



CENTRAL POLYTECHNIC COLLEGE

THARAMANI, CHENNAI – 600 113

(AN AUTONOMOUS INSTITUTION)

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

QUESTION BANK

FOR

EEEC31010 – ELECTRONIC DEVICES AND CIRCUITS

UNIT	Q NO	QUESTIONS
1	1	A half-wave rectifier conducts for how much of the input signal? (a) 25% (b) 50% (c) 75% (d) 100% Ans:50%
1	2	Which component is essential in a rectifier circuit? (a) Transistor (b) Resistor (c) Diode (d) Inductor Ans:Diode
1	3	Bridge rectifier uses how many diodes? (a) 1 (b) 2 (c) 3 (d) 4 Ans:4
1	4	In a full-wave rectifier, if one diode fails open, output becomes: (a) Full DC (b) Half DC (c) No output (d) AC output Ans:Half DC
1	5	What type of transformer is used in a full-wave rectifier? (a) Step-down (b) Center-tap transformer (c) Isolation transformer (d) Auto transformer Ans:Center-tap transformer
1	6	Which rectifier configuration requires no center tap? (a) Half-wave (b) Full-wave (c) Bridge (d) None Ans:Bridge
1	7	What is the main function of a rectifier? (a) To convert AC to DC (b) To convert DC to AC (c) To amplify signal (d) To filter signal Ans:To convert AC to DC
1	8	Which rectifier uses only one diode? (a) Full wave (b) Half wave (c) Bridge (d) Zener Ans:Half wave
1	9	What is the output frequency of a full-wave rectifier? (a) Same as input (b) Half of input (c) Double the input (d) Zero Ans:Double the input
1	10	Which type of rectifier provides higher efficiency? (a) Half-wave rectifier (b) Full-wave rectifier (c) Zener rectifier (d) Capacitor rectifier Ans:Full-wave rectifier

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1	11	Which of these can convert both halves of AC into DC? (a) Half-wave rectifier (b) Full-wave rectifier (c) Zener rectifier (d) Capacitor rectifier Ans: Full-wave rectifier
1	12	In a rectifier circuit, what does a transformer do? (a) Store energy (b) Rectify current (c) Filter the output (d) Change voltage level Ans: Change voltage level
1	13	Mention the application of rectifier (a) To convert AC to DC (b) To convert DC to AC (c) To amplify signal (d) UPS Ans: UPS
1	14	What is the primary function of a clipper circuit? (a) Amplify signals (b) Shift DC level (c) Remove parts of waveform (d) Store energy Ans: Remove parts of waveform
1	15	Which component is primarily used in clipper circuits? (a) Transistor (b) Capacitor (c) Diode (d) Inductor Ans: Diode
1	16	A clipper removes which part of the waveform? (a) Peak value (b) Frequency (c) Specific voltage range (d) Phase Ans: Specific voltage range
1	17	Which type of clipper removes the positive half of the input signal? (a) Negative clipper (b) Positive clipper (c) Series clipper (d) Shunt clipper Ans: Positive clipper
1	18	Which of the following is a series clipper? (a) Diode in parallel (b) Diode in series (c) Diode and capacitor (d) Transistor based Ans: Diode in series
1	19	What happens to the output in a biased clipper? (a) Output is unaffected (b) Output is filtered (c) Clipping occurs at non-zero voltage (d) No clipping occurs Ans: Clipping occurs at non-zero voltage
1	20	Which of the following is not a type of clipper? (a) Series (b) Parallel (c) Biased (d) Capacitive Ans: Capacitive

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1	21	What does a diode do in a clipper circuit? (a) Amplifies input (b) Blocks current (c) Allows or blocks parts of waveform (d) Increases frequency Ans:Allows or blocks parts of waveform
1	22	In a negative clipper, which part of the waveform is clipped? (a) Positive (b) Negative (c) Both (d) None Ans:Negative
1	23	What is the effect of adding a bias voltage to a clipper circuit? (a) Reduces frequency (b) Changes waveform shape (c) Alters clipping level (d) Increases voltage Ans:Alters clipping level
1	24	Clippers are also known as: (a) Attenuators (b) DC restorers (c) Amplitude limiters (d) Amplifiers Ans:Amplitude limiters
1	25	A shunt clipper consists of: (a) Diode only (b) Resistor only (c) Diode and resistor (d) Capacitor only Ans:Diode and resistor
1	26	Which clipper circuit uses a diode and a battery? (a) Clamper (b) Biased clipper (c) Amplifier (d) Shunt regulator Ans:Biased clipper
1	27	Series clippers are used for: (a) Filtering (b) Shifting DC level (c) Signal limiting (d) Boosting signal Ans:Shifting DC level
1	28	In a biased clipper, the clipping level depends on: (a) Diode forward voltage only (b) Supply voltage only (c) Bias voltage and diode drop (d) Load resistance Ans:Bias voltage and diode drop
1	29	Which of the following is a unidirectional device? (a) Resistor (b) Capacitor (c) Diode (d) Inductor Ans:Diode
1	30	LEDs are most commonly used in: (a) Power supplies (b) Switching circuits (c) Display devices (d) Amplifiers Ans:Display devices

