1. **In an amplitude modulated system if the total power is 600W and the power in the carrier is 400W, the modulation index is**

   a. 0.5
   b. 0.75
   c. 0.9
   d. 1

2. **The channel capacity under the Gaussian noise environment for a discrete memoryless channel with a bandwidth of 4MHz and SNR of 31 is.**

   a. 20 Mbps
   b. 4 Mbps
   c. 8 kbps
   d. 4 kbps

3. **In satellite communication, frequency modulation is used because satellite channel has**

   a. High modulation index
   b. Small bandwidth and negligible noise
   c. Large bandwidth and severe noise
   d. Maximum bandwidth and minimum noise

4. **For a 3-um-diameter optical fiber with core and cladding indexes of refraction of 1.545 and 1.510, respectively. The cut off wavelength is.**

   a. 2.3um
   b. 1.29um
   c. 1.5um
   d. 3.24um

5. **A 12-bit ADC is operating with a 1us clock period and total conversion time is seen to be 14us always. The ADC must be of the type**

   a. Flash type
   b. Counting type
   c. Integrating type
   d. Successive approximation type

6. **Consider the analog signal x(t) = 3cos100πt. If the signal is sampled at 200Hz, the discrete time signal obtained will be**

a. 3cos(πn/4)
b. 3cos(πn/2)
c. 3cos(πn)
d. 3cos(πn/3)

7. **In VHDL all the statements written inside a process statement are _____**

a. Concurrent
b. Sequential
c. Both (a) and (b)
d. None of the above

8. **A microprocessor with 12-bit address bus will be able to access ____ kilobytes of memory**

a. 0.4
b. 2
c. 10
d. 4

9. **A practical current source is usually represented by**

a. A resistance in series with an ideal current source.
b. A resistance in parallel with an ideal current source.
c. A resistance in parallel with an ideal voltage source.
d. None of the above.

10. **The dominant mode in a rectangular wave guide is TEo, because this mode has**

a. No attenuation
b. No cut off
c. No magnetic field component
d. The highest cut-off wavelength

11. **A PN junction in series with a 100 ohm resistor is forward biased so that a current of 100 mA flows. If voltage across the combination is instantaneously reversed to 10V at time t = 0, the reverse current that flows through the junction at t = 0 is approximately given by.**

a. 0 mA
b. 200 mA
c. 50 mA
d. 100 mA

12. **Ripple factor for a half wave rectifier is _____ .**

a. 1.65
b. 1.45
c. 1
d. 1.21

13. **_____ is a primitive that can execute code. It contains an instruction pointer (=program counter) and sometimes has its own stack**

a. Process
b. Task
c. Kernel
d. Thread

14. **If α and β are the roots of the equation $x^2-px+q = 0$, then $\sum\alpha^2$ is**

a. $p^2 + 2q$
b. $p + 2q$
c. $p^2 - 2q$
d. $p - 2q$

15. **A signal $m_1(t)$ is band limited to 3.6 kHz and the three other signals $m_2(t)$, $m_3(t)$ and $m_4(t)$ are band limited to 1.2 kHz each, and these signals are transmitted by means of TDM. Then, what will be the transmission bandwidth of the channel.**

a. 7.2 KHz
b. 14.4 KHz
c. 3.6 KHz
d. 2.4 KHz

16. **For a 10 bit PCM system the signal to quantization noise ratio is 62dB. If the number of bits is increased by 2, then the signal to quantization noise ratio will**

a. Increase by 6 dB
b. Increase by 12 dB
c. Decrease by 6 dB
d. Decrease by 12 dB

