1. In a zener diode :
   (A) only the P region is heavily doped
   (B) only the N region is heavily doped
   (C) both P and N regions are lightly doped
   (D) both P and N regions are heavily doped

2. Which of the following transistor configuration offers highest input impedance ?
   (A) CB (B) CE
   (C) CC (D) Cascade configuration

3. A half wave rectified sinusoidal waveform has a peak voltage of 10 V. Its average value of the fundamental component is :
   (A) $\frac{20}{\pi}$ V (B) $\frac{10}{\pi}$ V (C) 5 V (D) $\frac{5}{\pi}$ V

4. Barkhaussen criteria for oscillation is applicable to :
   (A) sinusoidal oscillators (B) astable multivibrators
   (C) relaxation oscillators (D) all oscillators

5. Which among the following is not an advantage of FET over BJT ?
   (A) its current controlled behaviour (B) high input impedance
   (C) low noise (D) high gain bandwidth product

6. RC coupled amplifier is used as a :
   (A) power amplifier (B) current amplifier
   (C) buffer amplifier (D) voltage amplifier

7. If a specific application of an amplifier demands better immunity to noise also which of the following amplifier can be chosen ?
   (A) RC coupled amplifier (B) Differential amplifier
   (C) Transresistance amplifier (D) Transconductance amplifier

8. The phase shift introduced by the wien bridge in a wien bridge oscillator at the frequency of oscillation is :
   (A) 180° (B) 360° (C) 0° (D) 90°

9. Which among the following will not affect the dc performance of the op-amp ?
(A) common mode rejection ratio (B) bandwidth
(C) slew rate (D) input resistance

10. Communication systems that do not use modulation are called :
(A) carrier communications (B) base band communications
(C) terrestrial communications (D) powerline communications

11. Which among the following can be taken as a constant envelope modulation ?
(A) DSBFC AM (B) DSBSC AM (C) SSB (D) FM

12. Choose the correct statement, regarding the measurement of a sinusoidal voltage waveform :
(A) using CRO the R.M.S. value can be measured.
(B) using CRO the R.M.S. value and using multimeter the average value can be measured.
(C) using CRO the average value and using multimeter the maximum value can be measured.
(D) using CRO the peak voltage and using multimeter the R.M.S. value can be measured.

13. A series RL circuit takes 160 watts of energy at 0.8 power factor lagging from 100 V, 50 Hz supply. The value of **R** is :
(A) 62.5 Ω (B) 30 Ω (C) 40 Ω (D) 50 Ω

14. Magnitude of Electric Field Intensity in the depletion region of an open circuited PN junction is :
(A) uniformly distributed
(B) maximum at the junction
(C) maximum at the region near P side
(D) maximum at the region near N side

15. Drift current in the semiconductor depends upon :
(A) only the electric field
(B) only the carrier concentration
(C) both the electric field and carrier concentration
(D) none of the above

16. A zener diode when used in voltage stabilization circuits is biased in :
(A) reverse bias region below the breakdown voltage
(B) reverse breakdown region
(C) forward bias region
(D) forward bias constant current mode

17. The PN junction in photodiode is :
(A) forward biased
(B) forward biased in the constant current region
(C) either forward or reverse biased
(D) reverse biased

18. Which MOSFET amplifier is best suited for high frequency applications ?
(A) CS (B) CD (C) CG (D) Source follower

19. A particular application requires dc level restoration of sinusoidal signals _____ circuit can be used for dc restoration.
(A) clamping (B) clipping (C) peak detector (D) rectifier

20. The input resistance of a CE amplifier can be increased by :
(A) increasing the input bias resistor
(B) including a coupling capacitor at the i/p
(C) including an unbypassed resistance in the emitter lead
(D) increasing the input voltage

21. Some properties of negative feedback are listed. Choose the property which is not applicable to negative feedback :
(A) Gain enhancement (B) Gain desensitivity
(C) Bandwidth extension (D) Noise reduction

22. Op-amp integrator can be used as _____ filter.
(A) HPF (B) BPF (C) LPF (D) BRF

23. _____ circuit can be used as a sine wave to square wave converter. (of same frequency)
(A) Schmitt trigger (B) Integrator
(C) Differentiator (D) Multivibrator

