi/8$
The maximum bandwidth is occupied by	1. BASK 2. BPSK 3. BFSK 4. All of the above

The technique that may be used to reduce the side band power is	<ol style="list-style-type: none"> 1. MSK 2. BPSK 3. Gaussian minimum shift keying 4. BFSK
In Alternate Mark Inversion (AMI) is	<ol style="list-style-type: none"> 1. 0 is encoded as positive pulse and 1 is encoded as negative pulse 2. 0 is encoded as no pulse and 1 is encoded as negative pulse 3. 0 is encoded as negative pulse and 1 is encoded as positive pulse 4. 0 is encoded as no pulse and 1 is encoded as positive or negative pulse
TDMA is a multiple access technique that has	<ol style="list-style-type: none"> 1. Different users in different time slots 2. Each user is assigned unique frequency slots 3. Each user is assigned a unique code sequence 4. Each signal is modulated with frequency modulation technique

TDMA allows the user to have	<ol style="list-style-type: none"> 1. Use of same frequency channel for same time slot 2. Use of same frequency channel for different time slot 3. Use of same time slot for different frequency channel 4. Use of different time slot for different frequency channels
The number of bits of data transmitted per second is called	<ol style="list-style-type: none"> 1. Data signaling rate 2. Modulation rate 3. Coding 4. All of the above
The signals which are obtained by encoding each quantized signal into a digital word is called as	<ol style="list-style-type: none"> 1. PAM signal 2. PCM signal 3. PPM signal 4. DM
Quantization noise can be reduced by _____ the number of levels	<ol style="list-style-type: none"> 1. Increasing 2. Decreasing 3. Doubling 4. unchanged

In PCM encoding, quantization level varies as a function of _____	1. Frequency 2. Amplitude 3. Square of frequency 4. Square of amplitude
Which is better for avoiding jamming?	1. Direct sequence spread spectrum 2. Frequency hopping spread spectrum 3. Time hopping spread spectrum 4. none
CDMA rejects	1. Narrow band interference 2. Wide band interference 3. Narrow & Wide band interference 4. None of the mentioned
CDMA uses	1. Hard hand off 2. Soft hand off 3. Hard & Soft hand off 4. None of the mentioned

The properties used for pseudorandom sequence are	1. Balance 2. Run 3. Correlation 4. All of the mentioned
If the initial pulse of 1000 is fed to shift register, after how many clock pulses does the sequence repeat?	1. 14 2. 15 3. 16 4. 17
For maximal length sequence, the sequence repetition clock pulses p is given by	1. 2^{n-1} 2. 2^{n+1} 3. 2^n 4. 2^{n-1}
Which system makes the detection difficult for all users other than the intended users?	1. Low probability of intercept 2. Low probability of detection 3. Low probability of intercept & detection 4. None of the above

FSK reception is	1. Phase Coherent 2. Phase Non Coherent 3. Phase Coherent & non coherent 4. None of the above
Matched filter is a _____ technique.	1. Modulation 2. Demodulation 3. Modulation & Demodulation 4. None of the above
Which is called as on-off keying?	1. Amplitude shift keying 2. Frequency shift keying 3. Unipolar format 4. Bipolar Format
QAM uses _____ as the dimensions.	1. In phase 2. Quadrature 3. In phase & Quadrature 4. biphase

Which has least probability of error	1. BPSK 2. BFSK 3. BASK 4. QPSK
signal which has gentle shift from one frequency level to another is called as	1. ASK 2. PSK 3. FSK 4. QPSK
The term heterodyning refers to	1. Frequency conversion 2. Frequency mixing 3. Frequency conversion & mixing 4. None of the above
Uniform quantizer is also known as	1. Low rise type 2. Mid rise type 3. High rise type 4. None of the mentioned

1 bit quantizer is a	1. Hard limiter 2. Two level comparator 3. Hard limiter & Two level comparator 4. None of the mentioned
Which helps in maintaining the step size?	1. DPCM 2. PCM 3. delta modulation 4. Adaptive delta modulation
If step size is increased _____ occurs.	1. Slope overload distortion 2. Granular noise 3. Both of the mentioned 4. None of the mentioned
The primary communication resource is	1. Transmitted power 2. Received power 3. Efficiency 4. None of the mentioned

The process of data conversion along with formatting the data is called as _____	1. Formatting 2. Modulation 3. Source coding 4. Amplifying
The point at which the output signal power has fallen to 0.707 of its peak value is called as _____	1. 3db point 2. Half power point 3. Both of the mentioned 4. None of the mentioned
The measure of width of the main lobe is called as _____	1. Null to null bandwidth 2. Half power bandwidth 3. Normalized bandwidth 4. Absolute bandwidth
SQNR can be improved by _____ sampling rate.	1. Increasing 2. Decreasing 3. Does not depend 4. None of the mentioned

The modulating frequency in frequency modulation is increased from 10 kHz to 20 kHz. The bandwidth is	<p>1. Doubled</p> <p>2. Halved</p> <p>3. Increased by 20 kHz</p> <p>4. Increase tremendously</p>
A sinusoidal 400 Hz modulating signal of 2V amplitude frequency modulates a carrier and produces 70 kHz frequency deviation. The frequency sensitivity is given	<p>1. 140 kHz/V</p> <p>2. 110 kHz/V</p> <p>3. 72 kHz/V</p> <p>4. 35 kHz/V</p>
In a double side-band (DSB) full carrier AM transmission system, if the modulation index is doubled, then what is the factor that the ratio of total sideband power to the carrier power increases?	<p>1. 1</p> <p>2. 2</p> <p>3. 3</p> <p>4. 3</p>
The maximum power efficiency of an AM modulator is	<p>1. 25%</p> <p>2. 15%</p> <p>3. 33%</p> <p>4. 95%</p>

Commented [24]: $\Delta f = k_f \cdot A_c$
 $70 = k_f \cdot 2$

<p>A 4 GHz carrier is DSB-SC modulated by a low-pass message signal with maximum frequency of 2 MHz. The resultant signal is to be ideally sampled. The minimum frequency of the sampling impulse train should be</p>	<ol style="list-style-type: none"> 1. 4 MHz 2. 8 MHz 3. 8 GHz 4. 8.004 GHz
<p>Which of the following is true about the AM and FM systems?</p>	<ol style="list-style-type: none"> 1. BW of FM < BW of AM; power FM > power AM; noise FM < noise AM 2. BW of FM < BW of AM; power FM < power AM; noise FM < noise AM 3. BW of FM > BW of AM; power FM < power AM; noise FM < noise AM 4. BW of FM < BW of AM; power FM > power AM; noise FM > noise AM
<p>With respect to the envelopes of the AM and FM signal, which of the following is true</p>	<ol style="list-style-type: none"> 1. Both are of constant amplitude 2. Both vary according to the shape of the message signal 3. Envelope of AM is constant, FM is variable 4. Envelope of AM varies and FM envelope is constant

An FM station is operating at 100 MHz. Maximum frequency deviation is 75 kHz. If the highest modulating frequency is limited to 15 kHz, find the modulation index and approximate bandwidth required by the system	1. 10, 180kHz 2. 5, 150kHz 3. 5, 180kHz 4. 10, 150kHz
In an FM system the deviation is 4 kHz where the modulating voltage is 3 V and modulating frequency is 400 Hz. If the modulating frequency is increased to 1000 Hz and its amplitude to 5 V, then the modulation index will:	1. remains the same 2. increase 3. decrease 4. be indeterminate
The band width of the signal is: $f(103\pi + 200 \cos 2\pi 108 \pi) = 10 \cos [2\pi f(x)$ The angle modulated signal is given by	1. 200 kHz 2. 400 kHz 3. 600 kHz 4. 800 kHz
The maximum frequency deviation for the signal $x_c(t) = 10 \cos [1010 \pi t + 10 \sin 2\pi(104t)]$	1. 600 kHz 2. 160 kHz 3. 60 kHz 4. 100 kHz

Commented [25]: mod_index=(freq_deviation)/(modulating freq)

