Question Paper Preview

Question Paper Name: Electronics and Communication Engineering 11th May 2018 Shift1
Subject Name: Electronics and Communication Engineering
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Electronics and Communication Engineering

Display Number Panel: Yes
Group All Questions: No

Question Number : 1 Question Id : 2203604441 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The trace and determinant of a 2×2 matrix A are -2 and -35 respectively. The eigen values of A are _____.

Options :

1. -7 and 5

2. -37 and 1

3. -30 and -5

4. $\frac{37}{2}$ and -2

Question Number : 2 Question Id : 2203604442 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The value of $\int_{1}^{2}\int_{1}^{3} xy^2\ dydx =$ _____ .

Options :

1. 13

2. 27

3. 0

4. 16

Question Number : 3 Question Id : 2203604443 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The vector field $F = x\bar{i} - y\bar{j}$ (where $\bar{i}, \bar{j}$ are unit vectors) is _____.

Options :

1. both solenoidal and irrotational

2. neither solenoidal nor irrotational

3. solenoidal but not irrotational

4. irrotational but not solenoidal

Question Number : 4 Question Id : 2203604444 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

$e^{-x}(c_1 \cos\sqrt{3}x + c_2 \sin\sqrt{3}x) + c_3 e^{2x}$ is the general solution of _____.

Options :

1. $\frac{d^3y}{dx^3} + 4y = 0$

2. $\frac{d^3y}{dx^3} - 8y = 0$

3. $\frac{d^3y}{dx^3} + 8y = 0$

4. $\frac{d^3y}{dx^3} - 2\frac{d^2y}{dx^2} + \frac{dy}{dx} - 2y = 0$

Question Number : 5 Question Id : 2203604445 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The Partial differential equation $\frac{\partial u}{\partial t} + u\frac{\partial u}{\partial x} - \frac{\partial^2 u}{\partial x^2} = 0$ is a _____.

Options :

1. Linear equation of order 2

2. Non-linear equation of order 2

3. Linear equation of order 1

4. Non-linear equation of order 1

Question Number : 6 Question Id : 2203604446 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

If $f(z) = \frac{e^z}{z^2(z^2+9)}$ then residue of $f(z)$ at $z = 0$ is _____.

Options :

1. 1

2. $\frac{1}{9}$

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

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

Question Number : 7 Question Id : 2203604447 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Let X be a random variable having normal distribution. If $P(X < 0) = P(X > 2) = 0.4$ then the mean value of X is _____.

Options :

1. 0

2. 1

3. 1.5

4. 2

Question Number : 8 Question Id : 2203604448 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

If a linear relation exists between the variables x and y then the coefficient of correlation between them is _____.

Options :

1. 1

2. -1

3. 1 or -1

4. 0

Question Number : 9 Question Id : 2203604449 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Consider the equation $y' - y = x$ with initial condition $y(0) = 0$, by Euler's method with step size 0.1, the value of $y(0.2)$ is _____.

Options :

1. 0.01

2. 0.1

3. 0.02

4. 0.2

Question Number : 10 Question Id : 2203604450 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The Newton-Raphson method may diverge if

Options :

1. $f'(x) = 0$

2. $f'(x) \to \infty$

3. $f'(x) < 0$

4. $f'(x) > 0$

Question Number : 11 Question Id : 2203604451 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

When the frequency of the applied voltage (sine wave) across an inductor is increased then the Current will

Options :

1. Decrease

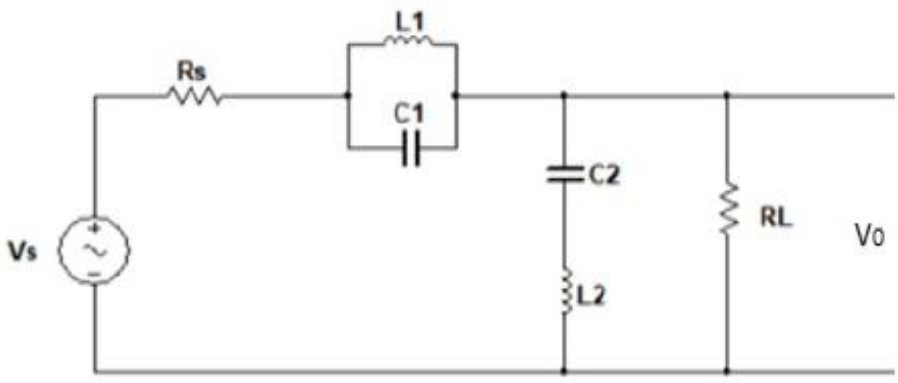
2. Increase

3. Remains same

4. be zero

Question Number : 12 Question Id : 2203604452 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The circuit in the following figure represents _____.



Options :

1. Low pass filter

2. High pass filter

3. Band reject filter

4. Band pass filter

Question Number : 13 Question Id : 2203604453 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

For a network of 11 branches and 6 nodes, what is the number of independent loops?

Options :

1. 4

2. 5

3. 6

4. 11

Question Number : 14 Question Id : 2203604454 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Consider a simple series RC topology. There are two circuits *a* and *b* with the same topology wherein $C_a = \frac{C_b}{2} R_a = 2R_b$. The circuit a is given a step input of V = 5 V whereas the circuit b is given a step input of V = 10 V at t = 0.

