English

1.

An orthogonal set in $\mathbb{R}^3$ containing a vector (1, 2, 1) is

(A) {(-2, 1, 0), (1, 2, 1), (-1, 0,1)}

(B) {(-1, 0, 1), (1, 2, 1), (0, 1, 0)}

(C) {(-2, 1, 0), (1, 2, 1), (0, 0, 1)}

(D) {(-1, -2, 5), (1, 2, 1), (-2, 1, 0)}

Correct Option(s): D

English

2.

If -5, 1, -1/3 are the eigen values of A, then the eigen values of $A^2 - 2A$ are

(A) $\frac{124}{5}, \ 2, \ 50$

(B) $\frac{127}{5}, \ -1, \ \frac{55}{9}$

(C) $\frac{122}{5}, \ -5, \ \frac{57}{9}$

(D) $\frac{121}{5}, \ -2, \ \frac{50}{9}$

Correct Option(s): B

English

3.

The conjugate harmonic function of $u = e^x \cos y$ *is*

(A) $u = e^y \cos x + c$

(B) $u = e^{-y} \cos x + c$

(C) $u = e^y \sin x + c$

(D) $u = e^x \sin y + c$

Correct Option(s): D

English

4.

Using finite differences, the missing term in the following polynomial corresponds to a second degree polynomial, is

x:	0	1	2	3	4
y:	1	0	1	4	?

(A) 9

(B) 5

(C) 3

(D) 2

Correct Option(s): A

English

5.

The probability of a man hitting a target is ¼. If he fires 7 times, what is the pro hitting the target at least twice?

(A) .234

(B) .33

(C) .68

(D) .555

Correct Option(s): D

English

6.

A 126-point DFT X(k) of a real-valued sequence x(n) has the following X(0)=12.8+j*a*, X(k)=9.1-j5.4, X(63)=13+jb, X(108) =c+j5.4, and th coefficients are zero values. The values of a, b, c and k are respectively

(A) 0, 0, -9.1 and 18

(B) 0, 0, 9.1 and 18

(C) 0, 13, 9.1 and 17

(D) 0, 13, -9.1 and 17

Correct Option(s): B

English

7.

IEEE 802.11a uses

(A) orthogonal FDM technique

(B) spread spectrum technique

(C) infrared schemes

(D) TDM

Correct Option(s): A

English

8.

Indicate which of the following Pulse Modulation system is analog

(A) PCM

(B) Differential PCM

(C) PWM

(D) Delta

Correct Option(s): C

English

9.

A phase coded pulsed radar signal uses 13 bit Barker code. The pulse width is frequency of the sinusoid being coded is 1 GHz. What are the matched bandw frequency of the spectrum ?

(A) 1 MHz , 1 GHz

(B) 1 GHz , 1 MHz

(C) 1 MHz , 1 MHz

(D) 1 GHz , 1 GHz

Correct Option(s): A

English

10.

In the 0.18 micron technology, the length of the smallest transistor is _____ mi

(A) 0.09

(B) 0.18

(C) 0.36

(D) 0.54

Correct Option(s): B

English

11.

LTE network uses

(A) SC-FDMA for downlink

(B) OFDM for downlink

(C) FH-CDMA for uplink

(D) TDMA

Correct Option(s): B

English

12.

The minimum sampling rate required to reconstruct the following distortion is

$$x(t)= 10\left(\frac{\sin(6000\pi t)}{\pi t}\right)^2 * \left(\frac{\sin(8000\pi t)}{\pi t}\right)^3$$, where * de

(A) 4000

(B) 12000

(C) 16000

(D) 36000

Correct Option(s): B

English

13.

For a continues channel, the maximum rate of transfer of information, as given b Hartley Law, is possible if and only if the input signal is

(A) Uniformly distributed

(B) Gaussian distributed

(C) Gaussian distributed and has a flat spectrum

(D) having a flat spectrum

Correct Option(s): C

English

14.

If a signal to interference ratio of 15dB is required for satisfactory performance in a cellular system, what is the cluster size that should be used for i if n=3?

(A) 3

(B) 4

(C) 7

(D) 12

Correct Option(s): D

English

15.

The best length of transmission line to match (8 + j6) ohms load to 100 ohms sou

(A) $\lambda/4$

(B) $\lambda/8$

(C) $\lambda/2$

(D) $\lambda/16$

Correct Option(s): B

English

16.

In order to reduce cross sectional dimensions the wave guide to use is_____

(A) Circular

(B) Ridged

(C) Rectangular

(D) Flexible

Correct Option(s): B

English

17.