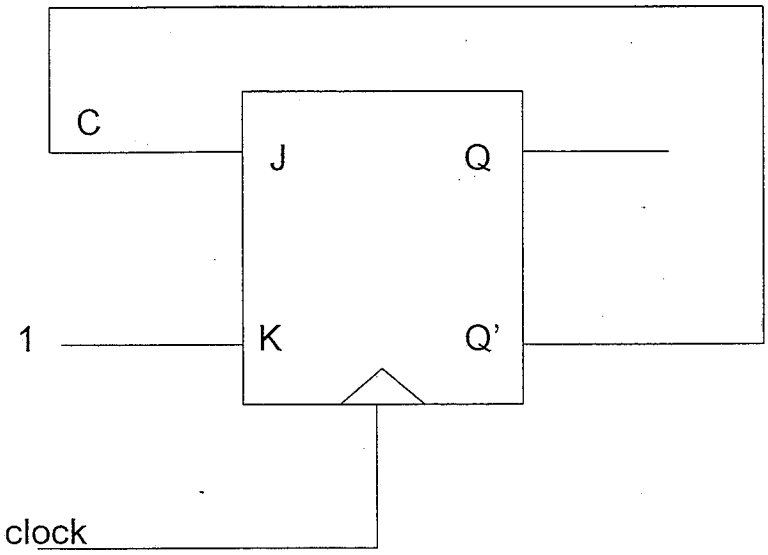
17. **The modulation normally used with the digital data is**

a. FM
b. AM
c. SSB
d. QPSK

18. **The critical angle θc in an optical fiber is given by _____. Where n_1 is refractive index of medium 1 and n_2 is the refractive index of medium 2.**

a. $Sin^{-1} (n_2/ n_1)$
b. $Sin^{-1} (n_1/ n_2)$
c. $Sin^{-1} (n_2 * n_1)$
d. $Sin^{-1} n_2$

19. **In a JK flip flop we have J = Q' and K = 1. Assuming that the flip flop was initially cleared and clocked for 6 pulses, the sequence at the Q output will be**



a. 010000
b. 011001
c. 010010
d. 010101

20. **Which of the following system is linear**

a. $y(n) = e^{x(n)}$
b. $y(n) = Ax(n) + B$
c. $y(n) = x(n^2)$
d. $y(n) = x^2(n)$

21. **Which of the following operator cannot be synthesized by VHDL synthesis tools**

a. +
b. -
c. *
d. &

22. **Which of the following statements with reference to a generic microprocessor is correct?**

a. Instruction cycle time period is exactly equal to machine cycle time period
b. Instruction cycle time period is shorter than machine cycle time period
c. Machine cycle time period is shorter than instruction cycle time period
d. Instruction cycle time period is exactly half of machine cycle time period

23. **An electric iron designed for 110V AC supply was rated at 500W. It was put across a 220V supply. Assuming that at 110V it supplied 500W output (i.e no losses) at the new voltage it will supply**

a. 2500W
b. 250W
c. 500W
d. 2000W

24. **A very lossy, λ/4 long, 50 ohm transmission line is open circuited at the load end. The input impedance measured at the other end of the line is approximately.**

a. 0
b. ∞
c. 50 ohm
d. none of the above

25. **For the 2N338 transistor, the manufacturer specifies P max =100mW at 25° C free air temperature and the maximum junction temperature, Tj max = 125°. Its thermal resistance is**

a. 10° C/W
b. 100° C/W
c. 1000° C/W
d. 10,000° C/W

26. **In a Class AB amplifier, the current flows through the active device for**

a. Less than half of the duration of input cycle
b. Half duration of input cycle
c. More than half but less than full cycle duration
d. Full duration of input cycle

27. **Which of the following is not true regarding a preemptive kernel**

a. If a high priority thread becomes ready to run, low priority thread is preempted
b. The kernel checks for the high priority ready to run threads when ever called
c. The executing thread is never interrupted
d. There are special demands on communication between threads and handling common resources

28. **The solution of differential equation $dy/dx = e^{x-y} + x^2e^{-y}$ is**

a. $e^y = e^x+x^3/3+c$
b. $e^y - e^x = c$
c. $x - e^y = c$
d. $e^y+e^x+x^3/3+y=0$

29. **The intermediate frequency of a super-heterodyne receiver is 450 KHz. If it is tuned to 1200 KHz, the image frequency will be**

a. 750 KHz
b. 900 KHz
c. 1600 KHz
d. 2100 KHz

30. **The bandwidth of a 'N' bit binary coded PCM signal for modulating a signal having bandwidth of 'f' Hz is**

a. f/N Hz.
b. f
c. Nf
d. N

31. **Go-stationary satellites are placed in equatorial orbits at the height approximately**

a. 1000 km
b. 15000 km
c. 25000 km
d. 36000 km

32. **For a single mode optical cable with 0.25dB/km loss, the optical power 100km from a 0.1mW source will be _____.**

a. -30dBm
b. -35dBm
c. -40dBm
d. -45dBm

33. **The function of a strobe function in digital system is**

a. To reset memory register.
b. To check the functioning of a logic gate
c. To avoid race problem
d. To tri-state the output of the register