Commented [26]: Max. freq. deviation

In commercial TV transmission in India, picture and speech signals are modulated respectively	<ol style="list-style-type: none"> 1. VSB and VSB 2. VSB and SSB 3. VSB and FM 4. FM and VSB
If a carrier of a 100 percent modulated AM wave is suppressed, the percentage power saving will be:	<ol style="list-style-type: none"> 1. 166.66 2. 36.66 3. 6.66 4. 66.66
The choice of the product RC in a simple envelope detector using a diode and an RC circuit is governed by	<ol style="list-style-type: none"> 1. both the lowest and the highest modulation frequencies 2. the depth of modulation and the lowest modulation frequency 3. the highest modulation frequency and the depth of modulation 4. the carrier frequency
When the modulating frequency is doubled, the modulation index is halved, and the modulating voltage remains constant. The modulation system is	<ol style="list-style-type: none"> 1. amplitude modulation 2. phase modulation 3. frequency modulation 4. none

One of the following methods cannot be used to remove the unwanted sidebands in SSB, that is:	1. filter system 2. phase shift method 3. third method 4. balanced modulator
If the amplitude of the modulating signal applied to a phase modulator is constant, the output signal will be	1. Zero 2. Above the carrier frequency 3. The carrier frequency 4. Below the carrier frequency
An FM wave uses a 2 – 5V amplitude and 1500Hz modulating frequency and has a modulation index of 10. What is the frequency sensitivity when the amplitude of message is maximum?	1. 2500Hz 2. 500Hz 3. 50000Hz 4. 5000Hz
A FM signal has a carrier swing of 100 kHz when the modulating signal has a frequency of 8 kHz. The modulation index is	1. 22.5 2. 12.5 3. 7.5 4. 15.5

A carrier is frequency modulated with a sinusoidal signal of 8 kHz, resulting in a maximum deviation of 20 kHz. If amplitude of modulating sinusoid is increased by a factor 3 and its frequency is lowered to 1 kHz. The bandwidth of new modulated signal is:	1. 320 kHz 2. 3.2 kHz 3. 32 kHz 4. 3200 kHz
Information rate basically gives an idea about the generated information per _____ by source.	1. Second 2. Minute 3. Hour 4. Year
If a noiseless channel bandlimited to 5 kHz is sampled every 1msec, what will be the value of sampling frequency?	1. 10 samples/sec 2. 10000 samples/sec 3. 100 samples/sec 4. 1000 samples/sec
Symbols 1 and 0 are represented by pulse of equal positive and negative amplitudes is called as	1. NRZ- Polar 2. RZ- Polar 3. UNRZ- BiPolar 4. RZ- Unipolar

Step size can be made smaller for smaller signals and larger for larger signals	<ol style="list-style-type: none"> 1. PCM 2. DPCM 3. DM 4. ADM
The output is zero for zero input, and the idle channel noise is correspondingly Zero	<ol style="list-style-type: none"> 1. Mid-tread 2. Mid-riser 3. Non Uniform 4. Uniform
Which one of the following is used to detect the unknown signal	<ol style="list-style-type: none"> 1. 16-PSK 2. PSK 3. QPSK 4. DPSK

QPSK requires -----transmission bandwidth of the BPSK	1. $\frac{1}{4}$ 2. $\frac{1}{2}$ 3. $\frac{1}{3}$ 4. Twice
The Nyquist sampling rate for a signal band limited 5 kHz is	1. 100 kHz 2. 10 kHz 3. 2.5 kHz 4. 12.5 kHz
The peak amplitude of one signal level is 0; the other is the same as the amplitude of the carrier frequency	1. PSK 2. FSK 3. ASK 4. QPSK
Which of the following is the main advantage of PCM system	1. Lower power 2. Lower Bandwidth 3. Lower noise 4. High power

The constellation diagram of QPSK has	<div>1.</div> <div>2</div> <div>2.</div> <div>1</div> <div>3.</div> <div>8</div> <div>4.</div> <div>4</div>
Which modulation technique transmits at higher data rate	<div>1.</div> <div>BPSK</div> <div>2.</div> <div>QPSK</div> <div>3.</div> <div>16 – PSK</div> <div>4.</div> <div>32 – PSK</div>
How many carrier frequencies are used in BFSK	<div>1.</div> <div>2</div> <div>2.</div> <div>1</div> <div>3.</div> <div>3</div> <div>4.</div> <div>4</div>
Find the value of Quantization noise in Watts, in a Pulse code modulation system when a signal of 0-16 volts amplitude is quantized using 3-bit quantization.	<div>1.</div> <div>1/2</div> <div>2.</div> <div>1/3</div> <div>3.</div> <div>1/4</div> <div>4.</div> <div>1/5</div>

Commented [27]: $\sigma = V / (2^{(bits-1)} * \text{root}(12))$

Suppose we sample a signal at frequency F_s . If we collect 1500 samples in 5 seconds, what is F_s in Hz?	1. 300 2. 400 3. 500 4. 200
Typical human voice is centred around	1. 1400-6000Hz 2. 400-600Hz 3. 280-3000Hz 4. 1400-1800Hz
A signal has frequency components from 300 Hz to 1.8 KHz. The minimum possible rate at which the signal has to be sampled is ---	1. 3600 samples 2. 36000 samples 3. 360 samples 4. 36 samples
The pulse rate in Delta modulation (DM) system is 50,000 per sec. The input signal is $5\cos(5000t) + 10\cos(2000t)$. The minimum value of step size to avoid slope overload distortion.	1. 0.4 2. 0.5 3. 0.44 4. 0.9

Commented [28]: Sampling frequency = No.OfSamples/Second

The process of converting the analog sample into discrete form is called	1. Modulation 2. Multiplexing 3. Quantization 4. Sampling
In PCM, the parameter varied in accordance with the amplitude of the modulating signal is	1. Phase 2. Amplitude 3. Frequency 4. None
In which kind of waveform is the phase velocity defined	1. Sinusoidal 2. Rectangular 3. Square 4. Triangular
Under which conditions of charge does the radiation occur through wire antenna?	1. For a charge with no motion 2. For a charge moving with uniform velocity with finite straight wire 3. For a charge oscillating in time motion 4. For a charge moving with uniform velocity in infinite wire

Which antennas are renowned as patch antennas especially adopted for space craft applications?	1. Aperture 2. Microstrip 3. Array 4. Lens
If a half-wave dipole operates at 300 MHz with $\lambda = 0.5\text{m}$ & $D_0 = 1.643$, what will be its effective area?	1. 0.032 m² 2. 0.047 m ² 3. 0.057 m ² 4. 0.067 m ²
If the radius of loop is $\lambda/20$ in a free space medium, what will be the radiation resistance of 8-turn small circular loop?	1. 0.7883 Ω 2. 1203.17 Ω 3. 123.17 Ω 4. 223.17 Ω
What determines polarisation of antenna?	1. The frequency of radiated wave 2. The direction of magnetic field vector 3. The direction of magnetic field vector 4. The direction of electric field vector

For avoiding ground losses, better is the surface conductivity, less is the _____	1. Attenuation 2. Phase velocity 3. Propagation constant 4. Tilt angle
For a Hertz dipole antenna, the half power beam width (HPBW) in the E – plane is	1. 190° 2. 90° 3. 180° 4. 45°
A dipole carries r.m.s. current of about 300A across the radiation resistance 2 Ω. What would be the power radiated by an antenna?	1. 1800 kW 2. 190 kW 3. 180 kW 4. 1180 kW
If the maximum electron density for F-layer in ionosphere is 4×10^6 electrons/cm ³ , then what will be the critical frequency of EM wave for F-layer?	1. 180 MHz 2. 1.8 MHz 3. 18 MHz 4. 18 GHz

<p>If the path difference of two waves with single source traveling by different paths to arrive at the same point, is $\lambda/2$, what would be the phase difference between them?</p>	<ol style="list-style-type: none"> 1. $\beta \times (\lambda/2)$ 2. $\beta / (\lambda/2)$ 3. $\beta + (\lambda/2)$ 4. $\beta - (\lambda/2)$
<p>A rectangular horn antenna operating at 4GHz has the wavelength of 0.075m and gain of about 13dBi. What will be its required capture area?</p>	<ol style="list-style-type: none"> 1. 0.0149 m² 2. 0.1149 m² 3. 0.2149 m² 4. 0.4149 m²
<p>Mention the range for C band</p>	<ol style="list-style-type: none"> 1. 1.4-8 MHz 2. 2.4-8 THz 3. 4-8 GHz 4. 2-4 MHz
<p>Which among the following is regarded as a condition of an ordinary endfire array?</p>	<ol style="list-style-type: none"> 1. $\alpha < \beta \cdot d$ 2. $\alpha > \beta \cdot d$ 3. $\alpha = \beta \cdot d$ 4. none of the above
<p>For M equally likely messages, $M \gg 1$, if the rate of information $R > C$, the probability of error is</p>	<ol style="list-style-type: none"> 1. Arbitrarily small 2. Close to unity 3. Not predictable 4. Arbitrarily large