24. A non-inverting amplifier with a gain of 10 is to be designed. If R_f and R_i are the resistors used, the possible values of R_f and R_i are _____ , _____ respectively.
(A) 10 kΩ, 1 kΩ (B) 10 Ω, 1 Ω (C) 10 kΩ, 10 kΩ (D) 9 kΩ, 1 kΩ

25. One input of a 2 input EXOR gate is connected to logic 1 and to the other input 'A' is given. The output of EXOR is :
(A) 1 (B) $\overline{A}$ (C) 0 (D) A

26. A logical expression in 3 variables is to be implemented using a multiplexer i.e; $y = f$ (A, B, C). The multiplexer chosen is :

(A) 8 : 1 Multiplexer
(B) 3 : 1 Multiplexer
(C) 4 : 1 Multiplexer
(D) 16 : 1 Multiplexer

27. An energy signal is one which has :

(A) infinite energy and finite average power
(B) infinite power and finite energy
(C) finite power and zero energy
(D) finite energy and zero average power

28. A system is said to be stable if :

(A) every bounded input results in a bounded output
(B) superposition applies to that system
(C) the system is time invariant
(D) the output does not begin before the input function applied

29. The output of LTI system is equal to the :

(A) product of impulse response and input sequence
(B) sum of impulse response and input sequence
(C) convolution of input and transfer function
(D) convolution of impulse response and input sequence

30. What is the condition for existence of Fourier transform of a signal $x(t)$?

(A) If signal $x(t)$ is absolutely integrable
(B) If signal $x(t)$ is periodic
(C) If signal $x(t)$ is aperiodic
(D) No such condition exists

31. The trigonometric Fourier series of an even function does not have the :

(A) dc term
(B) sine term
(C) cosine term
(D) odd harmonic terms

32. A finite duration two sided sequence's ROC :

(A) Entire z plane except $z = 0$ and $z = \infty$
(B) Is a ring (annular region) in the z plane
(C) Entire z plane except $z = 0$
(D) Inside a circle centering origin

33. About the realization of LTI systems, which among the following statement is most appropriate :

(A) IIR systems can be implemented recursively only

(B) FIR systems can be implemented recursively or non-recursively

(C) both (A) and (B) are correct

(D) IIR systems can be implemented recursively or non-recursively

34. For efficient computation of 16 point DFT :

(A) radix 2 FFT algorithm is used

(B) direct computation FFT is used

(C) radix 2 DIT FFT algorithm is used

(D) radix 4 FFT algorithm is used

35. When the phase characteristic of a filter is linear within its pass band, the group delay of the filter will be :

(A) zero (B) constant (C) linear (D) non linear

36. An analog signal is band limited to 4 kHz, sampled at Nyquist rate and the samples are quantised into 4 levels. The quantised levels are assumed to be independent and equiprobable. If we transmit two quantized samples per second, the information rate is _____ bits/second.

(A) 1 (B) 2 (C) 4 (D) 3

37. A transmission line of characteristic impedance 50 Ω is terminated by a 50 Ω load when excited by a sinusoidal voltage source at 10 GHz, the phase difference between two points spaced 2 mm apart on the line is found to be $\frac{\pi}{4}$ radians. The phase velocity of the wave along the line is :

(A) 0.8×10^8 m/s (B) 1.2×10^8 m/s

(C) 3×10^8 m/s (D) 1.6×10^8 m/s

38. The intrinsic impedance of free space is :

(A) 75 Ω (B) 377 Ω (C) 73 Ω (D) 120 Ω

39. During night which layer does not exist :

(A) D layer (B) F_1 layer (C) F_2 layer (D) E layer

40. Radiation resistance of $\lambda/2$ dipole is :

(A) 377 Ω (B) 75 Ω (C) 73 Ω (D) 120 Ω

41. The dominant wave of rectangular waveguide is :
(A) TE_{11} (B) TE_{10} (C) TE_{01} (D) TM_{11}

42. When an EM wave is incident normally on the surface of a perfect dielectric, it is :
(A) fully transmitted
(B) fully reflected
(C) absorbed
(D) partially transmitted and partially reflected

43. A uniform plane electromagnetic wave propagating in x-direction have :
(A) E_x component only
(B) Components of E and H in x-direction only
(C) Components of E and H only in direction perpendicular to x-direction
(D) H_x component only

