School of Electronics Engineering

Department of Communication Engg.

B.Tech. - Electronics and Communication Engg.

COMPRE Model Questions

Multiple Choice Questions and Answers

Question No.	Question with choice	Answer
1.	One of the following laws governs the movement of artificial satellites in earths orbit. a) Newton law of mechanics b) Laws of quantum mechanics c) Galilean laws d) Kepler's laws	d
2.	One of the following is a standard payload of any meteorological satellite a) Very High resolution radiometer (VHRR) b) Telescope c) Beam Shifter d) antenna	a
3.	With reference to satellite orbit Apogee is a) Highest point in the orbit b) lowest point in the orbit c) Parking orbit d) still orbit	a
4.	The earth observational satellites are placed in _____ orbits a) sun synchronous b) elliptical orbit c) circular orbit d) corner orbit	a
5.	The orbit inclination correction maneuver is carried out at _____ a) midnight b) nodal points c) regular intervals d) center points.	b
6.	An eccentricity figure of greater than unity would imply that a) the satellite orbit becomes elliptical b) the satellite orbit becomes circular c) the satellite escapes from the orbit d) the satellite will not operate in the orbit.	c
7.	The satellite orbit is termed as a retrograde orbit when its angle of inclination a) becomes 45° b) exceeds 90° c) zero d) becomes 90°	b

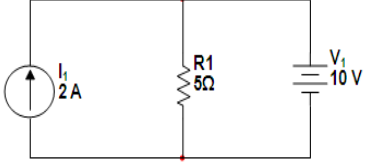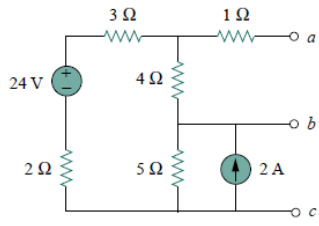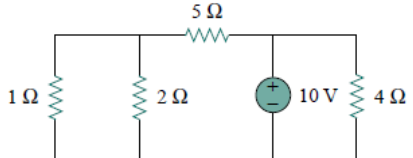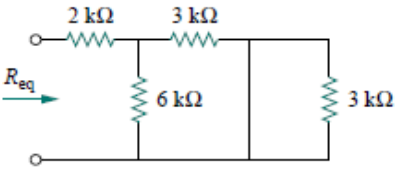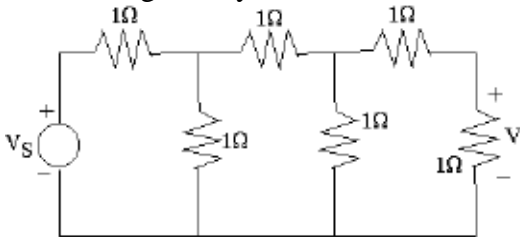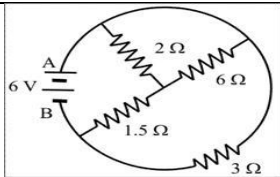|		

8.	The orbital velocity of the satellite
	    a) is directly proportional to its distance from earths surface
	    b) is inversely proportional to square root of its distance from earths center.
	    c) depends upon the thrust with which it is launched.
	    d)) is inversely proportional to the distance from earths center.
		b

9.	The Minimum number of geostationary satellite needed for uninterrupted global coverage is a) 3 b) 4 c) 1 d) 2	a
10.	Satellite Capacity depends on a) weight that can be placed in orbit b)panel area available for energy dissipation c) transmitter power d) all the above.	d
11.	The average failure rate of a satellite component is a) $2\lambda = 1/MTBF$ b) $\lambda = 3.14/MTBF$ c) $\lambda = 1/MTBF$ d) $\lambda = MTBF$	c
12.	One of the following communication satellites is in a highly eccentric inclined orbit a)Molniya series b) Raduga satellite. c) Ekran Satellite d) Gorizont satellite.	a
13.	Power loss that comes from the spreading of the signal in space is _____ a) Feeder space loss b) Free space loss c) spreading loss d) zero	b
14.	In Analog links the degradation of signal takes the form of a decrease in a) S/N ratio b) spikes c) frequency d) signal	a
15.	If(G) is the earth's gravitational constant and (M) the mass of earth, then for a circular orbit of radius (R) ,the satellite's Orbital velocity (V) is given by a) $V=SQRT(GM/R)$ b) $V=SQRT(2GM/R)$ c) $V=SQRT(R/GM)$ d) $V=SQRT(2G/R)$	a

16.	In a satellite orbit around the earth, the force acting outwards from the center of earth is the	c
	a) force of gravitation	
	b) centripetal force	
	c) centrifugal force	
	d) Impulse force.	
17.	In a spin stabilized geostationary satellite, the spin axis is	a
	a) Perpendicular to the orbital plane.	
	b) in the plane of the orbit.	
	c) Inclined at 45° to the orbital plane.	
	d) Parallel to the orbital plane.	
18.	For an antenna with a circular aperture, if the operating frequency is doubled, then for the same antenna gain, the antenna diameter	b
	a) can be reduced to one-fourth	
	b)can be reduced to half	
	c) can be increased to four times	
	d) can be reduced to one-third.	
19.	For an eccentric elliptical orbit with eccentricity (e) and semi-major axis (a)	a
	The apogee point distance from the center of earth having a radius of (R) is given by	
	a) $r_a=a(1+e)$	
	b) $r_a=a(1-e)$	
	c) $r_a=a(1+e)/R$	
	d) $r_a=aR(1+e)$	
20.	Earth station figure of merit is defined as	a
	a) 10log (G/T)	
	b) 10ln (G/T)	
	c) 10log GT	
	d) 20log (G/T)	
21.	Which one of the following is an example of open-loop system? a) Light switch b) Automatic electric iron c) Air conditioner d) Water level controller	a
22.	Consider the following statements regarding a linear system $y = f(x)$	

	1. $f(x_1 + x_2) = f(x_1) + f(x_2)$
	2. $f[x(t + T)] = f[x(t)] + f[x(T)]$
	3. $f(Kx) = K f(x)$
	Of these statements
	  a) 1, 2, 3 are correct
	  b) 1 & 2 are correct
	  c) 1 & 3 are correct
	  d) 3 alone is correct
			c

23.	Which of the following is the best method for determining the stability and transient response ? a) Root locus b) Bode plot c) Nyquist plot d) None of the above		a
24.	The steady-state error of a feedback control system with an acceleration input becomes finite in a a) type 0 system. b) type 1 system. c) type 2 system d) type 3 system.		c
25.	The transient response, with feedback system, a) rises slowly b) rises quickly c) decays slowly d) decays quickly		d
26.	The damping ratio of a system having the characteristic equation $S^2+2S+8=0$ is a) 0.353 b) 0.330 c) 0.300 d) 0.250		a
27.	The input to a controller is a) sensed signal. b) desired variable value. c) error signal. d) servo-signal.		c
28.	Transfer function of a system is used to calculate which of the following ? a) The order of the system b) The time constant c) The output for any given input d) The steady state gain		c
29.	Which of the following statements is correct for a system with gain margin close to unity or a phase margin close to zero ? a) The system is relatively stable b) The system is highly stable c) The system is highly oscillatory d) None of the above		c

30.	A phase lag lead network introduces in the output a) lag at all frequencies b) lag at high frequencies and lead at low frequencies c) lag at low frequencies and lead at high frequencies d) none of the above	c
31.	In force-voltage analogy, velocity is analogous to a) current b) charge c) inductance d) capacitance	a
32.	A Closed- loop system is unstable if a)Both gain margin and Phase margin are negative b)Gain margin is positive and phase margin is negative c)Gain margin is negative and phase margin is positive d) Both gain and phase margin are positive	a
33.	Static error co-efficients are used as a measure of the effectiveness of closed loop systems for specified _____ input signal. a) acceleration b) velocity c) position d) all of the above	d
34.	_____ Technique is not applicable to nonlinear system ? a) Nyquist Criterion b) Quasi linearization c) Functional analysis d) Phase-plane representation	a
35.	. A unity feedback system has an open loop transfer function $\frac{K(s+2)}{(s+1)^2}$. The root locus plot is 	c
36.	If the gain of the critical damped system is increased it will behave as a) oscillatory b) critically damped c) overdamped d) underdamped	d
37.	In order to increase the damping of a badly underdamped system which of following compensators may be used ?	a

	a) Phase-lead b) Phase-lag c) Both (a) and (b) d) Either (a) and (b)	
38.	Phase margin of a system is used to specify which of the following ? a) Frequency response b) Absolute stability c) Relative stability d) Time response	c
39.	For the system shown in the figure the transfer function $C(s)/R(s)$ is equal to (A) $\dfrac{G_2(G_1+G_3)}{1+G_1G_2H+G_1G_3H}$ (B) $\dfrac{G_1(G_2+G_3)}{1+G_1G_2H+G_1G_3H}$ (C) $\dfrac{G_1(G_2-G_3)}{1+G_1H+G_2H}$ (D) $\dfrac{G_1(G_2+G_3)}{1+G_1H+G_3H}$	b
40.	The initial response when the output is not equal to input is called a) Transient response b) Error response c) Dynamic response d) Either of the above	a
41.	If the Nyquist plot of the loop transfer function $G(s)\,H(s)$ of a closed-loop system encloses the $(-1, jo)$ point in the $G(s)\,H(s)$ plane, the gain margin of the system is a) zero. b) greater than zero. c) less than zero. d) infinity.	c
42.	The circuits in homes are connected in parallel rather than series because it is a) Economical b) easy to do c) possible to get same voltage d) possible to get same current	c
43.	Find the current in 5 Ω resistors using nodal voltage method.	a

a) 2 A
b) b) 10 A
c) c) 4 A
d) d) 20 A

44.	Determine thevenin resistance across bc terminals.	b
	  a) 5Ω b) 2.86 Ω c) 3.21 Ω d) 3 Ω	
45.	Determine,No.of meshes ,No.of nodes and No.of branches for the following circuit. a) 3,4,5 b) 4,3,5 c) 3.3.5 d) 3,5,3	c
46.	 The equivalent resistance of the circuit in Fig. a) 4 k Ω b) 8k Ω c) 5k Ω d) 14 k Ω	a