40. **For a class B amplifier providing a 20V peak signal to 16 ohm load and a power supply of Vcc = 30V, the efficiency will be.**

a. 52.3%
b. 25.65%
c. 75%
d. 78.6%

41. **When a microprocessor interfaces with a peripheral or memory device, the normal timing of the microprocessor may need to be altered by introducing _____**

a. Latching
b. Wait states
c. Tristate logics
d. None of the above

42. $\int_0^{\pi/2} (\mathbf{Cos}^3 \mathbf{x})\, \mathbf{dx} =$

a. 3/2
b. 2/3
c. 8/9
d. 8/13

43. **In phase modulated signal, the frequency deviation is proportional to**

a. Frequency only
b. Amplitude only
c. Both (a) and (b)
d. none of the above

44. **For a fast communication which of the following requirements have to be met**

a. Large bandwidth
b. High S/N ratio
c. High channel capacity
d. None of the above

34. **The impulse response of a linear time invariant system is h (n) = {1,2, 1,-1}. The response for the input signal x(n) = {1,2,3,1} is**

a. {1, 8, 4, 8, 3, -1, -2}
b. {1, 4, 8, 3, 8, -2, -2}
c. {1, 4, 8, 8, 3, -2, -1}
d. {1, 8, 3, 8, 8, 4, -1}

35. **Which of the following statement regarding a constant is not true**

a. Constant defined in a package can be referenced by any entity or architecture for which package is used.
b. The value of constant can be changed with in the design description
c. Constant defined in an architecture is visible only to that architecture
d. Constant defined in a process declarative region is not visible outside that process

36. **In a 8085 microprocessor system with memory mapped I/O**

a. I/O devices have 8 bit address
b. I/O devices are accessed using IN and OUT instructions.
c. There can be maximum 256 input and 256 output devices
d. Arithmetic and logic operations can be directly performed with I/O data

37. **The Thevenin and Norton circuits are**

a. Single frequency equivalent circuits
b. Multi frequency equivalent circuits
c. Equivalent independent of frequency
d. Band frequency equivalent circuits

38. **A broadside array operating at 100 cm wavelength consist of 4 half wave dipoles spaced 50 cm apart. Each element carries radio frequency current in the same phase and of magnitude 0.5A. The radiated power will be ____ if the radiation resistance is 146 ohm.**

a. 146 W
b. 73 W
c. 36.5 W
d. 18.25 W

39. **An NPN transistor has a beta cut off frequency f_β of 1MHz, and a common emitter short circuit low frequency current gain β_o of 200. its unity gain frequency f_T and the alpha cut-off frequency f_α respectively are**

a. 200 MHz, 201 MHz
b. 200 MHz, 199 MHz
c. 199 MHz, 200 MHz
d. 201 MHz, 200 MHz

45. **For an earth station transmitter input power of 40dBW (10,000W), with a back off loss of 3dB, a total branching and feeder loss of 3dB, and a transmit antenna gain of 40 dB, determine the EIRP.**

a. 40dBW
b. 74dBW
c. 34dBW
d. 80dBW

46. **_____ is used to describe the light gathering or light collecting ability of an optical fiber**

a. Critical angle
b. Cut-off wavelength
c. Numerical Aperture
d. Acceptance angle

47. **_____ has the maximum fan out capacity**

a. MOS
b. CMOS
c. ECL
d. RTL

48. **If Z transform of x(n) is X(z) then the Z transform of x(n-k) is _____**

a. $X(z^{-k} z)$
b. $X(z^{k} z)$
c. $z^{-k} X(z)$
d. $z^{k} X(z)$

49. **The following code will implement a _____**

```
process (clk, d) begin
        if (clk = '1') then
                q <= d;
        end if;
end process
```

a. Positive edge triggered D flip flop
b. Negative edge triggered D flip flop
c. A latch
d. None of the above.

