

- ① A semiconductor diode schematic symbol arrow head represents
 - a) N-type material
 - b) P-type material
 - c) both P and N-type materials
 - d) none of the above.
- ② In forward region of its characteristics, a diode appears as
 - a) an ON switch
 - b) an OFF switch
 - c) a capacitor
 - d) an high resistor
- ③ An electrical breakdown of a P-n junction occurs if
 - a) forward voltage increases up to the rating.
 - b) reverse voltage increases beyond the rating.
 - c) forward voltage decreases below the rating.
 - d) reverse voltage decreases below the rating.
- ④ With the increase of reverse bias in a P-n diode the reverse current
 - a) decreases
 - b) increases
 - c) Remains constant.
 - d) may increase or decrease depending upon doping.
- ⑤ What is the type of breakdown that occurs in a Zener diode having breakdown voltage (6V)?
 - a) Avalanche breakdown only.
 - b) Zener breakdown only.
 - c) Avalanche breakdown where breakdown voltage is below 6V and Zener breakdown otherwise.
 - d) Zener breakdown where breakdown voltage is below 6V and Avalanche breakdown otherwise.
- ⑥ The depletion region in an open circuited P-N junction contains
 - a) electron
 - b) holes
 - c) uncovered immobile impurity ions
 - d) neutralized impurity atoms.
- ⑦ The width of the depletion layer of a junction
 - a) decrease with light doping
 - b) increases with heavy doping
 - c) is independent of applied voltage.
 - d) is increased under reverse bias.

- 8) Zener breakdown occurs
- a) mostly in germanium junctions.
 - b) due to rupture of covalent bonds.
 - c) in lightly-doped junctions.
 - d) due to thermally-generated minority carriers.
- 9) Avalanche breakdown is primarily depends on the phenomenon of
- a) collision
 - b) doping
 - c) ionization
 - d) recombination
- 10) Diffusion capacitance of a junction is
- a) less than its transition capacitance.
 - b) essential for the design of varactors.
 - c) problem for devices which are required to switch rapidly from forward to reverse bias.
 - d) essential for the working of a tunnel diode.
- 11) A clipper circuit always
- a) needs a dc source
 - b) clips both half cycle of $\frac{2}{\pi}$ signal
 - c) clips upper portion of the signal
 - d) clips some part of the $\frac{2}{\pi}$ signal.
- 12) The primary function of a clamper circuit is to
- a) suppress variations in signal voltage
 - b) raise positive half-cycle of the signal
 - c) lower negative half-cycle of the signal
 - d) introduce a dc level into an ac signal.
- 13) A zener diode
- a) has a high forward-voltage rating.
 - b) has a sharp breakdown at low reverse voltage
 - c) is useful as an amplifier.
 - d) has a negative resistance.
- 14) In a half wave rectifier, the load current flows for
- a) the complete cycle of the input signal
 - b) only for the positive half-cycle of input signal.
 - c) less than half cycle of input signal.
 - d) more than half cycle but less than the complete cycle of input signal.

- 15) In a full wave rectifier, the current in each of the diodes flows for
- a) the complete cycle of the input signal
 - b) half cycle of the input signal
 - c) for zero time
 - d) more than half cycle of input signal
- 16) The ripple factor of power supply is a measure of
- a) its filter efficiency
 - b) diode rating
 - c) its voltage regulation
 - d) purity of power output
- 17) The bridge rectifier is preferable to an ordinary two-diode full wave rectifier because
- a) it use four diodes
 - b) transformer has no centre-tap
 - c) needs much smaller transformer for the same output
 - d) it has higher safety factor
- 18) Larger the value of filter capacitor
- a) larger the P-P value of ripple voltage
 - b) larger the peak current in the rectifying diode
 - c) longer the time that current pulse flows through the diode
 - d) smaller the d.c. voltage across the load.
- 19) In a centre-tap full-wave rectifier, if V_m is the peak voltage between the centre tap and one end of the secondary, the maximum voltage coming across the reverse-biased diode is
- a) V_m
 - b) $2V_m$
 - c) $V_m/2$
 - d) $V_m/\sqrt{2}$
- 20) The maximum efficiency of full-wave rectification is
- a) 40.6%
 - b) 100%
 - c) 81.2%
 - d) 85.6%
- 21) In a bridge type full wave rectifier, if V_m is the peak voltage across the secondary of the transformer the maximum voltage coming across each reverse-biased diode is
- a) V_m
 - b) $2V_m$
 - c) $V_m/2$
 - d) $V_m/\sqrt{2}$

- 22) The ripple factor for a bridge rectifier is
 a) 0.46 ~~b) 1.21~~ c) 1.11 d) 2.22
- 23) An ideal OP-AMP has
 a) infinite A_V b) infinite R_i
 c) zero output resistance ~~d) all the above~~
- 24) An ideal OP-AMP has bandwidth.
 a) zero b) small c) large ~~d) infinite~~
- 25) OP-AMPS have become very popular in industry mainly because
 a) they are cheaper
 b) of their extremely small size
 c) available in different packages
~~d) their external characteristics can be changed to suit any application~~
- 26) In differential mode
 a) opposite polarity signals are applied to the inputs
 b) the gain is one
 c) the outputs are of different amplitudes
 d) only one supply voltage is used.
- 27) Common mode gain is
 a) very high ~~b) very low~~ c) always unity ~~d) None of these~~
- 28) A voltage follower
 a) has gain one b) is non-inverting
 c) has no feedback resistor ~~d) all the above~~
- 29) With zero volts in both the inputs, an OP-AMP ideally should have an output equal to
 a) zero b) negative supply voltage
 c) positive supply voltage ~~d) the CMRR~~
- 30) When in a negative scaler, both R_1 & R_f are reduced to zero, the circuit function is
 a) adder ~~b) unity follower~~
 c) gm integrator ~~d) differentiator~~