47.	. Superposition theorem is applicable only to networks that are: a) Linear. b) Nonlinear. c)time-invariant. d)passive.	a
48.	A network N is to be connected to load of 500 ohms. If the Thevenin's equivalent voltage and Norton's equivalent current of N are 5 Volts and 10mA respectively, the current through the load will be a) 10mA b) 5mA c) 2.5mA d) 1mA	b

49.	5. For the circuit shown in Fig, the voltage across the last resistor is 1V. All resistors are of 1Ω .
	  The V_S is given by
	
	  a) 13 V
	  b) 4 V
	  c) 8V
	  d) 1 V
		a

50.	A delta configuration has equal resistances of 5 Ω. Find the resistances in its star equivalent.
	
	  a) 5 Ω
	  b) 1.67 Ω
	  c) 10 Ω
	  d) 15 Ω
		b

51.	
	The total current supplied by the 6 v battery is
	  a) 1 A
	  b) 2A
	  c) 4 A
		c

	d) 6 A	
52.	Which coding technique/s exhibit/s the usability of fixed length codes? a) Lempel Ziv b) Huffman c) Both a and b d)None of the above	a
53.	Which among the following is used to construct the binary code that satisfies the prefix condition? a) Information Rate b)Noiseless Channel c) Channel Coding Theorem d) Kraft Inequality	d
54.	Information rate basically gives an idea about the generated information per _____ by source. a)Second b) Minute c) Hour d) None of the above	a
55.	If a noiseless channel bandlimited to 5 kHz is sampled every 1msec, what will be the value of sampling frequency? a) 250 samples/sec b) 500 samples/sec c) 800 samples/sec d) 1000 samples/sec	d
56.	Assuming that the channel is noiseless, if TV channels are 8 kHz wide with the bits/sample = 3Hz and signaling rate = 16×10^6 samples/second, then what would be the value of data rate? a) 16 Mbps b) 24 Mbps c) 48 Mbps d) 64 Mbps	c
57.	On which factor/s do/does the channel capacity depend/s in the	c

	communication system? a) Bandwidth b) Signal to Noise Ratio c) Both a and b d) None of the above		
58.	For a (6,4) block code where n = 6, k = 4 and d_{min} = 3, how many errors can be corrected by this code? a) 0 b) 1 c) 2 d) 3	b
59.	In Repetition Code, how many information bit/s is/are present in addition to n-1 parity bits? a) One b) Two c) Four d) Eight	a
60.	Consider the assertions related to decoding process of cyclic code. Which among the following is a correct sequence of steps necessary for the correction of errors? A. Syndrome determination after the division of r(x) & g(x) B. Addition of error pattern to received code word C. Selection of error pattern corresponding to the syndrome D. Preparation of table comprising error patterns and syndromes a)A,B,C,D b)B,A,D,C c) C,B,D,A d) D,A,C,B	d
61.	Which among the below stated logical circuits are present in encoder and decoder used for the implementation of cyclic codes? A. Shift Registers B. Modulo-2 Adders	A

	C. Counters D. Multiplexers a) A & B b) C & D c) A & C d) B & D	

62.	Which one of the below is not divide and conquer approach?
	   a) Insertion Sort
	   b) Merge Sort
	   c) Shell Sort
	   d) Heap Sort
		b

63.	What data structure can be used to check if syntax has balanced parenthesis?
	   a) Queue
	   b) Tree
	   c) List
	   d) stack
		d

64.	The following formula is of
	
	left_subtree (keys) ≤ node (key) ≤ right_subtree (keys)
	
	   a) Binary Tree
	   b) Complete Binary Tree
	   c) Binary Search Tree
	   d) All of the above
		c

65.	Which of the following commands will copy the contents of RAM whose address is in register 0 to port 1?
	
	   a) MOV @ P1, R0
	   b) MOV @ R0, P1
	   c) MOV P1, @ R0
	   d) MOV P1, R0
		c

66.	An alternate function of port pin P3.0 (RXD) in the 8051 is:
	
	   a) serial port input
	   b) serial port output
	   c) memory write strobe
	   d) memory read strobe
		a

67.	When the 8051 is reset and the line is HIGH, the program counter points to the first program instruction in the:
	
	   a) internal code memory
	   b) external code memory
		a

	c) internal data memory		
	d) external data memory		
68.	The transmit buffer of serial data buffer is a a) serial-in parallel-out register b) parallel-in serial-out register c) serial-in serial-out register d) parallel-in parallel-out register	b
69.	The register that provides control and status information about serial port is a) IP b) IE c) TSCON d) PCON and SCON	d
70.	An example of a system that may use a process pipeline is a _____. a) High-speed data acquisition system b) Failure of a power supply in an embedded system c) Both High-speed data acquisition system AND Failure of a power supply in an embedded system d) None of the mentioned.	a
71.	The extra time needed to bring the data into memory in case of a miss is called as _____. a) Delay b) Propagation time c) Miss penalty d) None of the above	c
72.	Out of the following which is not a CISC machine. a) IBM 370/168 b) VAX 11/780 c) Intel 80486 d) Motorola A567	d
73.	To increase the speed of memory access in pipelining, we make use of _____. a) Special memory locations b) Special purpose registers c) Cache d) Buffers	c
74.	The contention for the usage of a hardware device is called as _____. a) Structural hazard b) Stalk c) Deadlock d) None of the mentioned	a

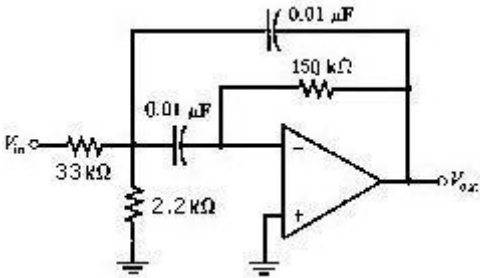| 75.	If memory access takes 20 ns with cache and 110 ns without it, then the ratio (cache uses a 10 ns memory) is a) 93% b) 90% c) 88% d) 87%	b
76.	If the main memory is of 8K bytes and the cache memory is of 2K words. It uses associative mapping. Then each word of cache memory shall be a) 11 bits b) 21 bits c) 16 bits d) 20 bits	c
77.	The return address from the interrupt-service routine is stored on the a) System heap b) Processor register c) Processor stack d) Memory	a
78.	The DMA controller has _____ registers a) 4 b) 2 c) 3 d) 1	c
79.	Which method/s of representation of numbers occupies large amount of memory than others? a) Sign-magnitude b) 1's compliment c) 2's compliment d) Both a and b	a
80.	When 1101 is used to divide 100010010 the remainder is _____. a) 101 b) 11 c) 0 d) 1	d
81.	The program is divided into operable parts called as _____. a) Frames b) Segments c) Pages d) Sheets	b

82.	A characteristic curve is the result of a current versus voltage plot of diode activity, which begins at the: a) 3rd quadrant b) current plot c) graph origin d) voltage plot	c
83.	Rectifier output polarity depends upon: a) cycles of input b) capacitor polarity c) half or full wave d) diode installation	d
84.	With a 12 V supply, a silicon diode, and a 370-ohm resistor in series, what voltage will be dropped across the diode? a) 0.3 V b) 0.7 V c) 0.9 V d) 1.4 V	b
85.	With a half-wave rectified voltage across the load resistor, load current flows for what part of a cycle? a) 0 degrees b) 90 degrees c) 180 degrees d) 360 degrees	c
86.	The voltage where current may start to flow in a reverse-biased pn junction is called the a) breakdown voltage b) barrier potential c) forward voltage d) biasing voltage	a
87.	The area at the junction of p-type and n-type materials that has lost its majority carriers is called the a) barrier potential b) depletion region c) n region d) p region	b
88.	In a power supply diagram, which block indicates a pulsating dc output? a) transformer b) filter c) rectifier d) regulator	c
89.	The ripple factor of a full-wave rectifier circuit compared to that of a half wave rectifier circuit without filter is	b

	a) half of that for a half 'wave rectifier b) less than half that for a half-wave rectifier circuit c) equal to that of a half wave rectifier. d) none of the above.	
90.	The output frequency of a full-wave rectifier is _____ the input frequency. a) one-half b) equal to c) twice d) one-quarter	c
91.	A short circuit has a _____ drop across its terminals, and the current is limited only by the surrounding network. a) 5 V b) 0 V c) 1 V d) infinity	b
92.	What type of diode circuit is used to add or restore a dc level to an electrical signal? a) clipper or limiter b) clamper c) IC voltage regulator d) none of the above	b
93.	If the ac supply is 50 Hz, what will be the ripple frequency out of the full-wave rectifier? a) 50 Hz b) 60 Hz c) 100 Hz d) D. 120 Hz	c
94.	Rectifiers are commonly used in battery chargers. a) True b) B. False	a
95.	The normal operating region for a zener diode is the a) forward-bias region. b) reverse-bias region. c) zero-crossing region. d) D. reverse-breakdown region	d
96.	What type of diode is commonly used in electronic tuners in TVs? a) varactor b) Schottky c) LED d) D. Gunn	a
97.	A _____ filter significantly attenuates all frequencies below fc and passes all frequencies above fc. a) low-pass	b

	b) high-pass c) band-pass d) D. band-stop	

98.	A capacitor circuit doesnot allow to pass_____component.
	  a) a.c.
	  b) d.c.
	  c) voltage
	  d) D. current
		b

99.	The maximum efficiency of full wave rectification is
	  a) 40.6%
	  b) 100%
	  c) 81.2%
	  d) D. 85.6%
		c

100.	What is another name for a clipper?
	  a) A limiter
	  b) A dc restorer
	  c) C. A half-wave rectifier
		A

101.	What effect does a clamper have on the peak-to-peak value of its input signal
	  a) It increases.
	  b) It decreases.
	  c) C. None
		a