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1	31	What does LED stand for? (a) Light Emission Display (c) Low Energy Diode Ans:Light Emitting Diode	(b) Light Emitting Diode (d) Linear Emitting Device
1	32	What is a Photo-Diode used for? (a) Power regulation (c) Light detection Ans:Light detection	(b) Sound detection (d) Voltage amplification
1	33	What is the symbol of LED? (a) Arrow and vertical bar (c) Arrow with circle Ans:Arrow and diode line	(b) Arrow and triangle (d) Arrow and diode line
1	34	What kind of junction is used in both LEDs and Photo-Diodes? (a) P-N junction (c) P-N-P Ans:P-N junction	(b) N-P-N (d) MOSFET
1	35	LED emits which type of signal? (a) Sound (c) Light Ans:Light	(b) Mechanical (d) Heat
1	36	Opto electronic devices are used to convert electrical signal into _____ (a) Sound (c) Optical Ans:Optical	(b) Mechanical (d) Heat
1	37	LED is a Semiconductor _____source (a) Sound (c) Light Ans:Light	(b) Mechanical (d) Heat
1	38	In LED, the colour of the light emits depends on the type of the _____ used. (a) Material (c) input Ans:Material	(b) Source (d) Device
1	39	In LED, the amount of light emitted from the diode is _____proportional to the forward current. (a) Directly (c) indirectly Ans:Directly	(b) equally (d) unequally
1	43	Which device is converts light into current? (a) Photo diode (c) LED Ans:Photo diode	(b) Zener diode (d) Varactor diode

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1	44	Identify the opto electronic device (a) Diode (b) Transistor (c) Resistor (d) Photo diode Ans:photodiode
1	45	which component used in 7 segment & 14 segment displays (a) Diode (b) Transistor (c) Resistor (d) LED Ans:LED
1	46	GaAs used for _____ (a) infrared radiation (b) Red or green light (c) Red or yellow light (d) Blue light Ans:infrared radiation
1	47	A typical use of Photo-Diode is: (a) Voltage source (b) photo sensor (c) RF oscillator (d) Transformer driver Ans:photo sensor
1	48	What is dark current in Photo-Diode? (a) Current in light (b) Current in absence of light (c) No current (d) Fault current Ans:Current in absence of light
1	49	The Photo-Diode works in which bias mode? (a) Forward (b) Reverse (c) Zero bias (d) Either Ans:Reverse
1	50	What is the symbol of a Photo-Diode? (a) Arrow into diode (b) Arrow out of diode (c) Arrow into capacitor (d) Arrow out of resistor Ans:Arrow into diode
2	1	The process of setting up a transistor for operation is called (a) Biasing (b) Loading (c) Amplifying (d) Modulating Ans:Biasing
2	2	In a PNP transistor, current enters through which terminal? (a) Base (b) Collector (c) Emitter (d) Any terminal Ans:Emitter
2	3	Which region of a BJT is heavily doped? (a) Base (b) Collector (c) Emitter (d) All are equally doped Ans:Emitter

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2	4	The active mode of a BJT is used primarily for: (a) Switching (b) Amplification (c) Rectification (d) Clipping Ans: Amplification
2	5	In cutoff mode, a BJT behaves like: (a) Closed switch (b) Open switch (c) Amplifier (d) Oscillator Ans: Open switch
2	6	In saturation mode, both junctions are: (a) Reverse biased (b) Forward biased (c) Emitter reverse, collector forward (d) Emitter forward, collector reverse Ans: Forward biased
2	7	Which biasing method provides the best stability? (a) Fixed bias (b) Voltage divider bias (c) Collector to base bias (d) None of these Ans: Voltage divider bias
2	8	Which biasing method uses a resistor between base and collector? (a) Voltage divider bias (b) Fixed bias (c) Collector to base bias (d) None of these Ans: Collector to base bias
2	9	The need for transistor biasing is to: (a) Maintain Q-point (b) Reduce power (c) Increase β (d) Reduce noise Ans: Maintain Q-point
2	10	The input characteristic of a CB configuration is similar to: (a) PN junction diode (b) Zener diode (c) Resistor (d) Capacitor Ans: PN junction diode
2	11	In active mode of an NPN transistor: (a) Emitter-base forward, collector-base reverse (b) Both junctions forward (c) Both junctions reverse (d) Emitter reverse, collector forward Ans: Emitter-base forward, collector-base reverse
2	12	Minority carriers in the base of an NPN transistor are (a) Electrons (b) Holes (c) Both electrons & holes (d) None Ans: Electrons
2	13	The emitter region is (a) Lightly doped (b) Moderately doped (c) Heavily doped (d) Undoped Ans: Heavily doped

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2	14	Fixed bias uses resistor between (a) Base and ground (b) Collector and base (c) Emitter and base (d) Collector and emitter Ans:Base and ground
2	15	Voltage divider bias is preferred for (a) Low cost (b) High stability (c) High β (d) Low β Ans:High stability
2	16	The collector region is (a) Lightly doped (b) Moderately doped (c) Heavily doped (d) Undoped Ans:Moderately doped
2	17	Output characteristic of CE shows (a) I_c vs V_{ce} (b) I_b vs V_{ce} (c) I_c vs I_b (d) I_e vs V_{ce} Ans:I_c vs V_{ce}
2	18	Which biasing has two resistors forming a divider? (a) Fixed bias (b) Voltage divider bias (c) Collector base bias (d) None Ans:Voltage divider bias
2	19	The base region is (a) Lightly doped (b) Moderately doped (c) Heavily doped (d) Undoped Ans:Lightly doped
2	20	A BJT acts as an open switch in (a) Active (b) Saturation (c) Cutoff (d) Breakdown Ans:Cutoff
2	21	Saturation mode is preferred in (a) Amplifier (b) Switch ON (c) Switch OFF (d) Oscillator Ans:Switch ON
2	22	In active mode of NPN transistor, which junctions are forward/reverse? (a) E-B forward, C-B reverse (b) E-B reverse, C-B forward (c) Both reverse (d) Both forward Ans:E-B forward, C-B reverse
2	23	The majority carriers in the base of an PNP transistor are (a) Electrons (b) Holes (c) Both electrons and holes (d) None Ans:Electrons

