परीक्षेचे नांव : सहायक प्राध्यापक, अणुविद्युत व दुरसंदेशवहन अभियांत्रिकी, अस्वायत्त शासकीय अभियांत्रिकी महाविद्यालय, महाराष्ट्र अभियांत्रिकी महाविद्यालयीन शिक्षक सेवा, गट -अ, चाळणी परीक्षा-2014

परीक्षेचा दिनांक : 27 जुलै, 2014

महाराष्ट्र लोकसेवा आयोगामार्फत सहायक प्राध्यापक, अणुविद्युत व दुरसंदेशवहन अभियांत्रिकी अभियांत्रिकी, अस्वायत्त शासकीय अभियांत्रिकी महाविद्यालय, महाराष्ट्र अभियांत्रिकी महाविद्यालयीन शिक्षक सेवा, गट -अ, चाळणी परीक्षा-२०१४ या चाळणी परीक्षेच्या प्रश्नपत्रिकेची उत्तरतालिका उमेदवारांच्या माहितीसाठी संकेतस्थळावर प्रसिध्द करण्यात आली होती. उमेदवारांनी अधिप्रमाणित (Authentic) स्पष्टीकरण / संदर्भ देऊन पाठविलेली लेखी निवेदने, तसेच तज्ज्ञांचे अभिप्राय विचारात घेऊन आयोगाने उत्तरतालिका सुधारित केली आहे. या उत्तरतालिकेतील उत्तरे अंतिम समजण्यात येतील. यासंदर्भात आलेली निवेदने विचारात घेतली जाणार नाहीत व त्याबाबत कोणताही पत्रव्यवहार केला जाणार नाही, याची कृपया नोंद घ्यावी.

उत्तरतालिका - KEY

Maharashtra Public Service Commission

Notations :

1.Options shown in green color and with ✔ icon are correct.

2.Options shown in red color and with ✖ icon are incorrect.

Question Paper Name:	Assistant Professor Electronics and Telecommunication Engineering ACTUAL
Subject Name:	Assistant Professor Electronics and Telecommunication Engineering
Creation Date:	2014-07-23 14:10:52.0
Cut Off:	10
Duration:	60
Number of Questions:	100

Group 1	
Group Number :	1
Group Id :	77
Group Maximum Duration :	0
Group Minimum Duration :	60
Revisit allowed for view? :	No
Revisit allowed for edit? :	No
Break time:	0

Assistant Professor Electronics and Telecommunication Engineering	
Section Id :	107
Section Number :	1
Section type :	Online
Mandatory or Optional:	Mandatory
Number of Questions:	100
Number of Questions to be attempted:	100

Sub-Section Number:	1
Sub-Section Id:	117
Question Shuffling Allowed :	No

Question Number : 1 Question Id : 9213 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

Inverse Laplace transform of the function $\frac{2s+5}{s^2+5s+6}$ is

Options :

1. ✖ $\exp(-2t) - \exp(-3t)$

2. ✔ $2 \exp(-2.5t) \cosh 0.5t$

3. ✗ $2 \exp(-2.5t) \cos 0.5t$

4. ✗ $2 \exp(-2.5t) \sinh 0.5t$

Question Number : 2 Question Id : 9214 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

A memory system has a total of 8 memory chips, each with 12 address lines and 4 data lines , the total size of the memory system is

Options :

1. ✔ 16 Kbytes

2. ✗ 32 Kbytes

3. ✗ 64 Kbytes

4. ✗ 48 Kbytes

Question Number : 3 Question Id : 9215 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

PAL consists of

Options :

1. ✗ Fixed AND, programmable OR array

2. ✗ Programmable AND, programmable OR array

3. ✔ Programmable AND, fixed OR array

4. ✗ Fixed AND, fixed OR array

Question Number : 4 Question Id : 9216 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

A bit stored in a FAMOS device can be erased by

Options :

1. ✗ Gamma Light

2. ✗ X-ray Light

3. ✗ Infra-red

4. ✔ U-V light

Question Number : 5   Question Id : 9217   Question Type : MCQ   Option Shuffling : No
Correct : 2.0   Wrong : 0.0

Without any additional circuit, an 8×1 multiplexer can be used to obtain

Options :