Options :

1. Circuit *a* will reach steady state faster than circuit *b*

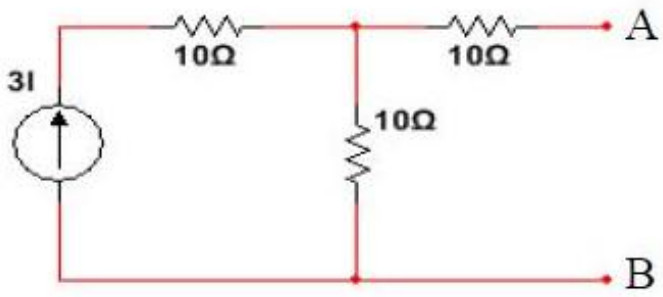
2. Circuit *b* will reach steady state faster than circuit *a*

3. Both circuits will reach steady state at the same time

4. Both circuits will not reach steady state at the same time

Question Number : 15 Question Id : 2203604455 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

What is the Thevenin's voltage at the terminals AB, for the following circuit?



Options :

1. 1.5 V

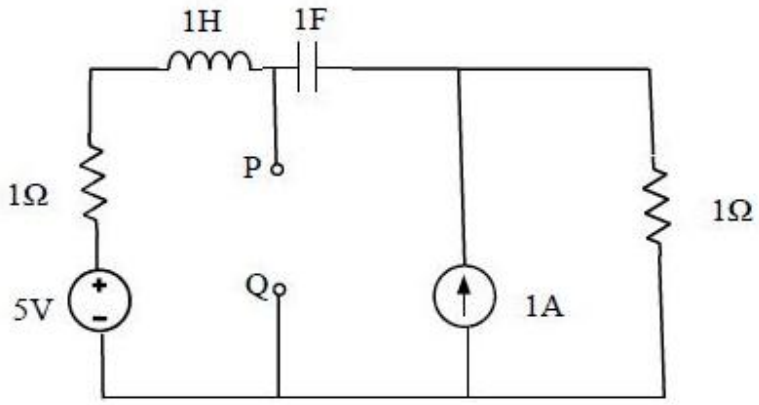
2. 0 V

3. 6 V

4. 8 V

Question Number : 16 Question Id : 2203604456 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Find the Thevenin equivalent impedance Z_{Th} between the nodes P and Q in the following circuit.



Options :

1. 2 Ω

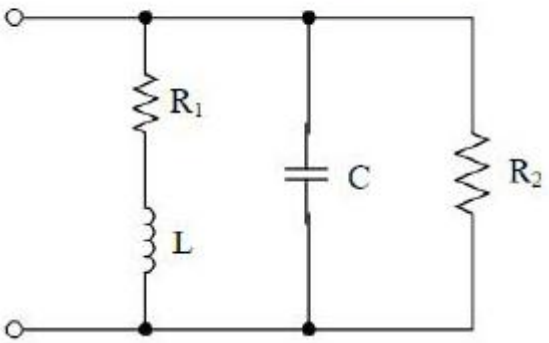
2. 1 Ω

3. 3 Ω

4. $6\ \Omega$

Question Number : 17 Question Id : 2203604457 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The half – power bandwidth of the resonant circuit of figure can be increased by:



Options :

1. increasing R_1 & decreasing R_2

2. decreasing R_1 & decreasing R_2

3. increasing R_1 & increasing R_2

4. decreasing R_1 & increasing R_2

Question Number : 18 Question Id : 2203604458 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Two voltage signals are applied to a tank of salt water. One signal is a sine wave and other is a triangular wave. Both the signals have same amplitude and frequency. What is the expected output?

Options :

1. No output

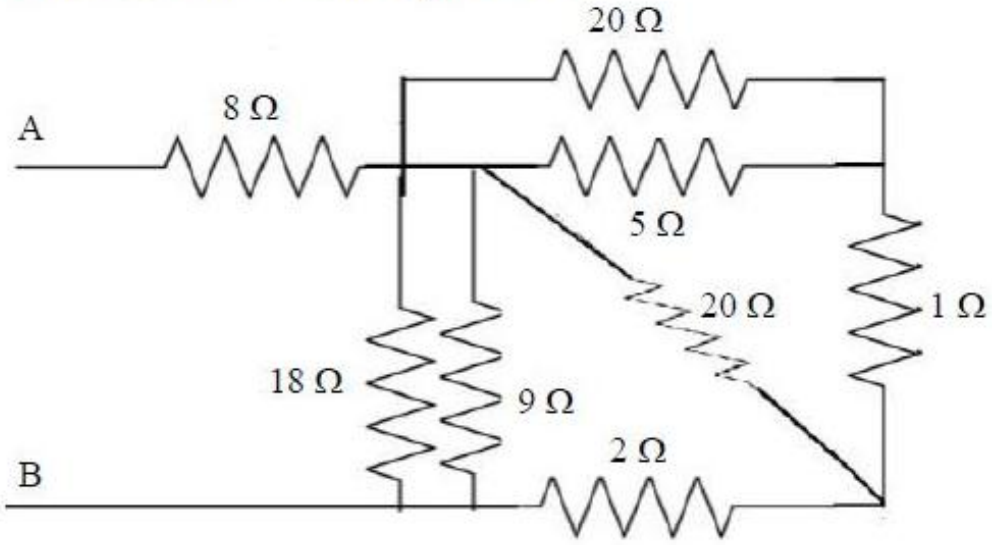
2. Superimposed waveform

3. Only sine wave

4. Only triangular wave

Question Number : 19 Question Id : 2203604459 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Find R_{AB} for the circuit shown in figure below?



Options :

1. 30 Ω

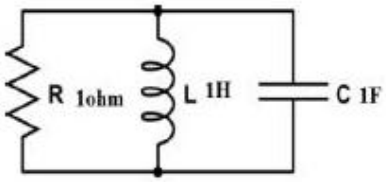
2. 11 Ω

3. 20 Ω

4. 18 Ω

Question Number : 20 Question Id : 2203604460 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Consider the parallel RLC circuit shown below. What type of response will it produce?