<p>A communication channel with AWGN operating at a signal to noise ratio $SNR \gg 1$ and bandwidth B has capacity C1. If the SNR is doubled keeping B constant the resulting capacity C2 is given by</p>	<ol style="list-style-type: none"> 1. $C2=2C1$ 2. $C2=C1+B$ 3. $C2=C1+2B$ 4. $C2=C1+3B$
<p>Which of the following is reverseable and lossless compression technique</p>	<ol style="list-style-type: none"> 1. Huffman Encoding 2. JPEG Encoding 3. Run Length Encoding 4. Both a and b
<p>The second derivative of the Entropy function, for its maximum is</p>	<ol style="list-style-type: none"> 1. Equal to zero 2. Greater than or equal to zero 3. Less than zero 4. None of the above
<p>Lempel-Ziv algorithm is</p>	<ol style="list-style-type: none"> 1. Variable to fixed length algorithm 2. Fixed to variable length algorithm 3. Fixed to fixed length algorithm 4. Variable to variable length algorithm

<p>The rate of a block code is the ratio of</p>	<ol style="list-style-type: none"> 1. Block length to message length 2. Message length to block length 3. Message weight to block length 4. None of the above
<p>The number of non-zero elements in the code-word is called as</p>	<ol style="list-style-type: none"> 1. Size of the code-word 2. Weight of the code-word 3. Distance of the code-word 4. Subspace of the code-word
<p>Turbo codes are</p>	<ol style="list-style-type: none"> 1. Forward error correction code 2. Backward error correction code 3. Error detection code 4. Hamming code
<p>Find the degree of (7,4) cyclic code</p>	<ol style="list-style-type: none"> 1. 2. 2. 3 3. 4. 4. 7

<p>The capacity of a band-limited additive white Gaussian (AWGN) channel is given by $C = W \log_2(1 + P/\sigma^2 W)$ bits per second (bps), where W is the channel bandwidth, P is the average power received and σ^2 is the one-sided power spectral density of the AWGN. For a fixed P, the channel capacity (in kbps) with infinite bandwidth ($W \rightarrow \infty$) is approximately</p>	<p>1. 1.44 2. 1.144 3. 0.44 4. 1.494</p>
<p>Decode a Huffman encoded bit stream 1001101111001100110 which follows the codes assignment as $a_1=110$, $a_2=0$, $a_3=10$, $a_4=111$. The sequence of symbols is</p>	<p>1. $a_3 a_2 a_3 a_1 a_3 a_2 a_1 a_2 a_1$ 2. $a_3 a_2 a_1 a_4 a_3 a_2 a_1 a_3 a_1$ 3. $a_3 a_2 a_1 a_3 a_2 a_1 a_2 a_1$ 4. $a_3 a_2 a_1 a_4 a_3 a_2 a_1 a_2 a_1$</p>
<p>If the receiver knows the message being transmitted, then amount of information is</p>	<p>1. 1 2. 1 3. 0.5 4. 0.44</p>
<p>Which one of the following is not true for Huffman coding?</p>	<p>1. No code word of an elementary symbol is a prefix of another elementary symbol. 2. Each symbol has a one-to-one mapping with its corresponding codeword. 3. The symbols are encoded as a group, rather than encoding one symbol at a time. 4. Shorter code words are assigned to more probable symbols</p>

Entropy of a source of symbols is dependent upon	<ol style="list-style-type: none"> 1. The number of source output generated 2. The average code-word length 3. The probabilities of the source symbol 4. The order in which the source outputs are generated
Which of the following must be ensured before assigning binary Huffman codes to a set of symbols?	<ol style="list-style-type: none"> 1. The channel is noiseless 2. There must be exactly n symbols to encode 3. No two symbols should have same probability 4. The probabilities of the symbols should be known a priori
Which of the following is a high capacity switch, thus provides handover, cell configuration data, and control of radio frequency power levels	<ol style="list-style-type: none"> 1. VLR 2. BSC 3. EIR 4. HLR
The most important revolutionary step of GSM towards UMTS is	<ol style="list-style-type: none"> 1. HSPA 2. W-CDMA 3. EDGE 4. GPRS

In GSM, the rate of voice transmission over TCH/F is	<ol style="list-style-type: none"> 119.6 kbps 19.6 kbps 90.6 kbps 9.6 kbps
In which domain separation is inversely proportional to the speed of the mobile station	<ol style="list-style-type: none"> Time Frequency Space Angle
Larger cells are more useful in	<ol style="list-style-type: none"> Lightly populated urban area Rural areas Densely populated urban areas Hilly areas
The propagation model that estimates radio coverage of a transmitter is called as	<ol style="list-style-type: none"> Large scale propagation model Small scale propagation model Fading model Okumura model

Which of the following do not undergo free space propagation?	<ol style="list-style-type: none"> 1. Satellite communication system 2. Microwave line of sight radio links 3. Wireless line of sight radio links 4. Wired telephone systems
The free space model predicts that received signal decays as a function of	<ol style="list-style-type: none"> 1. Gain of transmitter antenna 2. Transmitter-Receiver (T-R) separation 3. Power of transmitter antenna 4. Effective aperture of the antenna
Free space propagation model is to predicts the	<ol style="list-style-type: none"> 1. Received signal strength 2. Transmitted power 3. Gain of transmitter 4. Gain of receiver

Which leads to time dispersion and frequency selective fading?	1. Doppler spread 2. Multipath delay spread 3. Time dispersive parameters 4. Frequency delay spread
Flat fading channel is also known as	1. Amplitude varying channel 2. Wideband channel 3. Phase varying channel 4. Frequency varying channel
For fast fading channel, the coherence time of the channel is smaller than _____ of transmitted signal	1. Doppler spread 2. Bandwidth 3. Symbol period 4. Coherence bandwidth
How many users or voice channels are supported for each 200 KHz channel in GSM?	1. 8 2. 12 3. 15 4. 16

Interference on voice channels causes	<ol style="list-style-type: none"> 1. Blocked calls 2. Cross talk 3. Queuing 4. Missed calls
Adjacent channel interference occurs due to	<ol style="list-style-type: none"> 1. Power transmitted by Base station 2. MSCs 3. Same frequency of mobile users 4. Imperfect receiver filters
ISM stands for	<ol style="list-style-type: none"> 1. Industrial scientific medical 2. Industrial social mechanical 3. Industrial scientific mechanical 4. Industrial social medical
ISM band frequency is used by	<ol style="list-style-type: none"> 1. Bluetooth 2. WiFi 3. Zigbee 4. All

_____ is an application layer protocol for resource constrained devices.	1. MQTT 2. CoAP 3. HTTP 4. TCP/IP
IPv6 has a larger address space of	1. 16 2. 128 3. 132 4. 256
Microphone is	1. Sensor 2. Actuator 3. Both 4. None
Camera in Smartphone is	1. Sensor 2. Edge Device 3. Processor 4. None

IoT includes	<ol style="list-style-type: none"> 1. cloud 2. edge 3. sensor 4. all
_____ enables seamless integration of LoWPAN devices with internet leveraging.	<ol style="list-style-type: none"> 1. IETF 6LoWPAN 2. IETF CoAP 3. RFID 4. IEEE 802.5
_____ enables open application layer for constrained nodes.	<ol style="list-style-type: none"> 1. IETF 6LoWPAN 2. IETF CoAP 3. RFID/NFC 4. IEEE 802.15.4.LoWPAN
_____ specifications define the PHY and MAC layer of low power devices	<ol style="list-style-type: none"> 1. IETF 6LoWPAN 2. IETF CoAP 3. RFID/NFC 4. IEEE 802.15.4.LoWPAN