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2	24	In a NPN transistor, current enters through the (a) Base (b) Collector (c) Emitter (d) None Ans:Emitter
2	25	Which statement is correct for transistor operation? (a) E-B forward, C-B reverse (b) Both junctions forward (c) Both junctions reverse (d) E-B reverse, C-B forward Ans:E-B forward, C-B reverse
2	26	Which terminal controls the transistor action? (a) Emitter (b) Base (c) Collector (d) None Ans:Base
2	27	The collector region is designed to (a) Emit carriers (b) Collect carriers (c) Control carriers (d) Block carriers Ans:Collect carriers
2	28	The base is made very thin to (a) Increase current gain (b) Reduce leakage current (c) Increase breakdown voltage (d) Reduce β Ans:Increase current gain
2	29	In an NPN transistor, majority carriers in the emitter are (a) Electrons (b) Holes (c) Both (d) None Ans:Electrons
2	30	Which layer in BJT is largest in size? (a) Emitter (b) Base (c) Collector (d) All equal Ans:Collector
2	31	Which type of bias is required between emitter and base for normal operation? (a) Forward bias (b) Reverse bias (c) No bias (d) Variable bias Ans:Forward bias
2	32	In a PNP transistor, the direction of conventional current is from (a) Emitter to collector (b) Collector to emitter (c) Base to collector (d) Base to emitter Ans:Emitter to collector
2	33	Transistor was invented in: (a) 1928 (b) 1947 (c) 1975 (d) 1959 Ans:1947

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2	34	Which terminal is common to both i/p & o/p in CC configuration (a) Emitter (b) Base (c) Collector (d) All the above Ans:Collector
2	35	Which is the correct sequence of layers in an NPN transistor? (a) N-P-N (b) P-N-P (c) N-N-P (d) P-P-N Ans:N-P-N
2	36	Which is true for a PNP transistor? (a) Majority carriers are electrons (b) Majority carriers are holes (c) Both are majority carriers (d) No majority carriers Ans:Majority carriers are holes
2	37	A transistor is a (a) Unipolar device (b) Bipolar device (c) Photonic device (d) Magnetic device Ans:Bipolar device
2	38	A BJT has how many layers? (a) 1 (b) 2 (c) 3 (d) 4 Ans:3
2	39	Which type of transistor has electrons as majority carriers? (a) NPN (b) PNP (c) Both (d) None Ans:NPN
2	40	The base of a transistor is (a) Thick & heavily doped (b) Thin & lightly doped (c) Thick & lightly doped (d) Thin & heavily doped Ans:Thin & lightly doped
2	41	Which is the correct sequence of layers in an PNP transistor? (a) N-P-N (b) P-N-P (c) N-N-P (d) P-P-N Ans:P-N-P
2	42	Which region of a BJT is heavily doped? (a) Base (b) Collector (c) Emitter (d) All are equally doped Ans:Emitter
2	43	A BJT has how many junctions? (a) 1 (b) 2 (c) 3 (d) 4 Ans:2

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2	44	Which device is back to back connected in a transistor (a) Resistor (b) Capacitor (c) Diode (d) Inductor Ans:Diode
2	45	What is the typical voltage drop across the base-emitter junction of a silicon transistor? (a) 0.7 (b) 0.3 (c) 0.2 (d) 0 Ans:0.7
2	46	Which terminal is common to both i/p & o/p in CE configuration (a) Emitter (b) Base (c) Collector (d) All the above Ans:Emitter
2	47	A transistor is a _____ component (a) Active (b) Passive (c) bipolar (d) unipolar Ans:Active
2	48	The thin base in a transistor allows (a) Maximum recombination (b) Minimum recombination (c) No recombination (d) Excess heating Ans:Minimum recombination
2	49	Which terminal is not common to both i/p & o/p in CE configuration (a) Emitter (b) Base (c) Emitter & Base (d) None Ans:Base
2	50	What is the typical voltage drop across the base-emitter junction of a Germanium transistor? (a) 0.7 (b) 0.3 (c) 0.2 (d) 0 Ans:0.3
3	1	What is the primary function of a transistor in an amplifier circuit? (a) Store energy (b) Act as rectifier (c) Increase signal strength (d) Decrease voltage Ans:Increase signal strength
3	2	Which terminal of a transistor controls current flow? (a) Collector (b) Base (c) Emitter (d) Drain Ans:Base
3	3	What type of transistor is commonly used for amplification? (a) JFET (b) MOSFET (c) BJT (d) SCR Ans:BJT

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3	4	What does BJT stand for? (a) Binary Junction Transistor (b) Bipolar Junction Transistor (c) Bi-directional JT (d) Balanced JT Ans: Bipolar Junction Transistor
3	5	What is the function of the base in a BJT? (a) Power supply (b) Control signal (c) Ground (d) Load resistor Ans: Control signal
3	6	How does a transistor amplify a signal? (a) Adds voltage (b) Increases frequency (c) Small input controls large output (d) Stores charge Ans: Small input controls large output
3	7	What happens in the cutoff region? (a) Closed switch (b) Open switch (c) Conducts fully (d) Amplifies signal Ans: Open switch
3	8	In the active region, what is the transistor's role? (a) Switch (b) Resistor (c) Amplifier (d) Conductor Ans: Amplifier
3	9	What is the Purpose of transistor biasing? (a) Filter noise (b) Ensure proper operation (c) Increase voltage (d) Reduce resistance Ans: Ensure proper operation
3	10	Which region is used when transistor is ON as a switch? (a) Active (b) Cutoff (c) Saturation (d) Linear Ans: Saturation
3	11	Which configuration provides voltage amplification? (a) Common base (b) Common collector (c) Common emitter (d) None Ans: Common emitter
3	12	Stable bias method? (a) Base bias (b) Voltage divider (c) Emitter bias (d) Fixed bias Ans: Voltage divider
3	13	Best configuration for voltage gain? (a) Common base (b) Common collector (c) Common emitter (d) Emitter follower Ans: Common emitter