Options :

1. Over damped

2. Under damped

3. Critically damped

4. No damped

Question Number : 21 Question Id : 2203604461 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The voltage across a passive linear element is $V = 10\cos(10t + 10°)$ and the current through the element is $I = 10\cos(10t + 100°)$; Which of the following statements are correct?

Options :

1. Voltage leads current and the element is capacitor

2. Current leads Voltage and the element is inductor

3. Current leads Voltage and the element is capacitor

4. Voltage leads current and the element is inductor

Question Number : 22 Question Id : 2203604462 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

When port 1 of a two-port circuit is short circuited, $I_1 = 4I_2$ and $V_2 = 0.25I_2$. Which of the following is true?

Options :

1. $y_{11} = 4$

2. $y_{12} = 16$

3. $y_{21} = 16$

4. $y_{22} = 0.25$

Question Number : 23 Question Id : 2203604463 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A diode is having a current of 0.6 mA when applied voltage is 400 mV and 20 mA when applied voltage is 500 mV. Then find the η? ($V_T = 26$ mV)

Options :

1. 1.096

2. 26

3. 2.34

4. 100

Question Number : 24 Question Id : 2203604464 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

In a P-type Si sample the hole concentration is $2.25 \times 10^{15}/cm^3$. The intrinsic carrier Concentration is $1.5 \times 10^{10}/cm^3$, then the electron concentration is

Options :

1. Zero

2. $10^{10}/cm^3$

3. $10^5/cm^3$

4. $1.5 \times 10^{25}/cm^3$

Question Number : 25 Question Id : 2203604465 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Which of the following is a unique property of laser?

Options :

1. Directional

2. Speed

3. Coherence

4. Wavelength

Question Number : 26 Question Id : 2203604466 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A Transistor has early voltage of 75 V and is operated at collector current of 10 mA when V_{CE} = 1 V. If V_{CE} is increased to 11 V then the collector current will be

Options :

1. 15.33 mA

2. 11.33 mA

3. 12.33 mA

4. 16.33 mA

Question Number : 27 Question Id : 2203604467 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A Silicon PN junction at temperature of 20°C has a reverse saturation current of 10 Pico-Amperes (pA). The reverse saturation current at 40°C for the same bias is approximately

Options :

1. 30 pA

2. 40 pA

3. 50 pA

4. 60 pA

Question Number : 28 Question Id : 2203604468 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The free electron density in a conductor is 0.625×10^{22} cm^{-3} and the electron mobility is 10 cm^2/volt-sec. What is the value of its resistivity?

Options :

1. 10^{-4} Ωm

2. 1.6×10^{-2} Ωm

3. $10^{-4}\ \Omega cm$

4. 10^{-4} mho cm^{-1}

Question Number : 29 Question Id : 2203604469 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

In a NPN bipolar junction transistor what is the main stream of current in the base region?

Options :

1. Diffusion of electrons

2. Drift of electrons

3. Diffusion of holes

4. Drift of holes

Question Number : 30 Question Id : 2203604470 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

In p-n junction diode, a minimum resistance is offered to the forward flow of the current at very high forward voltage is called

Options :

1. Ohmic contact resistance

2. Bulk resistance

3. Reverse resistance

4. Leakage resistance

Question Number : 31 Question Id : 2203604471 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The doping is increased to in order of 1 in 10^3 and thickness of depletion layer reduced to order of less than 10^{-6} cm, then ordinary diode becomes a

Options :

1. Tunnel diode

2. Zener diode

3. Varactor diode

4. Gunn diode

Question Number : 32 Question Id : 2203604472 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A PN junction is forward biased and the current flowing through it is 2 mA. Assuming volt equivalent temperature, $V_T = 25$ mV, the small signal resistance of the diode is

Options :

1. 12.5 Ω

2. 12.5 kΩ

3. 50 kΩ

4. 50 Ω

Question Number : 33 Question Id : 2203604473 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The diffusion current in semiconductor is due to

Options :

1. Repulsion of the charge carriers

2. Electric field

3. Statistical phenomenon

4. Potential drop

Question Number : 34 Question Id : 2203604474 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The small signal conductance of a diode is

Options :

1. Directly proportional to forward voltage

2. Inversely proportional to forward voltage

3. Directly proportional to exponential of forward voltage

4. Inversely proportional to exponential of forward voltage

Question Number : 35 Question Id : 2203604475 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A green color LED emits light with a wavelength $5490A^0$ unit. Find the energy gap of material in eV.

Options :

1. 6.54 eV

2. 3.67 eV

3. 5.29 eV

4. 2.26 eV

Question Number : 36 Question Id : 2203604476 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The depletion layer in a p-n junction is made of which of the following?

Options :

1. Ionized donors in p-side and ionized acceptors in n-side

2. Ionized donors in n-side and ionized acceptors in p-side

3. Accumulated holes in p-side and accumulated electrons in n-side

4. Accumulated holes in n-side and accumulated electrons in p-side

Question Number : 37 Question Id : 2203604477 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Consider the following statements:

(A) A Schmitt trigger circuit can be emitter-coupled bi-stable circuit.

(B) Schmitt trigger circuit exhibits hysteresis phenomenon.

(C) The output of a Schmitt trigger will be triangular if the input is square wave.

Which of these statements are correct?