1. ✖ Some function of 3 variables

2. ✔ All functions of 3 variables but some function of 4 variables

3. ✖ All functions of 3 variables but none of 4 variables

4. ✖ All function of 4 variables

Question Number : 6   Question Id : 9218   Question Type : MCQ   Option Shuffling : No
Correct : 2.0   Wrong : 0.0

In a function of n variable consider a possible sub-cube of 2^m cells, is represented with how many number of literals

Options :

1. ✖ n

2. ✖ m

3. ✖ n + m

4. ✔ n - m

Question Number : 7   Question Id : 9219   Question Type : MCQ   Option Shuffling : No
Correct : 2.0   Wrong : 0.0

The characteristic equation of 'T' flip flop is

Options :

1. ✔ $Q_{n+1} = T \text{ XOR } Q_n$

2. ✖ $Q_{n+1} = \overline{T}\,\overline{Q_n} + TQ_n$

3. ✖ $Q_{n\times 1} = \overline{T}Q_n + T\overline{Q_n}$

4. ✖ Both (1) and (3)

Question Number : 8   Question Id : 9220   Question Type : MCQ   Option Shuffling : No
Correct : 2.0   Wrong : 0.0

Consider the two statements

> S1: If essential prime implicants covering all the minterms, then the function will be having unique minimal form.

> S2 : If the function is having unique minimal form then the prime implicants which are present in the minimal expression must be essential prime implicant

Options :

1. ✔ S_1 is true, S_2 is false

2. ✘ S_1 and S_2 both are true

3. ✘ S_1 and S_2 both are false

4. ✘ S_1 is false, S_2 is true

Question Number : 9 Question Id : 9221 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

Which of the following Gate is also known as coincidence logic gate

Options :

1. ✘ EX-OR gate

2. ✔ EX-NOR gate

3. ✘ NOR gate

4. ✘ OR gate

Question Number : 10 Question Id : 9222 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

The MOD value of 6 bit Moebious counter is

Options :

1. ✘ 4

2. ✘ 3

3. ✘ 6

4. ✔ 12

Question Number : 11 Question Id : 9223 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

Resistance offered by a human body is

Options :

1. ✗ $10\ \Omega$

2. ✗ $100\ \Omega$

3. ✓ $1\ K\ \Omega$

4. ✗ $1\ \Omega$

Question Number : 12 Question Id : 9224 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

Four terminal resistor is used to measure

Options :

1. ✗ High value of resistor

2. ✗ Medium value of resistor

3. ✗ Very high value of resistor

4. ✓ Low value of resistor

Question Number : 13 Question Id : 9225 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

Which of the following technique is used for multiple voltage source with multiple frequency

Options :

1. ✓ Superposition theorem

2. ✗ Compensation theorem

3. ✗ Reciprocity theorem

4. ✗ Substitution theorem

Question Number : 14 Question Id : 9226 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

For a given signal $x[n] - 3^n u[n]$, compute the DTFT $X(\Omega)$ of the given signal

Options :

1. ✗ $X(\Omega) = \dfrac{1}{1 - 3e^{-j\Omega}}$

2. ✗ $X(\Omega) = 1 + 3e^{-j\Omega} + (3e^{-j\Omega})^2 + \ldots\ldots$

3. ✗ $X(\Omega) = 1 + 3e^{-j\Omega} - 3e^{-j\Omega}$

4. ✔ DTFT of the given signal is not possible.

Question Number : 15 Question Id : 9227 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

The rank of a tie set matrix is

(Where N = no. of nodes, b = no. of branches)

Options :

1. ✗ N-1

2. ✔ b-N+1

3. ✗ b+N-1

4. ✗ N-b+1

Question Number : 16 Question Id : 9228 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

Time constant of a capacitance circuit may be defined as the time during which voltage

Options :

1. ✔ Rises to 63.2% of its final steady value

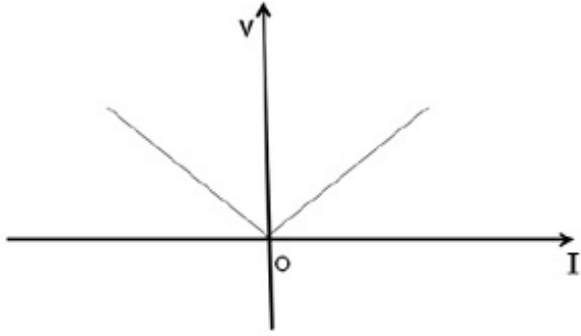2. ✗ Falls to 38.6% of its final steady value

