Total No. of Printed Pages : 13 (DO NOT OPEN THIS QUESTION BOOKLET BEFORE TIME OR UNTIL YOU ARE ASKED TO DO SO) SET-Y Ph.D-EE-December, 2024 **Electronics & Communication Engineering** 10013Sr. No.

Time : 11/4 Hours

Max. Marks : 100

Total Questions : 100

Roll No. (in figures)	(in words)	
Name	Date of Birth	
Father's Name	Mother's Name	•
Date of Examination	·	
(Signature of the Candidate)		(Signature of the Invigilator)

CANDIDATES MUST READ THE FOLLOWING INFORMATION/INSTRUCTIONS BEFORE STARTING THE QUESTION PAPER.

1. All questions are compulsory.

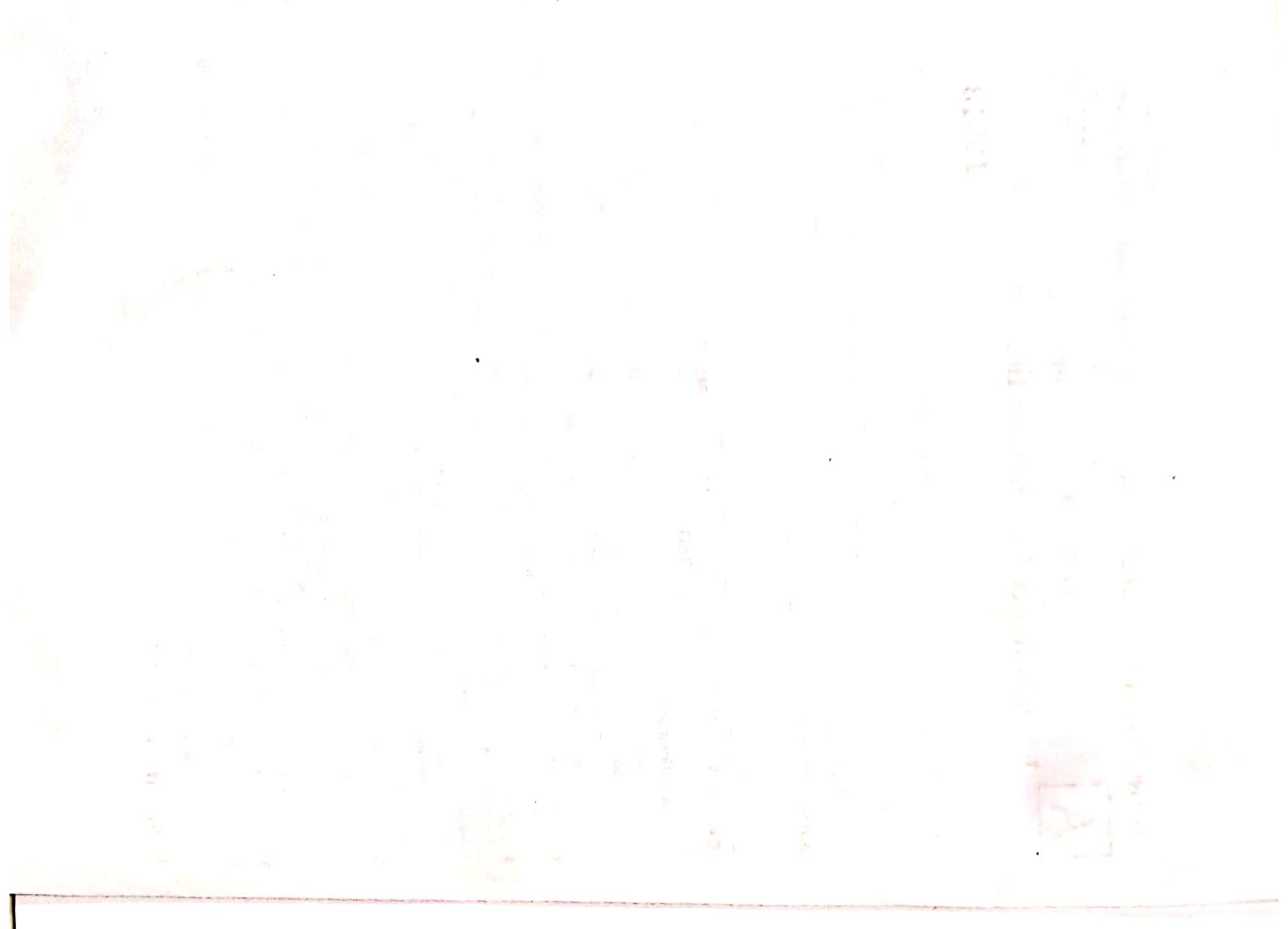
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Æ હ E C 28) Mean Mean Mean Mean 11 11 11 1 = 27.25, Median = 27, Mode = 26 = 27.25, Median = 26, Mode = 27 = 32, Median = 29, Mode = 28 = 29, Median = 32, Mode = 26

Determine ~ he mean, median and mode values for the set : {26, 31, 21, 29.

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Which of th e following is obtained by evaluating $\int_C (z-3)^n dz$ where C is $\sum_{c} C$

œ 2 Ξ હ Which of Stoke's Green's 5 theorem theorem ie following theorems use the curl operation ? (2) Gauss Divergence(4) Maxwell equation Gauss Divergence theorem

3 Ξ 221 ~.> + + 3 $2y\hat{j} + 2z\hat{k}$ ×, £ 2 $2\hat{i} + 2\hat{j} + 2\hat{k}$ $4x\hat{i} + 2y\hat{j} + 4z\hat{k}$

Ģ Find the 4 adient of the function given by $x^2 + y^2 + z^2$ at (1, 1, 1):

ω Double gradient operation (2) Curl operation(4) Null vector Curl operation

Ś Div Ξ ergence of gradient of a vector function is equivalent to : aplaci ian operation

Ξ 0

4 If f(0) 3 $f'(x) = (x)^{-1} dx$ $x^{2}+2$ ω the lower bound of f(2) estimated by mean

Ξ -

ω What is 5 e rank of the matrix A= 2 ŝ 2

N 0 -CD. 8 ŝ C . 0 S

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Find ž

Sigenvalues for the following 2×2 matrix :

8

2) 2, -1 હ S S (4) 4, 0

ins are tossed at once. (2) 3/8 What is the probability of getting exactly 2 tail હ 2/8 £ 14

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2 N 4 10 ය ŝ 8 Ð

4

(2) 7 (3) 12 £ S

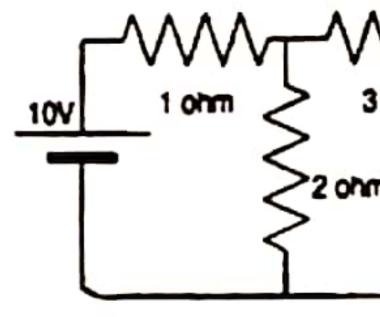
3 N 3 -(4) 0





- **10.** In a Binomial Distribution, if p, q and n are probability of success, failure and number of trials respectively then variance is given by .. $(3) np^{2}$ (2) *npq* (1) np
- **11.** If Event A and Event B are mutually exclusive, what is P(A|B)? (1) P(A) + P(B)(4) 0 (3) P(A) * P(B)
- 12. For which value of x will (x 1)(3 x) have its maximum? (3) 2 . (2) 1 (1) 0

13. Calculate the current across the 4 ohm resistor.



(1) 1.23 Amp

(2) 0 Amp

(4) 0.67 Amp (3) 0.86 Amp

14. A DC source of EMF E volts and internal resistance R ohms is connected to a variable load and it is adjusted such that the load absorbs maximum power from the source. The maximum power delivered from the source to the load is :

(1)
$$\frac{E^2}{2R}$$
 (2) $\frac{E^2}{4R}$ (3) $\frac{2}{4R}$

- If there are 5 branches and 4 nodes in the graph, then the numbers of mesh equations 15. that can be formed are?
 - (2) 4 (3) 6 (1) 2
- In a series RLC circuit, the phase difference between the current in the capacitor and 16. the current in the resistor is? (2) 90 degree (3) 18 (1) 0 degree
- In a series RL circuit, voltage across resistor and inductor are 3 V and 4 V respectively, 17. then what is the applied voltage? (2) 5 (3) 4 (1) 7

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(2) P(A) - P(B)

(4)

(4) 8

80 degree	(4)	360	degree
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(4) 3

Α

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18.

- (1) Z-transform
- (3) Laplace transform (4) All of these
- Discrete Fourier Transform is applicable to : 19. (1) Infinite sequences
- 20.

(1)
$$\frac{e^{-at}}{a^2}$$

(1) 70

(1)
$$\frac{dX(f)}{df}$$

- 23. Damped oscillations (3) Sustained oscillations

(3)

Transfer function of a system is defined as the ratio of output to input in : (2) Fourier transform

- - (2) Finite discrete sequences
- (3) Continuous infinite signals (4) Continuous finite sequences
- The autocorrelation of $x(t) = e^{-at}u(t)$ is

2)
$$\frac{e^{-at}}{2a}$$
 (3) $\frac{e^{-a\tau}}{a^2}$ (4) $\frac{e^{-a\tau}}{2a}$

21. For any given signal, average power in its 6 harmonic components is 10 mW each and the fundamental component also has 10 mW power. Then, average power in the periodic signal is

> (2) 60 (3) 10 (4) 5

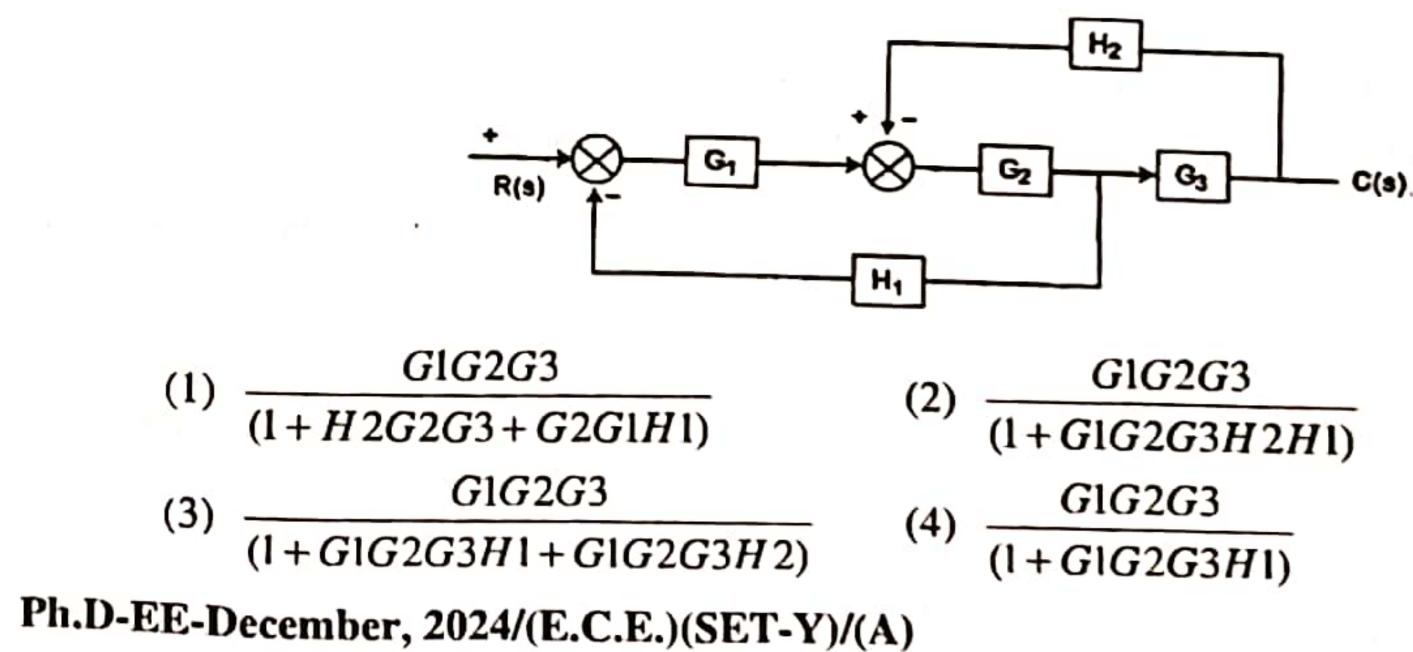
22. The Fourier transform (FT) of a function x(t) is X(f). The FT of $\frac{dx(t)}{dt}$ will be :

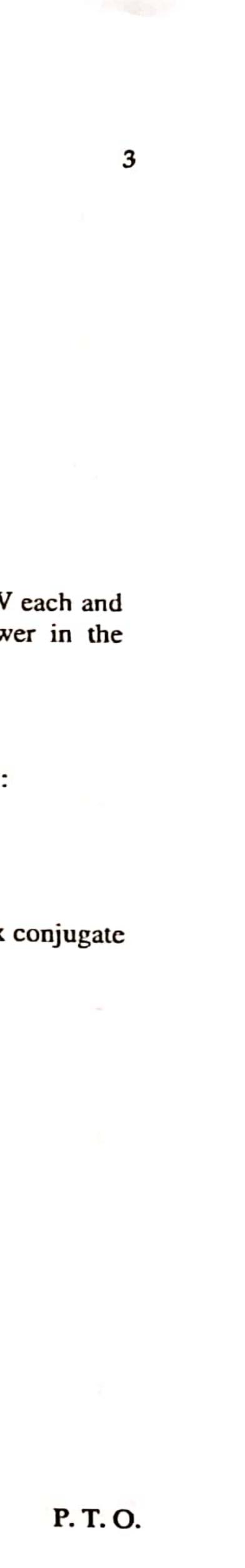
(4) $\frac{X(f)}{if}$ (2) $2\pi j f X(f)$ (3) X(f) jf

Which oscillations will be generated in the time domain response, if complex conjugate poles are present with a negative real part?