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3	14	Efficiency: switch vs amplifier (a) Amplifier more efficient (b) Switch more efficient (c) Equal (d) None Ans:Switch more efficient
3	15	In Class A amplifier, the transistor conducts for: (a) 180° (b) 360° (c) 90° (d) Less than 180° Ans:360°
3	16	Class B amplifier conduction angle is: (a) 180° (b) 360° (c) 90° (d) 270° Ans:180°
3	17	Class C amplifier conducts for: (a) 90° (b) More than 180° (c) Less than 180° (d) Full cycle Ans:Less than 180°
3	18	Push-pull amplifier configuration is commonly used in: (a) Audio amplifiers (b) RF transmitters (c) Op-amplifiers (d) Sensors Ans:Audio amplifiers
3	19	Class A amplifier is biased in which region? (a) Saturation (b) Cut-off (c) Active (d) Breakdown Ans:Active
3	20	Which class has highest efficiency among A, B, and C? (a) Class A (b) Class B (c) Class C (d) All same Ans:Class C
3	21	Which amplifier causes crossover distortion? (a) Class A (b) Class B (c) Class C (d) All same Ans:Class B
3	22	Main application of Class C amplifiers is: (a) Audio amps (b) RF transmission (c) Digital logic (d) Battery charging Ans:RF transmission
3	23	Why is Class A amplifier inefficient? (a) High distortion (b) Always conducting (c) Low gain (d) Needs tuning Ans:Always conducting

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3	24	Efficiency of Class A amplifier is approximately: (a) 25% (b) 50% (c) 75% (d) 100% Ans:25%
3	25	Class B amplifier uses which type of transistors? (a) Same polarity (b) Complementary (c) Power BJTs only (d) NPN only Ans:Complementary
3	26	Class A amplifier output signal is: (a) Inverted (b) Same phase (c) Clipped (d) Pulsed Ans:Inverted
3	27	What is the typical efficiency of a Class B amplifier? (a) 25% (b) 50% (c) 78.50% (d) 100% Ans:78.50%
3	28	What is the main feature of Class C operation? (a) Full conduction (b) High fidelity (c) High efficiency (d) Low power Ans:High efficiency
3	29	What's the main disadvantage of Class B? (a) High heat (b) High gain (c) Crossover distortion (d) Complex design Ans:Crossover distortion
3	30	What is differential mode signal? (a) Same signal on both inputs (b) Different signal on both inputs (c) Only output signal (d) Grounded signal Ans:Different signal on both inputs
3	31	Cascode amplifier uses how many transistors? (a) 1 (b) 2 (c) 3 (d) 4 Ans:2
3	32	Coupling capacitors are used to: (a) Transfer DC (b) Transfer AC (c) Filter high frequencies (d) Store signals Ans:Transfer AC
3	33	Phase shift between input and output in CE RC amplifier is: (a) 0° (b) 90° (c) 180° (d) 270° Ans:180°

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3	34	Amplifiers are increases the _____ of the applied input signal (a) Magnitude (b) Phase (c) Both magnitude & Phase (d) Frequency Ans: Magnitude
3	35	In active region, the amplifier is _____ (a) Non-linear (b) Linear (c) Active & Linear (d) Active & Non-Linear Ans: Linear
3	36	Single stage amplifier consists of (a) Single Transistor (b) Double Transistor (c) Triple Transistor (d) None Ans: Single Transistor
3	37	Which is a type of CE amplifier (a) Differential pair (b) Cascode (c) cascade (d) Single stage RC Coupled amplifier Ans: Single stage RC Coupled amplifier
3	38	Power amplifiers are called as (a) Low power amplifiers (b) Small signal amplifiers (c) Large signal amplifiers (d) All the above Ans: Large signal amplifiers
3	39	The operating point value of I_c and V_{ce} is (a) One (b) Zero (c) Greater than Zero (d) Lesser than Zero Ans: Zero
3	40	Which one is not a power amplifier (a) Audio frequency power amplifier (b) Video frequency power amplifier (c) Image frequency power amplifier (d) Radio frequency power amplifier Ans: Image frequency power amplifier
3	41	Which element is act as a coupling element in multistage amplifiers? (a) Inductor (b) Resistor (c) Capacitor (d) All the above Ans: Capacitor
3	42	What is the function of Coupling capacitors? (a) Block AC Signal (b) Block DC Signal (c) Block both AC & DC Signal (d) Allow DC Signal Ans: Block DC Signal
3	43	CMRR is the ratio of Differential mode voltage gain to _____ (a) Common Mode Current gain (b) Differential mode gain (c) Common Mode voltage gain (d) Differential mode current gain Ans: Common Mode voltage gain