102.	A precision diode can be used as
	
	  a) Half wave rectification
	
	  b) Full wave rectification
	
	  c) Clipper
	
	  d) Damper
		All

103.	The frequency of triangular wave generator oscillates is given by (
	Where P = Vpp / Vsat)
	
	  a) $f = 4\,PRC$
	  b) f = PR/2C
	  c) f = P/2RC
	  d) f = P/RC
		c

104.	In Schmitt trigger, Vo = 8 V, Vut = 4 V and Vlt = 3 V. Calculate R1 / R2 &
	Vref.
	
	  a) 15, 3.73 V
	  b) 1.5, 37.3 V
	  c) 15, 37.3 V
	  d) 1.5, 0.373 V
		a

105.	The slew rate for *IC* 741 is a) 0.5 V/µs b) (b) 0.9 V/µs c) (c) 0.8 V/µs d) (d) 1 V/µs	a
106.	Another name for a unity gain amplifier is a) Voltage follower b) b)Integrator c) c) Differentiator d) d) Inverting Amplifier	a
107.	An ideal op-amp should have a) Zero input impedance and output impedance b) Infinite input and output impedance c) **Infinite input impedance and zero output impedance** d) Zero input impedance and infinite output impedance	c
108.	What is the slew rate of an op-amp if the output voltages change from 2 V to 3 V in 0.2 ms? a) 5 V/ms b) **5000 V/□s** c) 50 V/ ms d) 5 V/□s	b
109.	A retriggerable one shot has a pulse of 10 ms. 3 ms after being triggered, another trigger pulse is applied. The resulting output pulse will be _____ ms. a) 3 b) 7 c) 10 d) 13	c
110.	A 22-kΩ resistor and a 0.02-μF capacitor are connected in series to a 5-V source. How long will it take the capacitor to charge to 3.4 V? a) 0.44 ms b) 0.501 ms c) 0.66 ms d) 0.70 ms	b
111.	What is the function of the comparators in the 555 timer circuit? a) to compare the output voltages to the internal voltage divider b) **to compar**e the input voltages to the internal voltage divider	b

	c) to compare the output voltages to the external voltage divider d) to compare the input voltages to the external voltage divider	
112.	What is the difference between an astable multivibrator and a monostable multivibrator? a) **The a**stable is free running. b) The astable needs to be clocked. c) The monostable is free running. d) none of the above	a
113.	A monostable 555 timer has the following number of stable states: a) A.0 b) **B. 1** c) C. 2 d) D. 3	b
114.	A 4-bit R/2R digital-to-analog (DAC) converter has a reference of 5 volts. What is the analog output for the input code 0101. a) 0.3125 V b) **3.**125 V c) 0.78125 V d) −3.125 V	b
115.	A binary-weighted digital-to-analog converter has a feedback resistor, R_f, of 12 kΩ. If 50 μA of current is through the resistor, the voltage out of the circuit is: a) 0.6 V b) **−0.6 V** c) 0.1 V d) −0.1 V	b
116.	The difference between analog voltage represented by two adjacent digital codes, or the analog step size of DAC, is the: a) quantization b) accuracy c) **resolu**tion d) monotonicity	c
117.	The resolution of a 0–5 V 6-bit digital-to-analog converter (DAC) is: a) 63% b) 64% c) **1.5**6% d) 15.6%	c
118.	What is the major advantage of the R/2R ladder digital-to-analog (DAC), as compared to a binary-weighted digital-to-analog DAC converter?	a

	a) **It only uses two different resistor values.** b) It has fewer parts for the same number of inputs. c) Its operation is much easier to analyze. d) The virtual ground is eliminated and the circuit is therefore easier to understand and troubleshoot.	

119.	A binary-weighted resistor used in a digital-to-analog converter (DAC) is only practical up to a resolution of _____.
	    a) 10 bits
	    b) 2 bits
	    c) 8 bits
	    d) 4 bits
		d

120.	A low-pass filter has a cutoff frequency of 1.23 kHz. Determine the bandwidth of the filter.
	    a) 2.46 kHz
	    b) 1.23 kHz
	    c) 644 Hz
	    d) not enough information given
		b

121.	Refer to the given figure. This is a _____ filter.
	
	    a) **band**-pass
	    b) band-stop
	    c) high-pass
	    d) low-pass
		a

122.	Signal travel through various paths and arrives at receivers at different time-multipath propagation.
	    a) Additive Noise Channel.
	    b) Linear Filter Channel.
	    c) Linear Time-Variant Filter Channel.
	    d) None of the above.
		b

123.	Symbols 1 and 0 are represented by pulse of equal positive and negative amplitudes is called as
	    a) NRZ- Polar
	    b) RZ- Polar
	    c) NRZ- Unipolar
		a

		d) RZ- Unipolar	
124.	The presence of channel noise and interference causes the repeater to make wrong decision occasionally, thereby introducing _____ in the regenerated signal. a) Jitter b) Bit error c) Data rate d) interference		b
125.	If the spacing between received pulses deviated from its assigned value a -------------- is introduced into the regenerated pulse position. a) Jitter b) Bit error c) Data rate d) interference		a
126.	Which one is channel coding technique? a) Huffman coding b) Shannon Coding c) Convolutional Codes d) Arithmetic coding		c
127.	Step size can be made smaller for smaller signals and larger for larger signals. a) PCM b) DPCM c) DM d) ADM		d
128.	The output is zero for zero input, and the idle channel noise is correspondingly Zero a) Mid-tread b) Mid-riser c) Non Uniform d) None of the above		b
129.	Width of the main spectral lobe, where most of the signal power is contained. a) Half power Bandwidth b) Null to null Bandwidth c) Absolute Bandwidth d) None		b
130.	Which one of the following is used to detect the unknown signal a) Coherent BFSK b) Coherent BPSK c) QPSK d) DPSK		d
131.	QPSK requires ----------------transmission bandwidth of the BPSK. a) ¼ b) b.1/2 c) 1/3		b

	d) d. twice	
132.	Transmitted signal energy per symbol is twice the signal energy per bit. Identify the system a) Pe= ½ erfc (sqrt (Eb/4No) b) Pe= ½ erfc (sqrt (Eb/No) c) Pe= ½ erfc (sqrt (Eb/2No) d) Pe= erfc (sqrt (Eb/No)	d
133.	For Stop-and-Wait ARQ, for n data packets sent, _____ acknowledgments are needed. a) a.0 b) b. n c) c.n-1 d) d.n+1	b
134.	The shortest frame in HDLC protocol is _____ a) I-frame b) B.S-frame c) U-Frame d) d. None	b
135.	In _____, the station configuration is unbalanced. We have one primary station and multiple secondary stations. a) a.ABM b) b.NRM c) c.ARM d) d.NBM	b
136.	A timer is set when _____ is (are) sent out. a) a.ACK b) b.NAK c) c. Data frame d) d. All of the above	c
137.	You download a file from an FTP site on the Internet. What is the highest layer in the OSI model used in this FTP operation? a) Data link b) Application c) Session d) Network	b
138.	Source routing Bridge is used in a)Ethernet LAN b) Token ring c) Wi-Fi d) None	b

139.	Actual rate at which information is sent over the channel. a) Efficiency b) Throughput c) normalized delay bandwidth d) frame transfer delay.	b
140.	The subnet mask for a class C network is 255.255.255.240. How many subnetwork are available? a) 4 b) 8 c) 16 d) None	a
141.	An organization has been granted a class B address. If the organization has 64 subnets, how many addresses are available in each subnet (including special addresses)? a) 65,534 b) 1024 c) 256 d) None	b
142.	The frequency range of 1GHz to 30 GHz are referred as a) Sound waves b) Microwaves c) Mini waves d) None of these	b
143.	The most suitable method for detecting a modulated signal $(2.5 + 5\ cos\omega_m t)cos\omega_c t\ is$ a) Envelope detector b) Synchronous detector c) Ratio detector d) both (a) and (b)	a
144.	In FM the carrier frequency deviation is determined by a) Modulating voltage b) Modulating frequency c) Both a &b d) None of these.	a
145.	The received signal frequency of a superhetrodyne receiver having IF=456 kHZ, is 1MHz. The corresponding image signal is a) With in its medium band b) Outside the medium band c) Depends on modulation index d) Depends on modulating frequency	a

146.	The plot of modulation index versus carrier amplitude yields a a) Horizontal line b) Vertical line c) Parabola d) Hyperbola	d
147.	A carrier is amplitude modulation to depth of 40%. The increase in power is a) 40 % b) 20 % c) 16 % d) 8 %	d
148.	Which of the following analog modulation scheme requires the minimum transmitted power and minimum bandwidth? a) VSB b) DSB-SC c) SSB d) AM	c
149.	The Hilbert transform is a a) Non linear system b) Non-causal system c) Time varying system d) Low pass system	a
150.	In FDM system used for telephone, which modulation scheme is adopted? a) AM b) DSB-SC c) SSB d) FM	b
151.	In amplitude modulated system, the total power is 600W and the power in carrier is 400W, then the modulation index is a) 0.5 b) 0.75 c) 0.90 d) 1	d
152.	The modulating frequency in frequency modulation is increased from 10 kHz to 20 kHz. The bandwidth is a)doubled b) Halved c) Increased by 20 kHz d) Increase tremendously	c
153.	Figure of merit is always unity in a)SSB b) AM c) FM d) All the three	a
154.	A sinusoidal 400 Hz modulating signal of 2V amplitude frequency modulates a carrier and produces 70 kHz frequency deviation. The frequency sensitivity	d

	is given by
	   a) 140 kHz/V
	   b) b) 70 kHz/V
	   c) c) 72 kHz/V
	   d) d) 35 kHz/V	