(2) Undamped oscillations (4) No oscillations

24. Determine the transfer function of the given system :







Ph.D-E	3 3	32.	<mark>31</mark> .	<mark>30.</mark>		29.	28.		27.	26.		25
EE-December, 2024/(E.C.E.)(SET-Y)/(A)	The solar incident light on the cell breaks cc (1) Thermal expansion (2) Breakd (3) Thermal equilibrium (4) Nickel	The phenomenon leading to avalanche breakdown as	 A BJT is a : (1) Current -Controlled device (2) Voltag (3) Power- Controlled device (4) Field- 	What is the value of current when the gate to source voltage? (1) 1 A (2) 5 A (3) 100 A	AF V	Field Effect Transistor (FET) is an unipolar device b (1) Vne of one polarity is used	The depletion width of a Si p-n junction at a rever reverse bias is increased to 20 V, the depletion widt (1) 4.0 μm (2) 3.2 μm (3) 2.8 μn	 Holes have higher velocity Electrons have higher mobility than holes Electrons have higher diffusivity than holes Electrons have higher effective mass than holes 	 N-channel FETs are preferred to p-channel FETs be 	 An intrinsic semiconductor at absolute zero temper (1) A perfect conductor (2) A per (3) A super conductor (4) An an 	6	• The step error coefficient of a system $G(s) = \frac{1}{(s+2)}$

umplifier erse ole. with unity feedback is : 2)(s+3)down B ge ŝ 30. th will be : rature behaves like : ondition of the diode's junction. rfect Insulator t ionization ecause : because : plating Controlled device in reverse-biased diodes is known voltage is less than the pinch off bias of 10 V Controlled device (4) 0A 4 (4) 1 2.4 µm is 2 μm. When the

39.

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0

37. 36. 35. 34. act as : (1) 1.11 (1) Si (1) 4.5 mA $I_{\rm B} = 95 \,\mu \text{A}$ Calculate -

3 Ξ If a capacitor Multipli

Integrat

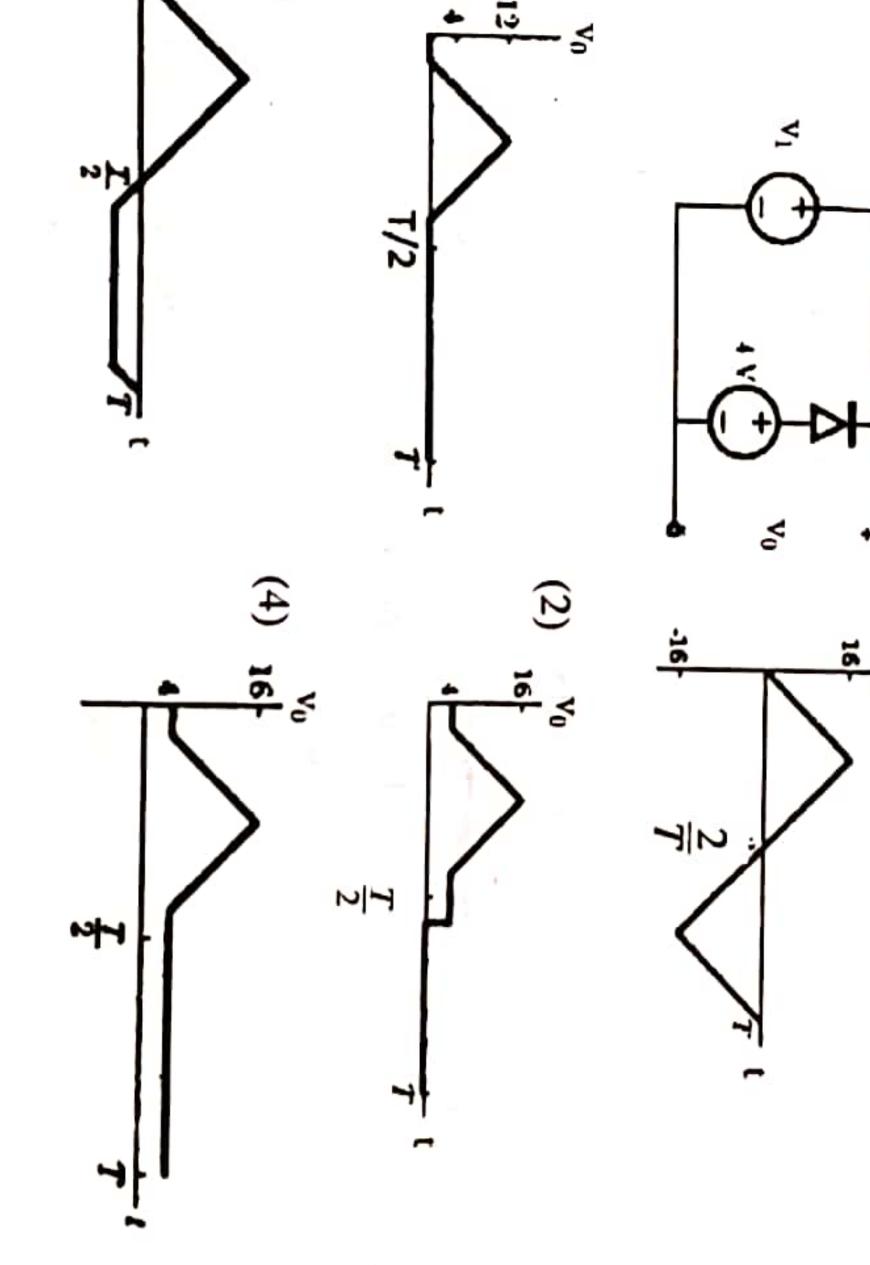
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Which of the following materials cannot be used as solar cells materials ? 2 GaAs 3 CdS (4) PbS

he value of emitter current for a transistor α_{dc} 11 0.98, I_{сво} 11

5

Ripple factor of the half wave rectifier is nearly

is placed in the feedback path of an Op-amp circuit, then the Q.

If an Op-amp CMRR woul ld be has 2 common mode gain of 0.01 and a differential gain of

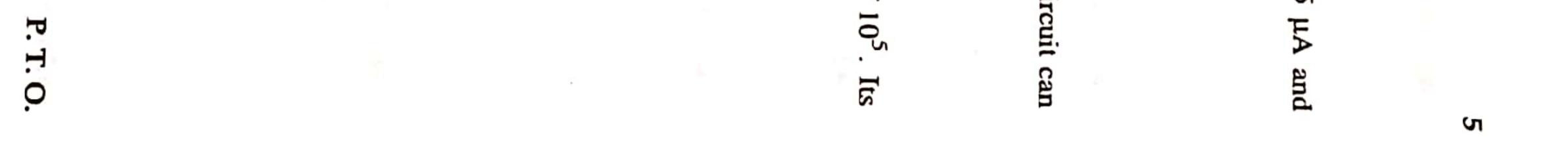
(2) Infinite (3)
$$10^{-3}$$
 (4) 10^{7}

Determine th ie output waveform from the given circuit and input waveform.

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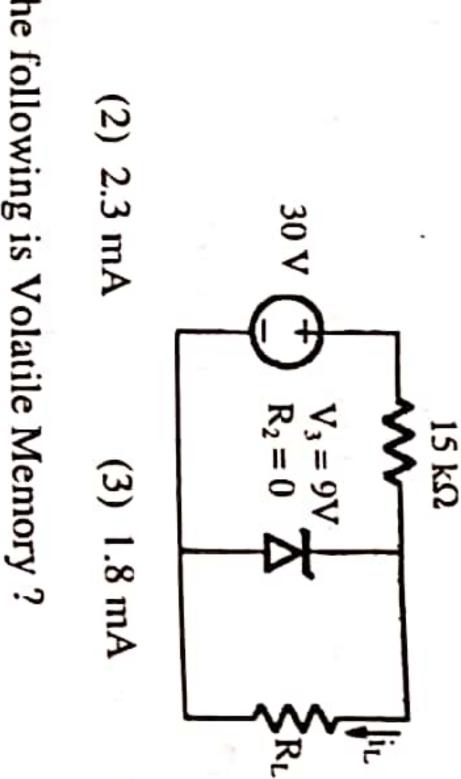
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40-The maximum load current that can be drawn to



<u>4</u>3-42. 4-Ξ (3) In ROM ω Where the result of an arithmetic and logical operation are stored ? Ξ Fan-in and Fan-out are the characteristics of Ξ Which among the following is Volatile Memory ? In Accumulator RAM Sequential Circuits Registers (2) ROM **4** <mark>(</mark>2) 4 **(**2 (3) DROM : In Instruction Registry In Logic families **Combinational Circuits** Cache Memory **4**

4 input but also on the past outputs are called ... The logic circuits whose outputs at any instant of time depends not only on the present

(3)	(1)
Sequential circuits	Combinational circuits
	(2)
-	T

-

Ξ

1.4 mA

9

from the following circuit is

4 2.5 mA

EPROM

lip-flops

atches,

Which of the following logic families has the shortest propagation delay ?

£ 74SXX

Which of the following describes the operation of a positive edge-triggered D flip-flop ? If both inputs are HIGH, the output will toggle.

46.

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CMOS

2

BiCMOS

(3) ECL

The output will follow the input on the leading edge of the clock.

When both inputs are LOW, an invalid state exists

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The input is toggled into the flip-flop on the leading edge of the clock and is to the output on the trailing edge of the clock. passed

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47. The circuit of the

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52. Ξ Э A digital multiplexer is a combinational circuit that selects One digital information from several sources and transmits the

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Mod 3

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Mod 8

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Decade

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Mod 6

The given

51. 50. Ξ of a bit of 5.78 µ

<u>(</u>

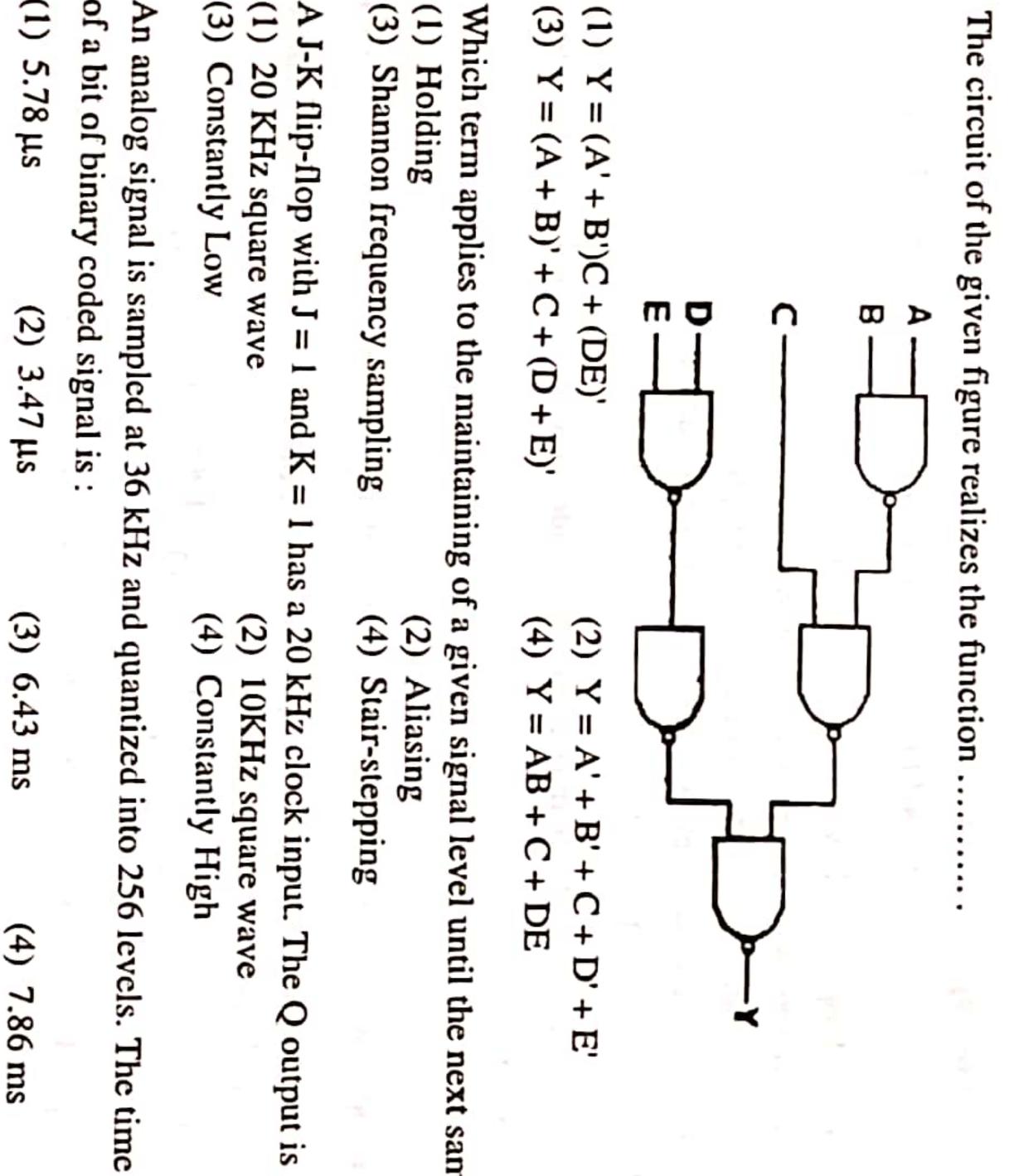
49. Ξ

A J-K flip

မြ Ξ Holding

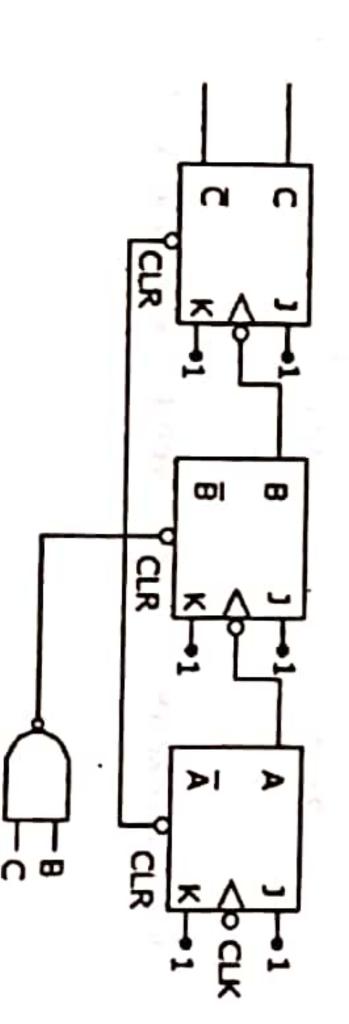
48. 3 Y = (

Э ĸ 11 $\overline{}$



ະ <u>(</u> 3.47 µs છ 6.43 ms

figure shows which type of counter ?