Options :

1. A, B and C

2. A and B only

3. B and C only

4. A and C only

Question Number : 38 Question Id : 2203604478 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

An npn BJT has $g_m = 38$ mA/V, $C\mu = 10^{-14}$ F, $C_\pi = 4\times10^{-13}$ F, and DC current gain β_0 = 90. For this transistor f_T and f_β are

Options :

1. $f_T = 1.64 \text{ X } 10^8$ HZ and $f_\beta = 1.47 \text{ X } 10^{10}$ HZ

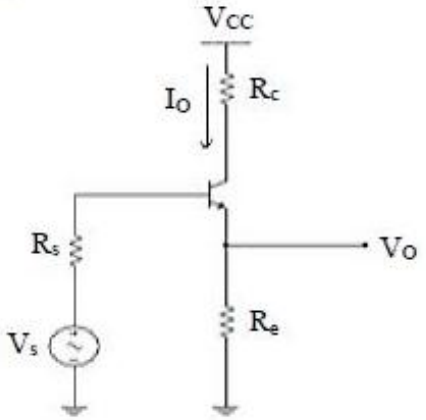
2. $f_T = 1.47 \text{ X } 10^{10}$ HZ and $f_\beta = 1.64 \text{ X } 10^8$ HZ

3. $f_T = 1.34 \text{ X } 10^8$ HZ and $f_\beta = 1.47 \text{ X } 10^{10}$ HZ

4. $f_T = 1.47 \text{ X } 10^{10}$ HZ and $f_\beta = 1.33 \text{ X } 10^8$ HZ

Question Number : 39 Question Id : 2203604479 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The feedback topology in the amplifier circuit (the base bias circuit is not shown for simplicity) in the figure is



Options :

1. Voltage shunt feedback

2. Current series feedback

3. Current shunt feedback

4. Voltage series feedback

Question Number : 40 Question Id : 2203604480 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The most commonly used amplifier in sample and hold circuit is

Options :

1. a unity gain inverting amplifier

2. a unity gain non inverting amplifier

3. an inverting amplifier with a gain of 10

4. an inverting amplifier with a gain of 100

Question Number : 41 Question Id : 2203604481 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

What is the function of the comparators in the 555 timer circuit?

Options :

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.

Question Number : 42 Question Id : 2203604482 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Virtual Short Circuit between two terminals of OP-AMP is valid under

Options :

1. Open loop Conditions

2. Closed loop, positive feedback

3. small signal inputs

4. Closed loop, negative feedback

Question Number : 43 Question Id : 2203604483 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A negative –feedback closed loop system is supplied to an input of 5 V. The system has a forward gain of '1' and a feedback gain of '1'. What is the output voltage?

Options :

1. 1.0 V

2. 2.5 V

3. 2.0 V

4. 1.5 V

Question Number : 44 Question Id : 2203604484 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The stability factor for fixed bias circuit is

Options :

1. $(1+\beta)\frac{1+\frac{R_{TH}}{R_e}}{1+\beta+\frac{R_{TH}}{R_e}}$

2. $\frac{-\frac{\beta}{R_e}}{1+\beta+\frac{R_{TH}}{R_e}}$

3. $1/\beta$

4. $1+\beta$

Question Number : 45 Question Id : 2203604485 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Condition for oscillations in Hartley oscillator considering mutual inductance is

Options :

1. $A_v > \frac{L_{1+M}}{L_{2+M}}$

2. $A_v > \frac{L_{2+M}}{L_{1+M}}$

3. $A_v > \frac{L_2}{L_1}$

4. $A_v > \frac{L_1}{L_2}$

Question Number : 46 Question Id : 2203604486 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The voltages of (–) terminal of upper comparator and (+) terminal of lower comparator of 555 timer are

Options :

1. Vcc, 2 Vcc

2. 1/3 Vcc, 2/3 Vcc

3. 2/3 Vcc, 1/3 Vcc

4. 3/4 Vcc, 1 /2 Vcc

Question Number : 47 Question Id : 2203604487 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

In a common source JFET amplifier the output voltage is

Options :

1. 180° out of phase with input

2. In phase with input

3. 90° out of phase with input

4. 270° out of phase with input

Question Number : 48 Question Id : 2203604488 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A transistor when connected in CE mode has

Options :

1. a low input resistance and a low output resistance

2. a high input resistance and high output resistance

3. a high input resistance and low output resistance

4. a medium input resistance and high output resistance

Question Number : 49 Question Id : 2203604489 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The maximum phase shift that an integrator can introduce is

Options :

1. 90◦

2. 180◦

3. Depends on the value of resistor and capacitor

4. Depends on the value of capacitor only

Question Number : 50 Question Id : 2203604490 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Assume that a common source amplifier is biased in saturation region. The current through the MOSFET is 1 mA and the overdrive voltage $V_{GS} - V_T$ is 0.2 V. If a load resistance of 10 K is connected, then the voltage gain of the amplifier is

Options :

1. 10

2. –5

3. –10

4. 5

Question Number : 51 Question Id : 2203604491 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The range of signed decimal numbers that can be represented by 4-bit 1's complement number is

Options :

1. –7 to +7

2. –8 to +8

3. –16 to +16

4. –8 to +7

Question Number : 52 Question Id : 2203604492 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

X = 01110 and Y = 11001 are two 5-bit binary numbers represented in two's complement format. The sum of X and Y represented in two's complement format using 6 bits is

Options :

1. 100111

2. 001000

3. 000111

4. 101001

Question Number : 53 Question Id : 2203604493 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Simplified form of the Boolean expression $Y = \overline{(A.B + \overline{C})(\overline{A + B + C})}$ is

Options :

1. $\overline{A}\ \overline{C} + A\overline{C} + \overline{B}\ \overline{C} + \overline{B}C$

2. $\overline{A}C + A\overline{C} + B\overline{C} + \overline{B}C$

3. $(\overline{A} + \overline{B})(A + \overline{C})$

4. $A(B + C)$

Question Number : 54 Question Id : 2203604494 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

If $X = 1$ in the logic equation, $[X + Z\{Y' + (Z' + XY')\}]\{X' + Z'(X + Y)\} = 1$ then

Options :

1. $Y = Z$

2. $Z = 1$

3. $Y = Z'$

4. $Z = 0$

Question Number : 55 Question Id : 2203604495 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Which one of the following statements is not correct?