50. **The greatest negative number which can be stored in a 8-bit register using 2's complement arithmetic is**

a. -256
b. -255
c. -127
d. -128

51. **Two coupled coils have self inductances L1 = 10mH and L2 = 20mH. The co-efficient of coupling (K) being 0.75 in the air. Voltage in the second coil when the current in circuit is given by I = 2 sin (314t) A is .....**

a. 3.14 cos (314t) V
b. 3.33 sin (314t) V
c. 6.66 cos (314t) V
d. 6.28 cos (314t) V

52. **In a radar system, if the peak transmitted power is increased by a factor of 16 and the antenna diameter is increased by a factor of 2, then the maximum range will increase by a factor of**

a. 16
b. 8
c. 4
d. $\sqrt{8}$

53. **The transconductance g_m of an FET in the saturation region equals**

a. $\frac{-2I_{DSS}}{Vp}\left[1 - \frac{V_{GS}}{Vp}\right]$

b. $\frac{-2I_{DSS}}{Vp}\left[1 - \frac{V_{GS}}{Vp}\right]^2$

c. $\frac{-2I_{DSS}}{Vp}\left[1 - \frac{V_{GS}}{Vp}\right]^{1/2}$

d. $\frac{I}{Vp}\left[I_{DSS} X I_{DS}\right]^{1/2}$

54. **The transistor amplifier with 85% of efficiency is likely to be**

a. Class A
b. Class B
c. Class AB
d. Class C

55. **A run-time stack cannot be used in a round-robin scheduling system because of the _____ nature of scheduling.**

a. LIFO (Last in First out)
b. FIFO (First in First out)
c. FILO (First in Last out)
d. None of the above

56. **$(3 + i)/(5 + 5i)$ is same as**

a. $(2 - i)/5$
b. $3 - i$
c. $5 - 5i$
d. $(2 + i)/5$

57. **The modulation index of an amplitude modulated wave is changed from 0 to 1. the transmitted power is**

a. Doubled
b. Halved
c. Increased by 50 percent.
d. Unchanged.

58. **In a communication system, each message (1 or 0) is transmitted three times in order to reduce the probability of error. The detection is based on the majority rule at the receiver. If Pc is the probability of bit error, the probability of error for this communication channel will be**

a. $3Pc^2 - 2Pc^3$
b. $1 - Pc^2 - Pc^3$
c. Pc^3
d. $Pc^2(1 - Pc)$

59. **For a satellite transponder with a receiver antenna gain of 12 dB , an LNA gain of 10 dB, and equivalent noise temperature of 26 dBK^{-1}, the G/Te is**

a. 4 dBK^{-1}
b. -4 dBK^{-1}
c. 26 dBK^{-1}
d. -26 dBK^{-1}

60. **_____ current is the leakage current that flows through a photo diode with no input used in as light detectors.**

a. Leakage
b. Dark
c. saturation current
d. Detection

61. **The figure of merit of a logic family is given by**

a. Gain bandwidth product
b. (propagation delay time) * (power dissipation)
c. fanout * (propagation delay time)
d. (noise margin) * (power dissipation)

62. **_____ is defined as the time delay that a signal component of frequency ω undergoes as it passes from the input to output of the system.**

a. Phase delay
b. Group delay
c. Frequency deviation
d. Latency

63. **Which statement is true regarding a behavior modeling in VHDL**

a. There can be more than one process statement in an architecture which will interact concurrently
b. Behavioral style of architecture can have only concurrent assignment statements
c. Process is not a single concurrent statement
d. A process need not have sensitivity list for proper implementation

64. **The process of imitating one system with another so that the imitating systems accepts the same data, executes same programs and achieves same results as the imitated systems is known as**

a. Simulation
b. Modification
c. Translation
d. Emulation

65. **The values of R, L and C in series RLC circuit that resonates at 1.5 KHz and consumes 50W from a 50V ac source operating at the resonant frequency. The bandwidth is 0.75 KHz.**

a. R = 50 ohm, L = 10.6 mH, C = 1.06uF.
b. R = 500 ohm, L = 10.6 mH, C = 10.6uF.
c. R = 50 ohm, L = 1.06 mH, C = 10.6uF.
d. R = 500 ohm, L = 1.06 mH, C = 1.06uF.

66. **When VSWR is 3, the magnitude of the reflection co-efficient will be**

a. ¼
b. ⅓
c. ½.
d. 1.