er,

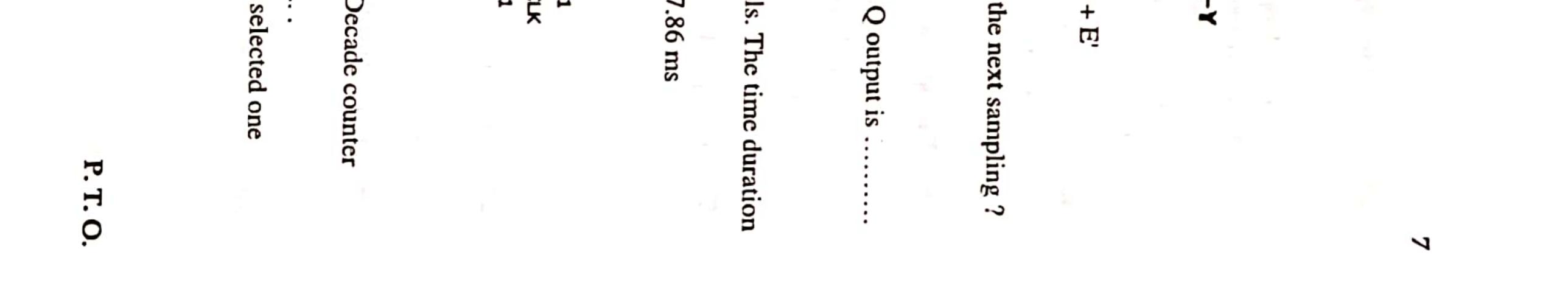
Ph.D-EE-Decemb Many Many Many decimal outputs decimal inputs and transmits the selected information digital information and convert them into one and accepts the selected information

3

<u>(</u>2

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CS CamScanner

59.	58.	57.	56.	55,	54.
(1) $-2,(-1, -2)$ (2) 2, (-1, 2) A system with the polynomial $s^4 + 5s^3$ (1) Unstable (3) In equilibrium	(1) $\frac{4}{13}$ (2) 4 (3) $\frac{4}{9}$ Calculate the poles and zeroes for the given transfer f	operated in unity feedback configuration, then the let the control system is : (1) $\frac{10(s+4)}{(s+2)}$ (2) $\frac{10(s+2)}{(s+10)}$ (3) $\frac{10(s-2)}{(s+10)}$ The open loop DC gain of an unity negative feedback function $\frac{s+4}{s^2+7s+13}$ is :	The open loop transfer function of a	The frequency at which maximum frequency. (1) Comer (2) Resonant	 The open-loop control system is one in which : (1) The output is dependent on the control input (2) The output is independent of the control input (3) Only system parameters have an effect on the control input (4) Output is independent to input
 (3) 2,(1, 2) 5s³ + 3s² + 6s + (2) Margin: (4) Stable 	$\begin{array}{c} (3) \frac{4}{9} \\ \hline 9 \end{array}$	ation, then the length of the feedback lengt	l plant is given	maximum amplitude ratio lesonant (3) Cross o	in which : ontrol input control input effect on the cor

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Convolutional coding 4 3 CRC Hamming coding coding

Ξ Block coding

60. is used to decode the data encoded by ... Viterbi decoding is one of the most commonly used techniques

'n

modern systems that

53

Convert binary number into gray code :

100101.

Ξ

101101

2

001110

(3) 1101

8

4 111001

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61.

modulation

control output

tio S attained IS called the

over 4 Natural

<u>64</u>

In a

property :

ä lead compensator that can stabilize as, G(s)11 (52 1 If the plant is

65.

10) 2) 4 10(s-1)(s + 2)

ack system with closed-loop transfer

4 13

67.

modulation

er function G(s)11 (s² 5(s + 2)+ S + 2

2 4 ċ (1, <u>v</u>

68.

Ξ

0.4

S = 0 is

s +

inally stable

Calculate power in each sideband, if power of carrier wave is 176W and there in amplitude modulated signal ?

(1) 13.36 W (2) 15.84 W (3) 52 W (4) 176 W

 100Ω and 25Ω respectively. The characteristic impedance of the line is : magnitude of open circuit and short circuit input impedances of a transmission line (2) 50 Ω (3) 75 Ω (4) 100 Ω

probability of error, binary coherent FSK is inferior to binary coherent PSK

63.

At a given

by

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6 dB

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25 D

are

62.

The

(2) 5 (2)	נ
(J) Z dB)
(4) U dB	

communication system, x.y = 0, then these waveforms are said to be : when two finite-power waveforms x(t) and y(t)

Poynting vector signifies : (1) Identical (2) Overlap (3) Similar £ Orthogona

Current Power density vector producing electromagnetic field Power density vector producing electrostatic field Current density vector producing electromagnetic field density vector producing electrostatic field

Folded dipole antenna belongs to which type of antenna ?

66.

4

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(1) Reflector (2) Aperture (3) Lens (4) Wire

An AM wave is given by $S_{AM}(t)=10 (1 + 0.4 \cos 10^3 t + 0.3 \cos 10^4 t) \cos 10^5 t$ index is :

(2) 0.5 (3) 0.3 (4) 0.9

then the bandwidth of the multiplexed signal will be : 10 signals, each band-limited to 5 KHz are to be transmitted over a single channel by frequency division multiplexing. If AM-SSB modulation guardband of 1 KHz is used,

(2) 60 KHz (3) 59 KHz (4) 61 KHz

A signal $X(t) = 100 \cos (24 \times 10^3) t$ is ideally sampled with a sampling period of 50

69.

(1) 79 KHz

of the following frequencies is/are present at the filter output ? passed through an ideal low pass filter with a cut off frequency of

12 KHz KHz only 2

KHz 4

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12 KHz and 8 KHz

8 KHz only

and 9

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Which

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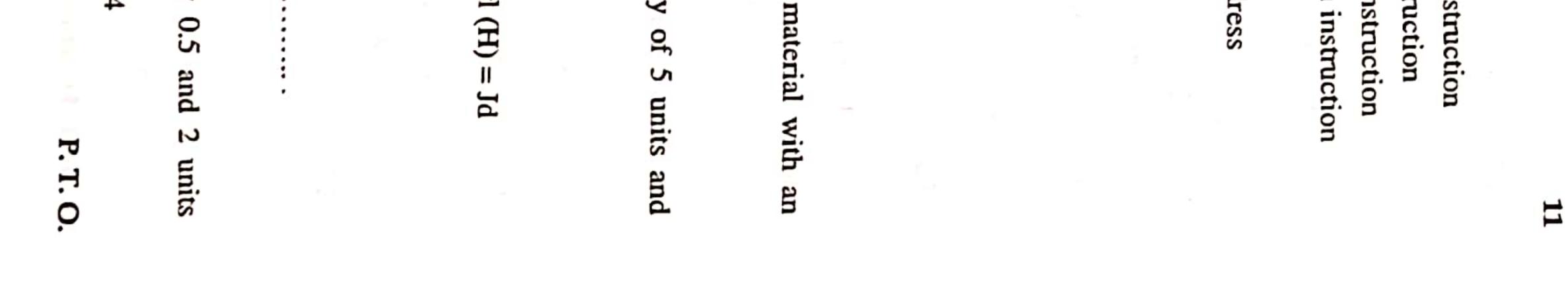
-										10
	80 .	79.	78.	77.	76.	75,	74.	73.	, , ,	0
4/(E.C.E.)(SET	This effect is known (2) Aliasing	101101 t to digi	A successive approximation A digital output for an analog inp	When does the transistor act like an o (1) cut off region (3) saturated region	Efficiency of a centre tapped full wave rectifier is (1) 50.2% (2) 44.5% (3) 70.1		(1) 1 (2) -2 (3) Convert 1100101 ₂ into an octal base system. (1) 145 ₈ (2) 340 ₈ (3)	I _c is the dc collector current of a BJT = 2 r Given $h_{fe} = 100$, the value of h_{ie} is given by (1) 125 Ω (2) 25 Ω (2) Determine the initial value of $x(t)$. The Lap	In a twin wire transmission line in air the 27.5 cm. The operating frequency is : (1) 300 MHz (2) 1 GHz The depth of the penetration of a wave in (1) Conductivity (2) Permeability	
 ? (2) Immediate Mode (4) Register Mode (4) Register Mode 	 (3) Fading (4) Attent 	(3) 01101011 (4) Insufficient signals in a communication syste	ter h V ?	an open switch ? (2) inverted region (4) active region	ve rectifier is : (3) 70.1% (4) 81.2%	 10ise : (2) varies with inverse of frequency (4) is constant with frequency 	 (3) 5 (4) 0 (3) 257₈ (4) 150₈ 	= 2 rnA at room temperature where kT/q=25 mV (3) 1250 Ω (4) 2500 Ω (4) 2500 Ω 1 Laplace transform $X(s) = \frac{1}{(s^2 + 5s - 2)}$	r the adjacent voltage maxima are a (3) 2 GHz (4) 6.28 GI e in a lossy dielectric increases with (3) Wavelength (4) Permitt	
										A
 90. The cut off wavelength and the guided wavelength are given by 0. respectively. Find the wavelength of the wave : (1) 0.48 (2) 0.32 (3) 0.45 (4) 0.54 Ph.D-EE-December, 2024/(E.C.E.)(SET-Y)/(A) 	 (3) Frequency meter (4) Spectrum analyzer (5) If there are no any reflections, then the value of the SWR will be (1) 1 (2) 0 (3) ∞ (4) 2 	ng is not used in the VSV on (2)	 87. The Maxwell second equation that is valid in any conductor is : (1) Curl(H) = Jc (2) Curl(E) = Jc (3) Curl(E) = Jd (4) Curl (F) 	 86. Find the loss tangent of a material with conduction current density of l0 units. (1) 2 (2) 0.5 (3) 5 (4) 10 	1.5 units. .5/5 (3) 5/4.5 (4	si ci	 (1) Frequency modulation (2) Population inversion (3) Total internal reflection (4) Doppler Effect 84. The optical source used for detection of optical signal is 	5, RI does 5 to the address of R1 and sto cof R1 and stores it in R1 cation 45 and adds that cont at memory location to 45	 81. How is the effective address of base-register calculated ? (1) By addition of implied register contents to the partial address in instruct (2) By addition of index register contents to the partial address in instruct (3) By addition of index register contents to the complete address in instruct (4) By addition of implied register contents to the complete address in instruct 	

uction Istruction instruction truction

of 5

(H) =

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Ph.D-H	100.	99.		98.	97.	96.	95.		94.	93.	92.	91.
-EE-December, 2024/(E.C.E.)(SET-Y)/(A)	Entropy is when both messages are (1) Maximum (2) Minimum (3)	The reverse bias current in a p-n diode is due(1) Minority carriers(2)(3) Electrons only(4)	of: (1) Bandwidth (3) Attenuation	(1) 2T (2) 1/2T (3) T/2 The technique OTDR (Optical time domain rafloctory	- The minimum Nyquist bandwidth for the rectangular is :	 If each pulse of the sequence to be detected is in detected without ISI. (1) Sine (2) Cosine (3) Sinc 	Solution Science Scie	(1) 5m (2) 0.25m (3) 0.50m	4. What is the length of the half-wave dipole with bandwidth of the half-wave dipole with bandwidth.	3. Find the power radiated by an antenna whose operating with 3A of current at 2GHz frequency? (1) 900W (2) 1800W (3) 450W	 A linear antenna having length less than λ/8 (1) Short monopole (2) (3) Half-wave dipole (4) 	 The product of the phase and the group velocities is given (1) Speed of light (2) Speed of (2) S
	equally lik 0	to : Majority (Holes onl	Core dian Cladding		gular	5	S ₂₁ ar II be t	Ħ	bandy	? ? W	is called a Short dip Quarter-v	ities is giv Speed of (speed of

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	y likely. (4) 1/2
	only
	diameter ling diameter
	ometry) is used for the measurement
	(4) 2/T
	(4) Square ular spectrum in raised cosine filter
	shape, t
	(4) $S_{11} = S_{22}$
	n (4) 2.5m 21 and S_{22} , if the transmission line is
	andwidth 20MHz and Quality factor
	V (4) 700W
	radiation resistance is 100Ω and
	t dipole ter-wave monopole
Þ	e oiven by the :

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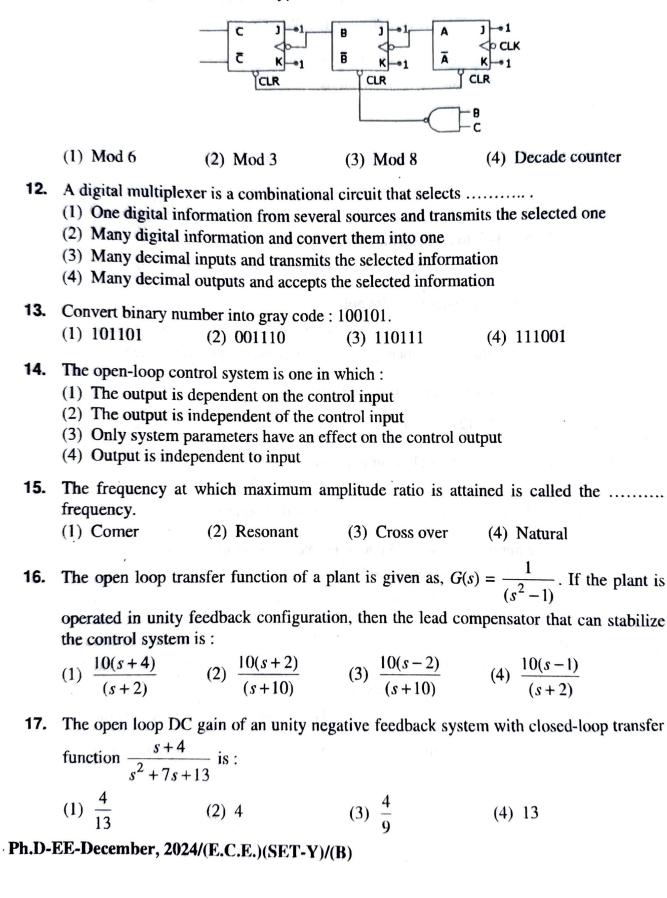
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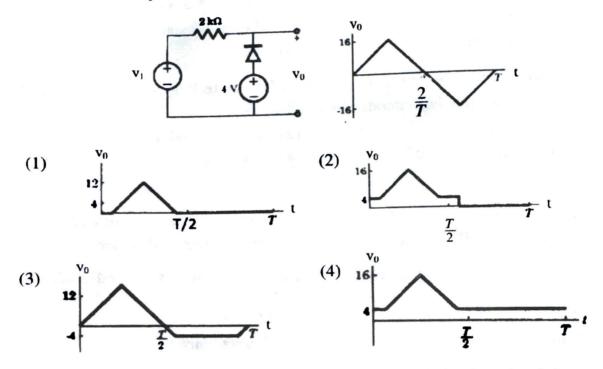
1. The depth of the penetration of a wave in a lossy dielectric increases with increasing : (4) Permittivity (1) Conductivity (2) Permeability (3) Wavelength 2. I_C is the dc collector current of a BJT = 2 rnA at room temperature where kT/q=25 mV. Given $h_{fe} = 100$, the value of h_{ie} is given by : (4) 2500 Ω (1) 125Ω (2) 25Ω (3) 1250Ω 3. Determine the initial value of x(t). The Laplace transform $X(s) = \frac{1}{(s^2 + 5s - 2)}$: (4) 0(3) 5 (2) - 2(1) 1 4. Convert 1100101₂ into an octal base system. $(4) 150_8$ $(3) 257_8$ $(2) 340_8$ $(1) 145_8$ 5. The power spectral density of white noise : (2) varies with inverse of frequency (1) is dependent on frequency (4) is constant with frequency (3) varies with square of frequency 6. Efficiency of a centre tapped full wave rectifier is : (4) 81.2% (3) 70.1% (2) 44.5% (1) 50.2% 7. When does the transistor act like an open switch ? (2) inverted region (1) cut off region (4) active region (3) saturated region 8. A successive approximation A/D converter has a resolution of 20 mV. What will be its digital output for an analog input of 2.17 V ? (4) Insufficient data (3) 01101011 (2) 01101101 (1) 01101100 9. An important impairment to digital signals in a communication system is the irregularities in timing caused by imperfections in clock extraction and waveform regeneration. This effect is known as (4) Attenuation (3) Fading (2) Aliasing (1) Jitter Which addressing mode executes its instructions within the CPU without the necessity 10. of reference memory for operands ? (2) Immediate Mode (1) Implied Mode (4) Register Mode (3) Direct Mode Ph.D-EE-December, 2024/(E.C.E.)(SET-Y)/(B) P. T. O. 11. The given figure shows which type of counter ?