3. ✗ Rises to 38.6% of its final steady value

4. ✗ Both (2) and (3)

Question Number : 17 Question Id : 9229 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

The V-I characteristics of an element is shown in the figure given below. The element is

Options :

1. ✖ Non linear, active, bilateral

2. ✖ Linear, active, bilateral

3. ✔ Non linear, active, unilateral

4. ✖ Non Linear, passive, unilateral

Question Number : 18 Question Id : 9230 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

The dual of parallel R-C circuit is a

Options :

1. ✖ Series R-C circuit

2. ✔ Series R-L circuit

3. ✖ Parallel R-C circuit

4. ✖ Parallel R-L circuit

Question Number : 19 Question Id : 9231 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

With respect to transmission parameters, which one of the following is correct?

Options :

1. ✔ A and D are dimensionless

2. ✖ B and D are dimensionless

3. ✖ A and B are dimensionless

4. ✖ B and C are dimensionless

Question Number : 20 Question Id : 9232 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

Consider

$$\dot{x}(t) = \begin{bmatrix} 0 & 2 \\ -2 & 0 \end{bmatrix} x(t)$$

find e^{At}

Options :

1. ✖ $\begin{bmatrix} 0 & e^{2t} \\ e^{-2t} & 0 \end{bmatrix}$

2. ✖ $\begin{bmatrix} e^{2t} & 0 \\ 0 & e^{-2t} \end{bmatrix}$

3. ✔ $\begin{bmatrix} \cos 2t & \sin 2t \\ -\sin 2t & \cos 2t \end{bmatrix}$

4. ✖ $\begin{bmatrix} \sin 2t & \cos 2t \\ -\cos 2t & \sin 2t \end{bmatrix}$

Question Number : 21 Question Id : 9233 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

Thermal runaway will take place if the quiescent point is such that

Options :

1. ✖ $V_{CE} < V_{CC}/2$

2. ✔ $V_{CE} > V_{CC}/2$

3. ✖ $V_{CE} < V_{CC}$

4. ✖ $V_{CE} < 2 V_{CC}$

Question Number : 22 Question Id : 9234 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

A 1ms pulse can be stretched to 1s pulse by using

Options :

1. ✖ Bistable multivibrator

2. ✖ An astable multivibrator

3. ✖ Schmitt trigger circuit

4. ✔ A monostable multivibrator

Question Number : 23 Question Id : 9235 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

The 3-dB cut-off frequency of a d.c. amplifier is 5MHz. Determine the rise time?

Options :

1. ✖ 35 nsec

2. ✖ 200nsec.

3. ✖ 350nsec.

4. ✔ 70nsec.

Question Number : 24 Question Id : 9236 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

The rectification efficiency of a half wave rectifier is

Options :

1. ✔ 40.6%

2. ✖ 20.3%

3. ✖ 45%

4. ✖ 81.2%

Question Number : 25 Question Id : 9237 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

Which of the following power amplifier is used to overcome cross-over distortion?

Options :

1. ✖ Class A

2. ✖ Class C

3. ✔ Class AB

4. ✘ Class B

Question Number : 26 Question Id : 9238 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

The cascode amplifier is a multistage configuration of

Options :

1. ✘ CC – CB

2. ✔ CE – CB

3. ✘ CB – CC

4. ✘ CE – CC

Question Number : 27 Question Id : 9239 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

An ideal op-amp is an ideal

Options :

1. ✘ Current controlled current source

2. ✘ Current controlled voltage source

3. ✔ Voltage controlled voltage source

4. ✘ Voltage controlled current source

Question Number : 28 Question Id : 9240 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

For a given op-amp, CMRR $= 10^5$ and differential gain $= 10^5$. What is
common mode gain of the op-amp?