155.	Two sinusoidal signals of same amplitude and frequency of 10 kHz and 10.1 kHz are added together. The combined signal is given to an ideal frequency detector. The output of the detector a)0.1 kHz sinusoid b) 20.1 kHz sinusoid c) A linear function of time d) A constant	a
156.	Which one of the following blocks is not common in both AM and FM receiver? a)RF amplifier b) Mixer c) IF amplifier d) Slope detector	d
157.	A PAM signal can be detected by using a)ADC b) Integrator c) Bandpass filter d) High pass filter	b
158.	The Nyquist sampling rate for a signal band limited 5 kHz is a)5 kHz b) 10 kHz c) 2.5 kHz d) 20 kHz	b
159.	Johnson noise is a)Always white b) White for all practical frequencies c)Never white d)Depends on temperature.	b

| 160. | A narrow band noise shows

a)Amplitude modulation only

b) Frequency modulation only

c)Both AM and FM

d) None | c |
|---|---|---|
| 161. | A system has a receiver noise resistance of 50 ohm. It is connected to an antenna with an input resistance of 50 ohm. The noise figure of the system is

a)1

b) 2

c) 50

d) 101 | c |
| 162. | What is the maximum data rate for the 802.11a standard
   a) 6Mbps
   b) 60Mbps
   c) 16Mbps
   d) d. 54Mbps | d |
| 163. | If the number of bits per sample in PCM system is increased from n to $n + 1$, then the improvement in signal to quantization noise ratio will be
   a) 3 db
   b) 6 db
   c) 10 db
   d) 8db | b |
| 164. | Three analog signals, having bandwidths 1200 Hz, 600 Hz, and 600 Hz are sampled at their respective Nyquist rates, encoded with 12 bit words, and time division multiplexed. The bit rate for the multiplexed signal is
   a) 100 Kbps
   b) 27.6 Kbps
   c) 57.6 Kbps
   d) 10.2 Kbps | c |
| 165. | The peak amplitude of one signal level is 0; the other is the same as the amplitude of the carrier frequency
   a) BPSK
   b) FSK
   c) ASK
   d) QPSK | c |
| 166. | Twenty Four telephone channels, each band limited to 3.4 kHz are to be time division multiplexed using PCM. If sampling frequency is 10 kHz and number of quantization levels is 128, the required bandwidth of PCM is
   a) 1.68MHz
   b) 2.54 MHz
   c) 12 MHz
   d) 3.25 MHz | a |
| 167. | Thermal noise has a power spectral density which is quite uniform upto frequencies in the order of | c |

	a) 10^{12} Hz b) 10^{11} Hz c) 10^{13} Hz d) d. 10^{10} Hz	

168.	Which of the following is the main advantage of PCM system
	   a) Lower power
	   b) Lower Bandwidth
	   c) Lower noise
	   d) High power
		c

169.	A discrete zero memory information source has 40 symbols and each symbol is equally likely. The minimum number of bits required to code the source with uniform length code and entropy of the source are
	   a) 6 and 5.32
	   b) 1 .06 and 15.32
	   c) 16 and 25.82
	   d) 2 and 3.33
		a

170.	The constellation diagram of QPSK has
	   a) 2
	   b) 1
	   c) 8
	   d) 4
		d

171.	What are the primary resources of an communication system
	
	   a) Transmitted Power
	   b) Channel Bandwidth
	   c) power and Bandwidth
	   d) none
		c

172.	What is meant by Thicknet
	   a) 10 BASE 5
	   b) 10 BASE 2
	   c) 10 BASE T
	   d) 10 BASE F
		a

173.	Which modulation technique transmits at higher data rate
	
	   a) BPSK
	   b) QPSK
	   c) 16-PSK
	   d) 32PSK
		d

174.	How many carrier frequencies are used in BFSK
	   a) 2
	   b) 1
	   c) 3
	   d) 4
		a

175.	What is the length of IPv6 address
	
	   a) 32 bits
	   b) 64 bits
		c

	c) 128 bits d) 48 bits	

176.	Which code is used to spread the signal across the places
	
	    a) Pseudo-noise code
	    b) Walsh code
	    c) Fast code
	    d) d. none
		a

177.	Where is the base station synchronization used a) GSM b) CDMA c) AMPS d) IS-96	d

178.	What is the default data rate for CDDI
	
	    a) a.100 Mbps
	    b) b. 10 Mbps
	    c) c. 4 Mbps
	    d) d. 1000Mbps
		a

179.	What is the default data rate for FDDI
	
	    a) a.10 Mbps
	    b) b. 100 Mbps
	    c) c. 4 Mbps
	    d) d. 1000Mbps
		b

180.	What is the standard for IEEE802.4
	
	    a) Ethernet
	    b) Token Bus
	    c) Token ring
	    d) Fddi
		b

181.	IMEI stands for
	
	    a) International Mobile Equipment Identity
	    b) International mandatary equipment insight
	    c) internet mobile equipment identity
	    d) Indian mobile equipment identity
		a

182.	MOV A, @ R1 will: a) copy R1 to the accumulator b) copy the accumulator to R1 c) copy the contents of memory whose address is in R1 to the accumulator	c

	d) copy the accumulator to the contents of memory whose address is in R1	
183.	When the 8051 is reset and the $\overline{EA}$ line is HIGH, the program counter points to the first program instruction in the: a) internal code memory b) external code memory c) internal data memory d) external data memory	a
184.	An alternate function of port pin P3.4 in the 8051 is: a) Timer 0 b) Timer 1 c) interrupt 0 d) interrupt 1	a
185.	The 8051 has _____ parallel I/O ports. a) 2 b) 3 c) 4 d) 5	c
186.	The total external data memory that can be interfaced to the 8051 is: a) 32K b) 64K c) 128K d) 256K	b
187.	Which of the following instructions will load the value 35H into the high byte of timer 0?	a

	a) MOV TH0, #35H b) MOV TH0, 35H c) MOV T0, #35H d) MOV T0, 35H	
188.	Bit-addressable memory locations are: a) 10H through 1FH b) 20H through 2FH c) 30H through 3FH d) 40H through 4FH	a
189.	The contents of the accumulator after this operation will be MOV A,#0BH ANL A,#2CH a) 11010111 b) 11011010 c) 00001000 d) 00101000	c
190.	Which of the following statements will add the accumulator and register 3? a) ADD @R3, @A b) ADD @A, R3 c) ADD R3, A d) ADD A, R3	d
191.	The I/O port that does not have a dual-purpose role is: a) port 0 b) port 1	b

	c) port 2		
	d) port 3		
192.	The contents of the accumulator after this operation will be: MOV A,#2BH ORL A,00H a) 1B b) 2B c) 3B d) 4B	b
193.	Which of the following commands will copy the contents of location 4H to the accumulator? a) MOV A, 04H b) MOV A, #04H c) MOV A, @04H d) MOV 04H,A	a
194.	The ADC0804 has _____ resolution. a) 4-bit b) 8-bit c) 16-bit d) 32-bit	b
195.	An alternate function of port pin P3.1 in the 8051 is: a) serial port input b) serial port output c) memory write strobe	b

	d) memory read strobe	
196.	What is the address range of SFR Register bank? a) 00H-77H b) 40H-80H c) 80H-7FH d) 80H-FFH	d
197.	ACALL instruction allows specifying _____address in the instruction and calling subroutine within _____ program memory block a) 2 Byte, 3K b) 11bit, 2K c) 9 bit ,2K d) 1 Byte,3K	b
198.	Which of the following instruction is wrong a) INC DPTR b) MOV @DPTR, A c) MOV A, @A+DPTR d) MOV A, @DPTR	c
199.	SP of 8051 is of ___ wide and it is loaded with the default value of ___ after reset	b

	a) 4 bit,00H b) 8 bit,07H c) 16 bit,07H d) 32 bit,00H	
200.	Serial port interrupt is generated, if ____ bits are set a) IE, IP b) RI, IE c) TI, IP d) TI, RI	d
201.	In 8051 which interrupt has highest priority? a) INT1 b) T0 c) INT0 d) T1	c
202.	Which are of the following has the highest priority in CSMA/CA network. a) SIFS b) PIFS c) DIFS	a
203.	In _____, the sequences are generated using orthogonal codes such the Walsh tables. a) FDMA b) TDMA c) CDMA d) none of the above	c
204.	The _____ sublayer is responsible for the operation of the CSMA/CD access method and framing. a) LLC	b

	b) MAC c) PDU d) SDU	

205.	In IEEE 802.11, communication between two stations in two different BSSs usually occurs via two _____.
	    a) BSSs
	    b) ESSs
	    c) APs
	    d) None of the above
		c

206.	Data rate of FDDI is a) 10 Mbps b) 100 Mbps c) 1000 Mbps d) 50 Mbps.	b
207.	Real time services in FDDI can be carried out by ------------------ a) S-Frames b) I-Frames c) A-Frames d)None	a
208.	Non Real time services in FDDI can be carried out by ------------------ a) S-Frames b) I-Frames c) A-Frames d) None	c
209.	Media Access Control belongs to ------------------ a) Physical Layer b) Data link Layer c) Network Layer d) None	c

210.	ARQ stands for _____.
	
	    a) Automatic repeat quantization
	    b) Automatic repeat request
	    c) Automatic retransmission request
	    d) Acknowledge repeat request
		b