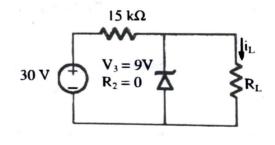
18. Calculate the poles and zeroes for the given transfer function $G(s) = \frac{5(s+2)}{(s^2+3s+2)}$ (4) -2, (1, -2)(1) -2, (-1, -2) (2) 2, (-1, 2) (3) 2, (1, 2) **19.** A system with the polynomial $s^4 + 5s^3 + 3s^2 + 6s + 5 = 0$ is : (2) Marginally stable (1) Unstable (3) In equilibrium (4) Stable 20. Viterbi decoding is one of the most commonly used techniques in modern systems that is used to decode the data encoded by (2) Hamming coding (1) Block coding (4) CRC coding (3) Convolutional coding 21. A BJT is a : (2) Voltage - Controlled device (1) Current -Controlled device (4) Field- Controlled device (3) Power- Controlled device 22. The phenomenon leading to avalanche breakdown in reverse-biased diodes is known as (2) Mode hopping (1) Auger recombination (4) Extract ionization (3) Impact ionization 23. The solar incident light on the cell breaks condition of the diode's junction. (2) Breakdown (1) Thermal expansion (4) Nickel plating (3) Thermal equilibrium 24. Which of the following materials cannot be used as solar cells materials ? (4) PbS (3) CdS (2) GaAs (1) Si 25. Calculate the value of emitter current for a transistor $\alpha_{dc} = 0.98$, $I_{CBO} = 5 \ \mu A$ and $I_B = 95 \mu A$ (4) 10 mA (3) 3.5 mA (2) 5 mA(1) 4.5 mA 26. Ripple factor of the half wave rectifier is nearly (3) 1.21 (4) 0.5(2) 0.87(1) 1.11 27. If a capacitor is placed in the feedback path of an Op-amp circuit, then the circuit can act as : (2) Differentiator (3) Multiplier (4) Divider (1) Integrator Ph.D-EE-December, 2024/(E.C.E.)(SET-Y)/(B) P. T. O.

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- If an Op-amp has a common mode gain of 0.01 and a differential gain of 10^5 . Its 28. CMRR would be (4) 10^7 $(3) 10^{-3}$
 - (1) 0(2) Infinite
- Determine the output waveform from the given circuit and input waveform. 29.



30. The maximum load current that can be drawn from the following circuit is



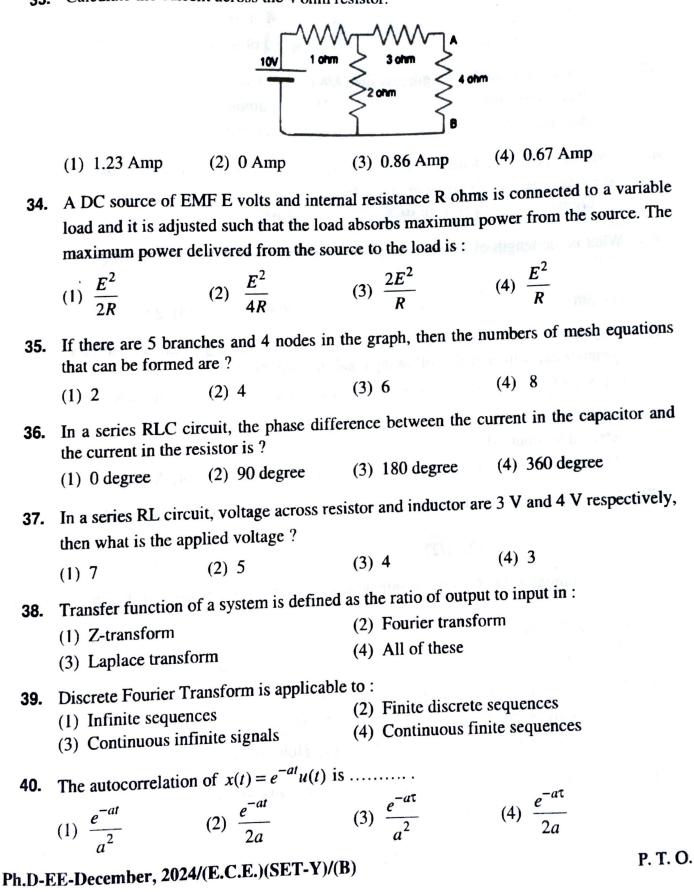
(1) 1.4 mA (2) 2.3 mA (3) 1.8 mA (4) 2.5 mA

If Event A and Event B are mutually exclusive, what is P(A|B)? 31. (2) P(A) - P(B)(1) P(A) + P(B)(3) P(A) * P(B)(4) 0

32. For which value of x will (x - 1)(3 - x) have its maximum ? (2) 1 (1) 0(3) 2(4) - 2

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33. Calculate the current across the 4 ohm resistor.



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B 6 The product of the phase and the group velocities is given by the : 41. (2) Speed of light/2 (1) Speed of light (4) (speed of light)/4 (3) $2 \times$ Speed of light 42. A linear antenna having length less than $\lambda/8$ is called as (2) Short dipole (1) Short monopole (4) Quarter-wave monopole (3) Half-wave dipole 43. Find the power radiated by an antenna whose radiation resistance is 100Ω and operating with 3A of current at 2GHz frequency ? (4) 700W (3) 450W (1) 900W (2) 1800W 44. What is the length of the half-wave dipole with bandwidth 20MHz and Quality factor 30? (4) 2.5m (3) 0.50m(1) 5m(2) 0.25m45. S parameters of a transmission line are S_{11} , S_{12} , S_{21} and S_{22} , if the transmission line is symmetrical, which of the following condition will be true : (1) $S_{11} = S_{12}$ (2) $S_{12} = -S_{21}$ (3) $S_{12} = S_{21}$ (4) $S_{11} = S_{22}$ 46. If each pulse of the sequence to be detected is in shape, the pulse can be detected without ISI. (1) Sine (2) Cosine (3) Sinc (4) Square 47. The minimum Nyquist bandwidth for the rectangular spectrum in raised cosine filter is : (1) 2T(2) 1/2T(3) T/2 (4) 2/TThe technique OTDR (Optical time domain reflectometry) is used for the measurement 48. (1) Bandwidth (2) Core diameter (3) Attenuation (4) Cladding diameter 49. The reverse bias current in a p-n diode is due to : (1) Minority carriers (2) Majority carriers (3) Electrons only (4) Holes only 50. Entropy is when both messages are equally likely. (1) Maximum (2) Minimum (3) 0(4) 1/2

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51.	Calculate power in modulation in amp	n each sideband, if j plitude modulated si	power of carrier wa gnal ?	we is 176W and there is 60%
	(1) 13.36 W	(2) 15.84 W	(3) 52 W	(4) 176 W
52.	The magnitude of are 100Ω and 25Ω (1) 25 Ω	respectively. The c	ort circuit input imp	edances of a transmission line ance of the line is : (4) 100 Ω
53.	At a given probabi	ility of error, binary	coherent FSK is in	ferior to binary coherent PSK
	by : (1) 6 dB	(2) 3 dB	(3) 2 dB	(4) 0 dB
54	In a communicatio	on system, when tw	o finite-power way	reforms $x(t)$ and $y(t)$ have the
54.	property : $r y = 0.1$	then these waveform	ns are said to be :	
	(1) Identical	(2) Overlap	(3) Similar	(4) Orthogonal
	Poynting vector sig	nifies :		
55.	(1) Current density	y vector producing e	electrostatic field	
	(2) Power density	vector producing el	ectrostatic field	
	(2) Current density	v vector producing e	electromagnetic nei	d
	(4) Power density	vector producing el	ectromagnetic field	
	Folded dipole anter	nna belongs to whic	h type of antenna?	
56.		(7) A perture	() LUIS	
		iven by $S_{AM}(t)=10$ ($(1 + 0.4 \cos 10^3 t +$	$0.3 \cos 10^4 t$) cos $10^6 t$. The
57.	An AM wave is gr modulation index i	s:		(1) 0.0
		(2) 05	(3) 0.3	(4) 0.9
			z are to be transmi	itted over a single channel by guardband of 1 KHz is used,
58.	10 signals, each ba	multiplexing. If AN	M-SSB modulation	guardband of 1 KHz is used,
	frequency division then the bandwidth	of the multiplenes	0	(4) 61 KHz
		(7) 60 K HZ	())) ===	
59.	$\Delta \text{ signal } \mathbf{X}(t) = 10$	$0 \cos (24 \times 10^3)$ t	is ideally sampled w pass filter with a	with a sampling period of 50 a cut off frequency of 15 KHz. Iter output ?
	sec and then passed Which of the follow	ving frequencies is/	are present at the fi	lter output ?
	Which of the follow	4111 <u>9</u> 1	(-)	
	(1) 12 KHz only 12 KHz only	KHz	(4) 12 KHz and	
	(3) 12 KHz and 9 1	KECE)(SET-Y)/	(B)	P. T. O.
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60	In a million	105
	27.5 cm. The operating frequency is : (1) 300 MHz (2) 1 GHz	the adjacent voltage maxima are at 12.5 em and (3) 2 GHz (4) 6.28 GHz
61.	How is the effective address of base-reg (1) By addition of implied register con (2) By addition of index register contex (3) By addition of index register contex	gister calculated ? tents to the partial address in instruction
62.	The instruction, Add #45, RI does (1) Adds the value of 45 to the address (2) Add 15	of R1 and stores 45 in that address
	 (2) Adds 45 to the value of R1 and store (3) Finds the memory location 45 and (4) R1 stores the value at memory location 	adds that content to that of R1
63.	What is the principle of fibre optical co (1) Frequency modulation (3) Total internal reflection	ommunication ? (2) Population inversion
64.	The optical source used for detection of (1) IR sensors (3) Zener diodes	
65.	electric field of 5 units is 4.5 units.	sity when the resistivity of a material with a
66.	(1) 22.5 (2) 4.5/5 Find the loss tangent of a material v	(3) 5/4.5 (4) 9.5 with conduction current density of 5 units an
	displacement current density of 10 unit	(3) 5 (4) 10
67.	The Maxwell second equation that is v (1) $Curl(H) = Jc$ (2) $Curl(E) = Jc$	alid in any conductor is : (3) Curl(E) = Jd (4) Curl (H) = Jd
68.	Which of the following is not used in t(1) Reflective Klystron(3) Frequency meter	he VSWR measurement ? (2) Slotted line (4) Spectrum analyzer
69.	If there are no any reflections, then the (1) 1 (2) 0	value of the SWR will be

B

B		
70.	The cut off wavelength and the gurrespectively. Find the wavelength of	uided wavelength are given by 0.5 and 2 units the wave :
	(1) 0.48 (2) 0.32	(3) 0.45 (4) 0.54
71.	Which among the following is Volati	(A) EDDOM
	(1) RAM (2) ROM	
72.	Fan-in and Fan-out are the characteria	
	(1) Registers	(2) Logic families(4) Combinational Circuits
	(3) Sequential Circuits	
73.	Where the result of an arithmetic and	logical operation are stored ?
The A	(1) In Accumulator	(2) In Cache Memory
	(3) In ROM	(4) In Instruction Registry
74.	The logic circuits whose outputs at a	ny instant of time depends not only on the present
	input but also on the past outputs are	caneu
	(1) Combinational circuits	(2) Flip-flops(4) Latches
	(3) Sequential circuits	
75.	Which of the following logic families	(3) ECL (4) 74SXX
	(1) CMOS (2) BiCMOS	(5) 202
76.	Which of the following describes the	operation of a positive edge-triggered D flip-flop?
	(1) If both inputs are HIGH, the output(2) The output will follow the input	
	(2) The output will follow the input (3) When both inputs are LOW, an input is the flip.	nvalid state exists.
	the main toggled into the line	
	to the output on the training edge	
77	The circuit of the given figure realize	es the function
	A	
	B	L Don
	c	
	0	
	E	
	(1) $Y = (A' + B')C + (DE)'$	(2) $Y = A' + B' + C + D' + E'$ (4) $Y = AB + C + DE$
	(3) $Y = (A + B)' + C + (D + E)$	PTO
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78. Which term applies to the maintaining of a given signal level until the next sampling ? (1) Holding (2) Aliasing (3) Shannon frequency sampling (4) Stair-stepping 79. A J-K flip-flop with J = 1 and K = 1 has a 20 kHz clock input. The Q output is (2) 10KHz square wave (1) 20 KHz square wave (4) Constantly High (3) Constantly Low 80. An analog signal is sampled at 36 kHz and quantized into 256 levels. The time duration of a bit of binary coded signal is : (4) 7.86 ms (1) 5.78 µs (3) 6.43 ms (2) 3.47 µs 81. For any given signal, average power in its 6 harmonic components is 10 mW each and the fundamental component also has 10 mW power. Then, average power in the periodic signal is (4) 5(1) 70 (2) 60 (3) 10 The Fourier transform (FT) of a function x(t) is X(f). The FT of $\frac{dx(t)}{dt}$ will be : 82. (1) $\frac{dX(f)}{df}$ (2) $2\pi j f X(f)$ (3) X(f) j f (4) $\frac{X(f)}{i f}$ 83. Which oscillations will be generated in the time domain response, if complex conjugate poles are present with a negative real part? (1) Damped oscillations (2) Undamped oscillations (3) Sustained oscillations (4) No oscillations 84. Determine the transfer function of the given system : G2 C(s) (1) $\frac{G1G2G3}{(1+H2G2G3+G2G1H1)}$ (2) $\frac{G1G2G3}{(1+G1G2G3H2H1)}$ (4) $\frac{G1G2G3}{(1+G1G2G3H1)}$ (3) $\frac{G1G2G3}{(1+G1G2G3H1+G1G2G3H2)}$