6LoWPAN Adaption layer contains	<ol style="list-style-type: none"> 1. Header compression 2. Fragmentation 3. Header compression, Fragmentation, and Layer 2 forwarding 4. Layer 2 forwarding
Dotted-decimal notation of 10000001 00001011 00001011 11101111	<ol style="list-style-type: none"> 1. 193.131.27.255 2. 129.11.11.239 3. 192.168.10.9 4. 172.16.11.3
In 6LoWPAN header compression , which field can't be compressible	<ol style="list-style-type: none"> 1. Traffic class 2. Flow label 3. Hop Limit 4. Destination address
Which protocol is used to link all the devices in the IoT	<ol style="list-style-type: none"> 1. TCP/IP 2. HTTP 3. UDP 4. FTP

ETSI standards are for	<ol style="list-style-type: none"> 1. Machine to machine communication 2. Machine to human communication 3. Networking standards 4. Optical standards
_____ is necessary when the sender wants to use IPv6, but the receiver does not understand IPv6.	<ol style="list-style-type: none"> 1. Dual stack 2. Header translation 3. Conversion 4. Tunnelling
IP Sec is designed to provide the security at the	<ol style="list-style-type: none"> 1. transport layer 2. network layer 3. application layer 4. session layer
When a DNS server accepts and uses incorrect information from a host that has no authority of giving that information, then it is called	<ol style="list-style-type: none"> 1. DNS lookup 2. DNS hijacking 3. DNS Spoofing 4. None of the mentioned

The size of IP address in IPv6 is	<ol style="list-style-type: none"> 1. 4 bytes 2. 128 bits 3. 8 bytes 4. 100 bits
RAD stands for	<ol style="list-style-type: none"> 1. Relative Application Development 2. Rapid Application Development 3. Relative AutoML Document 4. None of the mentioned
SDLC for a DevOP is	<ol style="list-style-type: none"> 1. Software Development Life Cycle 2. System Development Life cycle 3. Software Design Life Cycle 4. System Design Life Cycle
Submit a product within a stipulated time-frame with no cost barriers, which model would you select?	<ol style="list-style-type: none"> 1. Waterfall 2. spiral 3. RAD 4. Incremental

Which of the following life cycle model can be chosen if the development team have less experience on similar projects?	1. spiral 2. waterfall 3. RAD 4. iterative
Which two models doesn't allow defining requirements early in the cycle?	1. Waterfall & RAD 2. Prototype & spiral 3. Prototype & RAD 4. Waterfall & spiral
A company is developing an advance version of their current software , what model approach would they prefer	1. RAD 2. iterative 3. spiral 4. waterfall
Activity and sequence diagram are	1. behavior diagram 2. structural diagram 3. Flowchart 4. state chart

The order of events in a sequence diagram is determined by	<ol style="list-style-type: none"> 1. order of events 2. sequence number 3. position of events 4. all of the above
UML stands for	<ol style="list-style-type: none"> 1. Unified Machine Learning 2. Union Modelling and Learning 3. Unified Modelling Language 4. Un-supervised machine learning
Generalization in use case diagram is	<ol style="list-style-type: none"> 1. Inheritance of a class 2. Actor in use case 3. State in use case 4. None of the above
_____ allows us to control electronic components	<ol style="list-style-type: none"> 1. API 2. HTTP 3. UDP 4. TCP

MQTT stands for _____	1. MQ Telemetry Things 2. MQ Telemetry Transport 3. MQ Transport Things 4. MQ Telemetry Transmission
Standard port number for secure MQTT is	1. 8888 2. 8088 3. 8888 4. 1888
Terms SSL stand for	1. Session socket layer 2. Secure socket layer 3. Standard socket layer 4. Socket session layer
Which one out of these is not a data link layer technology	1. BLE 2. HTTP 3. ISM 4. TCP

Commented [29]: HTTP is a web-Application Layer protocol

TLS stand for	1. Transport Layer Session 2. Transport Level Session 3. Transport Layer Session 4. Transport Layer Security
Where should the computer be connected to join with internet	1. ISP 2. Processor 3. Device 4. Peripherals
Which transport layer protocols is used by DHCP	1. RSVP 2. DCCP 3. TCP 4. UDP
Which layer is called a port layer in OSI model	1. Transport 2. session 3. application 4. all

What is a firewall in computer network	<ol style="list-style-type: none"> 1. system designed to prevent unauthorized access 2. web browser 3. physical boundary of network 4. Network Operating System
Router operate at layer of OSI reference model	<ol style="list-style-type: none"> 1. Data link 2. Network 3. Physical 4. Transport
What is Secure Shell (SSH)	<ol style="list-style-type: none"> 1. router 2. Firewall 3. Protocol 4. Python shell
What is Inter Integrated Communication(I2C)	<ol style="list-style-type: none"> 1. application layer protocol 2. networking communication protocol for multi-master support 3. OS for distributed network communication 4. cellular communication protocol

What does LTE stand for	1. Long Term Errors 2. Long Term Evolution 3. Lengthy Terminal Estimation 4. Long Term Estimates
Which one out of these is not LPWAN technologies	1. SigFox 2. WiFi 3. LoRA 4. NB-IoT
_____ involves predicting a response with meaningful magnitude, such as quantity sold, stock price, or return on investment.	1. Summarization 2. Clustering 3. All of the above 4. Regression
The method by which companies analyse customer data is referred to as	1. Customer management 2. Data mining 3. Data digging 4. All

Which one of this is not a networking device	<ol style="list-style-type: none">1. Router2. Switch3. Bridge4. Traffic Analyzer
What is the standard length of MAC address:	<ol style="list-style-type: none">1. 16 Bits2. 32 Bits3. 48 Bits4. 64 Bits
Which of the following language is preferred for IoT analytics ?	<ol style="list-style-type: none">1. Python2. S3. R4. All
Which one is simplest form of analytics	<ol style="list-style-type: none">1. Predictive2. Descriptive3. All of the above mentioned4. Prescriptive

A collection of lines that connects several devices is called	<ol style="list-style-type: none"> 1. Bus 2. Driver 3. Cable 4. Transmission line
HTTP resources are located by	<ol style="list-style-type: none"> 1. unique resource locator 2. unique resource identifier 3. none of the mentioned 4. uniform resource locator
A Denial of Service attack is:	<ol style="list-style-type: none"> 1. Connection flooding 2. Bandwidth flooding 3. All of the mentioned 4. Vulnerability attack
IPSec provides security at	<ol style="list-style-type: none"> 1. Physical layer 2. Network layer 3. Session Layer 4. Transport layer
Raspbian is	<ol style="list-style-type: none"> 1. OS 2. Compiler 3. Language 4. Assembler

MQTT is	<ol style="list-style-type: none">1. client-server architecture2. publish-subscribe architecture3. ARM architecture4. Cloud architecture
Which cloud service has the highest level of security	<ol style="list-style-type: none">1. SAAS2. PAAS3. All4. IAAS
AWS Lambda Service is	<ol style="list-style-type: none">1. Virtual machine2. Serverless computing3. Bigdata4. Application
Which service of AWS provides granular permissions	<ol style="list-style-type: none">1. Bigdata2. AWS IAM3. Console4. Database

Map reduce algorithm is for	<ol style="list-style-type: none"> 1. sensors 2. Network 3. WiFi 4. Bigdata
How is memory accessed in RISC architecture?	<ol style="list-style-type: none"> 1. load and store instruction 2. opcode instruction 3. memory instruction 4. bus instruction
Which of the following statements are true for von Neumann architecture?	<ol style="list-style-type: none"> 1. shared bus between the program memory and data memory 2. separate bus between the program memory and data memory 3. external bus for program memory and data memory 4. external bus for data memory only
What is CAM ?	<ol style="list-style-type: none"> 1. content-addressable memory 2. complex addressable memory 3. computing addressable memory 4.

	concurrently addressable memory
Who coined the term RISC?	<ol style="list-style-type: none"> 1. David Patterson 2. von Neumann 3. Michael J Flynn 4. Harvard
Which of the following enables the user to utilize the system efficiently?	<ol style="list-style-type: none"> 1. kernel 2. operating system 3. software 4. hardware
What is the first stage of the compilation process?	<ol style="list-style-type: none"> 1. pre-processing 2. post-processing 3. compilation 4. linking