Options :

1. ✘ 10^{10}

2. ✘ 10^5

3. ✘ 2×10^5

4. ✔ 1

Question Number : 29 Question Id : 9241 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

The Ebers-Moll model is applicable to

Options :

1. ✖ NMOS transistors

2. ✖ Unipolar junction transistors

3. ✔ Bipolar junction transistor

4. ✖ Junction field effect transistor

Question Number : 30 Question Id : 9242 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

The essential blocks of a phase lock loop (PLL) are phase detector, amplifier

Options :

1. ✖ High pass filter and crystal controlled oscillator

2. ✖ Low pass filter and crystal controlled oscillator

3. ✖ High pass filter and voltage controlled oscillator

4. ✔ Low pass filter and voltage controlled oscillator

Question Number : 31 Question Id : 9243 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

Group of 4 bits is known as

Options :

1. ✖ Bytes

2. ✖ Word

3. ✔ Nibble

4. ✖ Bit

Question Number : 32 Question Id : 9244 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

Which of the following is not a linear data structure?

Options :

1. ✖ Linked list

2. ✔ Tree

3. ✘ Array

4. ✘ Stack

Question Number : 33 Question Id : 9245 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

The principle of locality of reference justifies the use of

Options :

1. ✔ Cache memory

2. ✘ DMA

3. ✘ Interrupts

4. ✘ Virtual memory

Question Number : 34 Question Id : 9246 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

The wrapping of data and functions into a single unit is called as

Options :

1. ✘ Polymorphism

2. ✘ Abstraction

3. ✘ Modularity

4. ✔ Encapsulation

Question Number : 35 Question Id : 9247 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

In 'C' language, f = -9 is equivalent to

Options :

1. ✘ $f = -9$

2. ✔ $f = f - 9$

3. ✘ $-f = 9$

4. ✘ $f = 9 - 1$

Question Number : 36 Question Id : 9248 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

Which of the following interrupts has the lowest priority?

Options :

1. ✖ RST 7.5

2. ✖ RST 5.5

3. ✖ TRAP

4. ✔ INTR

Question Number : 37 Question Id : 9249 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

What is the direction of data bus?

Options :

1. ✖ unidirectional into microprocessor

2. ✖ unidirectional out of microprocessor

3. ✔ bidirectional

4. ✖ both (1) and (3)

Question Number : 38 Question Id : 9250 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

In microprocessor, the register which holds the address of the next instruction to be fetched is

Options :

1. ✔ Program counter

2. ✖ Instruction register

3. ✖ Stack pointer

4. ✖ Accumulator

Question Number : 39 Question Id : 9251 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

The number of output pins of a 8085 microprocessor are

Options :

1. ✖ 21

2. ✖ 40

3. ✗ 19

4. ✔ 27

Question Number : 40 Question Id : 9252 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

A typical cell, for a dynamic RAM can be implemented by using how many MOS transistors?

Options :

1. ✗ Six

2. ✔ One

3. ✗ Two

4. ✗ Five

Question Number : 41 Question Id : 9253 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

In NMOS if drain current $I_D = 1mA$ without channel length modulation effect. If due to channel length modulation, channel length is decreased by 25% . What is the new value of drain current?

Options :

1. ✗ 0.75mA

2. ✗ 0.25mA

3. ✔ 1.25mA

4. ✗ 25mA

Question Number : 42 Question Id : 9254 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

For an SCR dv/dt protection is achieved through the use of

Options :

1. ✗ RC in series with SCR

2. ✔ RC across SCR

3. ✗ RL in series with SCR

4. ✗ L in series with SCR

Question Number : 43 Question Id : 9255 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

The most suitable device for high frequency inversion in switch mode power supply is

Options :

1. ✔ MOSFET

2. ✘ BJT

3. ✘ GTO

4. ✘ Both (2) and (3)

Question Number : 44 Question Id : 9256 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

A DC line chopper as compared to AC link is

Options :

1. ✘ Efficient

2. ✘ Less costly

3. ✘ Bulky

4. ✔ Both (1) and (2)

Question Number : 45 Question Id : 9257 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

SCR turn-off from conducting state to blocking state on

Options :

1. ✘ Applying AC to gate

2. ✘ Reversing gate voltage

3. ✘ Reducing gate current

4. ✔ Reducing anode current below holding current value

Question Number : 46 Question Id : 9258 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

Microwave link repeaters are typically 50Km apart

Options :

