A transistor is a …… operated device

A. current

B. voltage

C. both voltage and current

D. none of the above

ANSWER:A

In a npn transistor, ……. are the minority carriers

A. free electrons

B. holes

C. donor ions

D. acceptor ions

ANSWER:B

The emitter of a transistor is …… doped

A. lightly

B. heavily

C. moderately

D. none of the above

ANSWER:B

In a transistor, the base current is about …….. of emitter current

A. 25%

B. 20%

C. 35 %

D. 5%

ANSWER:D

At the base-emitter junctions of a transistor, one finds ……

A. a reverse bias

B. a wide depletion layer

C. low resistance

D. none of the above

ANSWER:C

The input impedance of a transistor is …….

A. high

B. low

C. very high

D. almost zero

ANSWER:B

Most of the majority carriers from the emitter ……..

A. recombine in the base

B. recombine in the emitter

C. pass through the base region to the collector

D. none of the above

ANSWER:C

The current IB is ……

A. electron current

B. hole current

C. donor ion current

D. acceptor ion current

ANSWER:A

The value of a of a transistor is …….

A. more than 1

B. less than 1

C. 1

D. none of the above

ANSWER:B

The voltage gain of a common collector configuration is

A. Unity

B. Zero

C. Very high

D. Moderate

ANSWER:A

Which amplifier whose output current flows for the entire cycle?

A. Class A

B. Class B

C. Class C

D. Class AB

ANSWER:A

Which coupling has the best frequency response?

A. Direct

B. RC

C. Transformer

D. Transistor

ANSWER:A

Which of the following is considered an amplifier figure of merit?

A. Gain-bandwidth product

B. Beta (ß)

C. Alpha (a)

D. Temperature

ANSWER:A

What type of coupling is generally used in power amplifiers?

A. Transformer

B. Direct

C. RC

D. Inductive

ANSWER:A

Oscillators operate on the principle of

A. Positive feedback

B. Negative feedback

C. Signal feedthrough

D. Attenuation

ANSWER:A

What happens if the input capacitor of a transistor amplifier is short-circuited?

A. Biasing conditions will change

B. Transistor will be destroyed

C. Signal will not reach the base

D. Biasing will stabilize

ANSWER:A

Which power amplifier has the highest collector efficiency?

A. Class A

B. Class C

C. Class B

D. Class AB

ANSWER:B

The ear is not sensitive to _____ distortion.

A. Frequency

B. Amplitude

C. Harmonic

D. Phase

ANSWER:A

If gain without feedback and feedback factor are A and ß respectively, then gain with negative feedback is given by

A. A/ 1-A ß

B. A/ 1+ A ß

C. 1+A ß / A

D. (1+A ß) A

ANSWER:B

The collector current in an common base configuration is equal to

A. Alpha times emitter current plus leakage current

B. Alpha times base current plus leakage current

C. Beta times emitter current plus leakage current

D. Beta times collector current plus leakage current

ANSWER:A

What is the purpose of RC or transformer coupling?

A. To block ac

B. To separate bias of one stage from another

C. To increase thermal stability

D. To block dc

ANSWER:B

To obtain good gain stability in a negative feedback amplifier, AB is

A. Equal to 1

B. Very much greater than 1

C. Less than 1

D. Zero

ANSWER:B

The number of stages that can be directly coupled is limited because

A. Change in temperature can cause thermal instability

B. Circuit becomes heavily and costly

C. It becomes difficult to bias the circuit

D. Circuits' resistance becomes too large

ANSWER:A

The input impedance of an amplifier _____ when negative voltage feedback is applied.

A. Decreases

B. Becomes zero

C. Increases

D. Is unchanged

ANSWER:C

The three amplifiers are connected in a multistage arrangement each with a voltage gain of 30. Compute for the overall voltage gain.

A. 90

B. 27,000

C. 10

D. 30

ANSWER:A

If Av is 50 Ai is 200, what is the power gain of a common emitter amplifier?

A. 1,000

B. 10,000

C. 100

D. 100,000

ANSWER:B

Negative feedback is employed in

A. Oscillators

B. Rectifiers

C. Amplifiers

D. Receivers

ANSWER:C

Hartley oscillator is commonly used in which of the following?

A. Radio receivers

B. TV receivers

C. Radio transmitters

D. CATV

ANSWER:A

A tuned amplifier is used in what application?

A. Radio frequency

B. Audio frequency

C. Intermediate frequency

D. Low frequency

ANSWER:A

Cascaded amplifiers total decibel gain is equal to

A. The sum of the individual gains

B. The product of the individual gains

C. The difference of the individual gains

D. The quotient of the individual gains

ANSWER:B

When the gain is 20 without feedback and 12 with negative feedback, feedback factor is

A. 0.033

B. 3/5

C. 5/3

D. 1/5

ANSWER:A

What is the piezoelectric effect in a crystal?

A. Voltage is developed because of mechanical stress

B. Change in resistance because of temperature

C. Change of frequency because of temperature

D. Current is developed due to force applied

ANSWER:A

What is the purpose of the bypass capacitor in a common-emitter amplifier?

A. It increases voltage gain

B. It decreases voltage gain

C. It provides ac grounding

D. No effect in the circuit

ANSWER:A

The crystal oscillator frequency is very stable due to _____ of the crystal.

A. Rigidity

B. Ductility

C. High Q

D. Low Q

ANSWER:C

When the collector resistor in a common emitter amplifier is increased in value the voltage gain

A. Increases

B. Decreases

C. Remain the same

D. Becomes erratic

ANSWER:A

Class B operation has a maximum possible frequency of _____ percent.

A. 100%

B. 78.5%

C. 75%

D. 2.2%

ANSWER:B

Emitter follower is used for

A. Impedance matching

B. Voltage gain

C. Current gain

D. Power gain

ANSWER:A

A buffer amplifier is used for

A. Maximum loading and minimum mismatch

B. Minimum loading and minimum mismatch

C. Maximum loading and maximum mismatch

D. Minimum loading and maximum mismatch

ANSWER:B

In an LC oscillator, if the value of L is increased four times, then the frequency of oscillation is

A. Decreased 2 times

B. Decreased 4 times

C. Increased 2 times

D. Increased 4 times

ANSWER:A

EDC

A semiconductor has …… temperature coefficient of resistance.