211.	For Stop-and-Wait ARQ, for 10 data packets sent, _____ acknowledgments are needed.
	
	    a) exactly 10
	
	    b) less than 10
	
	    c) more than 10
	
	    d) none of the above
		a

212.	HDLC is an acronym for _____.
	    a) High-duplex line communication
	    b) High-level data link control
		b

		c) Half-duplex digital link combination d) Host double-level circuit	
213.	For Stop-and-Wait ARQ, for n data packets sent, _____ acknowledgments are needed. a) a.0 b) b. n c) c.n-1 d) d.n+1	b
214.	The shortest frame in HDLC protocol is _____ a) I-frame b) S-frame c) U-Frame d) None	b
215.	Data link control deals with the design and procedures for _____ communication. a) node-to-node b) host-to-host c) process-to-process d) none of the above	a
216.	_____ in the data link layer separates a message from one source to a destination, or from other messages going from other sources to other destinations. a) Digitizing b) Controlling c) Framing d) none of the above	c
217.	The process-to-process delivery of the entire message is the responsibility of the _____ layer. a) Network b) Transport c) Application d) Physical	b
218.	The _____ layer is the layer closest to the transmission medium. a) Physical b) Data link c) Network d) Transport	a
219.	The _____ layer changes bits into electromagnetic signals.	a

	a) Physical b) Data link c) Transport d) None of the above	
220.	The subnet mask for a class C network is 255.255.255.192 How many subnetwork are available? a) a.4 b) b.8 c) c.26 d) d. None	c
221.	IPv6 has _____ -bit addresses. a) 32 b) 64 c) 128 d) variable	c
222.	The Inbuilt Timers of 8051 are a) up counters b) down counters c) up-down counters	a
223.	In the microcontroller 8051, the inbuilt timers are a) 8 bit Timers b) 16 bit Timers c) 7 bit Timers	b
224.	Timers built in 8051 has a) 4 modes of operations b) two modes of operations c) three modes of operations	a
225.	The microcontroller 8051 has inbuilt (a) two Timers (b) one Timer (c) three Timers	a
226.	The Timer in the microcontroller 8051 is called a Counter a) when its clock is external b) when its clock is internal c) when it has no clock.	a
227.	TCON register is a) Bit addressable b) Byte Addressable c) both	c
228.	TMOD register is a) Bit addressable b) Byte Addressable c) both	b
229.	Choose the correct answer, from the code below (a) P0 is input port (b) P1 input port (c) P0 is output port	a

	``
	        MOV A,#0FFH
	        MOV P0,A
	
	 BACK: MOV A,P0
	        MOV P1,A
	        SJMP BACK
	``	

230.	With XTAL = 11.0592 MHz, to have 9600 baud rates, the TH1 value needed is a) -3 b) -6 c) -12 d) -24	a
231.	With XTAL = 11.0592 MHz, and SMOD =1, to have 9600 baud rates, the TH1 value needed is a) -3 b) -6 c) -12 d) -24	b
232.	In serial communication with 8051 microcontroller a) Timer 0 in mode 1 b)Timer 1 in mode 0 c) Timer 0 in mode 2 d) Timer 1 in mode 2 is used for baud rate generation.	d
233.	The 8051 microcontroller has inbuilt (a) USART (b) UART (c) both (d) none	b
234.	In the following baud rates which is not a standard baud rate a) 28,800 b) 19,200 c) 9600 d) 4800	a
235.	To interface LCD to 8051 we need a) three ports b) two ports c) one port d) no ports	b
236.	Mode 01 of serial communication is a) one start bit and two stop bits b) two start bits and two stop bits c) one start bit and one stop bits d) no start bit and no stop bits.	c
237.	MAX 232 is a) line driver b) voltage amplifier	a

	c) line amplifier	
	d) line stabilizer	

238.	Serial data transmission is initiated by
	    a) placing the data byte in SBUF
	    b) b)setting TI flag
	    c) enabling Timer1 interrupt
	    d) none of these
		a

239.	Which of the following bits, when set, would double the baud rate generated by 8051 microcontroller for serial communication?
	    a) REN of SCON
	    b) b) SMOD of PCON
	    c) c)TF1 of TCON
	    d) d) SM2 of SCON
		b

240.	Serial data bits being received are initially stored in
	    a) temp. buffer
	    b) b) accumulator
	    c) c) SBUF
	    d) d) TH1
		c

241.	For serial communication, standard frequency of the crystal for 8051 would be
	    a) 11.0592 MHz
	    b) b) 11.0952 MHz
	    c) c) 12 MHz
	    d) d) 16 MHz
		a

242.	Which of the following is/are the main part(s) of basic cellular system.
	
	    a) A mobile Unit
	    b) A cell Site
	    c) A mobile Telephone Switching Office
	    d) D) All of the above
		d

243.	Block calls held condition specified the held probability at a time period equal to an average holding time.
	
	    a) Erlang B
	    b) Erlang C
	    c) Erlang D
	    d) D. Poisson
		d

244.	The channel separation of GSM channel
	
	    a) 270 kHz
	    b) 200 kHz
	    c) 120 kHz
	    d) D. 60 kHz
		b

245.	Speech coding rate for GSM
	
	    a) 80 kbps
	    b) 25 kbps
	    c) 21 kbps
	    d) D. 13 kbps
		d

246.	Number of channels for GSM
	
	    a) 333
	    b) 666
		c

		c) 124 d) D. 248	
247.	It is a database that contains information about the identity of mobile equipment that prevents calls from stolen, unauthorized, or defective mobile stations. a) Equipment Identity Register b) Authentication Center c) Home Location Register d) D. Visitor Location Register	a
248.	It provides all the control functions and physical links between the MSC and BTS a) OSS b) OMC c) MSC d) D. BSC	a
249.	It is the functional entity from which the operator monitors and controls the mobile communication system. a) Operation and Maintenance System b) Mobile Switching Center c) Gateway Mobile Switching Center d) D. Operation and Support System	a
250.	Which stage increases the selectivity of the circuit in an AM receiver? a) Detector b) IF stage c) Modulator d) D. Mixer	a
251.	The _____ of radio receiver amplify weak signal and produce a desirable intelligence at the output speaker. a) sensitivity b) selectivity c) reliability d) D. fidelity	a
252.	What is the number of channels of a cellular system with an allocated spectrum of 25 MHz and with a channel of 30 kHz bandwidth? a) 833 b) 240 c) 1000 d) D. 666	a
253.	GSM uses what digital modulation technique? a) QAM b) GFSK c) BPSK d) D. GMSK	d
254.	The combination of the mobile cellular phone and the cell-site radio equipment is known as a) forward link b) base transceiver station c) air interface	c

	d) D. base station controller	
255.	The duplex frequency of GSM a) 40 MHz b) 80 MHz c) 120 MHz d) D. 30 MHz	b
256.	A multiple access technique used in GSM cellular system. a) FDMA b) CDMA c) TDMA d) D. TACS	c
257.	In a cellular system, _____ is used to measure the spectrum efficiency. a) Radio efficiency b) Diversity c) Frequency reuse d) D. Radio capacity	d
258.	The mobile-to-base station frequency assignment for GSM system is a) 890-915 MHz b) 935-960 MHz c) 870-890 MHz d) D. 825-845 MHz	b
259.	PABX means a) Private All-purpose Broadcasting Exchange b) Private Automatic Branch Exchange c) Public Access Bi-directional Exchange d) D. Public Automatic Branch Exchange	b
260.	Cellular CDMA system uses what modulation method? a) GFSK b) ASK c) QAM d) D. BPSK	d
261.	Blocked calls delay condition specified delay probability a) Erlang B b) Erlang C c) Erlang D d) D. Poisson	B
262.	The center frequency of a band-pass filter is always equal to the (a) bandwidth (b) –3 dB frequency (c) bandwidth divided by Q (d) geometric average of the critical frequencies	d

263.	A zero-level detector is a
	    (a) comparator with a sine-wave output
	    (b) comparator with a trip point referenced to zero
	    (c) peak detector
	    (d) limiter
		b

264.	A digital-to-analog converter is an application of the a) scaling adder b) voltage-to-current converter c) non inverting amplifier d) adjustable bandwidth circuit	a
265.	A basic series regulator has a) an error detector b) a load c) a reference voltage d) both an error detector and a reference voltage	d
266.	If the input to a comparator is a sine wave, the output is a a) ramp voltage b) sine wave c) rectangular wave d) saw tooth wave	c
267.	A comparator is an example of a(n) a) active filter b) current source c) linear circuit d) nonlinear circuit	d
268.	In an averaging amplifier, the input resistances are a) equal to the feedback resistance b) less than the feedback resistance c) greater than the feedback resistance d) unequal	c
269.	A triangular-wave oscillator can consist of an op-amp comparator, followed by a(n) a) differentiator b) amplifier c) integrator d) multivibrator	c
270.	The ramp voltage at the output of an op-amp integrator a) increases or decreases at a linear rate b) increases or decreases exponentially c) is always increasing and never decreasing	a

	d) is constant	
271.	A two-pole high-pass active filter would have a roll-off rate of a) 40 dB/decade b) –40 dB/decade c) 20 dB/decade d) –20 dB/decade	b

272.	An ideal OP-AMP is an ideal
	
	    a) Current controlled Current source
	    b) Current controlled Voltage source
	    c) Voltage controlled Voltage source
	    d) Voltage controlled Current source
		c

273.	The ideal OP-AMP has the following characteristics
	
	    a) $R_i=\infty, A=\infty, R_0=0$
	    b) $R_i=0, A=\infty, R_0=0$
	    c) $R_i=\infty, A=\infty, R_0=\infty$
	    d) $R_i=0, A=\infty, R_0=\infty$
		a

274.	An opamp has a slew rate of 5V/ S. the largest sine wave o/p voltage possible at a frequency of 1MHz is
	    a) 10 V
	    b) 5 V
	    c) 5V
	    d) 5/2 V
		a

275.	A differential amplifier is invariably used in the i/p stage of all op-amps. This is done basically to provide the op-amps with a very high
	    a) CMMR
	    b) Bandwidth
	    c) Slew rate
	    d) Open-loop gain
		c