Options :

1. $ZX + Z\,X'Y = ZX + ZY$

2. $X(X' + Y) = XY$

3. $XY + XY' = X$

4. $X + X'\,Y = X$

Question Number : 56 Question Id : 2203604496 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Given that $(345)_{10} = (1333)_b$, determine the value of b is

Options :

1. 2

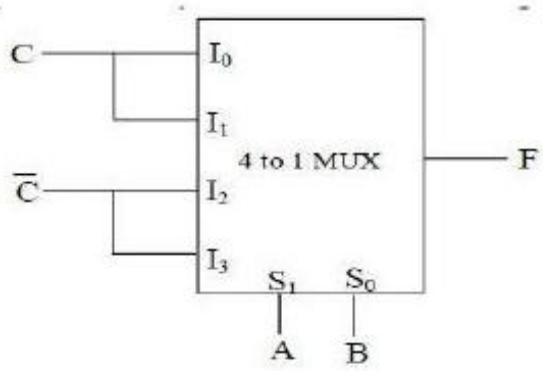
2. 8

3. 6

4. 16

Question Number : 57 Question Id : 2203604497 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The logic realized by the circuit shown in figure is



Options :

1. $F = A \odot C$

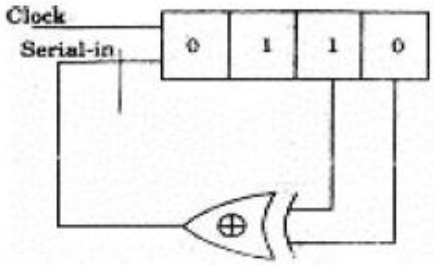
2. $F = A \oplus C$

3. $F = B \odot C$

4. $F = B \oplus C$

Question Number : 58 Question Id : 2203604498 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The initial contents of the 4-bit serial-in parallel-out, right-shift, shift register shown in the given figure is 0110. After three clock pulses are applied, the contents of the shift register will be



Options :

1. 0000

2. 0101

3. 1010

4. 1111

Question Number : 59 Question Id : 2203604499 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The characteristic equation of a JK flip-flop is _____.

Options :

1. $Q(t+1) = JQ' + K'Q$

2. $Q(t+1) = JQ + K'Q'$

3. $Q(t+1) = JQ$

4. $Q(t+1) = J'Q'$

Question Number : 60 Question Id : 2203604500 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The initial content of a four-bit shift register is 1000. What is the register content after it is shifted four times to the right, with the serial input being 111100?

Options :

1. 1111

2. 1100

3. 1000

4. 0011

Question Number : 61 Question Id : 2203604501 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Advanced low power schootky is a part of

Options :

1. ECL family

2. CMOS family

3. TTL family

4. RTL family

Question Number : 62 Question Id : 2203604502 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The 8085 microprocessor has 16 bit

Options :

1. Data bus, address bus

2. Data bus, stack pointer

3. Registers, program counter

4. Stack pointer, program counter

Question Number : 63 Question Id : 2203604503 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The speed of conversion is maximum in

Options :

1. Successive approximation A/D converter

2. Parallel comparative A/D converter

3. Counter ramp A/D converter

4. Dual slope A/D converter

Question Number : 64 Question Id : 2203604504 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

For 8085 microprocessor, the following program is executed

```
        MVI A, 05H;
        MVI B, 05H;
PTR:    ADD B;
        DCR B;
        JNZ PTR;
        ADI 03H;
        HLT;
```

At the end of program, accumulator contains

Options :

1. 20 H

2. 17 H

3. 21 H

4. 22 H

Question Number : 65 Question Id : 2203604505 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

According to Paley-Wiener criterion, the following condition should be satisfied for an amplitude response to be realizable.

Options :

1. $\int_{-\infty}^{\infty} \frac{|ln|H(jw)||}{1+w^2} dw < \infty$

2. $\int_{-\infty}^{\infty} \frac{||H(jw)||}{w} dw < \infty$

3. $\int_{-\infty}^{\infty} \frac{\left|ln\left|e^{-w^2}\right|\right|}{1+w^2} dw = 0$

4. $\int_{-\infty}^{\infty} \frac{\left|ln\left|e^{-w^2}\right|\right|}{w^2} dw = 1$

Question Number : 66 Question Id : 2203604506 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Which one of the following is the impulse response of the system whose step response is given as $y(t) = 0.5(1 - e^{-2t})u(t)$?

Options :

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

2. $0.5\delta(t) + e^{-2t}u(t)$

3. $0.5\delta(t) - 0.5e^{-2t}u(t)$

4. $0.5e^{-2t}u(t)$

Question Number : 67 Question Id : 2203604507 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The z – transform of the time function $\sum_{k=0}^{\infty} \delta(n-k)$

Options :

1. $\frac{(z-1)}{z}$

2. $\frac{z}{(z-1)^2}$

3. $\frac{z}{(z-1)}$

4. $\frac{(z-1)^2}{z}$

Question Number : 68 Question Id : 2203604508 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

For the function x(t), X(s) is given by $X(s) = e^{-s}\left[\frac{-2}{s(s+2)}\right]$ then ,what are the initial and final values of x(t) respectively?