1. ✗ because of atmospheric attenuation

2. ✗ because of output tube power limitations

3. ✓ because of the earth's curvature

4. ✗ to ensure that applied dc voltage is not excessive

Question Number : 47 Question Id : 9259 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

Responsivity of a photodiode is given by

(Where I_P = photocurrent generated, P_0 = incident optical power)

Options :

1. ✓ I_P/P_0

2. ✗ P_0/I_P

3. ✗ $I_P \times P_0$

4. ✗ $1/I_P P_0$

Question Number : 48 Question Id : 9260 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

Refractive index of glass is 1.5. Find the wavelength of a beam of light with frequency of 10^{14} Hz in glass. Assume velocity of light is 3×10^8 m/sec in vacuum.

Options :

1. ✗ 3mm

2. ✗ 3um

3. ✗ 2mm

4. ✓ 2um

Question Number : 49 Question Id : 9261 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

For a photodiode with a rise time of 2ns and a capacitance of 4pF, the bandwidth is

Options :

1. ✓ 175 MHz

2. ✖ 350 MHz

3. ✖ 500 MHz

4. ✖ 250 MHz

Question Number : 50 Question Id : 9262 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

Numerical aperture of the fiber is given by –

(n_1 = refractive index of core, n_2 = refractive index of cladding)

Options :

1. ✖ $\sqrt{(n_2^2 - n_1^2)}$

2. ✔ $\sqrt{(n_1^2 - n_2^2)}$

3. ✖ $1/\sqrt{(n_1^2 - n_2^2)}$

4. ✖ $1/\sqrt{(n_2^2 - n_1^2)}$

Question Number : 51 Question Id : 9263 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

A voltage of 1.70 volts is measured by an indicating instrument having a scale rang of 0 to 4V, if the instrument reads 1.65 volts then absolute error in the measurement is :-

Options :

1. ✖ $+ 2.0V$

2. ✔ $+ 0.05V$

3. ✖ $- 2.0\ V$

4. ✖ $- 0.05V$

Question Number : 52 Question Id : 9264 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

Pirani Gauge is used to measure

Options :

1. ✗ Very high pressure

2. ✗ Vibration

3. ✗ Flow

4. ✓ Low pressure

Question Number : 53 Question Id : 9265 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

Which one of the following method is used to measure very low resistance value

Options :

1. ✓ Kelvins double bridge

2. ✗ Wheatstone bridge

3. ✗ Ohm meter

4. ✗ Megger Method

Question Number : 54 Question Id : 9266 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

Which one of the following bridge is used to measure high Q coils

Options :

1. ✗ Wein bridge

2. ✓ Hay's bridge

3. ✗ Anderson's bridge

4. ✗ Maxwell inductance bridge

Question Number : 55 Question Id : 9267 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

Gauge factor of strain gauge is given by

(where L = longitudinal strain, D = latitudinal strain, R = resistance)

Options :

1. ✗ $(\Delta L/L)/(\Delta R/R)$

2. ✔ $(\Delta R/R)/(\Delta L/L)$

3. ✘ $(\Delta R/R)/(\Delta D/D)$

4. ✘ $(\Delta D/D)/(\Delta L/L)$

Question Number : 56 Question Id : 9268 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

What is the range of $2\frac{1}{2}$ digital meter?

Options :

1. ✘ 0 to 1999

2. ✔ 0 to 199

3. ✘ 0 to 990

4. ✘ 0 to 500

Question Number : 57 Question Id : 9269 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

Loading effect is due to

Options :

1. ✔ Low resistance

2. ✘ High resistance

3. ✘ High sensitivity

4. ✘ High range

Question Number : 58 Question Id : 9270 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

Which parameter is measured by Schering bridge –

Options :

1. ✔ Capacitance

2. ✘ Inductance

'Q' of a coil

3. ✖

4. ✖ Very small resistance

Question Number : 59 Question Id : 9271 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

Indicating instruments are always designed to be

Options :

1. ✖ Critically damped

2. ✖ Over damped

3. ✖ Undamped

4. ✔ Slightly under-damped

Question Number : 60 Question Id : 9272 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

Spring control mechanism has _____ scale

Options :

1. ✖ Non – uniform

2. ✔ Uniform

3. ✖ Cramped

4. ✖ Non–Uniform and cramped

Question Number : 61 Question Id : 9273 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