Which file is converted to an object file?	1. hex file 2. decoded file 3. coded file 4. assembly file
Which one of the following offers CPUs as integrated memory or peripheral interfaces?	1. Microcontroller 2. Microprocessor 3. Embedded system 4. Memory system
Main approaches for development during edit-test-debug cycle are in sequence of (i) Use an IDE or prototype tool (ii) use RTOS (iii) Uses a simulator without any hardware (iv) use emulator (v) Uses processor only at the target system and uses an in-between ICE (In-Circuit-Emulator) (vi) use locator (vii) Use target system at last stage (viii) Use target system at first stage.	1. ii, i, iv and vii 2. i, iii, v and vii 3. viii, i, iii and v 4. ii, vi, i and iii
Identify which of	1. An on-line bus ticketing system 2. Printing of annual report of a company's annual report 3. Reconciling a day's transactions in an account book of a small company 4. An aircrafts' yaw control system

Commented [30]: Q.> Identify which of these are real-time applications scenarios.
Ans: <http://www.waseian.com/2018/05/real-time-operating-systems-multiple.html>

<div>These are real- time appli- cations scenarios</div>	
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Which characteristics involve the facility the thing to respond in an intelligent way to a particular situation?	1. Intelligence 2. Connectivity 3. Dynamic Nature 4. Enormous Scale
_____ empowers IoT by bringing together everyday objects	1. Intelligence 2. Connectivity 3. Dynamic Nature 4. Enormous Scale
The collection of data is achieved with _____ changes.	1. Intelligence 2. Connectivity 3. Dynamic Nature 4. Enormous Scale
The number of devices that need to be managed and that communicate with each other will be much larger.	1. Intelligence 2. Connectivity 3. Dynamic Nature 4. Enormous Scale

_____ Provide the means to create capability that reflects true awareness of the physical world and people.	1. Sensors 2. Heterogeneity 3. Security 4. Connectivity
_____ in IoT as one of the key characteristics, devices have different hardware platforms and networks.	1. Sensors 2. Heterogeneity 3. Security 4. Connectivity
IoT devices are naturally vulnerable to _____ threats.	1. Sensors 2. Heterogeneity 3. Security 4. Connectivity
Which challenge comes under IoT devices, reliable bidirectional signalling.	1. Signalling 2. Security 3. Presence detection 4. Power consumption

Which	<div>1. Signalling</div> <div>2. Security</div> <div>3. Presence detection</div> <div>4. Power consumption</div>
<div>—</div> <div>—</div> <div>—</div> <div>—</div> <div>—</div> <div>—</div> <div>—</div> <div>g</div> <div>i</div> <div>v</div> <div>e</div> <div>s</div> <div>a</div> <div>n</div> <div>e</div> <div>x</div> <div>a</div> <div>c</div> <div>t</div> <div>,</div> <div>u</div> <div>p</div> <div>t</div> <div>o</div> <div>t</div> <div>h</div> <div>e</div> <div>s</div> <div>e</div>	<div>1. Signalling</div> <div>2. Security</div> <div>3. Presence detection</div> <div>4. Power consumption</div>

Commented [31]: Q.> _____ gives an exact, up to the second state of all devices on a network
Ans: <https://www.sanfoundry.com/iot-questions-answers-online-quiz/>

c o n d s t a t e o f a l l d e v i c e s o n a n e t w o r k .	
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Which challenge comes when we use many devices on the same network?	1. Signalling 2. Security 3. Presence detection 4. Power consumption
_____ a cellular network is expensive, especially with many IoT devices.	1. Signalling 2. Security 3. Bandwidth 4. Power consumption
Which of the following issues are considered in IoT?	1. Security Issue 2. Reliability Issue 3. Standard Issue 4. All issues
IoT is a paradigm that involves ubiquitous presence in the environment.	1. True 2. False 3. Partially true 4. No idea

<p>The availability of _____ is the cloud services provider who will host video and data for end users.</p>	<p>1. Devices</p> <p>2. Memory</p> <p>3. Security system</p> <p>4. Objects</p>
<p>With physical security, the stakes are incredibly</p>	<p>1. Very high</p> <p>2. Low</p> <p>3. Very low</p> <p>4. High</p>
<p>Issue with connecting to data stored have anything to do with data centers.</p>	<p>1. True</p> <p>2. False</p> <p>3. Partially true</p> <p>4. No idea</p>
<p>The most likely culprit is _____</p>	<p>1. Things</p> <p>2. Device</p> <p>3. Network</p> <p>4. Internet connectivity</p>

<p>— — — — — — — — — a r e d e s i g n e d t o p r o t e c t d a t a a n d s e r v</p>	<p>1. Physical walls</p> <p>2. Logical firewalls</p> <p>3. Both Physical and logical</p> <p>4. Neither physical nor logical</p>
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e r s .	
Communication between _____ and _____ is encrypted for security.	1. Cloud and device 2. End user and data center 3. Network and device 4. Cloud and Network
_____ phase starts with the construction of spanning tree for ordinary routing information.	1. Initialization 2. Message Relaying 3. Selective recovery 4. Lost message detection
In which phase packets are forwarded hop by hop to get closer to the sink?	1. Initialization 2. Message Relaying 3. Selective recovery 4. Lost message detection

_____ is achieved using over hearing mechanism.	1. Initialization 2. Message Relaying 3. Selective recovery 4. Lost message detection
What is the last step in algorithm for reliable data transfer?	1. Initialization 2. Message Relaying 3. Selective recovery 4. Lost message detection
IIOT stands for?	1. Industrial Internet of Things 2. Internet Internet of Things 3. Intelligence Internet of Things 4. Internal Internet of Things
IIoT is sophisticated?	1. True 2. False 3. Partially true 4. No idea

What does design provide?	1. Technology 2. Ecosystem 3. Technology and ecosystem 4. Digital revolution
Which possibility ensures load balancing and peak levelling of energy consumption?	1. Transportation and logistics 2. Energy and utilities 3. Automotive 4. Connected supply chain
Which possibility automatically communicates	1. Transportation and logistics 2. Energy and utilities 3. Automotive 4. Connected supply chain
Which possibility connects the production line to suppliers?	1. Transportation and logistics 2. Energy and utilities 3. Automotive 4. Connected supply chain

Which possibility provides inter connectivity between shop floor and top floor?	1. Transportation and logistics 2. Energy and utilities 3. Plant control flow operation 4. Connected supply chain
Which possibility is the highest contributor to cost overhead for manufacturing facilities?	1. Transportation and logistics 2. Energy and utilities 3. Plant control flow operation 4. Energy management and resource optimization
The Number of elemens in open IoT architecture?	1. 6 elements 2. 8 elements 3. 7 elements 4. 3 elements
Gloal Sensor network is built for?	1. Reducing cost and time for development 2. Reducing cost and increasing time for development 3. Increasing cost and increasing time for development 4. Increasing cost and decreasing time for development

<p>Internet of Things needs a lot of network connection. What is the proposed “white Space” radio standard called?</p>	<p>1. Bluetooth</p> <p>2. WiMAX</p> <p>3. Weightless</p> <p>4. Zigbee</p>
<p>What is the sensor/protocol used in GSN?</p>	<p>1. HTTP protocol</p> <p>2. CoAP protocol</p> <p>3. MQTT protocol</p> <p>4. XMPP protocol</p>
<p>Open IoT ontology is extending the W3C SSN ontology which supports the description of the physical and processing structure of sensors.</p>	<p>1. True</p> <p>2. False</p> <p>3. Partially true</p> <p>4. No idea</p>
<p>Which environment does Global Sensor Network work on?</p>	<p>1.C++</p> <p>2. Java</p> <p>3. HTML</p> <p>4. C</p>

_____ provides a middleware and application container for IoT gateway.	1. Eclipse Kura 2. Red Hat 3. Inter cloud 4. Bot 2 Bot
What happens when service providers change their operating system and communication protocols?	1. Inoperability and complexity arises 2. Only complexity arises 3. Only In-operability arises 4. Nothing arises
API enables services portability between _____	1. Systems 2. Devices 3. Networks 4. Services
API architecture not only includes critical elements but also caters for _____	1. System 2. Devices 3. Network 4. Multi homing