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3	44	Amplifiers are electronic devices which increase the magnitude of the applied i/p signal without affecting its _____ & _____ (a) Amplitude & Phase (b) Frequency & Phase (c) Amplitude & frequency (d) Frequency & waveshape Ans: Frequency & waveshape
3	45	CMRR is equal to (a) A_{cm}/A_d (b) $1+A_{cm}/A_d$ (c) $1+A_d/A_{cm}$ (d) A_d/A_{cm} Ans: A_d/A_{cm}
3	46	Phase inversion occurs in: (a) CE stage (b) CC stage (c) CB stage (d) None Ans: CE stage
3	47	In an RC coupled amplifier, the signal is taken from the: (a) Base (b) Collector (c) Emitter (d) Ground Ans: Collector
3	48	What does “RC” in RC coupled amplifier stand for? (a) Resistor-Capacitor (b) Reactive-Capacitor (c) Resistance-Control (d) Radiative-Circuit Ans: Resistor-Capacitor
3	49	Darlington pair configuration uses how many transistors? (a) 1 (b) 2 (c) 3 (d) 4 Ans: 2
3	50	The full form of CMRR is: (a) Common Mode Resistance Ratio (b) Common Modulation Ratio (c) Common Mode Rejection Ratio (d) Current Modulated Resistive Ratio Ans: Common Mode Rejection Ratio
4	1	What is feedback in electronics? (a) A signal that is filtered (b) A signal sent back to the input (c) A signal that is amplified (d) A signal that is attenuated Ans: A signal sent back to the input
4	2	Positive feedback _____ the input signal. (a) Reduces (b) Opposes (c) Amplifies (d) Filters Ans: Amplifies
4	3	Which type of feedback is used in oscillators? (a) Negative (b) Positive (c) Both (d) None Ans: Positive

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4	4	Negative feedback _____ gain but improves stability. (a) Increases (b) Eliminates (c) Reduces (d) Has no effect on Ans:Reduces
4	5	In negative feedback, the feedback signal is _____ with the input signal. (a) In Phase (b) Out of Phase (c) same phase (d) None Ans:Out of Phase
4	6	Negative feedback in amplifiers helps to _____. (a) Decrease bandwidth (b) Reduce noise (c) Reduce slew rate (d) Increase distortion Ans:Reduce noise
4	7	Voltage-shunt feedback is also known as _____. (a) Current-controlled (b) Transconductance feedback (c) Transresistance amplifier (d) Current-mixing Ans:Transresistance amplifier
4	8	Positive feedback results in _____. (a) Stabilization (b) Oscillation (c) Attenuation (d) Filtering Ans:Oscillation
4	9	One advantage of negative feedback is _____. (a) Increased gain (b) Reduced noise (c) Increased distortion (d) Narrower bandwidth Ans:Reduced noise
4	10	What is a tank circuit? (a) A filter (b) An amplifier (c) An LC resonant circuit (d) A rectifier Ans:An LC resonant circuit
4	11	A tank circuit consists of which components? (a) Resistor and Inductor (b) Inductor and Capacitor (c) Capacitor and Diode (d) Resistor and Diode Ans:Inductor and Capacitor
4	12	The main function of a tank circuit is to _____. (a) Rectify signals (b) Store energy and resonate (c) Filter AC (d) Amplify signals Ans:Store energy and resonate
4	13	Which condition must be satisfied for sustained oscillation? (a) Voltage gain = 1 (b) Loop gain < 1 (c) Barkhausen criterion (d) Zero phase shift Ans:Barkhausen criterion

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4	14	Barkhausen Criterion requires _____. (a) Loop gain = 0 (c) Negative feedback Ans: Loop gain = 1 & phase shift = 360° (b) Loop gain = 1 & phase shift = 360° (d) Filter in circuit
4	15	In Barkhausen Criterion, what must be the phase shift around the loop? (a) 90° (c) 270° Ans: 360° (b) 180° (d) 360°
4	16	Oscillators are classified based on _____. (a) Output voltage (c) Frequency range & component used Ans: Frequency range & component used (b) Frequency stability (d) Gain
4	17	Which oscillator uses a tank circuit? (a) Wien bridge (c) Phase shift Ans: Colpitts (b) Colpitts (d) Crystal
4	18	A Colpitts oscillator is a type of _____ oscillator. (a) LC (c) Crystal Ans: LC (b) RC (d) Relaxation
4	19	The frequency of an LC tank circuit depends on _____. (a) Resistance (c) Inductance and capacitance Ans: Inductance and capacitance (b) Supply voltage (d) Load
4	20	Which oscillator uses a tapped inductor for feedback? (a) Hartley (c) Wien bridge Ans: Hartley (b) Colpitts (d) Phase shift
4	21	Which oscillator uses a tapped capacitor for feedback? (a) Hartley (c) Wien bridge Ans: Colpitts (b) Colpitts (d) Phase shift
4	22	The Barkhausen criterion applies to _____. (a) Amplifiers (c) Filters Ans: Oscillators (b) Oscillators (d) Rectifiers
4	23	A sine wave oscillator must meet which condition? (a) High input (c) Barkhausen criterion Ans: Barkhausen criterion (b) Large loop gain (d) Load matching

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4	24	The Hartley oscillator's frequency depends on _____. (a) Capacitor only (b) Resistor only (c) Inductor and capacitor (d) Feedback resistor Ans: Inductor and capacitor
4	25	Hartley oscillator uses which feedback network? (a) Capacitive (b) Inductive (c) Resistive (d) Piezoelectric Ans: Inductive
4	26	Which oscillator gives a stable frequency using a piezoelectric element? (a) Hartley (b) Crystal (c) RC phase shift (d) Colpitts Ans: Crystal
4	27	Wien bridge oscillator uses which bridge configuration? (a) Maxwell bridge (b) Wien bridge (c) Schering bridge (d) Wheatstone bridge Ans: Wien bridge
4	28	The frequency of a Wien bridge oscillator is controlled by _____. (a) RC network (b) LC network (c) Transformer (d) Crystal Ans: RC network
4	29	Colpitts oscillators are widely used in _____. (a) Signal generators (b) Microwave (c) VHF generators (d) UHF generators Ans: Signal generators
4	30	What is used to control amplitude in Wien bridge oscillator? (a) Zener diode (b) Automatic gain control (c) LDR (d) Transistor bias Ans: Automatic gain control
4	31	The formula for gain of an amplifier without feedback is (a) $A_v = 1 - V_o / V_i$ (b) $A_v = V_i / V_o$ (c) $A_v = 1 + V_o / V_i$ (d) $A_v = V_o / V_i$ Ans: $A_v = 1 - V_o / V_i$
4	32	In a LC tank circuit, the L and C are connected in _____ form (a) Series & Parallel (b) Series (c) Parallel (d) Parallel & Series Ans: Parallel
4	33	The positive feedback is also called as _____. (a) Regenerative feedback (b) Inverse Feedback (c) Degenrative feedback (d) Indirect Feedback Ans: Regenerative feedback