In case of over-modulation, the output of an envelope detector for sinusoid input is

(i). full wave rectified version of envelope

(ii). half wave rectified version of envelope

Options :

1. ✖ Both are correct

2. ✔ (i) is correct (ii) is incorrect

3. ✖ (i) is incorrect (ii) is correct

4. ✖ Both are incorrect

Question Number : 62 Question Id : 9274 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

When modulation index changes from 0 to 1 in case of tone modulation, then % increase in total power is

Options :

1. ✖ 25%

2. ✖ 33.3%

3. ✔ 50%

4. ✖ 66.6%

Question Number : 63 Question Id : 9275 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

Quadrature Null effect is associated with which modulation scheme?

Options :

1. ✖ SSBSC

2. ✔ DSBSC

3. ✖ VSB

4. ✖ FM

Question Number : 64 Question Id : 9276 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

Find the output of Hilbert transform if modulating signal $m(t) = 3\,\delta(t\text{-}3)$

Options :

1. ✔ $3/\pi(t\text{-}3)$

2. ✖ $(t\text{-}3)/3\pi$

3. ✖ $3/\pi\ \delta\ (t-3)$

4. ✖ $3/\pi t$

Question Number : 65 Question Id : 9277 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

An angle modulated signal is given as

$$S(t) = 2\cos[w_c\,t + 10\sin 1000\pi t + 20\sin 2000\pi t]$$

Find maximum phase deviation (φ_{max}) –

Options :

1. ✖ 10

2. ✖ 20

3. ✖ 15

4. ✔ 30

Question Number : 66 Question Id : 9278 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

A superheterodyne receiver is tuned at signal frequency of 1MHz, calculate the image frequency, if intermediate frequency is 455KHz –

Options :

1. ✖ 90 KHz

2. ✖ 910 KHz

3. ✔ 1910 KHz

4. ✖ 545 KHz

Question Number : 67 Question Id : 9279 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

For any suppressed carrier modulation system figure of merit (F) and output of receiver contains

Options :

1. ✖ F = 0 and quadrature phase component of narrow band noise

Question Number : 68 Question Id : 9280 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

For a stationary ergodic process x(t), if correlation is $R_x(\tau) = (4 + \tau)/(8 + 9\tau)$

Find mean (u_x) and variance (σ_x^2)

Options :

1. ✔ $u_x = 1/3, \sigma_x^2 = 7/18$

2. ✘ $u_x = 1/9, \sigma_x^2 = 1/6$

3. ✘ $u_x = 1/3, \sigma_x^2 = 1/6$

4. ✘ $u_x = 1/9, \sigma_x^2 = 7/18$

Question Number : 69 Question Id : 9281 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

The bandwidth of a PCM system is –

Where n = no. of bits to be encoded, f_s = sampling frequency

Options :

1. ✘ nf_s

2. ✔ $nf_s/2$

3. ✘ f_s/n

4. ✘ $f_s/2n$

Question Number : 70 Question Id : 9282 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

Consider a source 'X' that produces 4 samples with equal probability. What will be the information rate, if baud rate is 25 Ksamples/sec.

Options :

1. ✘ 100Kbps

2. ✖ 75Kbps

3. ✔ 50Kbps

4. ✖ 25Kbps

Question Number : 71 Question Id : 9283 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

The correct sequence of "Electron transport Mechanism" in forward bias condition is

Options :

1. ✖ Diffusion, Recombination, drift

2. ✖ Drift, Recombination, drift – diffusion

3. ✔ Drift, Drift-Diffusion, Recombination

4. ✖ Recombination, Drift diffusion, Drift

Question Number : 72 Question Id : 9284 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

Which of the following statement is correct–

Options :

1. ✔ Pure semiconductors have negative temperature coefficient of halls constant

2. ✖ Pure semiconductors have positive temperature coefficient of halls constant

3. ✖ Extrinsic semiconductors have negative temperature coefficient of halls constant

4. ✖ Impure semiconductors have negative temperature coefficient of halls constant

Question Number : 73 Question Id : 9285 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

Match List –I with List-II and select the correct answer using the code given below the lists :