276.	A differential amplifier has a differential gain of 20,000. CMMR=80dB. The common mode gain is given by
	    a) 2
	    b) 1
	    c) 1/2
	    d) D.0
		c

277.	An ideal operational amplifier has a) infinite output impedance b) zero input impedance	c

	c) infinite bandwidth d) All of the above	
278.	A series dissipative regulator is an example of a a) linear regulator b) switching regulator c) shunt regulator d) dc-to-dc converter	a
279.	An astable multivibrator is also known as a: a) one-shot multivibrator b) free-running multivibrator c) bistable multivibrator d) monostable multivibrator	b
280.	With negative feedback, the returning signal: a) aids the input signal b) is proportional to output current c) opposes the input signal d) is proportional to differential voltage gain	c
281.	What starts a free-running multivibrator? a) a trigger b) an input signal c) an external circuit d) nothing	d

282.	The voltage across R and L in a series RL circuit is found to be 200 V and 150 V respectively. The rms value of the voltage across the series combination is __ V
	   a) 360
	   b) 250
	   c) 200
	   d) 450
		b

283.	A current of 4 A flows in an AC circuit when 100 V DC is applied to it whereas it takes 250 V AC to produce the same current the power factor of the circuit is
	   a) 1
	   b) 0.4
	   c) 0.6
	   d) 0.8
		b

284.	A reactance having an inductor of 0.15 H is connected in series with 10 Ω resistance. What will be the inductive reactance? a) 48.15 Ω b) 47.1 Ω c) 1.5 Ω d) None of these.	b
285.	A series circuit consists of R = 20 Ω, L = 20 mH, and AC supply 60 V with f = 100 Hz. The current in R is a) A)2.54 A b) B)1.27 A c) C)5.08 A d) D)10.16 A	a
286.	A series circuit consists of R = 20 Ω, L = 20 mH, and AC supply 60 V with f = 100 Hz. The voltage drop across R is a) 30.6 V b) 50.8 V c) C)40.8 V d) D)24.4 V	b
287.	A series circuit consists of R = 20 Ω, L = 20 mH, and AC supply 60 V with f = 100 Hz. The voltage drop across L is a) 39.1 V b) 31.9 V c) 45.5 V d) 50.5 V	b
288.	A series circuit consists of R = 20 Ω, L = 20 mH, and AC supply 60 V with f = 100 Hz. The phase angle of current in respect of supply voltage will be a) 40.4 b) 32.1 c) 28.8 d) 20.2	b
289.	If a resistor and an inductor are connected in series across a voltage source. Which two parameters in that circuit increase if frequency of voltage source increases? a) V_L and Z. b) Z and I. c) V_L and I. d) V_L and V_R.	a
290.	In a double tuned circuit, consisting of two magnetically coupled, identical high-Q tuned circuits, at the resonance frequency of either circuit, the amplitude response has a) A peak, always. b) A dip, always. c) Either a peak or a dip. d) Neither a peak nor a dip.	
291.	A T-section low pass filter has series inductor 80 mH and shunt capacitance 0	b

	μF. What is the cut-off frequency? a) 7 kHz. b) 7.58 kHz. c) 7.8 kHz. d) 8 kHz.	

292.	An RLC circuit has a resonance frequency of 160 kHz and a Q-factor of 100. Its band width is
	   a) 1.6 kHz.
	   b) 0.625 kHz.
	   c) 16 MHz
	   d) none of these
		a

293.	A circuit which has $\omega 0 = 10^6$ rad / sec (ω_0 = resonant frequency) C = 10 pF and Q = 100, must have a resistance of _____ kΩ. a) 5 b) B) 100 c) C) 10 d) D) 1	b
294.	When compared a 1st order LPF with a 2nd order LPF has a) Lower voltage gain. b) Higher voltage gain. c) Higher cut off frequency. d) Faster drop in filter response	c
295.	In active filter which element is absent? a) Inductor. b) B) Capacitor. c) C) Both of above. d) D) Resistor.	a
296.	If L and C are 4 mH and 0.0001 μF respectively a current chop of magnitude 50 Amp would induced a voltage a) 200 kV. b) B) 100 kV. c) C) 50 kV. d) D) 400 kV.	b
297.	If the percentage reactance of an element is 20 % and the full load current is 50 A, the short circuit current will be a) 250 A. b) 300 A. c) 200 A. d) 350 A.	a

298.	A circuit with resistor, inductor, capacitor in series is resonant of 50 Hz. If all the values are now doubled, the new resonant frequency is a) $f_0 / 2$. b) B) $f_0 / 4$. c) C) $2f_0$. d) D) Still f_0.	a
299.	Can a 250 V, 5 A single way switches be used in place of a 250 V, 15 A Switches? Single way switch doesn't exist. a) Yes. b) No. c) Single way switch d) doesn't operate at such current ratings.	c
300.	.A periodic voltage having the Fourier series V(t)= {1 + 4sinωt + 2cosωt} V is applied across a one ohm resistor. The power dissipated in the one ohm resistor is a) 1 W. b) 21 W c) 11 W. d) 24.5 W.	c
301.	For the resonance circuit ω0 = 105, Q = 50, R = 400 Ω the value of C is a) 250 pF. b) 500 pF. c) 1000 pF. d) 125 pF	b
302.	The vast majority of registers in 8051 are _____ bits a) 8 b) 16 c) 32 d) 4	a
303.	Which are the PSW(Program Status Word) bits are the responsible for the bank selection a) PSW.3,PSW.2 b) PSW.3,PSW.4 c) PSW.4,PSW.5 d) PSW.5,PSW.3	b
304.	PC(Program Counter) is _____ bits wide	b

	a) 8 b) 16 c) 32 d) 64		
305.	There are a total of _____ports in the 8051 and each has _____bits. a) 3, 8 b) 4,16 c) 4,8 d) 4,4	c	
306.	What is the addressing mode used in the instruction MOV @R1,A a) Direct b) Register Indirect c) Register direct d) indexed	b	
307.	8051 Bit addressable address range of RAM. a) 20-2F b) 30-3F c) 30-7F d) 20-7F	a	
308.	The following 8051 registers are bit addressable. a) ACC,PC b) ACC,IP c) B,IE d) ACC,B	b	
309.	_____ timer mode in 8051 is an auto re-load mode a) 0 b) 1 c) 2 d) 4	c	
310.	For setting the baud rate in 8051, _____ is used in mode _____ a) Timer 0, 1 b) Timer 1, 1 c) Timer 0, 2 d) Timer 1, 2	d	
311.	SCON.4 bit of SCON register can also be called as a) SM2 b) REN c) TB8 d) RB8	b	
312.	_____bit of PCON register is responsible for altering baud rate. a) SCON b) SMOD c) PMOD d) TMOD	b	

313.	RETI instruction clears the following flags a) TF0,RI b) TF0,TI c) TF0,IE0 d) d. RI,TI	c
314.	The vector address set aside for serial communication in 8051 a) OBH b) 13H c) 23H d) 03H	c
315.	_____ is the value to be loaded in to _____ Register to configure Counter 0 in Mode 2. a) 06H, SCON b) 60H,PCON c) 04H,TMOD d) 06H,TMOD	d
316.	How many interrupts are present in 8051 a) 4 b) 6 c) 5 d) 7	b
317.	_____ and _____are the two 16 bit registers in 8051. a) PC and ACC b) PC and DPTR c) IE and PC d) IP and IE	b
318.	8051 has _____timers. a) 1 b) 2 c) 3 d) 4	b
319.	The following are the control lines of LCD a) Enable b) Register Select c) Data Select d) Enable, Read/Write and Enable	d
320.	8051 has _____ bit data lines and _____bit address lines. a) 8, 8 b) 8, 16 c) 16, 8	b