UNIT	Q NO	QUESTIONS
4	34	The basic amplifier in a network may be _____ (a) Inductor (b) Resistor (c) Voltage (d) capacitor Ans:Voltage
4	35	_____ improves Stability. (a) Positive without feedback (b) Negative without feedback (c) Negative feedback (d) Positive feedback Ans:Negative feedback
4	36	The capacitor stores voltage in _____ (a) Electric field (b) Magnetic field (c) Far-field (d) None Ans:Electric field
4	37	What is the condition for resonance? (a) $X_L = X_C$ (b) $X_L > X_C$ (c) $X_L < X_C$ (d) X_L is not equal to X_C Ans:$X_L = X_C$
4	38	Oscillaotrs are widely used in _____ (a) fixed DC signals, (b) Radar signals (c) non-repetitive signals (d) None Ans:Radar signals
4	39	Which one is a Non Sinusoidal Oscillator (a) LC Oscillators (b) RC Oscillators (c) Square Wave Generators (d) None Ans:Square Wave Generators
4	40	Which one is a Sinusoidal Oscillator (a) LC Oscillators (b) Triangular Wave Generator (c) Square Wave Generator (d) Sawtooth Wave Generator Ans:LC Oscillators
4	41	The capacitor stores _____ in elctric field (a) Current (b) Both current & Volgae (c) Voltage (d) None Ans:Voltage
4	42	What is βA_v represents in feedback amplifier? (a) Feed back factor (b) Gain factor (c) Feed back ratio (d) Gain ratio Ans:Feed back factor
4	43	The Inductor stores voltage in _____ (a) Electric field (b) Magnetic field (c) Far-field (d) None Ans:Magnetic field

UNIT	Q NO	QUESTIONS
4	44	Which one is a frequency generated Oscillator (a) VHF Oscillators (b) LC Oscillators (c) Square Wave Generator (d) RC Oscillators Ans:VHF Oscillators
4	45	The Inductor stores _____ in magnetic field (a) Current (b) Both current & Voltage (c) Voltage (d) None Ans:Current
4	46	What type of feedback is required for oscillation? (a) Negative (b) Positive (c) Zero (d) Both Ans:Positive
4	47	Frequency of an LC circuit is given by _____. (a) $1/RC$ (b) $1/2\pi\sqrt{LC}$ (c) L/C (d) RLC Ans:$1/2\pi\sqrt{LC}$
4	48	Which oscillator offers the highest frequency stability? (a) Hartley (b) Colpitts (c) Crystal (d) RC phase shift Ans:Crystal
4	49	What property of quartz is used in crystal oscillators? (a) Ferromagnetic (b) Piezoelectric (c) Semiconducting (d) Resistive Ans:Piezoelectric
4	50	An RC phase shift oscillator provides _____ phase shift using RC sections. (a) 90° (b) 120° (c) 180° (d) 360° Ans:180°
5	1	The flow of current in FET depends on (a) Both Electrons & Holes (b) Electrons only (c) Holes only (d) Either Electrons or Holes Ans: Either Electrons or Holes
5	2	FET stands for: (a) Field Emitting Tube (b) Field Effect Transistor (c) Fast Electron Transistor (d) Forward Emission Transistor Ans:Field Effect Transistor
5	3	FET is a: (a) Unipolar device (b) Bipolar device (c) Digital device (d) Passive device Ans:Unipolar device

UNIT	Q NO	QUESTIONS
5	4	Main control parameter of FET is: (a) Base current (c) Gate voltage Ans:Gate voltage (b) Collector voltage (d) Source voltage
5	5	What type of device is a JFET? (a) Voltage-controlled (c) Light-controlled Ans:Voltage-controlled (b) Current-controlled (d) Time-controlled
5	6	FET compared to BJT has: (a) Less noise (c) Equal Ans:Less noise (b) more noise (d) None
5	7	Input impedance of FET is: (a) Low (c) High Ans:High (b) Medium (d) Very low
5	8	Which is not a terminal of FET (a) Drain (c) Gate Ans:Base (b) Source (d) Base
5	9	The drain characteristic of a JFET is a plot between? (a) I_d and V_{gs} (c) V_{gs} and V_{ds} Ans:I_d and V_{ds} (b) I_d and V_{ds} (d) I_g and V_{ds}
5	10	The region where drain current is almost constant is: (a) Ohmic region (c) Cutoff region Ans:Saturation region (b) Saturation region (d) Breakdown region
5	11	Construction of N-channel JFET includes? (a) P-type channel (c) PNP junction Ans:N-type channel (b) N-type channel (d) Bipolar junction
5	12	JFET is normally operated in which region? (a) Cut-off (c) Saturation Ans:Saturation (b) Breakdown (d) Ohmic
5	13	Pinch-off voltage is denoted as? (a) $V_{gs(off)}$ (c) V_t Ans:V_p (b) V_p (d) V_s