A. Positive

B. Zero

C .Negative

D. None of the above

ANSWER:A

A semiconductor has generally …… valence electrons.

A. 2

B .3

C. 6

D. 4

ANSWER:D

When a pure semiconductor is heated, its resistance ……..

A. Goes up

B. Goes down

C. Remains the same

D. Can’t say

ANSWER:B

When a pentavalent impurity is added to a pure semiconductor, it becomes ……

A. An insulator

B. An intrinsic semiconductor

C. p-type semiconductor

D. n-type semiconductor

ANSWER:D

A pentavalent impurity has ……. Valence electrons

A. 3

B. 5

C. 4

D. 6

ANSWER:B

A trivalent impurity has ….. valence electrons

A. 4

B. 5

C. 6

D. 3

ANSWER:D

As the doping to a pure semiconductor increases, the bulk resistance of the semiconductor ……..

A. Remains the same

B. Increases

C. Decreases

D. None of the above

ANSWER:C

A hole and electron in close proximity would tend to …….

A. Repel each other

B. Attract each other

C. Have no effect on each other

D. None of the above

ANSWER:B

The random motion of holes and free electrons due to thermal agitation is called …….

A. Diffusion

B. Pressure

C. Ionisation

D. None of the above

ANSWER:A

A forward biased pn junction diode has a resistance of the order of

A. OHMS

B. kOHMS

C. MOHMS

D. None of the above

ANSWER:A

The barrier voltage at a pn junction for germanium is about ……

A. 5 V

B. 3 V

C. Zero

D. 3 V

ANSWER:4

In the depletion region of a pn junction, there is a shortage of ……..

A .Acceptor ions

B. Holes and electrons

C. Donor ions

D. None of the above

ANSWER:B

A reverse bias pn junction has ……

A. Very narrow depletion layer

B. Almost no current

C. Very low resistance

D. Large current flow

ANSWER:B

A pn junction acts as a …….

A. Controlled switch

B. Bidirectional switch

C. Unidirectional switch

D. None of the above

ANSWER:C

The leakage current across a pn junction is due to ……..

A. Minority carriers

B. Majority carriers

C. Junction capacitance

D. None of the above

ANSWER:A

When the temperature of an extrinsic semiconductor is increased, the pronounced effect is on……

A. Junction capacitance

B. Minority carriers

C. Majority carriers

D. None of the above

ANSWER:B

With forward bias to a pn junction , the width of depletion layer ……

A. Decreases

B. Increases

C. Remains the same

D. None of the above

ANSWER:A

The leakage current in a pn junction is of the order of

A. A

B. mA

C. kA

D. µA

ANSWER:D

In an intrinsic semiconductor, the number of free electrons ……

A. Equals the number of holes

B. Is greater than the number of holes

C. Is less than the number of holes

D. None of the above

ANSWER:A

At room temperature, an intrinsic semiconductor has …….

A. Many holes only

B. A few free electrons and holes

C. Many free electrons only

D. No holes or free electrons

ANSWER:B

At absolute temperature, an intrinsic semiconductor has …….

A. A few free electrons

B. Many holes

C. Many free electrons

D. No holes or free electrons

ANSWER:D

At room temperature, an intrinsic silicon crystal acts approximately as ……

A. A battery

B. A conductor

C. An insulator

D. A piece of copper wire

ANSWER:C

The number of depletion layers in a transistor is ……

A. four

B. three

C. one

D. two

ANSWER:D

The base of a transistor is …….. doped

A. heavily

B. moderately

C. lightly

D. none of the above

ANSWER:C

The element that has the biggest size in a transistor is ……..

A. collector

B. base

C. emitter

D. collector-base-junction

ANSWER:A

In a pnp transistor, the current carriers are …….

A. acceptor ions

B. donor ions

C. free electrons

D. holes

ANSWER:D

The collector of a transistor is ……. doped

A. heavily

B. moderately

C. lightly

D. none of the above

ANSWER:B

A transistor is a …… operated device

A. current

B. voltage

C. both voltage and current

D. none of the above

ANSWER:A

In a npn transistor, ……. are the minority carriers

A. free electrons

B. holes

C. donor ions

D. acceptor ions

ANSWER:B

The emitter of a transistor is …… doped

A. lightly

B. heavily

C. moderately

D. none of the above

ANSWER:B

In a transistor, the base current is about …….. of emitter current

A. 25%

B. 20%

C. 35 %

D. 5%

ANSWER:D

At the base-emitter junctions of a transistor, one finds ……

A. a reverse bias

B. a wide depletion layer

C. low resistance

D. none of the above

ANSWER:C

The input impedance of a transistor is ……

A. high

B. low

C. very high

D. almost zero

ANSWER:B

Most of the majority carriers from the emitter ……..

A. recombine in the base

B. recombine in the emitter

C. pass through the base region to the collector

D. none of the above

A transistor has ……

A. one pn junction

B. two pn junctions

C. three pn junctions

D. four pn junctions

ANSWER : B

The number of depletion layers in a transistor is ……

A. four

B. three

C. one

D. two

ANSWER:D

The base of a transistor is …….. doped

A. heavily

B. moderately

C. lightly

D. none of the above

ANSWER:C

The element that has the biggest size in a transistor is ……..

A. collector

B. base

C. emitter

D. collector-base-junction

ANSWER:A

In a pnp transistor, the current carriers are …….

A. acceptor ions

B. donor ions

C. free electrons

D. holes

Answer:D

The collector of a transistor is ……. doped

A. heavily

B. moderately

C. lightly

D. none of the above

ANSWER:B

n-type semiconductors

A. are negatively charged

B. are produced when indium is added as impurity to germanium

C. are produced when phosphorus is added as impurity to silicon

D. none of the above

ANSWER:C

The voltage across a zener diode

A. is constant in forward direction

B. is constant in reverse direction

C. is constant in both forward and reverse directions

D. none of the above

ANSWER:B

Which of these has 3 layers?