Options :

1. 0 and 1

2. 0 and –1

3. 1 and 1

4. –1 and 0

Question Number : 69 Question Id : 2203604509 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The Laplace transform of signal $x(t) = -e^{(-at)}u(-t)$ is

Options :

1. $\frac{1}{S+a}$ with region of convergence $Re[S] < 0$

2. $\frac{1}{S-a}$ with region of convergence Re[S] < 0

3. $\frac{1}{S+a}$ with region of convergence Re[S] > 0

4. $\frac{1}{S-a}$ with region of convergence Re[S] > 0

Question Number : 70 Question Id : 2203604510 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A 1.0 KHz signal is flat top sampled at the rate of 1800 samples/sec and the samples are applied to an ideal rectangular LPF with cut-off frequency of 1100 Hz, then the output of the filter contains

Options :

1. Only 800 Hz component

2. 800 Hz and 900 Hz components

3. 800 Hz and 1000 Hz components

4. 800 Hz, 900 Hz and 100 Hz components

Question Number : 71 Question Id : 2203604511 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The convolution of a rectangular pulse of width T with a delta function is

Options :

1. a triangular pulse of duration 2T

2. a triangular pulse of duration T

3. a rectangular pulse of duration T

4. a rectangular pulse of duration 2T

Question Number : 72 Question Id : 2203604512 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A causal system having the transfer function $H(s) = \frac{1}{S+2}$ excited with 10 U(t). The time at which the output reaches 99% of its steady-state value is

Options :

1. 2.7 sec

2. 2.5 sec

3. 2.3 sec

4. 2.1 sec

Question Number : 73 Question Id : 2203604513 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

For an N-point FFT algorithm with $N=2^m$, which one of the following statements is TRUE?

Options :

1. It is not possible to construct signal flow graph with both input and Output in normal order

2. The number of butterflies in the m^{th} state is N/m

3. In-place computation requires storage of only 2N node data

4. Computation of a butterfly requires only one complex multiplication

Question Number : 74 Question Id : 2203604514 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A harmonic signal $x(t) = 3\sin(4t + 20^o) - 4\cos(12t + 40^o)$. Then the amplitude of second harmonic is

Options :

1. 0

2. 3

3. –4

4. -1

Question Number : 75 Question Id : 2203604515 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The number of butterflies in each stage of computation of a 64-point radix-2 FFT is

Options :

1. 8

2. 16

3. 32

4. 64

Question Number : 76 Question Id : 2203604516 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Which of the following is the correct statement? The continuous time system described by $y(t) = x(t^2)$ is

Options :

1. Causal, linear and time varying

2. Causal, non-linear and time varying

3. Non-causal, non-linear and time-invariant

4. Non-causal and time-variant

Question Number : 77 Question Id : 2203604517 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The ROC of z – transform of the discrete time sequence

$$x(n) = \left(\frac{1}{3}\right)^n u(n) - \left(\frac{1}{2}\right)^n u(-n-1) \text{ is}$$

Options :

1. $\frac{1}{3} < |z| < \frac{1}{2}$

2. $|z| < \frac{1}{2}$

3. $|z| < \frac{1}{3}$

4. $2 < |z| < 3$

Question Number : 78 Question Id : 2203604518 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The z-transform of a sequence x[n] is $0.25/(1 - 4z^{-1})$. If the region of convergence of X[z] includes the unit circle. The value of x[0] is

Options :

1. 0

2. –0.25

3. 0.25

4. 0.4

Question Number : 79 Question Id : 2203604519 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Given a unity feedback system with $G(s) = \frac{K}{s(s+4)}$, what is the value of K for a damping ratio of 0.5?

Options :

1. 1

2. 16

3. 4

4. 2

Question Number : 80 Question Id : 2203604520 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The characteristic equation of a control system is given as $s^4 + 8s^3 + 24s^2 + 32s + K = 0$. What is the value of K for which this system to be stable?

Options :

1. $0 < K < 80$

2. $0 \leq K < 100$

3. $0 \leq K < 300$

4. $0 \leq K < 600$

Question Number : 81 Question Id : 2203604521 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

If the characteristic equation of a closed-loop system is $s^2 + 2s + 2 = 0$, then the system is

Options :

1. Overdamped

2. critically damped

3. Underdamped

4. Undamped

Question Number : 82 Question Id : 2203604522 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The number of individual loci in a root locus plot is equal to

Options :

1. The number of open loop poles

2. The number of open loop zeros

3. The difference of the number of open loop poles and the number of open loop zeros

4. The number of open loop poles or zeros whichever is greater

Question Number : 83 Question Id : 2203604523 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The oscillation frequency of the system with the characteristic equation $S^6 + 2S^5 + 3S^4 + 4S^3 + 3S^2 + 2S + 1 = 0$ is

Options :

1. 1 radian/sec

2. –1 radian/sec

3. j1 radian/sec

4. –j1 radian/sec

Question Number : 84 Question Id : 2203604524 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A system has 14 poles and 4 Zeros. Its high frequency asymptote in its magnitude plot has slope

Options :

1. –200 db/dec

2. –240 db/dec

3. –280 db/dec

4. 320 db/dec

Question Number : 85 Question Id : 2203604525 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The settling time of a system with closed loop function $\frac{4}{s^2+1.6s+4}$ is

Options :

1. 0. 8 sec

2. 4 sec

3. 1.6 sec

4. 5 sec

Question Number : 86 Question Id : 2203604526 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

What is the radius and centre of the circular root locus of the system $(s) = \frac{k(s+a)}{s(s+b)}$?

Options :

1. $\sqrt{a^2 - b}$, (0, 0)

2. $\sqrt{a^2 - ab}$, (a, 0)

3. $\sqrt{b^2 - a}$, (b, 0)

4. $\sqrt{a^2 - a}$, (0, b)

Question Number : 87 Question Id : 2203604527 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The open-loop DC gain of a unity negative feedback system with closed-loop transfer function $\frac{S+4}{S^2+7S+13}$ is

Options :

1. 4/13

2. 4/9

3. 4

4. 13

Question Number : 88 Question Id : 2203604528 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

For a second-order system with the closed-loop transfer function $T(s) = \frac{9}{s^2 + 4s + 9}$

the settling time for 2-percent band, in seconds is

Options :

1. 1.5

2. 2.0

3. 3.0

4. 4.0

Question Number : 89 Question Id : 2203604529 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A system has poles at 0.01 Hz, 1 Hz and 80 Hz; zeros at 5 Hz, 100 Hz and 200 Hz.