UNIT	Q NO	QUESTIONS	
5	14	Channel in N-channel JFET is made of? (a) P-type silicon (c) Germanium Ans:N-type silicon	(b) N-type silicon (d) Indium
5	15	The drain resistance is the ratio between V_{ds} & _____ (a) I_d (c) I_s Ans:I_d	(b) I_g (d) None
5	16	How many terminals does a MOSFET have? (a) 2 (c) 4 Ans:4	(b) 3 (d) 5
5	17	Which terminal in MOSFET controls the conductivity of the channel? (a) Gate (c) Source Ans:Gate	(b) Drain (d) Substrate
5	18	What does MOSFET stand for? (a) Metal Oxide Semiconductor Field Effect Transistor (c) Multi Oxide Semiconductor Fast Emission Transistor Ans:Metal Oxide Semiconductor Field Effect Transistor	(b) Metal On Silicon Field Emission Transistor (d) Metal Oxide Silicon FET
5	19	In N-channel MOSFET, electrons are? (a) Majority carriers (c) Not involved Ans:Majority carriers	(b) Minority carriers (d) Hole attractors
5	20	What is the direction of current flow in N-channel MOSFET? (a) Gate to source (c) Drain to source Ans:Source to drain	(b) Source to drain (d) Gate to drain
5	21	What is the symbol of enhancement N-channel MOSFET? (a) Channel line is solid (c) Always ON Ans: Channel line is broken / dashed	(b) Always OFF (d) Channel line is broken / dashed
5	22	In MOSFET, what controls the conductivity of the channel? (a) Drain voltage (c) Gate voltage Ans:Gate voltage	(b) Source voltage (d) Substrate type
5	23	Transfer characteristics of a MOSFET plot? (a) I_d vs V_{ds} (c) I_d vs V_{gs} Ans:I_d vs V_{gs}	(b) V_{gs} vs V_{ds} (d) I_g vs V_{gs}

UNIT	Q NO	QUESTIONS
5	24	Which part of the MOSFET is insulated from the channel? (a) Source (b) Gate (c) Drain (d) Substrate Ans: Gate
5	25	What is the symbol of depletion N-channel MOSFET? (a) Channel line is solid (b) Always OFF (c) Always ON (d) Channel line is broken / dashed Ans: Channel line is solid
5	26	Why are enhancement MOSFETs normally off devices? (a) Channel is absent at $V_{gs} = 0$ (b) Channel is present at $V_{gs} = 0$ (c) Gate is connected to drain (d) Source is floating Ans: Channel is absent at $V_{gs} = 0$
5	27	When is a depletion mode MOSFET completely turned off? (a) $V_{gs} > 0$ (b) $V_{gs} < V_{th}$ (c) $V_{gs} = 0$ (d) $V_{ds} = 0$ Ans: $V_{gs} < V_{th}$
5	28	What is the function of the substrate in MOSFET? (a) Current path (b) Heat sink (c) Controls channel formation (d) Power supply path Ans: Controls channel formation
5	29	The two modes of MOSFETs are (a) Active & saturation (b) Enhancement & Cutoff (c) Active & depletion (d) Enhancement & depletion Ans: Enhancement & depletion
5	30	What does the solid line in the MOSFET symbol indicate? (a) No channel (b) Enhancement mode (c) Depletion mode (d) Short circuit Ans: Depletion mode
5	31	What is the default state of an N-channel enhancement MOSFET when $V_{GS} = 0$? (a) ON (b) OFF (c) Saturated (d) Depleted Ans: OFF
5	32	The gate terminal of a MOSFET is: (a) Heavily doped (b) Insulated by oxide (c) A diode junction (d) A PN junction Ans: Insulated by oxide
5	33	What does the broken or dashed line in the MOSFET symbol indicate? (a) No channel (b) Enhancement mode (c) Depletion mode (d) Short circuit Ans: Enhancement mode

UNIT	Q NO	QUESTIONS
5	34	Which terminal controls the current in a MOSFET? (a) Source (b) Gate (c) Drain (d) Substrate Ans:Gate
5	35	Which characteristic curve shows I_D vs. V_{DS} for various V_{GS} ? (a) Output characteristics (b) Drain characteristics (c) Load line (d) Transfer characteristics Ans:Drain characteristics
5	36	What type of device is a UJT? (a) Bipolar (b) Unipolar (c) Thyristor (d) FET Ans:Unipolar
5	37	How many terminals does a UJT have? (a) 2 (b) 3 (c) 4 (d) 5 Ans:3
5	38	Which terminal is connected to the p-type material in a UJT? (a) Base 1 (b) Base 2 (c) Emitter (d) Substrate Ans:Emitter
5	39	The UJT is mainly used as a: (a) Amplifier (b) Oscillator (c) Rectifier (d) Filter Ans:Oscillator
5	40	How many PN junctions formed in UJT? (a) 0 (b) 2 (c) 3 (d) 1 Ans:1
5	41	The resistance between B1 & B2 is called _____ (a) Inter resistance (b) Interbase resistance (c) base resistance (d) Intra resistance Ans:Interbase resistance
5	42	Which terminal is near to emitter in UJT? (a) B1 (b) B2 (c) Both B1 & B2 (d) None Ans:B2
5	43	The emitter of a UJT is made of: (a) p-type (b) n-type (c) intrinsic (d) metallic Ans:p-type