<p>All portals are embedded into a single supercomputer, known as _____</p>	<p>1. Network</p> <p>2. Web</p> <p>3. Internet</p> <p>4. system</p>
<p>Web is a mesh of computers, so too is _____</p>	<p>1. IoT</p> <p>2. Bigdata</p> <p>3. Cloud</p> <p>4. Internet</p>
<p>Without _____ computers embedded in house keys are worthless.</p>	<p>1. Data</p> <p>2. Services</p> <p>3. Both data and services</p> <p>4. Neither data nor services</p>
<p>_____ Services are the way in which the IoT is connected to data.</p>	<p>1. Cloud</p> <p>2. Big data</p> <p>3. Internet</p> <p>4. Network</p>

<p>_____ are the inter connectors.</p>	<p>1. web</p> <p>2. internet</p> <p>3. network</p> <p>4. API</p>
<p>W h a t i s t h e r o l e o f B i g d a t a i n s m a r t g</p>	<p>1. Store data</p> <p>2. Manage data</p> <p>3. Collect data</p> <p>4. Security</p>

<p>r i d a r c h i t e c t u r e o f I o T ?</p>	
<p>What is the role of Bigdata in smart grid architecture of IoT?</p>	<p>1. Store data</p> <p>2. Manage data</p> <p>3. Collect data</p> <p>4. security</p>
<p>A temperature sensitive transducer when subjected to sudden temperature change takes 9 seconds to reach equilibrium conditions (3 time constants). Calculate the time constant and the time taken by the transducer to read half of the temperature difference.</p>	<p>1. 2 sec and 1.06 sec respectively</p> <p>2. 3 sec and 2.08 sec respectively</p> <p>3. 4 sec and 4.06 sec respectively</p> <p>4. 3 sec and 4.06 sec respectively</p>

A Non-linear variation between Capacitance and displacement is observed for Capacitive type of transducers involving	1. Variable overlapping area between the plates 2. Variable distance between the plates 3. Variable dielectric constant 4. None of the above
Which type bridge configuration of Strain gauge produces a non-linear output?	1. Full Bridge configuration 2. Half Bridge configuration 3. Quarter Bridge configuration 4. None of the above
Low resistance measurements are used in which of the following applications?	1. Armatures winding of machines 2. Resistors employed in electronic circuits 3. Insulation measurement 4. None of the above
The primary and secondary coils in an LVDT are connected in which configuration?	1. In series but 180° out of phase either side of the primary 2. In parallel but 180° out of phase either side of the primary 3. In series but 90° out of phase either side of the primary 4.

	In parallel but 90° out of phase either side of the primary
A thermocouple works on which principle?	<ol style="list-style-type: none"> 1. Joule effect 2. Thompson effect 3. Peltier effect 4. Seebeck effect
Which of the following sensors provide electrical voltage as the primary output?	<ol style="list-style-type: none"> 1. Pressure measurement using strain gauge 2. Temperature measurement using thermocouple 3. Gas sensors 4. None of the above
Which temperature sensor has the highest sensitivity among the following?	<ol style="list-style-type: none"> 1. Thermocouple 2. RTD 3. Thermistor 4. Thermometer

For a Strain gauge with negligible piezoresistive effect, the maximum Gauge factor for metals can be	1. 1 2. 0.5 3. 2 4. can't be calculated
Which type of sensors develops an electric charge due to thermally induced stress upon exposure to heat energy/radiation?	1. Piezoelectric sensors 2. Pyroelectric sensors 3. Thermoelectric sensors 4. Photoelectric sensors
Hall Effect sensors are used in	1. Flow meter 2. Fuel level indicator 3. Both (A) and (B) 4. None of the above
Inductive proximity sensors can be effective only when the objects are of _____ materials.	1. Ferro magnetic 2. Dia magnetic 3. Para magnetic 4. All of the above

Following acts as detector in Optical sensor	1. Light emitting diode 2. Photo diode 3. Transistor 4. All of the above
A piezo-electrical crystal generates voltage when subjected to ____ force.	1. Electrical 2. Mechanical 3. Gravity 4. All of the above
Which of the following is an analog transducer?	1. Encoders 2. Strain gauge 3. Digital tachometers 4. Limit switches
What is the principle of operation of LVDT?	1. Mutual inductance 2. Self-inductance 3. Permanence 4. Reluctance

For a material capacitance increases with _____	1. Decrease in area of plates, all other factors constant 2. Increase in distance between plates, all other factors constant 3. Decrease in distance between plates, all other factors constant 4. None of the mentioned
Which of the following device is used for measuring relative humidity?	1. Capacitive pressure transducer 2. Hygrometer 3. Capacitive strain transducer 4. Capacitive moisture transducer
At equilibrium Lorentz forces will be _____ of force due to Electric field.	1. Double 2. Half 3. Equal 4. No proportionality
Which of the following represents correct conversion for magnetostrictive transducers?	1. Mechanical energy to magnetic energy 2. Mechanical energy to electrical energy 3. Magnetic energy to electrical energy 4.

Commented [32]: $F_e = F_b$ (Electric force = Mag. Force)
 $Lorentz F = F_e + F_b$

	Mechanical energy to acoustic energy
Which of the following materials shows an increase in permeability with increase in tensile stress?	<ol style="list-style-type: none"> 1. Negative magnetostriction materials 2. Non magnetostriction materials 3. Positive magnetostriction materials 4. None of the mentioned
Which of the following represents the output of Hall Effect transducer?	<ol style="list-style-type: none"> 1. Hall potential 2. Emf 3. Applied voltage 4. Lorentz Voltage
What will happen to resistance, if the length of the conductor is increased?	<ol style="list-style-type: none"> 1. Decreases 2. No change 3. Increases 4. Doubles

What will happen for resistivity metal and semiconductor if the temperature is increased?	1. Increases 2. Decreases 3. For metal increases and for semiconductor decreases 4. For metal decreases and for semiconductor increases
A metal with temperature coefficient of resistance has a value $200/^{\circ}\text{C}$, its initial resistance is given by 40Ω . For an increase in 300°C to 350°C . What will be the final resistance value?	1. $40\text{ K}\Omega$ 2. $4\text{ K}\Omega$ 3. 40Ω 4. 400Ω
Thermocouple is a _____	1. Primary device 2. Secondary transducer 3. Tertiary transducer 4. None of the mentioned
_____ describes current flow between two junctions formed by two different metals.	1. Peltier effect 2. Thomson effect 3. Seebeck effect 4. None of the mentioned

Analogous quantities of heat flow and temperature in electrical are _____ and _____	1. Potential and current 2. Current and potential 3. Power and potential 4. Current and power
LDR's are also called _____	1. Photo voltaic cell 2. Photo resistive cell 3. Photo emissive cell 4. All of the mentioned
Which of the following materials can be used as photoconductive transducer?	1. Selenium 2. Silicon 3. Germanium 4. All of the mentioned
Which of the following are used to form photo transistors?	1. Two photo diodes 2. Three photo diodes 3. Normal diodes 4. None of the mentioned

Which of the following is true for a charge-mode accelerometers?	1. There is no in-built signal conditioning circuit 2. They use ordinary two-wire or coaxial cables 3. Both a & b 4. Neither a nor b
Ceramic materials are made piezoelectric by polarizing them using a process called	1. Polling 2. Fluxgate effect 3. Polishing and grinding 4. Annealing
In flexure mode piezoelectric accelerometer, the seismic mass is	1. A beam shaped bar which is suspended on a pivot 2. Is sandwiched between and outer ring and a piezo disk 3. Simply sits/compresses a piezo disk 4. None of the above
Which mode of piezo accelerometers are used for low gravitational (g) acceleration applications	1. Shear Mode 2. Flexural beam mode 3. Compression mode 4. None of the above

Which mode of piezo accelerometers are used for testing high-g shock level applications	<ol style="list-style-type: none"> 1. Shear Mode 2. Flexural beam mode 3. Compression mode 4. None of the above
Which sensor among the following is used in a quasi-static application?	<ol style="list-style-type: none"> 1. Piezoelectric 2. Thermocouple 3. Magnetostrictive 4. Hall effect
A Multi hot wire anemometer can sense	<ol style="list-style-type: none"> 1. Only flow velocity of the fluid 2. Direction of velocity of fluid 3. Both flow velocity and direction of flow 4. None of the above
Which among the following flow sensors is a differential pressure (d/p) flowmeter?	<ol style="list-style-type: none"> 1. Pitot tube 2. Hot wire anemometer 3. Laser Doppler Anemometer 4. Doppler sensors

Commented [33]: Low Noise output
Low Amplitude vibration testing
High Amplitude shock testing
Excellent linearity over dynamic range