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The step error coefficient of a system $G(s) = \frac{1}{(s+2)(s+3)}$ with unity feedback is : 85. (4) 1 (3) 1/6 (2) Infinite (1) 0An intrinsic semiconductor at absolute zero temperature behaves like : 86. (2) A perfect Insulator (1) A perfect conductor (4) An amplifier (3) A super conductor 87. N-channel FETs are preferred to p-channel FETs because : (1) Holes have higher velocity (2) Electrons have higher mobility than holes (3) Electrons have higher diffusivity than holes (4) Electrons have higher effective mass than holes The depletion width of a Si p-n junction at a reverse bias of 10 V is 2 μ m. When the reverse bias is increased to 20 V, the depletion width will be : 88. (4) 2.4 µm (3) 2.8 µm (2) 3.2 µm (1) 4.0 µm 89. Field Effect Transistor (FET) is an unipolar device because : (1) V_{DS} of one polarity is used (2) V_{GS} of one polarity is used (3) I_D constitutes either electrons or holes (4) All the charge carriers flow towards a single pole. 90. What is the value of current when the gate to source voltage is less than the pinch off (4) 0A voltage? (3) 100 A (2) 5 A (1) 1 A **91.** Find the Eigenvalues for the following 2×2 matrix : $X = \begin{bmatrix} 1 & 8 \\ 2 & 1 \end{bmatrix}$ (4) 4,0 (3) - 5, 3 (2) 2, -1 (1) -3, 5 92. Three coins are tossed at once. What is the probability of getting exactly 2 tails ? (3) 5/8 (2) 3/8 (1) 1/8 **93.** What is the rank of the matrix $A = \begin{bmatrix} 1 & 2 & 3 \\ 2 & 3 & 4 \\ 4 & 10 & 18 \end{bmatrix}$ (4) 4(3) 3 (2) 2 P. T. O. (1) 1 Ph.D-EE-December, 2024/(E.C.E.)(SET-Y)/(B)

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94.	If $f(0) = 4 \&$.	$f'(x) = \frac{3}{x^2 + 2}$ the lo	wer bound of $f(2)$ est	imated by mean	t value theorem
	(1) 0	(2) 7	(3) 12	(4)	5
95.	(1) Laplacian	f gradient of a vector operation	function is equivalent (2) Curl opera		5
	(3) Double g	radient operation	(4) Null vector	r	
96.	Find the gradi	ent of the function gi	ven by $x^2 + y^2 + z^2$ a	at (1, 1, 1) :	
	(1) $\hat{i} + \hat{j} + \hat{k}$		(2) $2\hat{i} + 2\hat{j} + 2\hat{j}$	k	
	$(3) 2x\hat{i} + 2y\hat{j}$	$+2z\hat{k}$	(4) $4x\hat{i} + 2y\hat{j}$	$+4z\hat{k}$	
97.	Which of the	following theorems u	se the curl operation ?	1	
	(1) Green's th	eorem			
		ergence theorem			
	(3) Stoke's the	eorem			
	(4) Maxwell				
98.			by evaluating $\int_C (z-3)$	$)^n$. dz where C i	s z - 3 = 9 ?
	(1) -1	(2) 2	(3) 1		
99.	Determine the 28}:	mean, median and r	node values for the se	(4) 0 et : {26, 31, 21,	29, 32,26,25,
		7.25, Median = 27, M			
		7.25, Median = 26, M			
	(3) Mean = 32	2, Median = 29, Mode	ode = 27		
100		, Median = 32, Mode			
100.	In a Binomial of trials respec (1) np	Distribution, if <i>p</i> , <i>q</i> a tively then variance i (2) <i>npq</i>	and <i>n</i> are probability of s given by	f success, failure	e and number
			(<i>s</i>) <i>np q</i>	(4) npq^2	

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C		SET-Y
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Time : 11/4 Hours	Max. Marks : 100	Total Questions : 100
Roll No. (in figures)	(in words)	
Name	Date of Birth	
Father's Name	Mother's Name	
Date of Examination		
3.		

(Signature of the Candidate)

(Signature of the Invigilator)

CANDIDATES MUST READ THE FOLLOWING INFORMATION/INSTRUCTIONS BEFORE STARTING THE QUESTION PAPER.

1. All questions are compulsory.

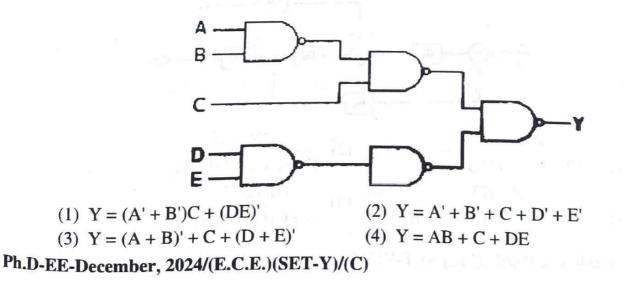
- 2. The candidates *must return* the question booklet as well as OMR Answer-Sheet to the Invigilator concerned before leaving the Examination Hall, failing which a case of use of unfairmeans / mis-behaviour will be registered against him / her, in addition to lodging of an FIR with the police. Further the answer-sheet of such a candidate will not be evaluated.
- **3.** Keeping in view the transparency of the examination system, carbonless OMR Sheet is provided to the candidate so that a copy of OMR Sheet may be kept by the candidate.
- 4. Question Booklet along with answer key of all the A, B, C & D code shall be got uploaded on the University Website immediately after the conduct of Entrance Examination. Candidates may raise valid objection/complaint if any, with regard to discrepancy in the question booklet/answer key within 24 hours of uploading the same on the University Website. The complaint be sent by the students to the Controller of Examinations by hand or through email. Thereafter, no complaint in any case, will be considered.
- 5. The candidate *must not* do any rough work or writing in the OMR Answer-Sheet. Rough work, if any, may be done in the question booklet itself. Answers *must not* be ticked in the question booklet.
- 6. There shall be negative marking. A deduction of 0.25 marks shall be there for each wrong answer. Each correct answer will be awarded one full mark. Cutting, erasing, overwriting and more than one answer in OMR Answer-Sheet will be treated as incorrect answer.
- 7. Use only Black or Blue Ball Point Pen of good quality in the OMR Answer-Sheet.
- 8. Before answering the questions, the candidates should ensure that they have been supplied correct and complete booklet. Complaints, if any, regarding misprinting etc. will not be entertained 30 minutes after starting of the examination.

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1.	Which among the (1) RAM	e following is Volat (2) ROM	ile Memory ? (3) DROM	(4) EPROM
2.	Fan-in and Fan-o (1) Registers (3) Sequential Ci	ut are the characteri	stics of (2) Logic famil (4) Combinatio	
3.	Where the result of (1) In Accumulat (3) In ROM	of an arithmetic and tor	logical operation are (2) In Cache Me (4) In Instructio	emory
4.	The logic circuits input but also on ((1) Combinationa (3) Sequential cir	the past outputs are al circuits	ny instant of time de called (2) Flip-flops (4) Latches	pends not only on the present
5.		owing logic families	has the shortest prop	pagation delay ?
6.	(1) CMOS Which of the follo	(2) BiCMOS	(3) ECL	(4) 74SXX
	in the full of the full	wing describes the (peration of a positive	edge-triggered D flip-flop?

- (1) If both inputs are HIGH, the output will toggle.
- (2) The output will follow the input on the leading edge of the clock.
- (3) When both inputs are LOW, an invalid state exists.
- (4) The input is toggled into the flip-flop on the leading edge of the clock and is passed to the output on the trailing edge of the clock.
- 7. The circuit of the given figure realizes the function



P. T. O.

2

8.	Which term applies(1) Holding(3) Shannon freque		(2)	Aliasing	l until the next sampling ?
9.		J = 1 and $K = 1$ have	as a 20 (2)		
10.	of a bit of binary co	sampled at 36 kHz ded signal is :	and q	uantized into 25	6 levels. The time duration
	(1) 5.78 μs	(2) 3.47 μs	(3)	6.43 ms	(4) 7.86 ms
11.	For any given signa the fundamental co periodic signal is	omponent also has	n its 6 s 10 r	harmonic comp nW power. The	onents is 10 mW each and en, average power in the
	(1) 70	(2) 60	(3)	10	(4) 5
12.	The Fourier transfor	m (FT) of a functi	on $x(t)$	is X(f). The FT	of $\frac{dx(t)}{dt}$ will be :
	(1) $\frac{dX(f)}{df}$	(2) $2\pi j f X(f)$	(3)	X(f) jf	(4) $\frac{X(f)}{jf}$
13.	Which oscillations with poles are present with			me domain resp	onse, if complex conjugate
	(1) Damped oscillat	tions	(2)	Undamped osci	illations
	(3) Sustained oscilla	ations	(4)	No oscillations	
14.	Determine the transf	fer function of the	given s	system :	
	+ R(s	→⊗G_],)) ↓	. [_ ⊗—	H2 -G2 -G3	C(s)
	(1) $- GIG2G$		(2)	G1G2G3	3
	$(1 + H^2G^2G^3 +$		(-)	(1+G1G2G3H)	H2H1)
	(3) - GlG		(4)	G1G2G3	
	(1+G1G2G3H1)	+G1G2G3H2)	(.)	(1 + G1G2G3F)	71)

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C The step error coefficient of a system $G(s) = \frac{1}{(s+2)(s+3)}$ with unity feedback is : 15. (4) 1(1) 0(2) Infinite (3) 1/6An intrinsic semiconductor at absolute zero temperature behaves like : 16. (2) A perfect Insulator (1) A perfect conductor (4) An amplifier (3) A super conductor 17. N-channel FETs are preferred to p-channel FETs because : (1) Holes have higher velocity (2) Electrons have higher mobility than holes (3) Electrons have higher diffusivity than holes (4) Electrons have higher effective mass than holes The depletion width of a Si p-n junction at a reverse bias of 10 V is 2 μ m. When the 18. reverse bias is increased to 20 V, the depletion width will be : (1) $4.0 \,\mu m$ (4) $2.4 \,\mu m$ (2) 3.2 µm (3) 2.8 µm Field Effect Transistor (FET) is an unipolar device because : 19. (1) V_{DS} of one polarity is used (2) V_{GS} of one polarity is used (3) I_D constitutes either electrons or holes (4) All the charge carriers flow towards a single pole. 20. What is the value of current when the gate to source voltage is less than the pinch off voltage? (3) 100 A (2) 5 A (4) 0A(1) 1 A Find the Eigenvalues for the following 2×2 matrix : 21. $X = \begin{bmatrix} 1 & 8 \\ 2 & 1 \end{bmatrix}$ (2) 2, -1 (3) -5, 3 (4) 4, 0(1) -3, 5 Three coins are tossed at once. What is the probability of getting exactly 2 tails ? 22. (3) 5/8 (2) 3/8(1) 1/8(4) 1/4 61 a ha a **[1**] -3 What is the rank of the matrix $A = \begin{bmatrix} 2 & 3 \\ 4 & 10 \end{bmatrix}$ 4 23. 18 (2) 2 (3) 3 (1) 1 (4) 4 Ph.D-EE-December, 2024/(E.C.E.)(SET-Y)/(C) P. T. O.

4	-			С
	If $f(0) = 4 & f'(x) = \frac{3}{x^2 + 2}$ the lower b	ound of $f(2)$ estimated b	y mean va	lue theorem
	is: (1) 0 (2) 7	(3) 12	(4)	5
25.	Divergence of gradient of a vector function(1) Laplacian operation(3) Double gradient operation	on is equivalent to : (2) Curl operation (4) Null vector		
26.	Find the gradient of the function given b):	
	10 - 10 - 10 - 10 - 10 - 10 - 10 - 10 -	(2) $2\hat{i} + 2\hat{j} + 2\hat{k}$ (4) $4x\hat{i} + 2y\hat{j} + 4z\hat{k}$		×
27.	Which of the following theorems use the(1) Green's theorem(3) Stoke's theorem	up dae store ^f allendare i de	heorem	1 (
28.	Which of the following is obtained by ev	valuating $\int_C (z-3)^n dz$ v	where C is	z-3 = 9?
	(1) -1 (2) 2	(3) 1 (4)	0	
29.	Determine the mean, median and mode 28}:	values for the set : {26	, 31, 21,	29, 32,26,25,
	 (1) Mean = 27.25, Median = 27, Mode = (2) Mean = 27.25, Median = 26, Mode = (3) Mean = 32, Median = 29, Mode = 2 (4) Mean = 29, Median = 32, Mode = 2 	= 27 8		
∕30.	In a Binomial Distribution, if p , q and r of trials respectively then variance is given (1) np (2) npq	are probability of succ	ess, failu	re and number
31.				
011	(1) Speed of light	(2) Speed of light/2		N P P P P P P P P P P P P P P P P P P P
	(3) $2 \times$ Speed of light	(4) (speed of light)/4		1
32.	A linear antenna having length less than(1) Short monopole(3) Half-wave dipole	(2) Short dipole(4) Quarter-wave model	nopola	
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33.	Find the power ra operating with 3A o	diated by an anten of current at 2GHz fre	na whose radiation	resistance is 100Ω and
	(1) 900W	(2) 1800W	(3) 450W	(4) 700W
34.	What is the length 30?	of the half-wave dip	ole with bandwidth	20MHz and Quality factor
	(1) 5m	(2) 0.25m	(3) 0.50m	(4) 2.5m
35.	S parameters of a t symmetrical, which	ransmission line are to of the following con	S_{11} , S_{12} , S_{21} and S_{22} addition will be true :	, if the transmission line is
		(2) $S_{12} = -S_{21}$		(4) $S_{11} = S_{22}$
36.	If each pulse of the detected without IS	e sequence to be de	tected is in	shape, the pulse can be
	(1) Sine	(2) Cosine	(3) Sinc	(4) Square
37.	The minimum Nyo is :	quist bandwidth for	the rectangular spect	trum in raised cosine filter
	(1) 2T	(2) 1/2T	(3) T/2	(4) 2/T
38.	The technique OT	DR (Optical time dor	nain reflectometry) i	s used for the measurement
	(1) Bandwidth	(2) Core diameter	(3) Attenuation	(4) Cladding diameter
39.	The reverse bias cu	urrent in a p-n diode i	is due to :	
	 (1) Minority carrie (3) Electrons only 		(2) Majority carrie(4) Holes only	
740.	Entropy is	when both message	es are equally likely.	
	(1) Maximum		(3) 0	
41.	Calculate power in modulation in amp	n each sideband, if p plitude modulated sig	ower of carrier wave nal?	e is 176W and there is 60%
	(1) 13.36 W	(2) 15.84 W	(3) 52 W	(4) 176 W
42.		open circuit and show respectively. The ch		lances of a transmission line line of the line is :
	(1) 25 Ω	(2) 50 Ω	(3) 75 Ω	(4) 100 Ω
43.	At a given probab by :	ility of error, binary	coherent FSK is infe	erior to binary coherent PSK
	(1) 6 dB	(2) 3 dB	(3) 2 dB	(4) 0 dB
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44. In a communication system, when two finite-power waveforms x(t) and y(t) have the property : x.y = 0, then these waveforms are said to be : (2) Overlap (1) Identical Poynting vector signifies :