The approximate phase of the system response at 20 Hz is

Options :

1. $-90°$

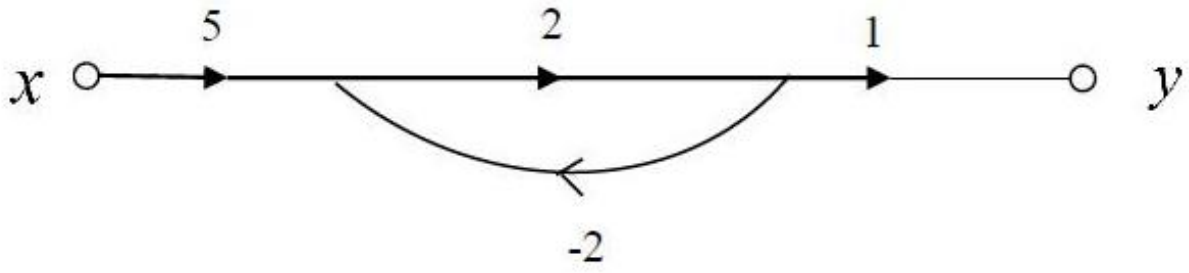
2. $0°$

3. $90°$

4. $-180°$

Question Number : 90 Question Id : 2203604530 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

In the signal flow graph of figure $\frac{y}{x}$ equals to



Options :

1. 3

2. 5/2

3. 2

4. 3/2

Question Number : 91 Question Id : 2203604531 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

For a system to be causal,

Options :

1. All poles must lie on imaginary axis

2. All poles must lie on left half of S-plane

3. All poles must lie on right half of S-plane

4. All poles must lie on real axis

Question Number : 92 Question Id : 2203604532 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A system with transfer function $\frac{\omega_c}{S+\omega_c}$ is

Options :

1. High pass filter

2. Low pass filter

3. Band pass filter

4. All pass filter

Question Number : 93 Question Id : 2203604533 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A signal $m(t) = 5\cos(2\pi\ 100\ t)$ frequency modulates a carrier. The resulting FM signal is $10\cos\{(2\pi 10^5\ t) + 15\sin(2\pi\ 100\ t)\}$. The approximate bandwidth of the FM signal would be

Options :

1. 0.1 kHz

2. 1 kHz

3. 3.2 kHz

4. 100 kHz

Question Number : 94 Question Id : 2203604534 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A source generates four messages with probability 1/8, 1/8, 1/4 and 1/2. What is the entropy of the source (bits/message)?

Options :

1. 1

2. 1.75

3. 2

4. 4

Question Number : 95 Question Id : 2203604535 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A 1 mW video signal having a bandwidth of 100 MHz is transmitted to a receiver through a cable that has 40 dB loss. If the effective one-sided noise spectral density at the receiver is 10^{-20} Watt/Hz, then the signal to noise ratio at the receiver is

Options :

1. 50 dB

2. 30 dB

3. 40 dB

4. 60 dB

Question Number : 96 Question Id : 2203604536 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

An FM signal with a deviation δ is passed through a mixer, and has its frequency reduced fivefold. The deviation in the output of the mixer is

Options :

1. δ

2. 2δ

3. $\delta/5$

4. 5δ

Question Number : 97 Question Id : 2203604537 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Determine the minimum bandwidth required for transmitting binary PCM wave with sampling rate of 8 kHz and number of quantization levels are 64.

Options :

1. 24 kHz

2. 16 kHz

3. 64 kHz

4. 8kHz

Question Number : 98 Question Id : 2203604538 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A DSB-SC signal is generated using the carrier $\cos(\omega_c t + \theta)$ and modulating signal x(t). The envelop of the DSB-SC signal is

Options :

1. x(t)

2. |x(t)|

3. Only positive portion of x(t)

4. $x(t)\cos\theta$

Question Number : 99 Question Id : 2203604539 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A source alphabet consists of N symbols with the probability of the first two symbols being the same. A source encoder increases the probability of the first symbol by a small amount e. After encoding, the entropy of the source

Options :

1. increases

2. remains the same

3. increases only if $N = 2$

4. decreases

Question Number : 100 Question Id : 2203604540 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A technique that helps offset high-frequency noise interference by passing a modulating signal through a simple network that amplifies high-frequency components more than the low-frequency components is called

Options :

1. pre-amplification

2. de-emphasis

3. pre-emphasis

4. crossover boost

Question Number : 101 Question Id : 2203604541 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

If E_b, the energy per bit of a binary digital signal, is 10^{-5} watt-sec and the one sided power spectral density of the white noise, N0 = 10^{-6} W/Hz, then the output SNR of the matched filter is

Options :

1. 26 dB

2. 10 dB

3. 20 dB

4. 13 dB

Question Number : 102 Question Id : 2203604542 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The diagonal clipping in Amplitude Demodulation (using envelope detector) can be avoided if RC time-constant of the envelope detector satisfies the following condition, (here W is message bandwidth and ω_c is carrier frequency both in rad/sec)

Options :

1. $RC < 1/W$

2. $RC > 1/W$

3. $RC < 1/\omega_c$

4. $RC > 1/\omega_c$

Question Number : 103 Question Id : 2203604543 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

In a PCM system with uniform quantization, increasing the number of bits from 8 to 9 will reduce the quantization noise power by factor of

Options :

1. 9

2. 8

3. 4

4. 2

Question Number : 104 Question Id : 2203604544 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Six channels, each with 100 kHz bandwidth, are to be multiplexed together with a guard band of 20 kHz. The minimum required bandwidth for such an FDM system is

Options :