Static pressure is measured in a Pitot tube	1. Along the flow direction 2. In a void space along the flow 3. Right angles to the flow direction 4. None of the above
Which one among the following is the most expensive differential type pressure sensor?	1. Mass Flowmeters 2. Pitot tube 3. Concentric orifice plate 4. Venturi tubes
Coriolis effect is used for flow detection in which type of flow meters?	1. Venturi tubes 2. Pitot tube 3. Mass flow meters 4. Ultrasonic Flow sensors
"Hot-wire anemometers" are differential pressure measurement type of Flow sensors.	1. True 2. False 3. Not always true (depends upon single or multi type) 4. Always true (depends upon single or multi type)

Which type of inertial force forms the basis of mass flowmeters?	1. Centrifugal force 2. Frictional force 3. Gravitational force 4. Coriolis force
If the absolute pressure at any place is 5 bar, what is the gauge pressure at that place?	1. Can't be measured 2. 6 bar 3. 4 bar 4. 1 bar
For a piezoelectric sensor, the sensor's discharge time constant (DTC) is generally determined by	1. product of Maximum resistance path and total capacitance of the system 2. product of lowest insulation resistance path and total capacitance of the system 3. addition of lowest insulation resistance path and total capacitance of the system 4. addition of Maximum resistance path and total capacitance of the system

In a Voltage Mode, Low-Impedance Piezoelectric Force Sensor, the connecting cables must be:	<ol style="list-style-type: none"> 1. ordinary cables/wires 2. low noise cables Not Sure 3. No cable connection is required at all 4. Thick and highly insulating cable
Doppler type ultrasonic sensors measure the flow through:	<ol style="list-style-type: none"> 1. Frequency shift caused by flow 2. Amplitude shift caused by flow velocity 3. Time shift caused by flow velocity 4. None of the above
The Bragg Cell in a LDA is used for:	<ol style="list-style-type: none"> 1. Splitting the laser beam 2. Merging the splitted laser beams 3. Creates the fringe patterns 4. None of the above
In a capacitive type level sensor which among the following is generally the variable quantity?	<ol style="list-style-type: none"> 1. Surface area between the electrodes 2. Distance between the electrodes 3. Dielectric constant of the material 4.

Commented [34]: A low noise output is required at the receiving end

	None of the above
The functional phase in Screen printing consists of:	1. metal and/or metal-oxide powders 2. inorganic binder materials 3. Liquid that suspends the inorganic constituents 4. No functional phase is present
A parallel plate capacitive transducer uses plates of area 300 mm ² which are separated by 0.2 mm distance in air. Determine: i) Original capacitance of the transducer with permittivity of air as 8.85×10^{-12} F/m.	1. 13.275 F 2. 13.275 pF 3. 13.275 nF 4. 1.3275 pF
A parallel plate capacitive transducer uses plates of area 300 mm ² which are separated by 0.2 mm distance in air. Determine: ii) Change in capacitance if a linear displacement reduces the distance between the plates to 0.18 mm.	1. 1.475 pF 2. 1.475 nF 3. 1.475 F 4. 14.75 pF

Several thermocouples connected together in series, such that all the reference junctions are at the same cold temperature and all the hot junctions are exposed to the temperature being measured is called a:	<ol style="list-style-type: none"> 1. Thermopile 2. Thermometer 3. Pyroelectric 4. Piezoelectric
In Pyroelectric effect, output voltage due to induced stress is caused by:	<ol style="list-style-type: none"> 1. external mechanical pressure 2. external magnetic field 3. external torque 4. external thermal radiation
In GMR sensors a higher Resistance is obtained when:	<ol style="list-style-type: none"> 1. The magnetization of adjacent ferromagnetic layers is parallel to each other. 2. The magnetization of adjacent ferromagnetic layers is anti-parallel to each other 3. Independent of the magnetization of the ferromagnetic layers. 4. GMR sensors don't show a high resistance.

What is the Common Mode Rejection Ratio?	1. Output of a differential amplifier 2. Ability of an amplifier to reject common mode signals 3. Ability of an amplifier to accept common mode signals 4. None of the mentioned
Which of the following is not a characteristic of an ideal op-amp?	1. Zero slew rate 2. Infinite bandwidth 3. Infinite input impedance 4. Zero output impedance
For an inverting amplifier positive terminal of input is connected to _____ of 741 IC.	1. Pin number 3 2. Pin number 2 3. Pin number 1 4. Pin number 7
In 741 IC, pin number 4 is represented by _____	1. Offset null 2. Positive input 3. Negative input 4. Negative supply

Which of the following cannot be treated as a requirement of the instrumentation amplifier?	1. Low drift 2. Low input impedance 3. High linearity 4. High CMRR
Amplifier with power supply and output circuits galvanically isolated are called _____	1. Differential amplifier 2. Isolation amplifier 3. Inverting amplifier 4. None of the mentioned
Voltage follower is also known as _____	1. Unity gain amplifier 2. Differential amplifier 3. Comparator 4. None of the mentioned
Which configuration of op-amp is used for filter circuit?	1. Differential 2. Non-inverting 3. Inverting 4. None of the mentioned

For an ideal op-amp, zero input results in ____ output	1. Zero 2. Positive 3. Negative 4. Differential
What is the purpose of a differential amplifier in voltmeter?	1. Elimination of unwanted signals 2. To find difference of voltages 3. To eliminate DC components 4. To set a certain voltage level
Which of the following are used in DAC?	1. Ladder network 2. Successive approximation technique 3. Both Ladder and successive approximation technique 4. None of the mentioned
Which of the following is an indication by settling time?	1. Accuracy of conversion 2. Speed of conversion 3. Precision in conversion 4. All of the mentioned

Which of the following is a binary weighted DAC?	1. R-2R ladder DAC 2. PWM DAC 3. Switched resistor DAC 4. Sampling DAC
Which of the following method is employed for ADC?	1. Ladder network 2. Successive approximation type 3. PWM type 4. None of the mentioned
Which of the following device is similar to analog comparator?	1. Analog switch 2. MCB 3. Energy meter 4. Digital switch
Which of the following can act as a comparator?	1. Op-amp with negative feedback 2. Op-amp with positive feedback 3. Op-amp without feedback 4. None of the mentioned

Zero crossing detector has _____ as reference voltage.	1. +ve Vcc 2. -ve Vcc 3. 0 V 4. 5 V
Which of the following detect the presence of a voltage between two voltages?	1. Zero crossing detector 2. Differential comparator 3. Window comparator 4. None of the mentioned
Difference between levels on input that causes transition in Schmitt trigger is _____	1. Hysteresis 2. Threshold 3. Cut-off value 4. Peak value
Threshold voltage for switching in Schmitt trigger is determined by _____	1. Resistor R1 2. Resistor R2 3. Both resistors 4. None of the mentioned

Which of the following is converted to square wave in Schmitt trigger?	1. Sine wave 2. Triangular wave 3. Pulse wave 4. All of the mentioned
For a particular op-amp hysteresis is governed by _____	1. Resistor R1 2. Resistor R2 3. Both resistors R1 and R2 4. Op-amp parameters
Motion of fast moving systems may be timed and studied by means of	1. Stroboscope 2. Piezoelectric crystal 3. Electronic timer 4. Photovoltaic cell
Which effect is useful in measuring rapidly varying forces?	1. Piezoelectric 2. Photovoltaic 3. Strain gauge 4. Change of capacitance

Hysteresis error in Bourdon tube can be minimized by	<ol style="list-style-type: none"> 1. Using proper tube material 2. Using proper diameter and thickness of tube 3. Avoiding temperature cycling 4. Using it well within the designed pressure range
Pick up false statement about pressure measurements:	<ol style="list-style-type: none"> 1. Low pressure is normally measure by manometers 2. Medium pressure by diaphragms or bellows 3. Medium and high pressure by Bourdon gauge 4. Absolute pressure by piezoelectric crystal
Which type of device is suitable for dynamic force measurement?	<ol style="list-style-type: none"> 1. Spring balance 2. Lever balance 3. Piezoelectric transducer 4. Proving ring
Thermal expansion of a solid is employed in:	<ol style="list-style-type: none"> 1. Thermocouple 2. Resistance thermometer 3. Bulb thermometer 4. Bimetal element