- (1) Current density vector producing electrostatic field
- (2) Power density vector producing electrostatic field
- (3) Current density vector producing electromagnetic field
- (4) Power density vector producing electromagnetic field
- 46. Folded dipole antenna belongs to which type of antenna?
 - (4) Wire (3) Lens (2) Aperture (1) Reflector

An AM wave is given by $S_{AM}(t)=10 (1 + 0.4 \cos 10^3 t + 0.3 \cos 10^4 t) \cos 10^6 t$. The 47. modulation index is :

(3) Similar

- (4) 0.9 (3) 0.3(1) 0.4(2) 0.5
- 48. 10 signals, each band-limited to 5 KHz are to be transmitted over a single channel by frequency division multiplexing. If AM-SSB modulation guardband of 1 KHz is used, then the bandwidth of the multiplexed signal will be :
 - (4) 61 KHz (3) 59 KHz (1) 79 KHz (2) 60 KHz
- A signal $X(t) = 100 \cos (24 \times 10^3)$ t is ideally sampled with a sampling period of 50 49. sec and then passed through an ideal low pass filter with a cut off frequency of 15 KHz. Which of the following frequencies is/are present at the filter output ?
 - (2) 8 KHz only (1) 12 KHz only
 - (3) 12 KHz and 9 KHz (4)12 KHz and 8 KHz
- 50. In a twin wire transmission line in air the adjacent voltage maxima are at 12.5 em and 27.5 cm. The operating frequency is :
 - (1) 300 MHz (2) 1 GHz (3) 2 GHz (4) 6.28 GHz
- **51.** A BJT is a :

as

52.

- (1) Current -Controlled device
- (2) Voltage Controlled device
- (3) Power- Controlled device
- The phenomenon leading to avalanche breakdown in reverse-biased diodes is known
- (1) Auger recombination

- (2) Mode hopping
- (3) Impact ionization
- (4) Extract ionization

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45.

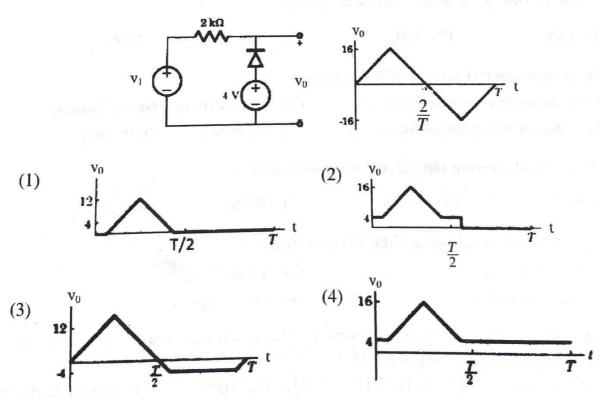
(4) Orthogonal

(4) Field- Controlled device

С

The solar incident light on the cell breaks condition of the diode's junction. 53. (1) Thermal expansion (2) Breakdown (3) Thermal equilibrium (4) Nickel plating Which of the following materials cannot be used as solar cells materials ? 54. (1) Si (2) GaAs (4) PbS (3) CdS Calculate the value of emitter current for a transistor $\alpha_{dc} = 0.98$, $I_{CBO} = 5 \ \mu A$ and 55. $I_B = 95 \mu A$ (1) 4.5 mA (2) 5 mA(4) 10 mA (3) 3.5 mA Ripple factor of the half wave rectifier is nearly 56. (1) 1.11 (4) 0.5 (2) 0.87(3) 1.21 If a capacitor is placed in the feedback path of an Op-amp circuit, then the circuit can 57. act as : (2) Differentiator (3) Multiplier (4) Divider (1) Integrator If an Op-amp has a common mode gain of 0.01 and a differential gain of 10^5 . Its 58. CMRR would be $(4) 10^7$ $(3) 10^{-3}$ (1) 0(2) Infinite

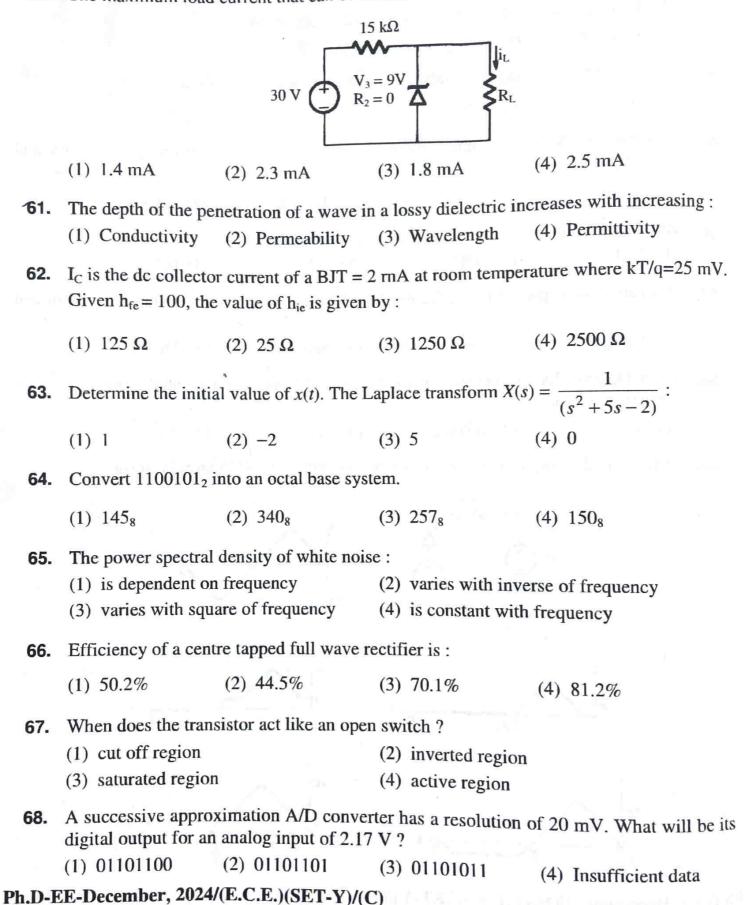
59. Determine the output waveform from the given circuit and input waveform.



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60. The maximum load current that can be drawn from the following circuit is



- **69.** An important impairment to digital signals in a communication system is the irregularities in timing caused by imperfections in clock extraction and waveform regeneration. This effect is known as
 - (1) Jitter (2) Aliasing (3) Fading (4) Attenuation
- **70.** Which addressing mode executes its instructions within the CPU without the necessity of reference memory for operands ?
 - (1) Implied Mode (2) Immediate Mode
 - (3) Direct Mode (4) Register Mode
- 71. How is the effective address of base-register calculated ?
 - (1) By addition of implied register contents to the partial address in instruction
 - (2) By addition of index register contents to the partial address in instruction
 - (3) By addition of index register contents to the complete address in instruction
 - (4) By addition of implied register contents to the complete address in instruction
- 72. The instruction, Add #45, Rl does

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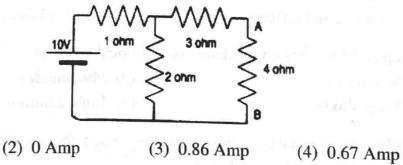
- (1) Adds the value of 45 to the address of R1 and stores 45 in that address
- (2) Adds 45 to the value of R1 and stores it in R1
- (3) Finds the memory location 45 and adds that content to that of R1
- (4) R1 stores the value at memory location to 45
- 73. What is the principle of fibre optical communication?
 - (1) Frequency modulation (2) Population inversion
 - (3) Total internal reflection (4) Doppler Effect
- 74. The optical source used for detection of optical signal is
 - (1) IR sensors (2) Photodiodes
 - (3) Zener diodes (4) Light Emitting Diodes
- **75.** Calculate the conduction current density when the resistivity of a material with an electric field of 5 units is 4.5 units.
 - (1) 22.5 (2) 4.5/5 (3) 5/4.5 (4) 9.5

76. Find the loss tangent of a material with conduction current density of 5 units and displacement current density of 10 units.

(1) 2 (2) 0.5 (3) 5 (4) 10

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77.	The Maxwell second equation that is va (1) Curl(H) = Jc (3) Curl(E) = Jd		is :
78.	Which of the following is not used in th	e VSWR measureme	ent?
	 (1) Reflective Klystron (3) Frequency meter 	(2) Slotted line(4) Spectrum analy	
79.	If there are no any reflections, then the	value of the SWR will	ll be
	(1) 1 (2) 0	(3) ∞	(4) 2
80.	The cut off wavelength and the guid respectively. Find the wavelength of the (1) 0.48 (2) 0.32	1000	given by 0.5 and 2 units (4) 0.54
81.	If Event A and Event B are mutually exc	ובי יון יינו בימונ	
	(1) $P(A) + P(B)$	(2) $P(A) - P(B)$	
	(3) $P(A) * P(B)$	(4) 0	
82.	For which value of x will $(x - 1)(3 - x)$ h		
	(1) 0 (2) 1	(3) 2	(4) -2
83.	Calculate the current across the 4 ohm re		Anne an ann a' Maisteil - 185 Anne Anne Anne Anne Anne
		100 C	



84. A DC source of EMF E volts and internal resistance R ohms is connected to a variable load and it is adjusted such that the load absorbs maximum power from the source. The maximum power delivered from the source to the load is :

(1)
$$\frac{E^2}{2R}$$
 (2) $\frac{E^2}{4R}$ (3) $\frac{2E^2}{R}$ (4) $\frac{E^2}{R}$

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(1) 1.23 Amp

С

If there are 5 branches and 4 nodes in the graph, then the numbers of mesh equations 85. that can be formed are ? (1) 2(2) 4 (3) 6(4) 8 86. In a series RLC circuit, the phase difference between the current in the capacitor and the current in the resistor is ? (1) 0 degree (2) 90 degree (3) 180 degree (4) 360 degree 87. In a series RL circuit, voltage across resistor and inductor are 3 V and 4 V respectively, then what is the applied voltage ? (1) 7(2) 5 (3) 4(4) 3 88. Transfer function of a system is defined as the ratio of output to input in : (1) Z-transform (2) Fourier transform (3) Laplace transform (4) All of these 89. Discrete Fourier Transform is applicable to : (1) Infinite sequences (2) Finite discrete sequences (3) Continuous infinite signals (4) Continuous finite sequences 90. The autocorrelation of $x(t) = e^{-at}u(t)$ is (2) $\frac{e^{-at}}{2a}$ (3) $\frac{e^{-a\tau}}{a^2}$ (1) $\frac{e^{-at}}{2}$ (4) $\frac{e^{-a\tau}}{2a}$ The given figure shows which type of counter ? -91. B CLR CLR (2) Mod 3 (1) Mod 6 (3) Mod 8 (4) Decade counter A digital multiplexer is a combinational circuit that selects 92. (1) One digital information from several sources and transmits the selected one (2) Many digital information and convert them into one (3) Many decimal inputs and transmits the selected information (4) Many decimal outputs and accepts the selected information

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(1) 101101 (2) 001110 (3) 110111 (4) 111001

- (1) The output is dependent on the control input
- (2) The output is independent of the control input
- (3) Only system parameters have an effect on the control output
- (4) Output is independent to input
- **95.** The frequency at which maximum amplitude ratio is attained is called the frequency.
 - (1) Comer (2) Resonant (3) Cross over (4) Natural

96. The open loop transfer function of a plant is given as, $G(s) = \frac{1}{(s^2 - 1)}$. If the plant is

operated in unity feedback configuration, then the lead compensator that can stabilize the control system is :

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

97. The open loop DC gain of an unity negative feedback system with closed-loop transfer function $\frac{s+4}{s^2+7s+13}$ is :

(1) $\frac{4}{13}$ (2) 4 (3) $\frac{4}{9}$ (4) 13

98. Calculate the poles and zeroes for the given transfer function $G(s) = \frac{5(s+2)}{(s^2+3s+2)}$

(1) -2, (-1, -2) (2) 2, (-1, 2) (3) 2, (1, 2) (4) -2, (1, -2)

99. A system with the polynomial $s^4 + 5s^3 + 3s^2 + 6s + 5 = 0$ is : (1) Unstable (2) Marginally stable

(1) Unstable(2) Marginally stable(3) In equilibrium(4) Stable

100. Viterbi decoding is one of the most commonly used techniques in modern systems that is used to decode the data encoded by

- (1) Block coding (2) Hamming coding
- (3) Convolutional coding (4) CRC coding

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Total No. of Printed Pages : 13

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10012 Sr. No.

Time : 11/4 Hours	Max. Marks : 100	Total Questions : 100
Roll No. (in figures)	(in words)	
Name	Date of Birth	
Father's Name	Mother's Name	
Date of Examination		

(Signature of the Candidate)

(Signature of the Invigilator)

CANDIDATES MUST READ THE FOLLOWING INFORMATION/INSTRUCTIONS BEFORE STARTING THE QUESTION PAPER.