A. PIN diode

B. Zener diode

C. Schottky diode

D. Photo diode

ANSWER:A

At room temperature the current in an intrinsic semiconductor is due to

A. holes

B. electrons

C. ions

D. holes and electrons

ANSWER:D

The most commonly used semiconductor material is

A. silicon

B. germanium

C. mixture of silicon and germanium

D. none of the above

ANSWER:A

A transistor has a current gain of 0.99 in the CB mode. Its current gain in the CC mode is

A. 100

B. 99

C. 1.01

D. 0.99

ANSWER:A

In a bipolar transistor the barrier potential

A. 0

B. a total of 0.7 V

C. 0.7 V across each depletion layer

D. 0.35 V

ANSWER:C

A zener diode is used in

A. voltage regulator circuit

B. amplifier circuits

C. both voltage regulator and amplifier circuit

D. none of the above

ANSWER:A

In a bipolar transistor which current is largest

A. collector current

B. base current

C. emitter current

D. base current or emitter current

ANSWER:A

The types of carriers in a semiconductor are

A. 1

B. 2

C. 3

D. 4

ANSWER:B

The word enhancement mode is associated with

A. tunnel diode

B. MOSFET

C. JFET

D. photo diode

ANSWER:B

In which region of a CE bipolar transistor is collector current almost constant?

A. Saturation region

B. Active region

C. Breakdown region

D. Both saturation and active region

ANSWER:B

The power dissipation in a transistor is the product of

A. emitter current and emitter to base voltage

B. emitter current and collector to emitter voltage

C. collector current and collector to emitter voltage

D. none of the above

ANSWER:C

In which of the following is the width of junction barrier very small?

A. Tunnel diode

B. Photo diode

C. PIN diode

D. Schottky diode

ANSWER:D

The units for transconductance are

A. ohms

B. amperes

C. volts

D. siemens

ANSWER:D

When a p-n junction is forward biased

A. the width of depletion layer increases

B. the width of depletion layer decreases

C. the majority carriers move away from the junction

D. the current is very small

ANSWER:B

The carriers of n channel JFET are

A. free electrons and holes

B. holes

C. free electrons or holes

D. free electrons

ANSWER:D

Which of the following has highest conductivity?

A. Silver

B. Aluminium

C. Tungsten

D. Platinum

ANSWER:A

Compared to bipolar junction transistor, a JFET has

A. lower input impedance

B. high input impedance and high voltage gain

C. higher voltage gain

D. high input impedance and low voltage gain

ANSWER:A

Which of the following devices has a silicon dioxide layer?

A. NPN transistor

B. Tunnel diode

C. JFET

D. MOSFET

ANSWER:D

PDC

If a square wave is fed to a differentiating circuit, the output will be

A. Sine wave

B. Sharp narrow pulses

C. Rectangular wave

D. Triangular wave

ANSWER:B

An integrating circuit is a simple RC series circuit with output taken across

A. Both R and C

B. R

C. C

D. None of the above

ANSWER:C

A differentiating circuit is a simple RC circuit with output taken across

A. R

B. C

C. Both R and C

D. None of the above

ANSWER:A

switch has ……

A. One state

B. Two states

C. Three states

D. None of the above

ANSWER:B

A monostable vibrator has ……..

A. No stable state

B. One stable state

C. Two stable states

D. None of the above

ANSWER:B

When a transistor is used as an amplifier, it is operated in the …… region

A. Off

B. Saturation

C. Active

D. None of the above

ANSWER:C

Which multivibrator is a square wave oscillator

A. Monostable

B. Astable

C. Bistable

D. None of the above

ANSWER:B

Time base should have _____

A. non-linearity

B. ramp relationship

C. linearity

D. unit step relationship

ANSWER:c

A trigger circuit is _____

A. is used for triggering the input

B. is used for triggering the output

C. used with time base generator

D. used as a oscillator

ANSWER:c

Time base generator circuit resembles a _____

A.regulator

B. rectifier

C. amplifier

D. oscillator

ANSWER:D

All input of NOR as low produces result as

A.Low

B. Mid

C. High

D. None of the Mentioned

ANSWER:C

RTL consists of a common emitter stage with a _____ connected between the base and the input voltage source.

A. collector

B. base resistor

C. Capacitor

D. None of the Mentioned

ANSWER:B

TTL circuits with “totem-pole” output stage minimize

A.The power dissipation in RTL

B. The time consumption in RTL

C. The speed of transferring rate in RTL

D. Nothing

ANSWER:A

In DTL amplifying function is performed by

A.Diode

B. Transistor

C. Register

D. Capacitor

ANSWER:B

In an ECL the output is taken from

a. Emitter

b. Base

c. Collector

d. None of the Mentioned

ANSWER:D

IIL is sometimes also known as

A. Single transistor logic

B. Multiple transistor logic

C. Merged transistor logic

D. None of the Mentioned

ANSWER:C

The output of a NOR gate is HIGH if _____.

A. all inputs are HIGH

B. any input is HIGH

C. any input is LOW

D. all inputs are LOW

ANSWER:D

The output of an exclusive-OR gate is HIGH if _____.

A. all inputs are LOW

B. all inputs are HIGH

C. the inputs are unequal

D. none of the above

ANSWER:C

When a transistor is used as an amplifier, it is operated in the …… region

A. Off

B. Saturation

C. Active

D. None of the above

ANSWER:C

The positive clipper is that which removes the ……. half-cycles of the input voltage.

A. Negative

B. Positive

C. Both positive and negative

D. None of the above

ANSWER:B

If a square wave is fed to a differentiating circuit, the output will be ……

A. Sine wave

B. Sharp narrow pulses

C. Rectangular wave

D. Triangular wave

ANSWER:B

An integrating circuit is a simple RC series circuit with output taken across ……

A. Both R and C

B. R

C. C

D. None of the above

ANSWER:C

For an integrating circuit to be effective , the RC product should be ……. the time period of the input wave

A. 5 times greater than

B. 5 times smaller than

C. Equal to

D. At least 10 times greater than

ANSWER:D

A differentiating circuit is a simple RC circuit with output taken across ……..

A. R

B. C

C. Both R and C

D. None of the above

ANSWER:A

For a differentiating circuit to be effective, the RC product should be …… the time period of the input wave

A. Equal to

B. 5 times greater than

C. 5 times smaller than

D. At least 10 times greater than

ANSWER:D

When a rectangular voltage waveform is applied to a capacitor, then the current waveform is ……

A. Rectangular

B. Sinusoidal

C. Sawtooth

D. Square

ANSWER:A

The positive clipper is that which removes the ……. half-cycles of the input voltage.