67. **The conductivity of the intrinsic germanium at 300°K is _____. When, n_i at 300°K = 2.5 X 10^{13} /cm and μ_n and μ_p in germanium are 3800 and 1800 cm^2/Vs respectively.**

a. 0.224 S/cm
b. 0.0224 S/cm
c. 2.24S/cm
d. 0.00224 S/cm

68. **As compared to a full wave rectifier using 2 diodes, the four diode bridge rectifier has the dominant advantage of**

a. Higher current carrying
b. Lower peak inverse requirement
c. Lower ripple factor.
d. Higher efficiency.

69. **In a real time system, the simplest scheme that allows the operating system to allocate memory to two processes simultaneously is _____.**

a. Over lays
b. Pipeline
c. Swapping
d. None of the above

70. **$(\cos 5\theta - i \sin 5\theta)^2$ is same as**

a. $\cos 10\theta + i \sin 10\theta$
b. $\cos 25\theta - i \sin 25\theta$
c. $(\cos \theta + i \sin \theta)^{-10}$
d. $(\cos \theta - i \sin \theta)^{-10}$

71. **In case of which of the following, an increase on the modulation index leads to increase in bandwidth**

a. PM
b. FM
c. AM
d. Both (a) and (b)

72. **Four voice signals, each limited to 4 kHz and sampled at Nyquist rate, are converted into binary PCM signal using 256 quantisation levels. The bit transmission rate for the time division multiplexing signal will be**

a. 8 kbps
b. 64 kbps
c. 256 kbps.
d. 5126 kbps

73. **If a counter having 10 FFs is initially at 0, what count will it hold after 2060 pulses?**

a. 000 000 1100
b. 000 001 1100
c. 000 001 1000
d. 000 000 1110

74. **The output of a circular convolution performed on two signals $x_1(n) = \{\underline{2}, 1, 2, 1\}$ and $x_2(n) = \{\underline{1},2,3,4\}$ is**

a. $\{\underline{16}, 14, 16, 14\}$
b. $\{\underline{14}, 16, 14, 16\}$
c. $\{\underline{12}, 14, 12, 14\}$
d. $\{\underline{14}, 12, 14, 12\}$

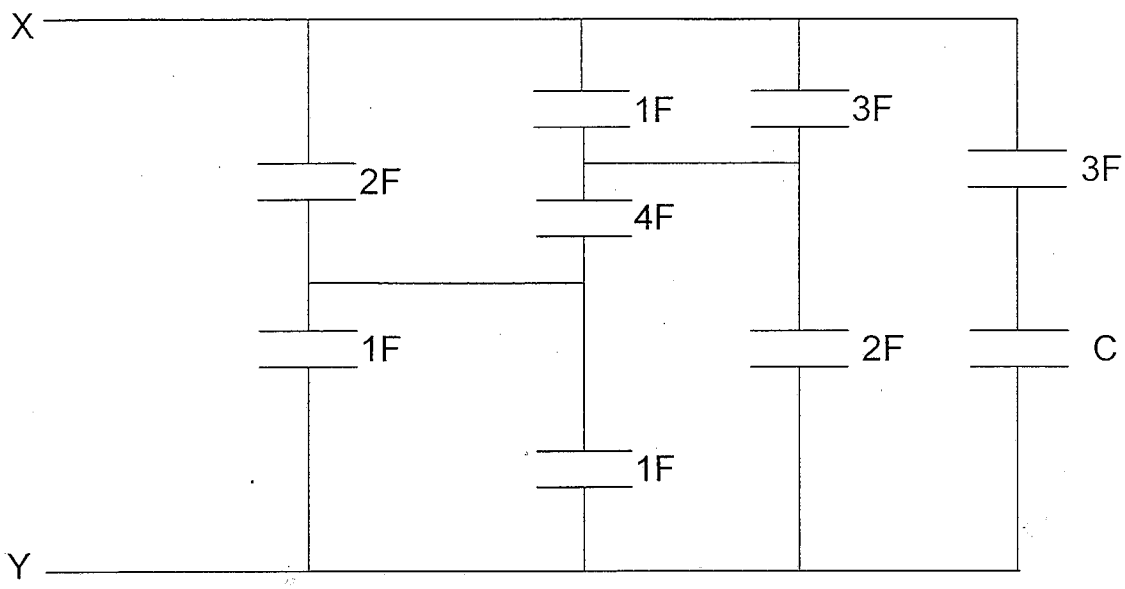
75. **When using a sequential code to design a combinational logic in VHDL, if complete truth table is not defined, the synthesis tool will implement a _____ which is not required.**

a. Clock buffer
b. Buffer
c. Flip Flop
d. Latch

76. **In what order the elements of a pushdown stack are accessed?**

a. First In First Out (FIFO)
b. Last In Last Out (LILO)
c. Last In First Out (LIFO)
d. None of the above