- ① An ideal amplifier has
- (a) has +ve feedback
 - (b) gives uniform frequency response
 - (c) has infinite voltage gain
- (d) response only to signal at its input terminals

- ② In voltage amplifier the load resistance should be
- (a) large
 - (b) small
 - (c) equal to output impedance
 - (d) equal to input impedance

- ③ A buffer amplifier has a gain of
- (a) Infinity
 - (b) zero
 - (c) unity
 - (d) depend upon circuit parameter

- ④ Thermal noise in transistor amplifier is also known as
- (a) shot noise
 - (b) Schottky noise
 - (c) black noise
 - (d) Johnson noise

- ⑤ By increasing the number of identical stages in an amplifier the gain bandwidth product
- (a) decreases
 - (c) constant
 - (b) unity
 - (d) increases

(6) A BJT is biased with a power supply of 12V. For minimum heat dissipation, the drop across the transistor will be:

- (a) 6V (b) 4V (c) 12V (d) $>9V$ but $<12V$

(7) In an amplifier, the coupling capacitors are employed for:

- (a) limiting the bandwidth
(b) matching the impedance
(c) controlling the output
 (d) preventing of dc mixing with input or output

(8) maximum possible conversion efficiency of a class-B amplifier is

- (a) 25%
(b) 50%
(c) 75%
 (d) 78.5%

(9) Which of the following power amplifiers has the maximum efficiency?

- (a) class A (b) class B
(c) class AB (d) class C

(10) Negative feedback in an amplifier leads to which one of the following:

- (a) decrease in bandwidth (b) increase in current gain

- (c) increase in voltage gain (d) decrease in voltage gain

- (11) For tuned radio-frequency we use
- (a) class A amplifier
 - (b) class B amplifier
 - (c) class AB amplifier
 - (d) class C amplifier

- (12) The frequency of oscillation of a Hartley oscillator is:
- (a) $\omega = 1/LC$
 - (b) $\omega = \sqrt{LC}$
 - (c) $\omega = 2\pi LC$
 - (d) $\omega = 2\pi \sqrt{LC}$

- (13) A Hartley oscillator is used for generation of
- (a) very low frequency of oscillation
 - (b) radio frequency oscillation
 - (c) microwave oscillation
 - (d) audio-frequency oscillation

- (14) The highest frequency stability is achieved by using an oscillator of the type:
- (a) Colpitts
 - (b) Crystal
 - (c) Hartley
 - (d) RC phase shift

- (15) In three RC combination of a phase shift oscillator, each RC gives a phase shift of
- (a) 60°
 - (b) 90°
 - (c) 30°
 - (d) 45°

- (16) Frequency of oscillation of Wein bridge oscillator is given by
- (a) $f_0 = \frac{1}{2\pi RC}$
 - (b) $f_0 = \frac{1}{2\pi\sqrt{RC}}$
 - (c) $f_0 = \frac{1}{\pi RC}$
 - (d) $f_0 = \frac{1}{\pi\sqrt{RC}}$

(17) In a wien bridge oscillator, if the resistance in the positive feedback circuit are decreased the frequency :

- (a) decrease
- (b) Increase
- (c) remain same
- (d) fluctuate

(18) A wien bridge oscillator is suitable for

- (a) Audio frequency application
- (b) radio frequency application
- (c) low frequency application
- (d) High frequency application

(19) The most commonly used transistor configuration for use as a switching device is

- (a) common-base configuration
- (b) common-collector configuration
- (c) collector-emitter shorted configuration
- (d) common-emitter configuration

(20) A BJT operates as a switch

- (a) In the active region
- (b) with no signal condition
- (c) under small signal condition
- (d) under large signal condition

(21) For faithful amplification, minimum value of V_{BE} for Si transistor should be

- ~~(a) 0.7V~~ (b) 0.8V (c) 0.4V (d) 0.5V

(22) To produce sustained oscillation the positive feedback should be such that loop gain is at least _____

- ~~(a) unity~~ (b) infinite (c) zero (d) 100

(23) In BJT, collector current is given as

(a) $I_C = \beta I_B$ (b) $I_C = \beta I_B + I_{CO}$

(c) $I_C = \beta I_B + (1 + \beta) I_B$ ~~(d) $I_C = \beta I_B + (1 + \beta) I_{CO}$~~
leakage current

(24) What is the maximum collector circuit efficiency of transformer coupled class A power amplifier

- ~~(a) 50~~ (b) 70 (c) 80 (d) 100

(25) CMRR stands for

- (a) combined mode rejection ratio
(b) common mode rejection ratio
~~(c) common mode rejection ratio~~
(d) None of the above