44. VSWR of a line terminated in an open circuit is :
(A) infinity (B) 0 (C) 1 (D) -1

45. For BIBO stability of a system which of the following statement is correct ?
(A) all roots of the characteristic equation must lie in RHS plane
(B) all roots must be in the LHS plane
(C) roots must lie either on jw axis or LHS plane
(D) roots must lie either on jw axis or RHS plane

46. The number of poles in the left half plane, right half plane and on the jw axis can be found out from :
(A) Root locus plot (B) Nyquist criterion
(C) Mason's gain formula (D) Routh Hurwitz criterion

47. For frequency domain analysis of systems, the methods available are :
(A) Nyquist plot (B) Bode plot
(C) Both (A) and (B) (D) Root locus plot

48. Signal Flow Graph applies :
(A) to all systems (B) only to linear systems
(C) only to discrete systems (D) only to non linear systems

49. Preemphasis and deemphasis is associated with :
(A) AM broadcasting (B) TV broadcasting
(C) Amateur communication (D) FM broadcasting

50. _____ can be used for the demodulation of PM.
(A) FM demodulator followed by an integrator
(B) AM demodulator followed by a filter
(C) Envelope detector with a low pass filter
(D) Frequency converter

51. The error due to insufficient sampling rate is called :
(A) aliasing (B) quantisation error
(C) slope overload (D) grannular error

52. A signal m(*t*) band limited to 3 kHz is sampled at a rate 33 $\frac{1}{3}$ % higher than Nyquist rate. What is the actual sampling rate ?
(A) 6000 Hz (B) 8000 Hz (C) 6600 Hz (D) 3300 Hz

53. The number of message points in the signal space diagram of BFSK is :
(A) 8 (B) 6 (C) 4 (D) 2

54. The primary objective of spectrally efficient modulation is to :
(A) maximize power efficiency
(B) reduce bit error rate
(C) maximize the bandwidth efficiency
(D) improve SNR

55. Average information content per source symbol of a discrete memoryless source is termed as :
(A) information rate (B) entropy
(C) information capacity (D) data compaction

56. The power spectral density of a stationary process is always :
(A) zero (B) positive (C) negative (D) non negative

57. For the same bit energy to noise density ratio the bit error rate of :
(A) Coherent BFSK is less (B) Coherent BPSK is less
(C) BPSK and BFSK are same (D) BPSK and BFSK cannot be compared

58. A continuous time signal can be converted to discrete time signal by :
(A) sampling and quantising (B) quantising and sampling
(C) convoluting with train of pulses (D) low pass filtering and differentiation

59. The impulse response of a linear time invariant filter matched to an input signal is _____.

(A) input signal itself

(B) delayed version of the input

(C) time reversed and delayed version of input

(D) delayed input multiplied with a constant

60. If the input to a stable linear time invariant filter is stationary process then the output of the filter is _____.

(A) ergodic (B) non stationary (C) random (D) stationary

61. A stack is :

(A) an 8 bit register in the microprocessor

(B) a 16 bit register in the microprocessor

(C) a set of memory locations in R/W memory reserved for storing information temporarly during the execution of a program

(D) a 16 bit memory address stored in the program counter

62. The OUT instruction :

(A) sends the data from register to output port

(B) sends the data from accumulator to output port

(C) sends data from memory location to output port

(D) sends the flag register content to accumulator

63. Consider an inverting amplifier configuration using op-amp with slew rate 1 V/μs. The value of resistors used in the circuit is $R_f = R_i = 10\ k\Omega$. What is the shortest interval of time that the input pulse could rise to 5 V without exceeding the amplifier's slew rate ?

(A) 1 μs (B) 10 μs (C) 0.1 μs (D) 5 μs

64. A CMOS inverter can be formed from the proper connection of NMOS transistor Q_1 and PMOS transistor Q_2. The connection will be (power supply connection, properly given) :

(A) Q_1 and Q_2 parallel, i/p to gate of both o/p drain of both, supply to drain

(B) Q_1 and Q_2 parallel, i/p to gate of both o/p drain of Q_2

(C) Q_2 and Q_1 in series, drain of Q_2 to drain of Q_1, i/p to gate of both, o/p from drain. Supply to source of Q_2

(D) Q_1 and Q_2 in series, supply to source of Q_1, i/p to gate of both, o/p from drain

65. Wire ANDing is possible with :

(A) Schottky TTL (B) Standard TTL

(C) Totem pole output (D) Open collector output