List – I	List – II
A. Drift current	(i). law of conservation of charge
B. Einstein's equation	(ii) electric field
C. Diffusion current	(iii) Thermal voltage
D. Continuity equation	(iv) concentration gradient

Options :

1. ✖ A- (ii) B-(i) C- (iv) D- (iii)

2. ✖ A- (iv) B- (iii) C- (ii) D-(i)

3. ✖ A-(iv) B- (i) C- (ii) D- (iii)

4. ✔ A- (ii) B- (iii) C- (iv) D- (i)

Question Number : 74 Question Id : 9286 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

Gunn diode is a

Options :

1. ✖ Single junction device

2. ✔ Junction less device

3. ✖ Double junction device

4. ✖ Triple junction device

Question Number : 75 Question Id : 9287 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

The pinch off offered by V_{GS} causes the current

Options :

1. ✔ to become zero

2. ✖ to its maximum value

3. ✖ to saturate at constant value

4. ✖

Both (to its maximum value) and

(to saturate at constant value)

Question Number : 76 Question Id : 9288 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

MOSFET can be used as a

Options :

1. ✖ Current controlled capacitor

2. ✖ Voltage controlled inductor

3. ✔ Voltage controlled capacitor

4. ✖ Current controlled inductor

Question Number : 77 Question Id : 9289 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

In subthreshold region, the I_D - V_{DS} characteristics of a MOSFET are

Options :

1. ✖ Linear

2. ✖ Hyperbolic

3. ✖ Quadratic

4. ✔ Exponential

Question Number : 78 Question Id : 9290 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

Moor's law is applicable to

Options :

1. ✖ Power rating of device

2. ✖ Fan out of device

3. ✗ Speed of operation of MOS device

4. ✔ Level of integration of MOS device

Question Number : 79 Question Id : 9291 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

Which type of semiconductor is used in fabrication of light emitting diode?

Options :

1. ✗ Indirect band gap semiconductor

2. ✔ Direct band gap semiconductor

3. ✗ Individual type semiconductor

4. ✗ Elemental type semiconductor

Question Number : 80 Question Id : 9292 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

Which one of the following relationship is correct regarding emitter injection efficiency (γ), Base transport factor (B) and emitter current gain $(\propto)$

Options :

1. ✔ $\propto = B\gamma$

2. ✗ $B = \propto \gamma$

3. ✗ $\gamma = \propto B$

4. ✗ $\propto = B/\gamma$

Question Number : 81 Question Id : 9293 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

If vector field $\overline{B}$ is solenoidal, which one of these is correctType equation here.

Options :

1. ✗ $\nabla.\overline{B} \neq 0$

2. ✗ $\nabla \times \overline{B} = 0$

3. ✔ $\nabla . \overline{B} = 0$

4. ✘ $\S \ \overline{B}.\overline{dl} = 0$

Question Number : 82 Question Id : 9294 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

Wave guide is analogous to

Options :

1. ✔ High pass filter

2. ✘ Low pass filter

3. ✘ All pass filter

4. ✘ Band pass filter

Question Number : 83 Question Id : 9295 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

Circuit representation of cavity resonator is similar to

Options :

1. ✘ RLC series circuit

2. ✔ LC circuit

3. ✘ RL circuit

4. ✘ RC circuit

Question Number : 84 Question Id : 9296 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

The dominant mode of rectangular waveguide where b $^>$ a

Options :

1. ✘ TE_{11}

2. ✘ $\S\ TE_{10}$

3. ✔ TE_{01}

TE_{00}
4. ✖

Question Number : 85 Question Id : 9297 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

Which one of the following antenna is frequency independent ?

Options :

Log periodic antenna
1. ✔

Helical antenna
2. ✖

Isotropic antenna
3. ✖

Omnidirectional antenna
4. ✖

Question Number : 86 Question Id : 9298 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

The microwave power is measured by using-

Options :

Circulator
1. ✖

Isolator
2. ✖

Bolometer
3. ✔

Attenuator
4. ✖

Question Number : 87 Question Id : 9299 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

The radiation resistance of a half wave dipole antenna is

Options :

1. ✖ $36.5 \, \Omega$

2. ✔ $73 \, \Omega$

3. ✖ $76 \, \Omega$

4. ✖ $100 \, \Omega$

Question Number : 88 Question Id : 9300 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