1. 600 kHz

2. 620 kHz

3. 700 kHz

4. 720 kHz

Question Number : 105 Question Id : 2203604545 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The 4G cellular networks utilize 16 QAM as one of the modulation schemes. The maximum number of bits/symbol that can be communicated by 16 QAM scheme are

Options :

1. 1

2. 2

3. 3

4. 4

Question Number : 106 Question Id : 2203604546 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

For a continuous time random signal x(t) defined for $t \geq 0$,its probability density function(PDF) at $t = t_0$ is such that

Options :

1. It is non-negative and its integral equals to 1

2. Need not be non-negative, but integral equal to 1

3. It is non-negative, but integral is not equal to 1

4. It is negative, but integral is not equal to 1

Question Number : 107 Question Id : 2203604547 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The skin depth of copper at a frequency of 3 GHz is 1 micron (10^{-6} meter). At 12 GHz, for a non magnetic conductor whose conductivity is 1/9 times that of copper, the skin depth would be

Options :

1. $\sqrt{9 \times 4}$ microns

2. $\sqrt{\frac{9}{4}}$ microns

3. $\sqrt{\frac{4}{9}}$ microns

4. $\frac{1}{\sqrt{9 \times 4}}$microns

Question Number : 108 Question Id : 2203604548 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The skin depth for copper, given $\mu_R = 1$, $\sigma = 5.8 \times 10^7$ mhos/m and frequency of 10 GHz is

Options :

1. 6.6×10^{-7}m

2. 5.8×10^{-8}m

3. 1.2×10^{-12}m

4. 4.32×10^{-9}m

Question Number : 109 Question Id : 2203604549 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The return loss (in dB) of a device whose reflection coefficient is 0.1 is

Options :

1. 10 dB

2. 0.1 dB

3. 20 dB

4. 40 dB

Question Number : 110 Question Id : 2203604550 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The electric field produced by a static dipole

Options :

1. Is conservative and varies as $1/r^2$

2. Is non-conservative and varies as $1/r^2$

3. Is conservative and varies as $1/r^3$

4. Is non-conservative and varies as $1/r^3$

Question Number : 111 Question Id : 2203604551 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Which of the following statements is false

Options :

1. Time rate of change of magnetic field creates a non-conservative electric field in space

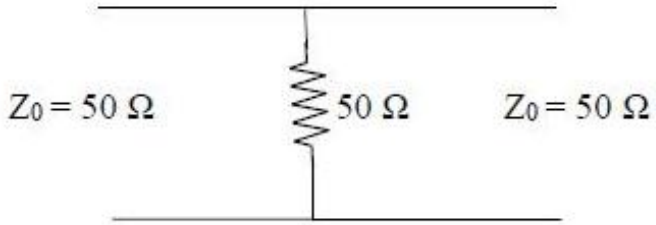
2. An electric pole placed randomly in an electric field always exhibits linear motion

3. Equi-potential surfaces are always perpendicular to electric field lines

4. The divergence of the magnetic flux density is equal to zero

Question Number : 112 Question Id : 2203604552 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A load of 50 Ω is connected in shunt in a 2 wire transmission line of $Z_0 = 50\ \Omega$ as shown in the figure. The 2 – port scattering parameter (s –Matrix) of the shunt element is



Options :

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

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

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

4. $\begin{bmatrix} \frac{1}{4} & \frac{-3}{4} \\ \frac{1}{2} & \frac{1}{4} \end{bmatrix}$

Question Number : 113 Question Id : 2203604553 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The wavelength of a wave in a waveguide is

Options :

1. Greater than in free space

2. Depends on only waveguide dimensions

3. Inversely proportional to phase velocity

4. Directly proportional to the group velocity

Question Number : 114 Question Id : 2203604554 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

If the phase velocity of a plane wave in a perfect dielectric is 0.4 times its value in free space, then what is the relative permittivity of the dielectric?

Options :

1. 6.25

2. 4.25

3. 2.5

4. 1.25

Question Number : 115 Question Id : 2203604555 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A TEM wave is incident normally upon a perfect conductor. The E and H fields at the boundary will be _____ respectively.

Options :

1. minimum and minimum

2. minimum and maximum

3. maximum and maximum

4. maximum and minimum

Question Number : 116 Question Id : 2203604556 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Gauss law relates the electric field intensity $\overline{E}$ with volume charge density 'ρ' at a point as

Options :

1. $\nabla \times \overline{E} = \varepsilon_0 \rho$

2. $\nabla \cdot \overline{E} = \varepsilon_0 \rho$

3. $\nabla \times \overline{E} = \frac{\rho}{\varepsilon_0}$

4. $\nabla \cdot \overline{E} = \frac{\rho}{\varepsilon_0}$

Question Number : 117 Question Id : 2203604557 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

An antenna in free space receives 2 μW of power when the incident electric field is 20 mV/m rms. The effective aperture of the antenna is

Options :

1. $0.005\ m^2$

2. $0.05\ m^2$

3. $1.885\ m^2$

4. $3.77\ m^2$

Question Number : 118 Question Id : 2203604558 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

If R, L, C and G are the resistance, inductance, capacitance and conductance of a transmission line respectively, then the condition for distortionless transmission line is

Options :

1. $R/C = G/L$

2. $RC = LG$

3. $R^2C = G^2L$

4. $RC^2 = GL^2$

Question Number : 119 Question Id : 2203604559 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The phase velocity of waves propagating in a hollow metal waveguide is

Options :

1. equal to the group velocity

2. equal to velocity of light in free space

3. greater than the velocity of light in free space

4. less than the velocity of light in free space

Question Number : 120 Question Id : 2203604560 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The dominant mode in a circular waveguide is

Options :

1. TEM

2. TM_{01}

3. TE_{21}

4. TE_{11}