A. Negative

B. Positive

C. Both positive and negative

D. None of the above

ANSWER:B

A clamping circuits adds …… component to the signal

A. c.

B. c.

C. both d.c. and a.c.

D. none of the above

ANSWER:A

One would find a clamping circuit in ……..

A. Receiving antenna

B. Radio transmitter

C. Radio receiver

D. Television receiver

ANSWER:D

A negative clipper removes the …… half-cycles of the input voltage

A. Negative

B. Positive

C. Both positive and negative

D. None of the above

ANSWER:A

If the input to an integrating circuit is a succession of alternating positive and negative pulses of very short duration, the output will be …… wave

A. Rectangular

B. Triangular

C. Sine

D. Square

ANSWER:D

A switch has ……

A. One state

B. Two states

C. Three states

D. None of the above

ANSWER:B

The switch that has the fastest speed of operation is …….. switch

A. Electronic

B. Mechanical

C. Electromechanical

D. None of the above

ANSWER: A

The most inexpensive switch is …….. switch

A. Electronic

B. Mechanical

C. Electromechanical

D. None of the above

ANSWER: A

When a transistor is driven to saturation, ideally the output is ……

A. VCC

B. 0

C. VCC/2

D. 2VCC

ANSWER:B

The maximum speed of electronic switch can be …….. operations per second

A. 104

B. 10

C. 1000

D. 109

ANSWER:D

When a transistor is driven to cut off, ideally the output is ……..

A. VCC

B. 0

C. VCC/2

D. VCC/3

ANSWER:A

……. multivibrator is a square wave oscillator

A. Monostable

B. Astable

C. Bistable

D. None of the above

ANSWER:B

An astable multivibrator has …….

A. One stable state

B. Two stable states

C. No stable state

D. None of the above

ANSWER:C

A bistable multivibrator has ……..

A. Two stable states

B. One stable state

C. No stable state

D. None of the above

ANSWER:A

A monostable vibrator has ……..

A. No stable state

B. One stable state

C. Two stable states

D. None of the above

ANSWER:B

The multivibrator which generates square wave of its own is the …… multivibrator

A. Monostable

B. Bistable

C. Astable

D. None of the above

ANSWER:C

When a transistor is used as an amplifier, it is operated in the …… region

A. Off

B. Saturation

C. Active

D. None of the above

ANSWER:C

When the transistor (CE arrangement) is in the cut off region, the collector current is ……..

A. ICBO

B. ICEO

C. (ß + 1) ICEO

D. IC(sat)

ANSWER:B

In a multivibrator, we have ……. feedback.

A. Negative

B. 100 % positive

C. Both positive and negative

D. None of the above

ANSWER:B

The main disadvantage of a mechanical switch is that it…….

A. Is operated mechanically

B. Is costly

C. Has high inertia

D. None of the above

ANSWER:C

When a transistor is driven to saturation, ideally the output is ……

A. VCC

B. 0

C. VCC/2

D. 2VCC

ANSWER:B

A relay is superior to a mechanical switch because it ……

A. Is relatively inexpensive

B. Does not require moving contacts

C. Combines control with power amplification

D. None of the above

ANSWER:C

……. multivibrator is a square wave oscillator

A. Monostable

B. Astable

C. Bistable

D. None of the above

ANSWER:B

If d.c. supply of 10 V is fed to a differentiating circuit, then output will be …….

A. 20 V

B. 10 V

C. 0 V

D. None of the above

ANSWER:C

The multivibrator which generates square wave of its own is the …… multivibrator

A. Monostable

B. Bistable

C. Astable

D. None of the above

ANSWER:C

In a multivibrator, we have ……. feedback.

A. Negative

B. 100 % positive

C. Both positive and negative

D. None of the above

ANSWER:B

When a transistor is used as an amplifier, it is operated in the …… region

A.Off

B.Saturation

C.Active

D.None of the above

ANSWER:C

EMT

What are the Units for poynting vector?

A. Watt/m2

B. Watts

C. Tesla

D. Webber

ANSWER:A

Find the work done in an inductor of 4H when a current 8A is passed through it?

A. 256

B. 128

C. 64

D. 512

ANSWER:B

Identify the devices that do not use electromagnetic energy.

A. Television

B. Washing machine

C. Microwave oven

D. Mobile phones

ANSWER:B

In conductors, which condition will be true?

A. $\sigma/\omega\varepsilon > 1$

B. $\sigma\omega\varepsilon > 1$

C. $\sigma/\omega\varepsilon < 1$

D. $\sigma\omega\varepsilon < 1$

ANSWER:A

For metals, the conductivity will be

A. 0

B. 1

C. -1

D. Infinity

ANSWER:D

For a dielectric, the condition to be satisfied is

A. $\sigma/\omega\varepsilon > 1$

B. $\sigma/\omega\varepsilon < 1$

C. $\sigma = \omega\varepsilon$

D. $\omega\varepsilon = 1$

ANSWER:B

For a perfect dielectric, which parameter will be zero?

A. Conductivity

B. Frequency

C. Permittivity

D. Permeability

ANSWER:A

skin depth of a material

A. $\delta = 1/\alpha$.

B. $\delta = 1$.

C. $\alpha = 1$

D. $\delta = \alpha$.

ANSWER:A

The conductivity in free space medium is

A. Infinity

B. Unity

C. Zero

D. Negative

ANSWER:C

The relation between the speed of light, permeability and permittivity is

A. $v = 1/\sqrt{(\mu\varepsilon)}$

B. $v = \mu\varepsilon$

C. $v = \mu/\varepsilon$

D. $v = 1/\mu\varepsilon$

ANSWER:A

The intrinsic impedance of free space is _____ ohms

A. 489

B. 265

C. 192

D. 377

ANSWER:D

The Brewster angle is expressed as

A. Tan-1(n)

B. Tan-1(n1/n2)

C. Tan-1(n2/n1)

D. Tan (n)

ANSWER:C

The Poynting vector is the power component that is calculated by the

A. EH

B. E/H

C. E.H

D. E X H

ANSWER:D

For time varying currents, the field or waves will be

A. Electrostatic

B. Magneto static

C. Electromagnetic

D. Electrical

ANSWER:C

According to Faraday's law, EMF stands for

A. Electromagnetic field

B. Electromagnetic force

C. Electromagnetic friction

D. Electromotive force

ANSWER:D

The magnetic moment of a field with current 12A and area 1.6 units is

A. 19.2

B. 12.9

C. 21.9

D. 91.2

ANSWER:A

Azimuthal angle is extended from ___ to___radiuns.