A rectangular waveguide has dimensions 1cm × 0.5cm. Its cut-off frequency is:

Options :

1. ✖ 5 GHz

2. ✖ 10 GHz

3. ✔ 15 GHz

4. ✖ 12 GHz

Question Number : 89 Question Id : 9301 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

A transmission line is said to be lossless when

Options :

1. ✔ wL >> R and wC >> G

2. ✖ LG = RC

3. ✖ C = 0 and R = 0

4. ✖ L = 0 and C = 0

Question Number : 90 Question Id : 9302 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

Which one of the following is an avalanche transit time device –

Options :

1. ✔ IMPATT

2. ✖ Gunn diode

3. ✖ Tunnel diode

4. ✖ Varactor diode

Question Number : 91 Question Id : 9303 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

The transfer function G(S) of a PID controller is

Options :

1. ✗ $K[1 + T_i s + T_d s]$

2. ✗ $K[1 + T_i S + 1/T_d s]$

3. ✗ $K[1 + 1/T_i s + 1/T_d s]$

4. ✓ $K[1 + 1/T_i s + T_d s]$

Question Number : 92 Question Id : 9304 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

The laplace transform of a transportation lag of 10 seconds is

Options :

1. ✓ $1/(s+10)$

2. ✗ $\exp(-s/10)$

3. ✗ $\exp(10s)$

4. ✗ $\exp(-10s)$

Question Number : 93 Question Id : 9305 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

What is the response of first order system when unit step input is applied –

Options :

1. ✗ $\frac{1}{\tau} e^{-t/\tau}$

2. ✓ $1 - e^{-t/\tau}$

3. ✗ $t - \tau e^{-t/\tau}$

4. ✗ $1 - \tau e^{-t/\tau}$

Question Number : 94 Question Id : 9306 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

The open loop transfer function of a unity feedback system is $G(S) = \frac{10(S+1)}{S^2(S+10)}$.

The steady state error for input $r(t) = 10 + 6t + 2t^2$

Options :

1. ✗ 0

2. ✔ 4

3. ✗ 8

4. ✗ ∞

Question Number : 95 Question Id : 9307 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

The root locus of the system $G(S) \, H(S) = \frac{K}{S(S+2)(S+3)}$ has the break-away point

located at

Options :

1. ✗ $(-0.5, 0)$

2. ✗ $(-2.548, 0)$

3. ✗ $(-4, 0)$

4. ✔ $(-0.784, 0)$

Question Number : 96 Question Id : 9308 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

The open loop transfer function of a unity feedback system is given by $\frac{K}{S(S+1)}$.

If the value of gain 'K' in such that the system is critically damped, the closed loop poles of the system will be at

Options :

1. ✗ $0.5 \pm j\, 0.5$

2. ✔ $-0.5, -0.5$

3. ✗ $\pm j\, 0.5$

4. ✗ 0 and -1

Question Number : 97 Question Id : 9309 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

For standard 1st order system and 2nd order system the gain margin is

Options :

1. ✖ 1

2. ✔ ∞

3. ✖ 0

4. ✖ 0.5

Question Number : 98 Question Id : 9310 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

The open loop transfer function $G(S) = \frac{K(S-1)}{S^2}$ of a unity negative feedback system is given. Determine the number of encirclement in Nyquis plot for gain $K = 2$

Options :

1. ✖ 0

2. ✖ 1

3. ✔ -1

4. ✖ ∞

Question Number : 99 Question Id : 9311 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

The lead compensator transfer function $G_c(S) = \frac{S+1}{S+2}$ is given. Find the frequency (ω_m) at which this provides maximum phase shift

Options :

1. ✖ $1/\sqrt{2}$

2. ✖ 2

3. ✖ 1/2

4. ✔ $\sqrt{2}$

Question Number : 100 Question Id : 9312 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

The unit step response of a 2nd order system is given by

$$C(t) = 1 - \frac{e^{-6t} sin}{\sqrt{1-\varepsilon^2}} (8t + \theta),$$

damping ratio (ε) and undamped natural frequency (w_n) respectively are-

Options :

1. ✖ 0.1   60

2. ✔ 0.6   10

3. ✖ 0.6   5

4. ✖ 0.8   10