Pick up the false statement	<p>1. Copper constantan thermocouple is used as a reference standard for calibration purposes</p> <p>2. Iron- constantan thermocouple suffers from oxidation attack on iron wire, if exposed</p> <p>3. Both wires of chromel-alumel thermocouples are prone to damage by sulphurous gases</p> <p>4. Iron- constantan thermocouple is a stable couple resistant to both oxidizing and reducing atmosphere, but needs protection from acidic vapours</p>
To prevent self-heating errors becoming too great, the current through platinum element (100 ohm) is kept at a very small value:	<p>1. 1 mA</p> <p>2. 5 mA</p> <p>3. 20 mA</p> <p>4. 50 mA</p>
Local velocity is measured by a_____	<p>1. Pitot tube</p> <p>2. Venture tube</p> <p>3. Orifice plate</p> <p>4. Nozzle</p>

For measuring air flow, _____ is used	1. Vane type anemometer 2. Electromagnetic flowmeter 3. Ultrasonic flowmeter 4. Vortex shedding meter
Paramagnetic analyser is used to measure following gas sample in air	1. Oxygen 2. Nitrogen 3. Hydrocarbons 4. Carbon
The error caused in vibration measuring equipment due to non-compliance of bond made between sensor and the surface it is mounted is called:	1. Cross-coupling 2. Coupling compliance 3. Influence error 4. Subject loading by sensor
Chromatographic analyser is used to measure the	1. Oxygen content in a sample 2. CO ₂ content in a sample 3. CO content in a sample 4. Amount of individual gases in a sample

All pH measurements are made with a	1. Glass electrode 2. Solid state electrode 3. Liquid ion exchange electrode 4. Redox electrode
Which measurement is a good guide to the quality of water	1. pH 2. conductivity 3. dissolved O2 content 4. turbidity
Mass-spring seismic sensors measure directly the	1. Displacement 2. Velocity 3. Acceleration 4. Shock
Determine the wavelength of ultrasound travelling in water with a velocity of 1480m/s and a frequency of 1MHz	1. 1.58 2. 1.62 3. 1.48 4. 1.34

Consider a 1 cm thick specimen in which the acoustic power emerging is one half of that entering. Determine the attenuation coefficient of the medium	1. -4dB/cm 2. -3.01dB/cm 3. -3.7dB/cm 4. -3.98dB/cm
If the velocities of ultrasound in soft tissue and bone are 1500 and 1400m/s, respectively, the critical angle of incidence is given by	1. 22 deg 2. 30 deg 3. 28 deg 4. 38 deg
Mercury in rubber strain gauge was wrapped around the forearm of a subject and it covers 6 cm of length. Venous occlusion was applied at time t=0 and the circumference of the forearm was increased by 0.5 cm in 64 secs. The initial limb circumference was 25.3 cm. the perfusion is _____ mL/min per 100mL of tissue.	1. 4 2. 3 3. 4.5 4. 3.7
If 25 g of a liquid occupies 20 cm ³ in a measuring cylinder, what is the density of the liquid?	1. 0.25 g cm ⁻³ 2. 0.8 g cm ⁻³ 3. 1.25 g cm ⁻³ 4. 5 g cm ⁻³

Commented [35]: Attenuation = $\log(P_{out}/P_{in})$
 $P_{out} = 0.5P_{in}$ (Given in Q.)

Commented [36]: $V = c/u$;
Snell's Law: $u_1 \sin(\theta_1) = \text{const}$
 $\theta_{c_c} = \sin^{-1}(u_r/u_i)$
Solve and get

Commented [37]: Page-48, First Para, Last Line.

<https://books.google.co.in/books?id=zwD00iU52PcC&pg=PA48&lpg=PA48&dq=perfusion+in+rubber+strain+gauge+formula&source=bl&ots=-pa-DFMUfS&sig=ACfU3U17fZ3iQVBdi3n9ws66r5t87beQzQ&hl=en&sa=X&ved=2ahUKEwjprJm1ieDkAhVf6XMBHcC2Co8Q6AEwGHoECAkQAQ#v=onepage&q=perfusion%20in%20rubber%20strain%20gauge%20formula&f=false>

Dipsticks are used for	<ol style="list-style-type: none"> 1. Pressure measurement 2. Flow measurement 3. Displacement measurement 4. Level measurement
In ultrasonic level gauge, the ultrasonic source is placed at the	<ol style="list-style-type: none"> 1. Bottom of the vessel containing the liquid 2. Top of the vessel containing the liquid 3. Middle of the vessel containing the liquid 4. Far from the vessel containing the liquid
In radiation methods, the detector system is located	<ol style="list-style-type: none"> 1. The top of the liquid filled tank 2. The bottom of liquid filled tank 3. Middle of the liquid filled tank 4. Outside a liquid filled tank
A vibrating level sensors consists of	<ol style="list-style-type: none"> 1. One piezoelectric oscillators 2. Two piezoelectric oscillators 3. Three piezoelectric oscillators 4. Four piezoelectric oscillators

To produce a change in deflection of 1.5 mm of the galvanometer of Wheatstone bridge, a change of 5Ω in the unknown arm of bridge is required. The sensitivity is	1. 0.2 mm/ Ω 2. 0.3 mm/ Ω 3. 0.4 mm/ Ω 4. 0.5 mm/ Ω
The smallest change which can be measured by the transducer of the range of 0 to 150 N force and resolution of 0.1% of full scale is	1. 0.1 N 2. 0.15 N 3. 0.3 N 4. 0.35 N
A zero order system is the one in which output changes instantaneously as the input changes. The example of zero order system is	1. Potentiometer 2. Liquid-in-glass thermometer 3. Accelerometer 4. Transducer
If a balloon is equipped with temperature and altitude measuring instruments, then the order of the temperature measuring and altitude measuring instruments are	1. Zero order, first order 2. Both are first order instruments 3. Both are zero order instruments 4. First order, zero order

Accelerometer is an example of which order instrument?	1. First order instrument 2. zero order instrument 3. second order instrument 4. third order instrument
While going through a heap of junk in her garage, Jackie found an uncalibrated mercury thermometer. After a few experiments, she succeeded in calibrating it. Her notes show that ice point of thermometer corresponds to 3 cm while steam point corresponds to 30 cm of mercury. If Jackie's calculations are fine then length = 15 cm would correspond to:	1. 46 °C 2. 44 °C 3. 42 °C 4. 40 °C
In a resistance thermometer, a metal wire shows a resistance of 500 Ω at ice point and 550 Ω at steam point, calculate temperature that corresponds to resistance of 535 Ω .	1. 60 °C 2. 65 °C 3. 70 °C 4. 75 °C
A car covers a distance of 5 km in 5 mins, its average speed is equal to	1. 1 km/h 2. 25 km/h 3. 60 km/h 4. 50 km/h

Compressions are formed where air pressure is	1. Higher 2. lower 3. normal 4. zero
Average angular velocity of body rotating at angle of 30° during time interval 5 seconds will be:	1. 6 rad/s 2. 7 rad/s 3. 8 rad/s 4. 10 rad/s
A girl with a mass of 40 kg wears heels with an area of 1 cm^2 in contact with ground, pressure on ground is (take earth's gravitational field strength)	1. 4×10^{-5} 2. 4×10^4 3. 4×10^5 4. 40×10^5
The purpose of compensation for a thermocouple is	1. to increase voltage output 2. to decrease temperature sensitivity 3. to cancel unwanted voltage output of a thermocouple 4. used for high-temperature circuits

In sound, reflection coefficient of 1 means	<ol style="list-style-type: none"> 1. all incident energy is transmitted 2. none of the incident energy is transmitted 3. 1% of energy is reflected 4. 1% of energy is transmitted
Which one among the following is used as a reference electrode?	<ol style="list-style-type: none"> 1. platinum electrode 2. calomel electrode 3. glass electrode 4. hydrogen electrode
The commonly used unit of conductivity is	<ol style="list-style-type: none"> 1. Mho 2. m ohm/m 3. n mho/cm 4. ohm/m
LEACH stands for	<ol style="list-style-type: none"> 1. <ul style="list-style-type: none"> • Low Energy Adaptive Clustering Hierarchy 2. Low Energy Agglomerative Clustering Hypothesis 3. Low Energy Aggregate Channel Hypothesis 4. Low Energy Aggregate Channel Hierarchy