A. 0, π

B. 0, $\pi/2$

C. 0, 2π

D. None of these

ANSWER:C

YZ-plane is represented by _____

A. y=constant & z=constant

B. x=constant

C. xy=constant

D. None of these

ANSWER:B

Which of the following option regarding unit vectors is correct

A. ax•ax = ay•ay= az•az.=1

B. ax x ay = az

C. ax•ay=0

D. All of these

ANSWER:D

The curl of a vector field is_____

A. a vector

B. a scalar

C. vanishes

D. None of these

ANSWER:A

If the distance between two point charges is doubled, then F will become

A. Half

B. Double

C. ¼

D.none of these

ANSWER:C

The relaxation time is ___ for good conductor & __ for good dielectric

A. Long, Short

B. Short, Short

C. Long, Long

D. None of these

ANSWER:A

The magnetic field (H) is proportional to=_____

A. Q

B. D

C. Idl

D. None of these

ANSWER:C

The force between two charges is 120 N. If the distance between the charges is doubled, the force will be

A. 60 N

B. 30 N

C. 40 N

D. 15 N

ANSWER:B

The electric field intensity at a point situated 4 metres from a point charge is 200 N/C. If the distance is reduced to 2 metres, the field intensity will be

A. 400 N/C

B. 600 N/C

C. 800 N/C

D. 1200 N/C

ANSWER:B

The lines of force due to charged particles are

A. always straight

B. always curved

C. sometimes curved

D. none of the above

ANSWER:B

The electric field at a point situated at a distance d from straight charged conductor is

A. proportional to d

B. inversely proportional to d

C. inversely proportional to d

D. none of the above

ANSWER:C

A field line and an equipotential surface are

A. always parallel

B. always at 90°

C. inclined at any angle 0

D. none of the above

ANSWER:D

If the sheet of a bakelite is inserted between the plates of an air capacitor, the capacitance will

A. decrease

B. increase

C. remains unchanged

D. become zero

ANSWER:D

For making a capacitor, it is better to select a dielectric having

A. low permittivity

B. permittivityb slightly more than that of air

C. high permittivity

D. permittivity same as that of air

ANSWER:B

The units of capacitance are

A. volts/coulomb

B. coulombs/volt

C. henry/Wbb

D. ohms

ANSWER:C

A dielectric material must be

A. resistor

B. insulator

C. good conductor

D. semi conductor

ANSWER:D

"The total electric flux through any closed surface surrounding charges is equal to the amount oflcharge enclosed".

The above statement is associated with

A. Coulomb's square law

B. Gauss's law

C. Maxwell's first law

D. Maxwell's second law

ANSWER:B

For which of the following parameter variation, the capacitance of the capacitor remains unaffected ?

A. Distance between plates

B. Thickness of the plates

C. Area of the plates

D. Nature of dielectric

ANSWER:B

Which of the following materials has the highest value of dielectric constant?

A. Glass

B. Vacuum

C. Ceramics

D. Oil

ANSWER:C

"The surface integral of the normal component of the electric displacement D over any closed surface equals the charge enclosed by the surface".

The above statement is associated with

A. Gauss's law

B. Kirchhoff s law

C. Faraday's law

D. Lenz'sa law

ANSWER:D

Dielectric strength _____ with increasing thickness

A. increases

B. decreases

C. remains unaltered

D. none of the above

ANSWER:D

Tesla is a unit of

A. field strength

B. inductance

C. flux density

D. flux

ANSWER:C

The materials having low retentivity are suitable for making

A. weak magnets

B. temporary magnets

C. permanent magnets

D. none of the above

ANSWER:D

The ratio of intensity of magnetisation to the magnetisation force is known as

A. flux density

B. susceptibility

C. relative permeability

D.none of the above

ANSWER:D

In the left hand rule, forefinger always represents

A. voltage

B. current

C. directionc of force on the conductor

D. magnetic field

ANSWER:C

The Biot-savart's law is a general modification of

A. Faraday's laws

B. Lenz's law

C. Ampere's law

D.Kirchhoffs law

ANSWER:A

The relative permeability of materials is not constant.

A. diamagnetic

B. insulating

C. paramagnetic

D. ferromagnetic

ANSWER:B

Magnetic moment is a

A. pole strength

B. universal constant

C. vectord quantity

D. scalar quantity

ANSWER:C

What will be the current passing through the ring shaped air cored coil when number of turns is 800 and ampere turns are 3200 ?

A. 2

B. 4

C. 6

D. 8

ANSWER:D

PTSP

An examination consists of two papers, Paper 1 and Paper 2. The probability of failing in Paper 1 is 0.3 and that in Paper 2 is 0.2. Given that a student has failed in Paper 2, the probability of failing in Paper 1 is 0.6. The probability of a student failing in both the papers is

A. 0.5

B. 0.18

C. 0.12

D. 0.06

ANSWER:C

P(A U B) _____ P(A) + P(B)

A. ≤

B. ≥

C. ≤

D. none

ANSWER:A

Complement of A is

A. S – A

B. S +A

C. S .A

D. none

ANSWER:A

Two independent R.V's X, Y are always

A. Correlated

B. Uncorrelated

C. have cov (X, Y) ≠ 0

D. have correlation co-efficient – 1

ANSWER:B

Cov (X, Y) {covariance of (X, Y) is}

A. E (XY)

B. E(XY) - E(X)

C. E(XY) - E (X) E (Y)

D. E (XY) + E(X) E(Y)

ANSWER:C

The independent R.V's with zero mean are

A. orthogonal

B. non-orthogonal

C. correlated

D. have RXY ≠ 0

ANSWER:A

The probability density function of the envelope of narrow band Gaussian noise is