	d) 16 , 16	
321.	Which interrupt has the highest priority in 8051 by default? a) External Interrupt 1 b) Timer 0 c) External Interrupt 0 d) Timer 1	C
322.	Prosthesis area of robotics deals with a) Artificial replacements for parts of the human body b) Remote manipulation c) Robot designed to walk on legs d) None of these	a
323.	The main function of a robot is a) 'sensing' the environment by external sensors b) 'decision making' based on the information received from the sensor c) 'performing' the task decided d) All of the above	d
324.	A robot may be designed for which of the following jobs a) To simply pick up and place the work pieces b) To interact with and work load a lathe, a milling machine or any equipment c) To perform some assembly work d) All of the above	d
325.	Which are the following methods of gripping is used in a robot? a) Mechanical gripping b) Magnetic gripping c) Vacuum gripping d) All of the above	d
326.	Which of the following drives are clean and quiet with a high degree of accuracy and reliability? a) Pneumatic drives b) Hydraulic drives c) Electrical drives d) All of the above	c
327.	Which of the following sensors are non-contact type robotic sensors? a) Proximity Sensors b) Electro-optical sensors c) Range imaging sensors d) None of the above	d
328.	Which of the following configurations has three mutually perpendicular axes? a) Cartesian coordinate configuration b) Cylindrical Configuration c) Spherical Configuration d) None of the above	a
329.	'Pitch motion' enables a) Rotation of wrist b) Rightward or Leftward swiveling movement of the wrist c) Up and down movement of the wrist and involves rotational	c
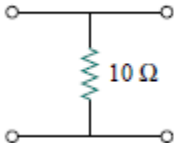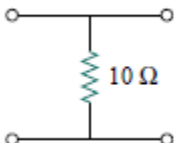
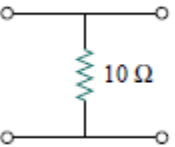|	movements as well	
	d) None of these	
330.	What refers to the minimum and maximum changes in input signal to which the sensor can respond? a) Sensitivity b) Range c) Threshold d) All of the above	b
331.	Tachometer is what kind of state sensor? a) External b) Internal c) Orthogonal d) All of the above	b
332.	LVDT is a Tactile Sensor, Microswitch is a status sensor a) Yes, No b) No, Yes c) Yes, Yes d) No, No	c
333.	A potentiometer is the simplest device that can be used to measure a) Position b) Velocity c) Acceleration d) None of the above	a
334.	What sensor determines the range by measuring the elapsed time between the transmission of certain frequencies and their detected echos? a) Proximity sensor b) LVDT c) Potentiometer d) Ultrasonic	d
335.	What is the process of identifying a group of related pixels for locating connected regions or areas of image having similar characteristics? a) Segmentation b) Thresholding c) Opening d) Closing	a
336.	What is a binary conversion technique in which each pixel is converted into a binary value, either black or white? a) Dilation b) Erosion c) Thresholding d) None of the above	c
337.	Median Filter is used to a) Remove Salt and pepper noise b) Smooth the image c) Increase the PSNR d) All of the above	a
338.	Frequency distribution of pixels is called as a) Edge detection b) Histogram c) Filtering operation	b
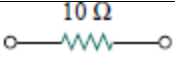
	d) Feature Extraction	
339.	Erosion process is a) Shrinkage of foreground image b) Shrinkage of background image c) Both A and B d) None of above	b
340.	Closing process is a) Erosion followed by Dilation b) Dilation followed by Erosion c) Applying Erosion only once d) All of the above	b
341.	Opening process is a) Erosion followed by Dilation b) Dilation followed by Erosion c) Applying Erosion only once d) All of the above	a
342.	If timer/counter 0 is used as an event counter, what is the maximum count for the MODE1? a) 65535 b) 65534 c) 65536 d) 65533	c
343.	Indicate which pin is used for timer/counter 1 a) P3.4 b) P3.5 c) P3.2 d) P3.3	b
344.	On reset, which interrupt has the highest priority? a) Timer 0 b) Timer 1 c) Reset d) External Interrupts	c
345.	The 8051 can transmit/receive data in a) Full Duplex b) Half Duplex c) Simplex d) Cannot transmit or receive	a
346.	The ADC804 is a(n) _____-bit converter a) 4 bit b) 8 bit c) 2 bit d) 16 bit	b
347.	When is the information (code or data) on the LCD pin latched into the LCD? a) Low to High signal on RS pin of LCD b) Low to High signal on EN pin of LCD c) High to Low signal on RS pin of LCD d) High to Low signal on EN pin of LCD	d

348.	To send letter 'A' to be displayed on the LCD, we must make RS = ____. a) Low to high b) Low c) High d) High to low	c
349.	How does the LCD distinguish data from instruction codes when receiving information at its data pin? a) By sending Low to RS pin b) By sending High to RS pin c) By sending High to EN pin d) By sending Low to EN pin	b
350.	Which port of the 8051 does not have internal pull-up resistors? a) Port 0 b) Port 1 c) Port 2 d) Port 3	a
351.	With XTAL=11.0592 MHz, what is the maximum baud rate for the 8051? a) 19200 b) 9600 c) 4800 d) 38400	a
352.	Upon pushing data onto the stack, the SP register is a) Incremented two locations b) Incremented one location c) Decremented two locations d) Decremented one location	b
353.	The stack uses the same area of RAM as bank a) Bank 3 b) Bank 2 c) Bank 1 d) Bank 0	c
354.	Upon reset, what is the value in the SP register? a) 0AH b) 09H c) 08H d) 07H	d
355.	Embedded Systems communicate with the outside world through a) Peripherals b) Processors c) OS d) Microcontrollers	a
356.	What is the purpose of an In-Circuit debugger (ICD)? a) specific debugging capabilities b) allows the operation of the microprocessor to be controlled externally	d

	c) Provides full control over all aspects of the microprocessor d) Both a and c	
357.	In which type of embedded system architecture a series of tasks are defined and each task gets its own environment to run in? a) multi-threading b) Simple control loop c) Interrupt controlled system d) Cooperative multitasking	d
358.	Embedded middleware sits between a) embedded application and operating system b) kernel and the real time operating system c) embedded application and the real time operating system d) kernel and the real time operating system	c
359.	Which provides a simulation of all aspects of the hardware a) Emulator b) ICD c) ICE d) HLL	a
360.	Which is the most commonly used language(s) used in embedded system? a) C b) JAVA c) COBOL d) Both a and c	a
361.	Which of the following are examples of peripherals? a) Universal serial bus b) Networks c) Timers d) All of the above	d
362.	The energy stored in the magnetic field at a solenoid 30 cm long and 3 cm diameter wound with 1000 turns of wire carrying an current at 10 A, is a) 0.015 J. b) 0.15 J. c) 0.5 J. d) 1.15 J.	b
363.	Which of the following theorem can be applied to any network, which is linear (or) nonlinear active (or) passive, time variant (or) time in variant? a) Superposition theorem. b) Norton's theorem. c) Thevenin's theorem. d) Tellegen's theorem.	d
364.	A practical DC current source provides 20 kW to a 50 Ω load and 20 kW to a 200 Ω load. The maximum power that can draw from it is	d

	a) 45 kW b) 40 kW c) 30.3 kW d) 22.5 kW	
365.	A balanced star connected load with impedance of 30∠ - 300 Ω is supplied from a 3 - Φ, 4-wire, 173 V system, the voltages to neutral being 100∠ -900, 100∠ - 300 and 100∠ -1500 V. The current in neutral wire is a) Zero. b) 5 A. c) 8.85 A d) 50 A.	a
366.	A balanced delta connected load has an impedance of 9∠ 30° Ω per phase. What is the impedance per phase of its equivalent star? a) 28∠ 30° Ω. b) 27∠ 90° Ω. c) 3∠ 30° Ω. d) None of above	c
367.	Phase voltages of a star connected alternator are ER = 240∠ 0° V, EY = 240∠ -120° V and EB = 240 ∠ + 120° V. What is the phase sequence of the system? a) RYB b) RBY c) YBR d) D) BYR	a
368.	A balanced 3 - Φ star connected load is fed from a 208 V, 3 - Φ supply. Each load has resistance of 35 Ω. The total power is a) 411.3 W. b) 618 W. c) 1236 W. d) none of these.	c
369.	A system with transfer function G(S) = {(S2 + 9) (S + 2)}{(S + 1) (S + 3) (S + 4)} is excited by sinω t. The steady state output of the system output of the system is zero at a) ω = 1 rad/sec. b) ω = 2 rad/sec. c) ω = 3 rad/sec. d) D) ω = 4 rad/sec.	c
370.	For an ac circuit, if u(t) = 160 sin (ω t+ 10°) and i(t) = 5sin(ωt - 20 °); then reactive power absorbed by the circuit is a) 100 VARS. b) B) 200 VARS. c) C) 300 VARS. d) D) 400 VARS.	b
371.	A 2 port network using Z parameter representation is said to be reciprocal if a) $Z_{11} = Z_{22}$ b) $Z_{12} = Z_{21}$	b

	c) $Z_{12} = -Z_{21}$ d) $Z_{11}Z_{22} - Z_{12}Z_{21} = 1$	
372.	The period of the signal x (t) = 8 sin (0.8πt + π /4) is a) 0.4πs b) 0.8πs c) 1.25s d) 2.5s	d
373.	For the single-element two-port network in Fig, then Z_{12} is: a) 0 b) 5 c) 10 d) 20	c
374.	For the single-element two-port network in Fig, then $Y_{12}$is a) 0 b) 5 c) 10 d) doesn't exist	d
375.	For the single-element two-port network in Fig, then h_{21} is	a

a) -1
b) 0
c) 10
d) doesn't exist

376.	For the single-element two-port network in Fig, then**B** is a) 0 b) 5 c) 10 d) doesn't exist	a
377.	When port 1 of a two-port circuit is short-circuited, $I_1 = 4I_2$ and $V_2 = 0.25I_2$. Which of the following is true? a) $y_{11} = 4$ b) $y_{12} = 16$ c) $y_{21} = 16$ d) $y_{22} = 0.25$	b
378.	A two-port is described by the following equations: $V_1 = 50I_1 + 10I_2$ $V_2 = 30I_1 + 20I_2$ then which of the following is not true? a) $Z_{12} = 10$ b) $y_{12} = -0.0143$ c) $h_{12} = 0.5$ d) $B = 50$	d
379.	If a two-port is reciprocal, which of the following is not true? a) $z_{21} = z_{12}$ b) $y_{21} = y_{12}$ c) $h_{21} = h_{12}$ d) $AD = BC + 1$	c
380.	Which of the following cannot be the Fourier series expansion of a periodic signal? a) $x(t) = 2 \cos t + 3 \cos 3t$ b) $x(t) = 2 \cos \pi t + 7 \cos t$ c) $x(t) = \cos t + 0.5$ d) $x(t) = 2 \cos 1.5\pi t + \sin 3.5 \pi t$	b

381.	The Fourier Transform of a conjugate symmetric function is always
	   a) Imaginary
	   b) conjugate anti-symmetric
	   c) C)real
	   d) conjugate symmetry
		C

382.	The range between a ground station and a satellite is 42,000 km. Calculate the free-space loss at a frequency of 6 GHz.
	   a) 200 dB
	   b) 300dB
	   c) 400dB
	   d) 500dB
		a

383.	An amplifier has a noise figure of 2.5 dB.What is its equivalent noise temperature?
	   a) 226K
	   b) 200K
	   c) 430K
	   d) 520K
		b