77. **What is the value of C such that equivalent capacitance across x-y is 5F**

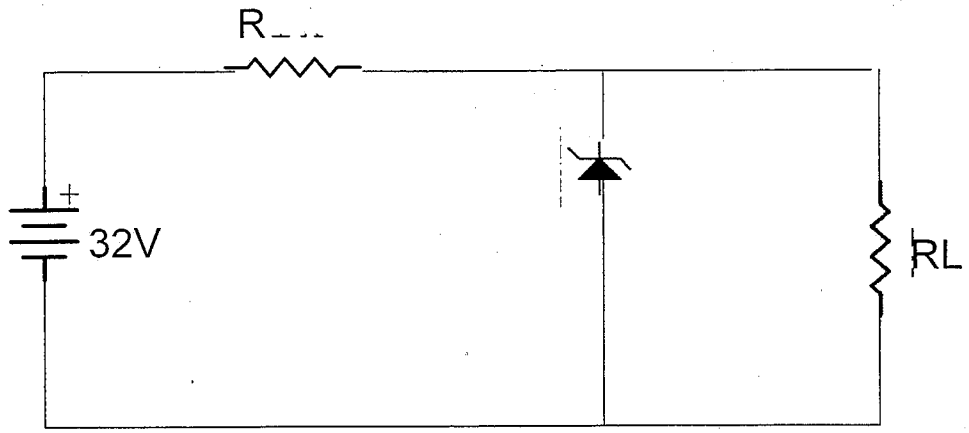


a. 20F
b. 23F
c. 22F
d. 21F

78. **A wave guide section in a microwave circuit will act as a**

a. Low pass filter
b. Band pass filter
c. High pass filter
d. Band stop filter

79. **A 24V, 600mW Zener is to be used for providing a 24V stabilized supply to a variable load. Assume that for proper Zener action, a minimum of 10 mA must flow through the Zener. If the input voltage is 32V, what would be the value of R and the maximum load current?**



a. 320 ohm, 10mA
b. 400 ohm, 15mA
c. 400 ohm, 10mA
d. 320 ohm, 15mA

80. **The value of x at which y has a minimum for $y = x^2 - 3x + 1$ is**

a. -3/2
b. 3/2
c. 0
d. None of these

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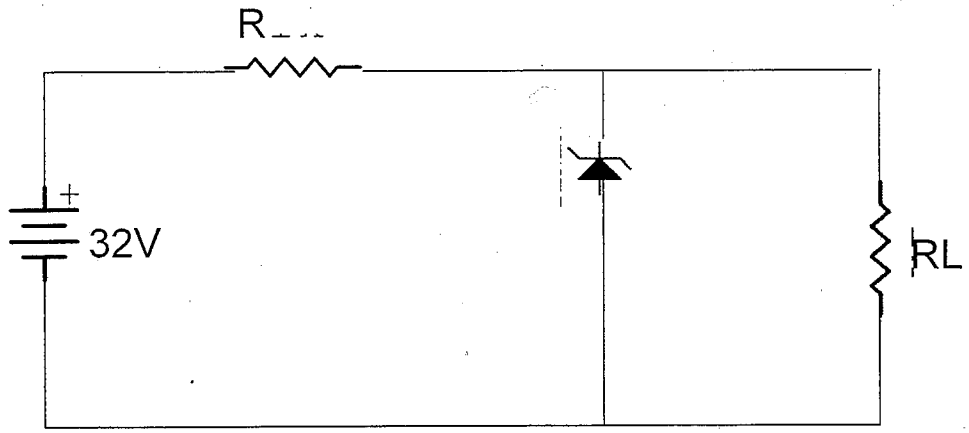

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