In a poly diffusion antifuse programming technology, a programming cu result in an average blown antifuse resistance of about

(A) 500 Ω

(B) 100 Ω

(C) 80 Ω

(D) 200Ω

Correct Option(s): A

English

18.

The parasitic delay of a two input CMOS NAND gate is

(A) 3

(B) 1

(C) 4

(D) 2

Correct Option(s): D

English

19.

The original system is pipelined to reduce the supply voltage to bV and if the
and parallel processed to get the supply voltage aV then what is the supply volt
if it is only parallel processed ?

(A) ab

(B) b/a

(C) a/b

(D) b

Correct Option(s): B

English

20.

The technology time constant τ for TSMC 180nm CMOS process is

(A) 10ps

(B) 20ps

(C) 15ps

(D) 12ps

Correct Option(s): C

English

21.

In CMOS scale down process, the relation between minimum supply volt
threshold voltage is

(A) $V_{DD,min} = 2\ V_{th}$

(B) $V_{DD,min} = 5\ V_{th}$

(C) $V_{DD,min} = 3\ V_{th}$

(D) $V_{DD,min} = V_{th}$

Correct Option(s): C

English

22.

In IC design, which package can support higher lead count?

(A) dual-in-line package (DIP)

(B) quad flat package (QFP)

(C) pin grid array (PGA)

(D) small outline IC (SOIC)

Correct Option(s): C

English

23.

The time-of-flight of a 5mm interconnect over the Sio_2 insulator with $\varepsilon_r = 4$ is

(A) 0.33mm/μs

(B) 0.33cm/μs

(C) 0.33m/μs

(D) 0.33μm/μs

Correct Option(s): A

English

24.

A digital communication system is to carry a single voice signal using linearly quan PCM bit rate will be required if an ideal anti-aliasing filter with cut-off frequency of 3. transmitter and then SNR_q is to be kept above 50dB?

(A) 74.8Kbps

(B) 7.4Kbps

(C) 748Kbps

(D) 1.48Kbps

Correct Option(s): A

English

25.

Which of the following wavelength is mostly affected by Excited State Absorption suitable for EDFA ?

(A) 0.98μm

(B) 0.85μm

(C) 0.8μm

(D) 1.55μm

Correct Option(s): C

English

26.

For a passive star network , the total optical power supplied by the central node is 1n received at the terminal nodes is 0.1 μW. If the fractional insertion loss at each coupl no. of subscribers (nodes) would be ___.

(A) 50

(B) 100

(C) 250

(D) 500

Correct Option(s): D

English

27.

Under free space path loss model, what is the transmit power required to obtain a re of 10 μW for a wireless system with isotropic antennas (G_l = 1) and a center frequen assuming a distance of d = 10m?

(A) 142 W

(B) 8.6 W

(C) 12 W

(D) 1.42 W

Correct Option(s): A

English

28.

The adaptive LMS algorithms is stochastic version of

(A) Newton method

(B) Gradient method

(C) Steepest-descent method

(D) Inversion method

Correct Option(s): C

English

29.

An LTI system has an impulse response $h(t)=te^{-2t}u(t)$ and an input signal that is a samp from a random process having sample functions of the form X(t)=M for all t, in which variable that is uniformly distributed from 0 to 12. What is the variance of the output

(A) 0.75

(B) 1.5

(C) 3

(D) 5

Correct Option(s): A

English

30.

In T-1 carrier system with 24 voice channels as followed in US, the bandwidth require

(A) 1.544 MHz

(B) 96 KHz

(C) 192 KHz

(D) 0.772 MHz

Correct Option(s): A

English

31.

The message bit sequence input to a DPSK modulator is 1, 1, 0, 0, 1, 1. The carrier phase du the first two message bits is π, π. The carrier phase for the remaining four message bits is

(A) $\pi, \pi, 0, \pi$

(B) $0, 0, \pi, \pi$

(C) $0, \pi, \pi, \pi$

(D) $\pi, \pi, 0, 0$

Correct Option(s): C

English

32.

For a periodic function, the spectral density and auto correlation functions form

(A) Fourier transform pair

(B) Laplace transform pair

(C) Hilbert transform pair

(D) Z transform pair

Correct Option(s): A

English

33.

Consider the following statements comparing delta modulation (DM) with PCM syste

(A) 1, 2 and 4

(B) 1, 2, and 3

(C) 1, 3, and 4

(D) 2,3 and 4

Correct Option(s): D

English

34.