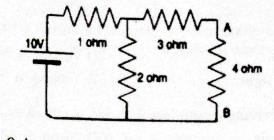
- 1. All questions are compulsory.
- 2. The candidates *must return* the question booklet as well as OMR Answer-Sheet to the Invigilator concerned before leaving the Examination Hall, failing which a case of use of unfair-means / mis-behaviour will be registered against him / her, in addition to lodging of an FIR with the police. Further the answer-sheet of such a candidate will not be evaluated.
- 3. Keeping in view the transparency of the examination system, carbonless OMR Sheet is provided to the candidate so that a copy of OMR Sheet may be kept by the candidate.
- 4. Question Booklet along with answer key of all the A, B, C & D code shall be got uploaded on the University Website immediately after the conduct of Entrance Examination. Candidates may raise valid objection/complaint if any, with regard to discrepancy in the question booklet/answer key within 24 hours of uploading the same on the University Website. The complaint be sent by the students to the Controller of Examinations by hand or through email. Thereafter, no complaint in any case, will be considered.
- 5. The candidate *must not* do any rough work or writing in the OMR Answer-Sheet. Rough work, if any, may be done in the question booklet itself. Answers *must not* be ticked in the question booklet.
- 6. There shall be negative marking. A deduction of 0.25 marks shall be there for each wrong answer. Each correct answer will be awarded one full mark. Cutting, erasing, overwriting and more than one answer in OMR Answer-Sheet will be treated as incorrect answer.
- 7. Use only Black or Blue Ball Point Pen of good quality in the OMR Answer-Sheet.
- 8. Before answering the questions, the candidates should ensure that they have been supplied correct and complete booklet. Complaints, if any, regarding misprinting etc. will not be entertained 30 minutes after starting of the examination.

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FAL

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- 1. If Event A and Event B are mutually exclusive, what is P(A|B)? (1) P(A) + P(B) (2) P(A) - P(B) (3) P(A) * P(B) (4) 0
- 2. For which value of x will (x 1)(3 x) have its maximum? (1) 0 (2) 1 (3) 2 (4) -2
- 3. Calculate the current across the 4 ohm resistor.



- (1) 1.23 Amp (2) 0 Amp (3) 0.86 Amp (4) 0.67 Amp
- 4. A DC source of EMF E volts and internal resistance R ohms is connected to a variable load and it is adjusted such that the load absorbs maximum power from the source. The maximum power delivered from the source to the load is :
 - (1) $\frac{E^2}{2R}$ (2) $\frac{E^2}{4R}$ (3) $\frac{2E^2}{R}$ (4) $\frac{E^2}{R}$
- 5. If there are 5 branches and 4 nodes in the graph, then the numbers of mesh equations that can be formed are ?
 - (1) 2 (2) 4 (3) 6 (4) 8
- 6. In a series RLC circuit, the phase difference between the current in the capacitor and the current in the resistor is ?
 - (1) 0 degree (2) 90 degree (3) 180 degree (4) 360 degree
- 7. In a series RL circuit, voltage across resistor and inductor are 3 V and 4 V respectively, then what is the applied voltage ?
 - (1) 7 (2) 5 (3) 4 (4) 3
- 8. Transfer function of a system is defined as the ratio of output to input in :
 - (1) Z-transform (2) Fourier transform
 - (3) Laplace transform (4) All of these

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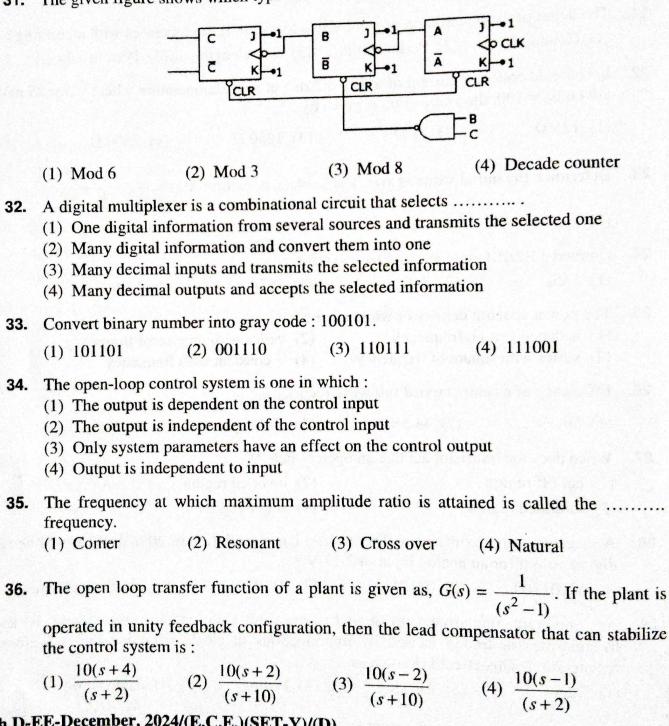
9.	Discrete Fourier Tra	unsform is application	ble to :	
	(1) Infinite sequence	ces	(2) Finite discre	ete sequences
	(3) Continuous infi	nite signals	(4) Continuous	finite sequences
10.				
	The autocorrelation	of $x(t) = e^{-at}u(t)$	is	
	(1) $\frac{e^{-at}}{a^2}$	(2) $\frac{e^{-at}}{a}$	(3) $\frac{e^{-a\tau}}{a\tau}$	(4) $\frac{e^{-a\tau}}{a}$
	a²	2 <i>a</i>	a^2	2 <i>a</i>
11.	The product of the p	bhase and the grou	p velocities is giver	h by the :
	(1) Speed of light	0	(2) Speed of lig	
	(3) $2 \times \text{Speed of lig}$;ht	(4) (speed of light	
12.	A linear antenna ha	ving length less th		
	(1) Short monopole		(2) Short dipole	
	(3) Half-wave dipo		(4) Quarter-wa	같은 20년 동안의 부장님이 다른 것은 정책에서 집안 것을 다 것이라. 방법에는 한 것은 것이 같이 가지?
Angela	and a set the set of the			
13.				tion resistance is 100Ω and
	operating with 3A c		같은 영향에 있는 것 같은 것 같	
	(1) 900W	(2) 1800W	(3) 450W	(4) 700W
14.	What is the length 30?	of the half-wave	lipole with bandwi	dth 20MHz and Quality factor
	(1) 5m	(2) 0.25m	(3) 0.50m	(4) 2.5m
15.	S parameters of a to symmetrical, which			S_{22} , if the transmission line is it :
	(1) $S_{11} = S_{12}$	(2) $S_{12} = -S_{21}$	(3) $S_{12} = S_{21}$	(4) $S_{11} = S_{22}$
16.	If each pulse of the detected without IS		detected is in	shape, the pulse can be
	(1) Sine	(2) Cosine	(3) Sinc	(4) Square
17.	The minimum Nyq	uist bandwidth fo	or the rectangular s	pectrum in raised cosine filter
	is :		5	poor and in faised cosine filter
	(1) 2T	(2) 1/2T	(3) T/2	(4) 2/T
18.	The technique OTD	R (Optical time d	omain reflectomet	ry) is used for the measurement
	01:			sy is used for the measurement
	(1) Bandwidth		(2) Core diam	eter
	(3) Attenuation		(4) Cladding d	liameter
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D				3
19.	The reverse bias cu (1) Minority carrie	rrent in a p-n diode i rs	s due to : (2) Majority carrie	rs
	(3) Electrons only		(4) Holes only	
20.	Entropy is	when both message (2) Minimum	es are equally likely. (3) 0	(4) 1/2
21.	The depth of the pe (1) Conductivity	enetration of a wave i (2) Permeability	in a lossy dielectric in (3) Wavelength	ncreases with increasing : (4) Permittivity
22.	I_C is the dc collector Given $h_{fe} = 100$, the	or current of a BJT = e value of h _{ie} is giver	2 rnA at room temp by :	erature where kT/q=25 mV.
	(1) 125 Ω	(2) 25 Ω	(3) 1250 Ω	(4) 2500 Ω
23.	Determine the initi	al value of $x(t)$. The	Laplace transform X	$(s) = \frac{1}{(s^2 + 5s - 2)} :$
	(1) 1	(2) -2	(3) 5	(4) 0
24.	Convert 1100101 ₂	into an octal base sy	stem.	
	(1) 1458	(2) 3408	(3) 2578	(4) 1508
25.	The power spectral (1) is dependent of (3) varies with squ	l density of white no n frequency nare of frequency	ise : (2) varies with in (4) is constant wi	verse of frequency th frequency
26.	Efficiency of a cen	tre tapped full wave	rectifier is :	
	(1) 50.2%	(2) 44.5%	(3) 70.1%	(4) 81.2%
27.	When does the tran	nsistor act like an op	en switch ?	
	(1) cut off region		(2) inverted regi	
	(3) saturated region	m	(4) active region	
28.	A successive approdigital output for a	n analog input of 2.	1/ V :	on of 20 mV. What will be its
	(1) 01101100	(2) 01101101	(3) 01101011	(4) Insufficient data
29.	irregularities in ti	pairment to digita ming caused by ir effect is known as .	nperfections in clo	mmunication system is the ck extraction and waveform
	(1) Jitter	(2) Aliasing	(3) Fading	(4) Attenuation
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The given figure shows which type of counter ? 31.

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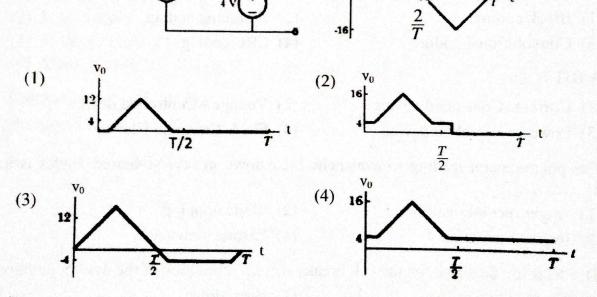
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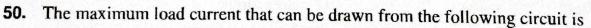
The open loop DC gain of an unity negative feedback system with closed-loop transfer 37. function $\frac{s+4}{s^2+7s+13}$ is : (3) $\frac{4}{9}$ (4) 13 (1) $\frac{4}{13}$ (2) 4 Calculate the poles and zeroes for the given transfer function $G(s) = \frac{5(s+2)}{(s^2+3s+2)}$ 38. (1) -2, (-1, -2) (2) 2, (-1, 2) (3) 2, (1, 2)(4) -2, (1, -2)**39.** A system with the polynomial $s^4 + 5s^3 + 3s^2 + 6s + 5 = 0$ is : (1) Unstable (2) Marginally stable (3) In equilibrium (4) Stable 40. Viterbi decoding is one of the most commonly used techniques in modern systems that is used to decode the data encoded by (2) Hamming coding (1) Block coding (3) Convolutional coding (4) CRC coding 41. A BJT is a : (2) Voltage - Controlled device (1) Current -Controlled device (4) Field- Controlled device (3) Power- Controlled device The phenomenon leading to avalanche breakdown in reverse-biased diodes is known 42. as (2) Mode hopping (1) Auger recombination (4) Extract ionization (3) Impact ionization 43. The solar incident light on the cell breaks condition of the diode's junction. (2) Breakdown (1) Thermal expansion (4) Nickel plating (3) Thermal equilibrium 44. Which of the following materials cannot be used as solar cells materials ? (4) PbS (3) CdS (2) GaAs (1) Si 45. Calculate the value of emitter current for a transistor $\alpha_{dc} = 0.98$, $I_{CBO} = 5 \ \mu A$ and $I_B = 95 \mu A$ (4) 10 mA (3) 3.5 mA (2) 5 mA (1) 4.5 mA P. T. O. Ph.D-EE-December, 2024/(E.C.E.)(SET-Y)/(D)

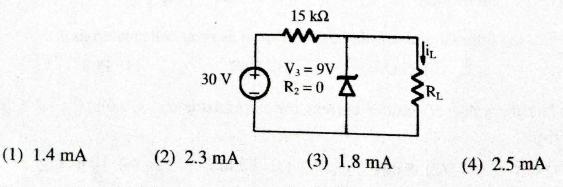
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46. Ripple factor of the half wave rectifier is nearly (1) 1.11 (2) 0.87 (3) 1.21 (4) 0.5 If a capacitor is placed in the feedback path of an Op-amp circuit, then the circuit can 47. act as : (1) Integrator (2) Differentiator (3) Multiplier (4) Divider If an Op-amp has a common mode gain of 0.01 and a differential gain of 10⁵. Its 48. CMRR would be $(3) 10^{-3}$ $(4) 10^7$ (1) 0(2) Infinite 49. Determine the output waveform from the given circuit and input waveform. 2 kΩ 16 V1 Vo







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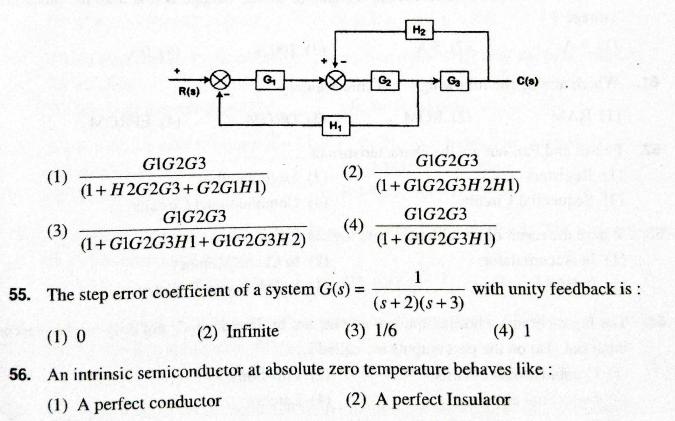
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51. For any given signal, average power in its 6 harmonic components is 10 mW each and the fundamental component also has 10 mW power. Then, average power in the periodic signal is

52. The Fourier transform (FT) of a function x(t) is X(f). The FT of $\frac{dx(t)}{dt}$ will be :

(1) $\frac{dX(f)}{df}$ (2) $2\pi j f X(f)$ (3) X(f) j f (4) $\frac{X(f)}{j f}$

- **53.** Which oscillations will be generated in the time domain response, if complex conjugate poles are present with a negative real part ?
 - (1) Damped oscillations (2) Undamped oscillations
 - (3) Sustained oscillations (4) No oscillations
- 54. Determine the transfer function of the given system :



(3) A super conductor (4) An amplifier

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P. T. O.