A. Poisson

B. Gaussian

C. Rayleigh

D. Rician

ANSWER:C

A probability function is given by P (X) = K exp ((- x^2)/2), - ∞ < x <∞. The value of K should be

A. 1/√(2 π)

B. √(2/π)

c. 1/(2 √π)

D. 1/(π√2)

ANSWER:A

The power spectral density of Y(t) can be obtained by the formula SYY(w) =

A. (S_XX (w))/(|H (w)|)

B. (S_XX (w))/〖|H (w)|〗^2

C. | H (w)| SXX (w)

D. |H (w)|2 SXX (w)

ANSWER:D

Time average of cross correlation function and the cross spectral density function from _____ pair

A. Laplace Transform

B. Z-Transform

C. Fourier Transform

D. Convolution

ANSWER:C

A WSS process X (t) has an auto correlation function R XX (τ) = 〖e〗^(- 3 |τ|) . The PSD is

A. 6/(9+ ω^2)

B. 9/(6+ ω^2)

C. 3/(9+ ω^2)

D. 9/(3+ ω^2)

ANSWER:A

Fx(-∞)=

A. ∞

B. -∞

c. 0

D. None

ANSWER:C

If S= {1,2,3,4,5,6,7,8,9} then find which one below is true

A. Continuous random variable can be definable

B. Only discrete random variable is definable

c. Both continuous and Discrete random variables are definable

D. None

ANSWER:B

E [aX + Y/b] =

A. Not possible

B. a E[X] + E [Y]

c. a E[X] + E [Y]/b

D. none

ANSWER:C

when X and Y are stastically independent random variables the covariance of them is

A. CXY = RXY – E[X].E[Y]

B. CXY =0

C. no covarisence exists

D. none

ANSWER:B

PSD of sum of two random variables ie Z=X+Y are

A. Szz=Sxx+Syy

B. Szx=Szz+Szy

C. Sxx=Szz+Szy

D. Syy=Szy+Szx

ANSWER:A

Gaussian function become as normal gaussian function when

A. Mean=1 & var=1

B. Mean=0 & var=1

C. Mean=0 & var=0

D. Mean=-1 & var=0

ANSWER:B

var(ax+b)=----------

A. a2 var(x)

B. a var(x)

C. 0

D. 1

ANSWER:A

If A & B are mutually exclusive events then P(A.B)=----------

A. O

B. -1

C. 1

D. BOTH A & B

ANSWER:A

If S is a sample space then P(S)=--------

A. O

B. -1

C. 1

D. BOTH A & B

ANSWER:C

var(255)=----------

A. 25

B. 50

C. 0

D. 1

ANSWER:C

A card is drawn at random from ordinary pack of 52 cards. Probability of selecting a ace is

A. 1/4

B. 1/13

C. 13/52

D. 1/16

ANSWER:B

If A and B are two independent events then P(A/B) is

A. P(B)

B. P(A)

C. either a and b

D. 1

ANSWER:B

Pdf is…… of distribution function.

A. derivative

B. integral

C. both

D. EQUAL TO

ANSWER:A

Gaussian is symmetrical about its

A. mean

B. variance

C. standard deviation

D. ZERO

ANSWER:A

E(400)=----------

A. 255

B. 20

C. 400

D. 40

ANSWER:C

Stochastic Process is also known as---------

A. mean

B. Non Stationary Process

C. Stationary Process

D. Random Process

ANSWER:D

If A and B are two mutually exclusive events, then P (AU B) = _____

A. P (A) – P (A∩B)

B. P (A) – P (B)

C. 0

D. P (A) + P(B)

ANSWER:D

One card is drawn from a regular deck of 52 cards. What is the probability of the card being either a red or king?

A. 30/52

B. 28/52

C. 26/52

D. none

ANSWER:B

For two events statistically independent, P (A/B) = _____

A. P (A)

B. P (A∩B)

C. 0

D. P (A) . P (B)

ANSWER:A

A random variable that takes infinite number of values is known as _____

A. Discrete random variable

B. Continuous random variable

C. Mixed random variable

D. None

ANSWER:B

_____ is the process of assigning a real number ‘x’ to every outcome of sample space ‘S’ of random experiment ‘E’.

A. Mutually exclusive events

B. Independent Events

C. Random variable

D. Probability

ANSWER:C

The CDF of a random variable X is _____ function

A. Increasing

B. Decreasing

C. Constant

D. None

ANSWER:A

FX (+∞) = _____

A. 0

B. 1

C. ∞

D. None

ANSWER:B

The probability of the event P [X = - ∞] = _____

A. 0

B. 1

C. 2

D. ∞

ANSWER:A

If the probability density function , fX(x) of a random variable ‘X’ is symmetrical about a point ‘a’ i.e, fX(x+a) = fX(x - a), then E[X] = _____

A. E[X]

B. 0

C. 1

D. a

ANSWER:D

If the mean value of E[X] = 5, then E[5X+4] = _____

A. 25

B. 0

C. 29

D. 5

ANSWER:C

The expectation of linear function aX + b is _____

A. a . E

B. a . E [X] + b

C. a . E [X] X b

D. none

ANSWER:B

If ‘X’ & ‘Y’ are independent random variables then E[XY]=_____

A. E[x]

B. E[Y]

C. E[X] .E[Y]

D. E[X]+E[Y]

ANSWER:C

IF X & Y are independent , then covariance of random variables ‘X’ & ‘Y’ then Cov (X,Y) =____