UNIT	Q NO	QUESTIONS
5	44	Which of the following is not a characteristic of UJT? (a) Negative resistance (b) Three terminals (c) Two junctions (d) High input impedance Ans:Two junctions
5	45	In UJT, the PN junction is reverse biased when _____ voltage is applied to the emitter (a) Positive (b) Zero (c) Negative (d) No voltage Ans:Negative
5	46	The intrinsic stand-off ratio is the ratio of: (a) R_{B1}/R_{B2} (b) R_{B1}/R_{BB} (c) R_{B2}/R_{B1} (d) R_{B1}/R_E Ans:R_{B1}/R_{BB}
5	47	The relaxation oscillator works on principle of: (a) Negative feedback (b) Positive feedback (c) Charging/discharging capacitor (d) Magnetic coupling Ans:Charging/discharging capacitor
5	48	The negative resistance region occurs: (a) Before firing (b) After firing (c) At peak voltage (d) When $V_{BB} = 0$ Ans:After firing
5	49	Which waveform is generated by a UJT relaxation oscillator? (a) Sine wave (b) Square wave (c) Sawtooth wave (d) Triangular wave Ans:Sawtooth wave
5	50	UJT stands for: (a) Uniform Junction Transistor (b) Uni Junction Transistor (c) Unique Junction Transistor (d) Unilateral Junction Transistor Ans:Uni Junction Transistor

Unit no	Part A/B	Q No	Questions
1	B	1	Describe the working of a half-wave rectifier with circuit diagram.
1	B	2	Describe the operation of a full-wave rectifier using center-tap transformer.
1	B	3	List any four applications of rectifiers.
1	B	4	Describe the working of a bridge rectifier with circuit diagram.
1	B	5	Define clipper and mention its types.
1	B	6	Define Clamper mention its types.
1	B	7	Draw the input and output waveform of a bridge rectifier.
1	B	8	Describe the operation of a positive clipper with circuit diagram.
1	B	9	Draw the input and output waveform of a negative clamper.
1	B	10	Draw the construction of LED.
2	B	1	Write short notes on BJT terminals.
2	B	2	Explain active mode operation of a transistor.
2	B	3	What is the need for transistor biasing?
2	B	4	Draw the circuit diagram of collector-to-base bias method.
2	B	5	Compare CE, CB, and CC configurations based on input impedance.
2	B	6	Explain voltage divider bias method with circuit diagram.
2	B	7	Draw the CB configuration circuit diagram.
2	B	8	Explain current flow in a NPN transistor with a diagram.
2	B	9	Write short notes on BJT terminals.
2	B	10	Explain current flow in a PNP transistor with a diagram.
3	B	1	Describe the working principle of a common emitter amplifier.
3	B	2	Compare Class A and Class B amplifiers.
3	B	3	Describe the working of class B power amplifiers with circuit diagram
3	B	4	Explain how a transistor can be used as an amplifier.
3	B	5	Describe the working of class A power amplifiers with circuit diagram
3	B	6	Describe the common mode of operation in a differential amplifier.
3	B	7	Write short notes on cascode amplifiers.
3	B	8	Mention the types of coupling used in multistage amplifier.
3	B	9	Describe the differential mode of operation in a differential amplifier.
3	B	10	State the applications of differential amplifier.
4	B	1	Differentiate between positive and negative feedback.
4	B	2	Mention the effect of negative feedback on amplifier gain.
4	B	3	State the conditions for sustained oscillations and explain their significance.
4	B	4	Explain the concept of feedback in amplifiers with block diagram.
4	B	5	Describe the operation of RC phase shift oscillator with circuit diagram.
4	B	6	Describe the construction of Colpitts oscillator with circuit diagram.
4	B	7	Compare Hartley and Colpitts oscillators (any three points).
4	B	8	Explain the operation of crystal oscillator with block diagram.

4	B	9	Write short notes on voltage series feedback amplifier with circuit diagram.
4	B	10	Derive the gain formula of an amplifier with negative feedback.
5	B	1	Compare FET and BJT (any three points).
5	B	2	Describe the construction of an N-channel JFET with diagram.
5	B	3	Draw and explain the VI characteristics of UJT.
5	B	4	Write short notes on UJT as a relaxation oscillator with circuit diagram.
5	B	5	Explain the construction of UJT with neat diagram.
5	B	6	Draw and explain the equivalent circuit of UJT.
5	B	7	Write short notes on operation of depletion-mode MOSFET.
5	B	8	Draw and explain the transfer characteristics of FET.
5	B	9	Draw and explain the drain characteristics of FET.
5	B	10	What is source, drain and gate in FET.
1	C	1	Explain the working principle of a Half Wave Rectifier with circuit diagram and output waveform.
1	C	2	Explain the construction and working principle of a Positive and Negative Clipper with waveforms.
1	C	3	Explain the working principle of PhotoDiode under reverse bias condition.
1	C	4	Explain the construction and working of a Positive Clamper with circuit diagram.
1	C	5	Explain the working principle of LED and list its applications.
2	C	6	Explain the construction and working principle of an NPN transistor.
2	C	7	Explain the Active mode, Saturation mode, and Cut-off mode of a BJT.
2	C	8	Explain the input and output characteristics of a transistor in CE configuration.
2	C	9	Explain the voltage divider bias circuit with neat diagram.
2	C	10	Explain the working principle of a PNP transistor.
3	C	11	Explain the working principle of CE amplifier.
3	C	12	Explain the working principle of a transistor as an amplifier.
3	C	13	Explain the working principle of a transistor as a switch.
3	C	14	Explain the construction and operation of a differential amplifier.
3	C	15	Explain the construction and working of Class A amplifier.
4	C	16	Explain the concept of negative feedback in amplifiers.
4	C	17	Explain the conditions for oscillation using Barkhausen criterion.
4	C	18	Explain the construction and working principle of RC phase shift oscillator.
4	C	19	Explain the construction and working principle of Colpitts oscillator.
4	C	20	Explain the working principle of an LC tank circuit.
5	C	21	Explain the working principle of N-channel JFET.

5	C	22	Explain the working principle and operation of UJT.
5	C	23	Explain the construction and operation of N-channel depletion MOSFET.
5	C	24	Explain the drain characteristics of JFET with neat graphs.
5	C	25	Explain the transfer characteristics of JFET with neat graphs