A step-index fiber has a normalized frequency V=26.6 at a 1300 nm wavelength. If the cor what is the numerical aperture?

(A) 0.22

(B) 0.33

(C) 0.11

(D) 0.44

Correct Option(s): A

English

35.

A 50 km long optical fiber has an attenuation of 0.25 dB/km at 1550 nm. If 100 µW of optic into the fiber, then calculate the power emerging at the fiber output.

(A) -32.5 dBm

(B) -12.5 dBm

(C) -42.5 dBm

(D) -15.5 dBm

Correct Option(s): A

English

36.

A photodiode is constructed of GaAs, which has a bandgap energy of 1.43 eV at 300K. Wha wavelength of this device?

(A) 769 nm

(B) 869 nm

(C) 1229 nm

(D) 1449 nm

Correct Option(s): B

English

37.

A glass fiber has refractive indices n_1 of 1.5 and n_2 of 1. The multipath time di

(A) 2.5 ns/m

(B) 2.5 μs/m

(C) 5 ns/m

(D) 5 μs/m

Correct Option(s): B

English

38.

An baseband Nyquist channel which has a piecewise linear amplitude response, a bandwidth of 10kHz, and is approximate for a baud rate of 16 kbaud. What is the cha bandwidth?

(A) 2kHz

(B) 20kHZ

(C) 0.2kHz

(D) 20Hz

Correct Option(s): A

English

39.

In a Direct Sequence spread spectrum system, the length of the shift register used sequence generator is 12, the minimum required E_b/N_o is 11dB. The processing gain i

(A) 30.1 dB

(B) 36.1 dB

(C) 40.1 dB

(D) 46.1 dB

Correct Option(s): B

English

40.

Four like charges of 30μC each are located at the four corners of a square, the diag m. The force on a 100μC located 3m above the center of the square is ____N.

(A) 2.592

(B) 5.298

(C) 9.812

(D) 4.235

Correct Option(s): A

English

41.

The modulation technique used in GSM is_____

(A) GMSK

(B) FM

(C) QPSK

(D) AM

Correct Option(s): A

English

42.

The polarization **P** in a linear dielectric material with $\varepsilon_r = 2.8$ and $\mathbf{D} = 3 \times 10^{-7}$ **k** (C/m^2) is

(A) 9.13×10^{7}

(B) 1.93×10^{-7}

(C) 1.93×10^{7}

(D) 9.13×10^{-7}

Correct Option(s): B

English

43.

A 10μC charge is at the origin of a spherical coordinate system. The electric flux cr of a spherical shell described by $0 \leq \theta \leq \pi/2$ is_____Wb.

(A) 5.65×10^{15}

(B) 6.5×10^{5}

(C) 5.65×10^{5}

(D) 6.5×10^{15}

Correct Option(s): C

English

44.

Inversion of impedance is achieved by the use of

(A) Balun transformer

(B) Full wave line

(C) Half wave line

(D) Quarter wave line

Correct Option(s): D

English

45.

In air, a lossless transmission line of length 50 cm with L = 10 μH/m, C= 40 pF at 25 MHz. Its electrical length is

(A) 0.5 meters

(B) λ meters

(C) $\pi/2$ radians

(D) 180^{o}

Correct Option(s): D

English

46.

The Four Wave Mixing (FWM) nonlinear phenomenon originates from _____

(A) First order nonlinear susceptibility $\chi^{(1)}$

(B) Second order nonlinear susceptibility $\chi^{(2)}$

(C) Third order nonlinear susceptibility $\chi^{(3)}$

(D) Fourth order nonlinear susceptibility $\chi^{(4)}$

Correct Option(s): C

English

47.

The energy of the discrete time sequence x(n) = { 2+2j, 1, 2-2j, 2} is

(A) 25

(B) 21

(C) 5

(D) 5.25

Correct Option(s): B

English

48.

What is the peak data rate supported for LTE downlink?

(A) 10 Mbps

(B) 100 Mbps

(C) 50 Mbps

(D) 25Mbps

Correct Option(s): B

English

49.

Assume a link with data rate of 1Mbps and one way latency of 40ms. Assume a
of 1000 bytes. What should the sending window size be (in packets) over this li

(A) 8

(B) 10

(C) 8000

(D) 1000

Correct Option(s): B

English

50.

An antenna at a 10GHz , faces a large conducting sheet at a distance of 2m
conditions the antenna has a reflection co efficient of - 15dB. Assuming t
perfectly matched, its gain is _____dBi.

(A) 30.5

(B) 40

(C) 24.7

(D) 15.7

Correct Option(s): C