A. -E[X] E[Y]

B. 0

C. E[X].E[Y]

D. $\sigma_x^2.\sigma_y^2$

ANSWER:B

The correlation co-efficient values lies between ____

A. 0&1

B. -1&0

C. -1 &1

D. $-\infty$ to ∞

ANSWER:C

If X(t) and Y(t) are orthogonal them____

A. Sxy (w)< 1

B. Sxy(w)> 1

C. Sxy (w)=1

D. Sxy(w) = 0

ANSWER:D

Cov (ax,by) =_____

A. abcov(ax,by)

B. ab cov(x,y)

C. cov(x,y)

D. a2b2 cov (ax,by)

ANSWER:D

Fx,y (∞,y) =___

A. Fx,y(x,y)

B. Fx,y(∞,y)

C. Fx(x)

D. Fy(y)

ANSWER:D

If Rxx(τ) =25+4/(1+τ^2) , then the mean value of X(t) is

A. ± 5

B. ± 4

C. √29

D. 25

ANSWER:A

Var(k) , where ‘K’ is constant is _____

A. 1

B. 2

C. 0

D. -1

ANSWER:C

The maximum magnitude of characteristic function at w=0 is_____

A. ϕx(w)

B. 0

C. 2

D. 1

ANSWER:D

The auto correlation function ,Rxx(0)=_____

A. E[X]

B. E[X2(t)]

C. Sxx(w)

D. None

ANSWER:B

Cross PSD of output response y(t) of a linear system SXY(w)=_____

A. H(w)Sxx(w)

B. H(w).Syy(w)

C. H(w)|2

D. H(w)|2Sxx(w)

ANSWER:D

STLD

The 10’s complement of (89270)10 is _____

A. 10739

B. 10673

C. 10730

D. 13456

ANSWER:C

The 2’s complement representation of decimal number -35 is _____

A. 1100011

B. 1011101

C. 1011001

D. 1110011

ANSWER:B

The Excess – 3 equivalent of decimal number 36 is

A. 0100110

B. 0110 1001

C. 100111

D. 100100

ANSWER:B

(129)10 = (_____)16

A. 61

B. 81

C. 63

D. 4A

ANSWER:C

(4D)16 = (_____)2

A. 01001101

B. 01001100

C. 01101101

D. 01111101

ANSWER:A

AA1 =_____

A. 1

B. 1

C. 0

D. 0

ANSWER:C

X + 1 = _____

A. X

B. 0

C. 1

D. X1

ANSWER:C

The complement of the Boolean function F = (A + B + A1B1C) is

A. A.B1.(A + B + C1)

B. A1.B1.(A + B + C1)

C. A1.B1.(A + B + C)

D. A1.B1.(A1 + B + C1)

ANSWER:B

The state of a 12-bit register is 010110010111. What are its contents if it represents three decimal digits in Express-3 code?

A. 597

B. 264

C. 297

D. 569

ANSWER:B

The number of parity bits required to encode the data 10101110, using hamming code technique is

A. 3

B. 4

C. 5

D. 6

ANSWER:B

The Boolean function (x+y) . (x+z) =

A. x + z

B. x + y

C. x + yz

D. y + xz

ANSWER:C

The simplified Boolean expression of F (x,y,z) = ? m (2,3,4,5)

A. XY + Z

B. X1Y + XY

C. X1Y + XY1

D. XZ + X1Y1

ANSWER:C

The code used for labeling the cells of k-map is

A. Natural BCD

B. Hexadecimal

C. Gray

D. Octal

ANSWER:C

The Consensus term in the following Boolean Expression F = BC + B1A + AC

A. BC

B. B1A

C. AC

D. B1

ANSWER:C

The 2’s complement of 10111 is _____

A. 01110

B. 01001

C. 01101

D. 10010

ANSWER:B

Eights cell group in four variable K-map gives _____ literals

A. 1

B. 2

C. 3

D. 4

ANSWER:A

A+A1 =_____

A. 0

B. 1

C. 1

D. 0

ANSWER:B

The gray code for binary number 10110110

A. 11011011

B. 11101101

C. 11111011

D. 01001001

ANSWER:B

The number of parity bits required to encode the data 1010111, using hamming code technique is

A. 3

B. 4

C. 5

D. 6

ANSWER:B

Any two adjacent squares in a K – map differs by _____ literals

A. 2

B. 3

C. 1

D. 4

ANSWER:C

A ? 1 = _____

A. 4

B. 1

C. A1

D. A

ANSWER:C

In J-K Flip Flop, if J= 1,K=0 Q(t) =0, then Q(t+1)= _____

A. 0

B. 1

C. X

D. None

ANSWER:B

To construct mod-14 counter the number of Flip Flop required is

A. 3

B. 5

C. 4

D. none

ANSWER:C

The size of the Decoder required to implement a Full Subtractor _____

A. 2 X 4

B. 2 X 8

C. 3 X 8

D. None

ANSWER:C

Decoder outputs are

A. Min terms

B. Max terms

C. Product terms

D. Sum terms

ANSWER:A

In a Programmable Logic Array, _____ gates are programmable

A. AND

B. OR

C. Both AND and OR

D. None

ANSWER:C

In a SR Flip Flop, if present state Qn = 0 and S = 1 and R = 0, then the next state Qn + 1 =

A. 3

B. 1

C. 0

D. None

ANSWER:B

For an 8 X 1 Mux, the number of selection lines is _____

A. 3

B. 4

C. 8

D. 6

ANSWER:A

A =1 0 ,B = 0 1 The output of comparator is _____

A. A> B

B. A< B

C. A = B

D. None

ANSWER:A

Latch is ____ trigged, F/F is _____ trigged

A. Edge , Edge

B. Level ,Level

C. Level, Edge

D. Edge, level

ANSWER:C

To construct mod-16 counter the number of F/F are needed

A. 3

B. 5

C. 4

D. None

ANSWER:C

PAL stand for _____

A. Programmable And Logic

B. Programmable Array Logic

C. Programmable Arithmetic Logic

D. Programmable Alphanumeric Logic

ANSWER:B

SS

If a signal f(t) has energy E, then the energy of f(2t) is……

A. E

B. E/2

C. 2E

D. 4E

ANSWER:B

Which of the following sequence is a perodic signal

A. unit step sequence

B. exp(jnw)

C. sinusoidal sequence

D. unit ramp sequence

ANSWER:C

At t=0, the function f(t)=(sint)/t has…

A. a minimum

B. a discontinuity

C. a point of inflection

D. a maximum

ANSWER:D

Which of following is false statement…

A. area of impulse is unity

B. amplitude of impulse is unity

C. area under the curve is unity

D. integration of impulse is step

ANSWER:B

Scaling doesnot change the ..... content of the signal.