- 57. N-channel FETs are preferred to p-channel FETs because :
 - (1) Holes have higher velocity
 - (2) Electrons have higher mobility than holes
 - (3) Electrons have higher diffusivity than holes
 - (4) Electrons have higher effective mass than holes
- 58. The depletion width of a Si p-n junction at a reverse bias of 10 V is 2 μ m. When the reverse bias is increased to 20 V, the depletion width will be :
 - (1) $4.0 \,\mu m$ (2) $3.2 \,\mu m$ (3) $2.8 \,\mu m$ (4) $2.4 \,\mu m$
- 59. Field Effect Transistor (FET) is an unipolar device because :
 - (1) V_{DS} of one polarity is used
 - (2) V_{GS} of one polarity is used
 - (3) I_D constitutes either electrons or holes
 - (4) All the charge carriers flow towards a single pole.
- **60.** What is the value of current when the gate to source voltage is less than the pinch off voltage ?
 - (1) 1 A (2) 5 A (3) 100 A (4) 0 A
- 61. Which among the following is Volatile Memory?
 - (1) RAM (2) ROM (3) DROM (4) EPROM

62. Fan-in and Fan-out are the characteristics of

- (1) Registers (2) Logic families
- (3) Sequential Circuits (4) Combinational Circuits
- 63. Where the result of an arithmetic and logical operation are stored ?
 - (1) In Accumulator (2) In Cache Memory
 - (3) In ROM (4) In Instruction Registry

64. The logic circuits whose outputs at any instant of time depends not only on the present input but also on the past outputs are called

(1)	Combinational circuits	(2)	Flip-flops
(3)	Sequential circuits	(4)	Latches

65. Which of the following logic families has the shortest propagation delay ?
(1) CMOS
(2) BiCMOS
(3) ECL
(4) 74SXX
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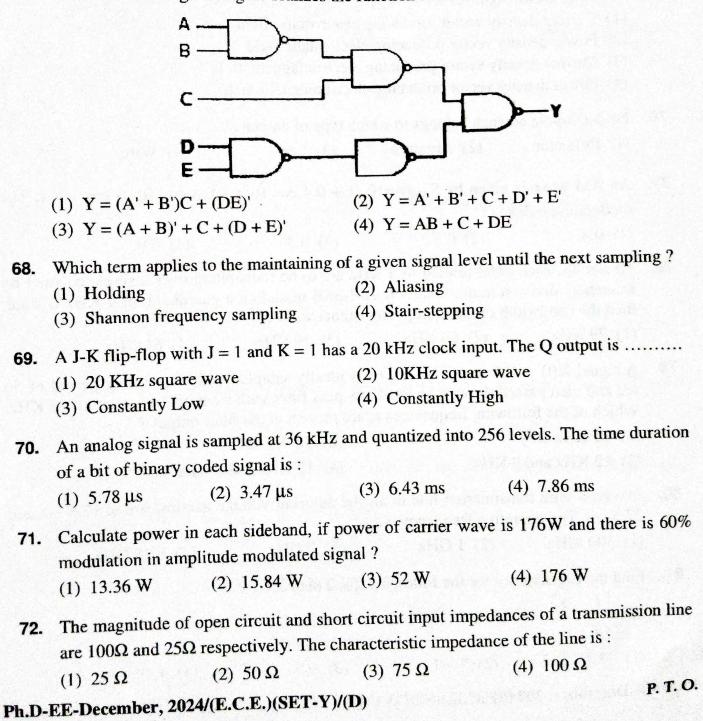
82.	Three coinc	te esta				11
02.	Three coms a	are tossed at once. Wh	nat is 1	the probabi	lity of getting exactly	2 tails ?
	(1) 1/8	(2) 3/8		(3) 5/8	(4) 1/4	
83.	What is the r	ank of the matrix $A =$	12	$\begin{bmatrix} 2 & 3 \\ 3 & 4 \end{bmatrix}$		
	(1) 1		4		al and the again	
84.		(2) 2		(3) 3	(4) 4	
	II f(0) = 4 & is:	$f'(x) = \frac{3}{x^2 + 2}$ the lo	ower ł	bound of $f(2)$	2) estimated by mean	n value theorem
	(1) 0	(2) 7		(3) 12	(4)	5
85.	(1) Laplacia	of gradient of a vector n operation gradient operation		(2) Curl (operation	
86.	(1) $\hat{i} + \hat{j} + \hat{k}$			(2) $2\hat{i} + 2$	$2\hat{j} + 2\hat{k}$	
	(3) $2x\hat{i} + 2y\hat{j}$	$\hat{j} + 2z\hat{k}$		(4) $4x\hat{i}$ -	$+2y\hat{j}+4z\hat{k}$	
87.	Which of the	following theorems u	ise the	e curl opera	ition ?	
	(1) Green's t	heorem		(2) Gauss	s Divergence theorem	n
	(3) Stoke's th	neorem		(4) Maxv	vell equation	
88.	Which of the	following is obtained	l by e	valuating ∫ C		C is z - 3 = 9?
	(1) -1	(2) 2		(3) 1	(4) 0	
89.		e mean, median and	mode	values for	the set : {26, 31, 2	21, 29, 32,26,25,
		7.25, Median = 27 , N				
		7.25, Median = 26, M 2, Median = 29, Mod				
		9, Median = 32 , Mod				
90.		Distribution, if p , q ctively then variance			bility of success, fai	lure and number
	(1) <i>np</i>	(2) npq	6-1	(3) np^2q	$(4) npq^2$	
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- 66. Which of the following describes the operation of a positive edge-triggered D flip-flop?
 - (1) If both inputs are HIGH, the output will toggle.

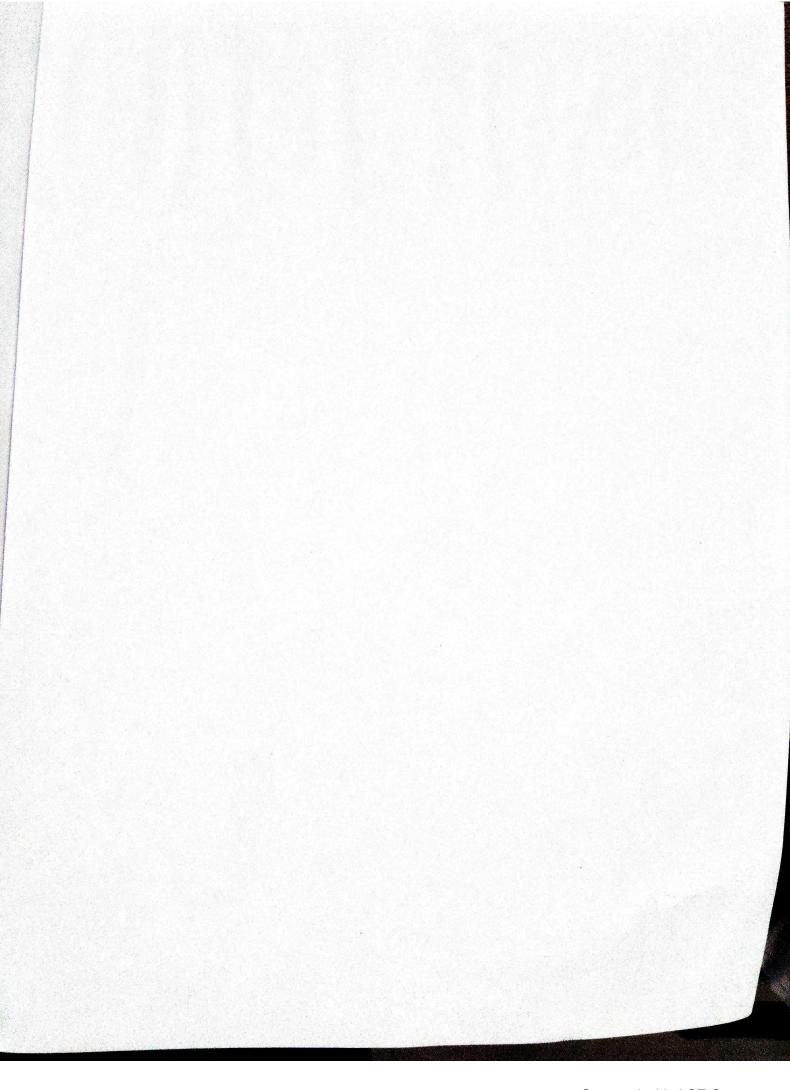
D

- (2) The output will follow the input on the leading edge of the clock.
- (3) When both inputs are LOW, an invalid state exists.
- (4) The input is toggled into the flip-flop on the leading edge of the clock and is passed to the output on the trailing edge of the clock.
- 67. The circuit of the given figure realizes the function



10				D
73.	At a given proba	bility of error, binary	coherent FSK is in	ferior to binary coherent PSK
	(1) (JD		(3) 2 dB	(4) 0 00
74.	In a communica property : $x.y = ($ (1) Identical	tion system, when tw), then these waveform (2) Overlap	vo finite-power wav ns are said to be : (3) Similar	veforms $x(t)$ and $y(t)$ have the (4) Orthogonal
75.	(2) Power densit(3) Current dens	signifies : ity vector producing e ty vector producing el ity vector producing e ty vector producing el	lectrostatic field electromagnetic fiel	d
76.	Folded dipole an (1) Reflector	tenna belongs to whic (2) Aperture	ch type of antenna? (3) Lens	(4) Wire
77.		given by $S_{AM}(t)=10$		$0.3 \cos 10^4 t$) cos $10^6 t$. The
	(1) 0.4	(2) 0.5	(3) 0.3	(4) 0.9
78.	frequency division	on multiplexing. If Al th of the multiplexed	M-SSB modulation	tted over a single channel by guardband of 1 KHz is used,
	(1) 79 KHz	(2) 60 KHz	(3) 59 KHz	(4) 61 KHz
79.	bee and men pabo	owing frequencies is/	W DACE THITAP TUATh a	
80.	In a twin wire tra 27.5 cm. The open	nsmission line in air rating frequency is :	the adjacent voltag	e maxima are at 12.5 em and
01	(1) 300 MHz	(2) 1 GHz	(3) 2 GHz	(4) 6.28 GHz
81.	Find the Eigenval $X = \begin{bmatrix} 1 & 8 \\ 2 & 1 \end{bmatrix}$	ues for the following	2×2 matrix :	
	(1) -3, 5	(2) 2, -1	(3) - 5, 3	
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91. How is the effective address of base-register calculated ? (1) By addition of implied register contents to the partial address in instruction (2) By addition of index register contents to the partial address in instruction (3) By addition of index register contents to the complete address in instruction (4) By addition of implied register contents to the complete address in instruction The instruction, Add #45, Rl does 92. (1) Adds the value of 45 to the address of R1 and stores 45 in that address (2) Adds 45 to the value of R1 and stores it in R1 (3) Finds the memory location 45 and adds that content to that of R1(4) R1 stores the value at memory location to 45 What is the principle of fibre optical communication ? 93. (2) Population inversion (1) Frequency modulation (4) Doppler Effect (3) Total internal reflection The optical source used for detection of optical signal is 94. (2) Photodiodes (1) IR sensors (3) Zener diodes (4) Light Emitting Diodes Calculate the conduction current density when the resistivity of a material with an 95. electric field of 5 units is 4.5 units. (1) 22.5 (2) 4.5/5 (3) 5/4.5(4) 9.596. Find the loss tangent of a material with conduction current density of 5 units and displacement current density of 10 units. (1) 2(2) 0.5 (3) 5 (4) 10 The Maxwell second equation that is valid in any conductor is : 97. (2) Curl(E) = Jc(1) Curl(H) = Jc(3) Curl(E) = Jd(4) $\operatorname{Curl}(H) = \operatorname{Jd}$ **98.** Which of the following is not used in the VSWR measurement ? (1) Reflective Klystron (2) Slotted line (3) Frequency meter (4) Spectrum analyzer 99. If there are no any reflections, then the value of the SWR will be (3) ∞ 100. The cut off wavelength and the guided wavelength are given by 0.5 and 2 units (3) 0.45 Ph.D-EE-December, 2024/(E.C.E.)(SET-Y)/(D) (4) 0.54



Q. NO.	A	В	С	D
1	1	3	1	4
2	2	3	2	3
3	3	2	1	3
4	4	1	3	2
5	1	4	3	1
6	2	4	2	1
7	3	1	1	2
8	4	1	1	3
9	1	1	2	2
10	2	4	2	4
11	4	1	2	4
12	3	3	2	1
13	3	3	1	1
14	2	2	1	2
15	1	2	3	4
16	1	4	2	3
17	2	3	2	2
18	3	1	3	3
19	2	1	3	1
20	4	3	4	1
21	2	1	1	3
22	2	3	2	3
23	1	3	3	2
24	1	4	4	1
25	3	2	1	4
26	2	3	2	4
27	2	1	3	1
28	3	4	4	1
29	3	4	1	1
30	4	1	2	4
31	1	4	4	1
32	3	3	1	3
33	3	3	1	3
34	4	2	2	2
35	2	1	4	2
36	3	1	3	4
37	1	2	2	3
38	4	3	3	1
39	4	2	1	1
40	1	4	1	3
41	1	4	2	1
42	2	1	2	3
43	1	1	2	3
44	3	2	4	4
45	3	4	4	2
46	2	3	4	3
47	1	2	2	1
48	1	3	3	4
	2	1	4	4

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10 per Ca

Q. NO.	Answer keys of PH.D (A	В	С	D
51	1	2	1	2
52	3	2	3	2
53	3	2	3	1
			4	1
54	2	4		3
55	2	4	2	
56	4	4	3	2
57	3	2	1	2
58	1	3	4	3
59	1	4	4	3
60	3	2	1	4
61	2	2	3	1
62	2	2	3	2
63	2	3	2	1
64	4	2	1	3
65	4	3	4	3
66	4	2	4	2
67	2	1	1	1
68	3	4	1	1
69	4	1	1	2
70	2	1	4	2
71	3	1	2	2
72	3	2	2	2
73	2	1	3	2
74	1	3	2	4
75	4	3	3	4
76	4	2	2	4
77	1	1	1	2
78	1	1	4	3
79	1	2	1	4
80	4	2	1	2
81	2	2	4	1
82	2	2	3	2
	3	1	3	3
83			2	4
84 85	2 3	1	1	41
			1	2
86	2	2		3
87	1		2	
88	4	3	3	4
89	1	3	2	1
90	1	4	4	2
91	4	1	1	2
92	1	2	3	2
93	1	3	3	3
94	2	4	2	2
95	4	1	2	3
96	3	2	4	2
97	2	3	3	1
98	3	4	1	4
99	1	1	1	1

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