A. power

B. energy

C. both power and energy

D. none

ANSWER:A

The period of the signal $x(t)=6\sin(0.8\pi t+45)+5\cos(0.8t+45)$ is

A. 0.8

B. 1.6

C. 0.1

D. none

ANSWER:C

The fourier series of a odd periodic function, contains only

A. Odd harmonic

B. even harmonic

C. cosine terms

D. sine terms

ANSWER:D

Which of following cannot be the fourier series expansion of a periodic signal?

A. $x(t)=2\cos t+3\cos 3t$

B. $x(t)=5+\cos t$

C. $x(t)=2\cos(5\pi t)+7\sin(4\pi t)$

D. none

ANSWER:D

If $X(w)=\delta(w-2)$ then x(t)is

A. exp(-2jt)

B. delta(t)

C. (exp(2jt))/2pi

D. 1

ANSWER:C

Hilbert transform of dirac delta function is

A. 2π

B. $1/(\pi t)$

C. $1/(2\pi)$

D. 1

ANSWER:C

FT{x(t)}=X(w) then FT{x(t+4)}is

A. X(w)exp(-4w)

B. X(w)exp(+4w)

C. X(w)exp(+8w)

D. X(W)

ANSWER:B

FS is applicable for ..... signal.

A. nonperiodic

B. perodic

C. periodic and nonperiodic

D. CONSTANT terms

ANSWER:B

If FT{x(t)}=X(w) and F.T{y(t)}=Y(w) then F.T{x(t)y(t)} is

A. X(w)Y(w)

B. $\{X(w)Y(w)\}/2\pi$

C. X(w)*Y(w)

D. $\{X(w)*Y(w)\}/2\pi$

ANSWER:D

Thefourier transform of sgn(t) is------

A. $-j\pi w$

B. $j/(\pi w)$

C. 2/(jw)

D. 1

ANSWER:C

If x(t)=1,FT{x(t)}=

A. 2π delta(-w)

B. delta(-f)

C. Both

D. ZERO

ANSWER:C

FT{rect(t/T)}is-------

A. 2Tsinc(2fT)

B. Tsinc(wT/2π)

C. Tsinc(fT)

D. both b and c

ANSWER:D

FT{exp(-at)} is

A. 1/(jw+a)

B. -1/(jw-a)

C. 1/(jw-a)

D. none

ANSWER:A

i)T.F.S are having amplitude spectrum is double sided.

ii) E.F.S are having amplitude spectrum is single sided.

A. i & ii is true

B. i is true & ii is false

C. i is false & ii is true

D. i & ii is false

ANSWER:D

FT is applicable for ..... signal.

A. nonperiodic

B. perodic

C. periodic and nonperiodic

D. none

ANSWER:C

The Laplace transform is very similar to the

A. differential transform

B. Fourier transform

C. integral transform

D. exponential transform

ANSWER:B

The inverse Laplace transform takes a function of a complex variables and yields a function of a

A. complex function

B. real function

C. string function

D. special function

ANSWER:B

If inverse Laplace transform takes a function of frequency it yields a function of

A. velocity

B. time

C. distance

D. acceleration

ANSWER:B

Laplace transform is an

A. differential transform

B. power series transform

C. integral transform

D. exponential transform

ANSWER:A

The process of converting a continuous–time signal into discrete –time signal is called

A.Sampling

B.SEQUENCE

C.Encoding

D.Decoding

ANSWER:A

For existence of Fourier series, Dirichlet's conditions are

a. Necessary

b. sufficient

c. both a & b

d. none

ANSWER:B

A trigonometric Fourier series has

A. a one sided spectrum

B. a two sided spectrum

c. both a&b

D. none

ANSWER:C

The phase spectrum of exponential Fourier series is _____ about vertical axis.

A. Symmetrical

B. Asymmetrical

C. both a&b

D. none

ANSWER:A

A system which has a unique relation between its input and output is called _____system.

A. Linear

B. causal

C. time variant

D. invertible

ANSWER:D

The two basic condition to be satisfied if x(t) is to be recovered from its samples are_____

A. band limited signal & $fs \geq 2$ fm

B. unband limited signal & fs=2fm

C. Band limited signal & $fs < 2fm$

D. none

ANSWER:A

For a LTI system to be BIBO stable ,its ____must be absolutely integrable

A. |h(t)|

B. H(w)

C. |H(W)|

D. none

ANSWER:A

For distortion less transmission system band width must be equal to ____

A. Two times signal bandwidth

B. ½ of signal band width

C. infinite

D. none

ANSWER:A

Laplace Transform is used to convert differential equation into _____equation

A. Difference

B. Algebraic

C. Constant

D. Quadratic

ANSWER:B

The only signal whose Roc is the entire Z- plane is

A. δ(n)

B. u(n)

C. r(n)

D. NONE

ANSWER:A

ROC is defined as the range of values of Z for which x(z)_____

A. Diverges

B. Converges

C. Zero

D. infinite

ANSWER:B

The process of spectral overlap is called

A. Aliasing

B. Filtering

C. Modulation

D. Demodulation

ANSWER:A

An LTI system is described by _____

A. Logarithmic

B. Differential

C. Matrix

D. none

ANSWER:B

The time interval between two successive sampling instants is called

A. sampling period

B. sampling interval

C. sampling frequency

D. none

ANSWER:A

Application of signals and systems

A. Satellite

B. Radar

C. Image processing

D. All

ANSWER:D

The co-efficient bn is zero for _____ function

A. Even

B. Odd

C. Both A&B

D. None

ANSWER:A

The most widely used fourier series is __

A. trigonometric series

B. exponential series

C. cosine form

D. sine form

ANSWER:B

Unit step signal is ___signal

A. Causal

B. Anti-causal

C. Non-deterministic

D. None

ANSWER:A

Z-T/F of impulse function is

A. 1

B. 0

C. 2

D. 4

ANSWER:A

U(t-a) =0, if

A. t-a=0

B. t-a<0

C. t-a>0

D. none

ANSWER:B

The relation between a signum function and a unit step function is ,sgn(t)=_____

A. 2u(t)-1

B. u(t)-1

C. 2u(t)

D. u(t)-u(-t)

ANSWER:A

δ(n)=u(n)-u(-n-1)

A. TRUE

B. FALSE

C. A OR B

D. NONE

ANSWER:A