384.	The first geostationary satellite launched in 1965 was called
	
	   a) ANIK
	
	   b) EARLY BIRD (Intelsat-I)
	
	   c) WESTAR
	
	   d) MOLNIYA
		b

385.	Rotation of a geosynchronous satellite means its
	
	   a) drift from stationary position
	
	   b) wobbling
	
	   c)three-axis stabilization
	
	   d)three-dimensional stabilization
		b

386.	Noise temperature of Sun is more than _____ °K. a)1000 b)5000 c)100000 d)500	c
387.	A 20 m antenna gives a certain uplink gain at frequencies of 4/6 GHz. For getting same gain in the 20/30 GHz band, antenna size required is metre. (a)100 (b)4 (c)1 (d)10	b
388.	he discussing sharing of a communication satellite by many geographically dispersed Earth station, DAMA means a)Demand-Assigned Multiple Access b)Decibel Attenuated Microwave Access c)Digital Analog Master Antenna d)Dynamically-Assigned Multiple Access	a
389.	The angle subtended by earth at geostationary communication satellite is a)17.34° b)51.4° c)120° d)60°	a
390.	A transponder is a satellite equipment which	d

	a) receives a signal from Earth station and amplifies		
	b) changes the frequency of the received signal		
	(c)retransmits the received signal		
	c) does all of the above-mentioned functions		
391.	A geosynchronous satellite a)has the same period a that of the Earth b)has a circular orbit c)rotates in the equatorial plane d)has all of the above	d
392.	To make antenna more directional, either its size must be increased or a)the number of its feed horns must be increased b)the frequency of its transmission must be increased c)its effective isotropic radiated power (EIRP) must be increased d)its footprint must be increased	b
393.	Satellite launch sites are invariably located on Eastern seaboards to ensure that a)launch takes place eastward b)expenditure of propulsion fuel is reduced during plane changing c)the satellite achieves circular orbit quickly	d

		d)spent rocket motor and other launcher debris falls into the sea	
394.		The number of days when Earth's shadow falls on a geosynchronous satellite is a)88 b)277 c)5 d)10	a
395.		Radio broadcasting is a familiar example of a) space multiplexing b) time multiplexing c)frequency multiplexing d)none of the above	c
396.		The quality of a space-link is measured in terms of the _____ ratio. a)C/N b)S/N c)G/T d)EIRP	a
397.		At present, the radio-frequency band mainly used by most satellites is a)EHF b)UHF c)VHF d)SHF	d
398.		Orbital disturbances of a geosynchronous satellite are caused by the	d

	a)moon		
	b)sun		
	c)earth		
	d)all of the above		
399.	Which one of the following statement is correct? a)Satellite spacing is not affected by the bandwidth of the transmitting earth station b)Beamwidth is independent of antenna size and frequency band used c)The width of a beam in space is inversely proportional to the width of the transmitting antenna d)Use of high-frequency bands permits less number of satellites to share the orbit	c	
400.	In a stop-and-wait ARQ system, the transmitting terminal a) waits for positive or negative acknowled-gement from the receiving terminal after sending a block b) sends another block if positive acknowledge is received through ACK character c)resends the previous block if negative acknowledgement is received through a NAK character d)does not wait for acknowledgement after sending a block	d	
401.	A geostationary satellite is one which a) hangs motionless in space about 36000 km about Earth b)travels around the Earth in 24 hours c)remains stationary above the Earth	d	

	d)appears stationary to everybody on Earth	

402.	In a virtual memory system, the addresses used by the programmer belongs to
	    a. Memory space.
	    b. Physical addresses.
	    c. Address space.
	    d. Main memory address.
		c

403.	DMA interface unit eliminates the need to use CPU registers to transfer data from
	
	    a) MAR to MBR
	    b) MBR to MAR
	    c) I/O units to memory
	    d) Memory to I/O units
		d

404.	How many 128 x 8 RAM chips are needed to provide a memory capacity of 2048 bytes?
	    a) 8
	    b)16
	    c) 24
	    d) 32
		b

405.	**Which is true for a typical RISC architecture?**
	    a) Micro programmed control unit.
	    b) Instruction takes multiple clock cycles.
	    c) Have few registers in CPU.
	    d) Emphasis on optimizing instruction pipelines.
		a

406.	How many memory chips of (128 x 8) are needed to provide a memory capacity of 4096 x 16?
	    a) 64
	    b) 46
	    c) 32
	    d) None
		a

407.	Dynamic RAM consumes _____ Power and _____ then the Static RAM.
	    a) more, faster
	    b) more, slower
	    c) less, slower
	    d) less, faster
		c

408.	Cache memory works on the principle of
	    a) Locality of data.
	    b) Locality of reference
		b

	c) Locality of memory d) Locality of reference & memory	
409.	In DMA the data transfer is controlled by a) Microprocessor b) RAM c) Memory d) I/O devices	d
410.	Cycle stealing technique is used in a) Interrupt based data transfer b) Polled mode data transfer c) DMA based data transfer d) None of these	c
411.	If the main memory is of 8K bytes and the cache memory is of 2K words. It uses associative mapping. Then each word of cache memory shall be_____. a) a.11 bits b) b.21 bits c) c.16 bits d) d.20 bits	c
412.	The average time required to reach a storage location in memory and obtain its contents is called the _____. a) seek time b) turnaround time c) access time d) d. transfer time	c
413.	Page Fault Occurs when? a) The page is corrupted by application software b) The page is in main memory c) The page is not in main memory d) When the process enters the BLOCKED state.	c
414.	Which transmission mode is used for data communication along telephone lines? a) Parallel b) Serial c) Synchronous d) Asynchronous	b
415.	Odd one out: In SPI Communication a) Multiple slaves are very complicated. b) No acknowledgement ability c) Good inherent arbitration d) d. No flow control	c
416.	IrDA is a) Point to point protocol b) Uses synchronous serial communication c) Uses asynchronous serial communication	d

		d) Both a & c	
417.	**Context switching time is equal to**	a) Interrupt latency time b) Dispatch latency time c) both (a) and (b) d) Depends on scheduling policy	b
418.	**An embedded system must have**	a) hard disk b) processor and memory c) operating system d) processor and input-output unit(s).	b
419.	**RTOS is used in most embedded systems when the system does**	a) concurrent processing of multiple real time processes b) sequential processing of multiple processes when the tasks have real time constraints c) real time processing of multiple processes d) d. the concurrent processing of multiple processes, tasks have real time constraints and deadlines, and high priority task preempts low priority task as per the real time constraints.	d
420.	**A device driver is software for**	a) opening or connecting or binding or reading or writing or closing or other actions of the device b) receiving input or sending outputs from device c) access to parallel or serial port by the device d) d. controlling and configuring the device for read and write functions.	a
421.	**A system must have an interrupt handling mechanism for executing the interrupt service routines in case of the interrupts from**	a) physical devices b) interfaced circuits or systems, software interrupt instructions and software exceptions c) physical devices or interfaced circuits or systems d) d. physical devices or interfaced circuits or systems, software interrupt instructions and software exceptions.	d

Question No.	Question with choice	Answer
422.	Which of the following system is causal? a) $h(n) = n \left(\frac{1}{2}\right)^n u(n+1)$ b) $y(n) = x^2(n) - x(n+1)$ c) $y(n) = x(-n) + x(2n-1)$ d) $h(n) = n \left(\frac{1}{2}\right)^n u(n)$	d

423.	Which of these is false about the following system? $y(n) = x(n - 3) - 4\,x(n - 10)$ a) Linear b) causal c) time varying d) dynamic	c
424.	Which of these is true about the following system? $y(n) = nx(n) - 4x(n - 10) + 10$ a) Linear b) causal c) time invariant d) BIBO stable	b
425.	The minimum sampling frequency of the following analog signal, to avoid aliasing should be $x(t) = 4\sin(150\pi t) + 2\cos(50\pi t)$ should be, a) 75 Hz b) 150 Hz c) 200 Hz d) 50 Hz	b
426.	The transfer function of the LTI system y(n) = 0.5 y(n-1) + 2 x(n) has a pole at z=_____ a) z = 2 b) z = ½ c) z = 1/5 d) z=5	b
427.	If the ROC of X(z) = $\frac{z}{z-2}$ + $\frac{z}{z-0.5}$ + $\frac{z}{z-1}$ is $|z|< 0.5$; then What is x(n)? a) -(0.5)^n u(-n-1) + (0.2)^n u(n) + (0.8)^n u(n). b) (0.5)^n u(n) + (0.2)^n u(n) + (0.8)^n u(n). c) (0.5)^n u(n) - (0.2)^n u(-n-1) + (0.8)^n u(n). d) -(2)^n u(-n-1) -(0.5)^n u(-n-1) - u(-n-1)	d
428.	What is the ROC of the Z-transform of x(n) = -(0.5)^n u(-n-1) + (0.2)^n u(n) + (0.8)^n u(n)? a) $|z| > 0.8$ b) $|z| < 0.5$ c) $|z|> 0.5$ and $|z| < 0.8$ d) ROC does not exist	d

429.	What is the circular convolution between two discrete time sequences given by x(n) = {1,0,-1,0} and h(n)={0,0,2,6}.
	         a) {2,2,6,6} b) {-2,-6,2,6}
	
	         c) {2,0,2,0} d) {0,2,0,2}
		b

430.	What is the linear convolution between two discrete time sequences given by x(n) = {1,0,-1,0} and h(n)={0,1,2,3}.
	         a) {2,2,6,6} b) {0, 0, 2, 6, -2, -6, 0}
	
	         c) {2,0,2,0} d) { 0, 1, 2, 2, -2, -3, 0}
		d

431.	What is the 4-point DFT of the sequence x(n) = { 0,-1,1,0}? a) {0, -1+j, 2, -1-j} b) {0, 2j, 0, -2j} c) {0, 2, 0, 2} d) {0, -2j, 0, 2j}	a
432.	Give the number of butterfly stages for a 2048 point FFT. a) 2048 b) 1024 c) 14 d) 11	d
433.	Which of the following is true about the AM and FM systems?	c

	a) BW of FM < BW of AM; power FM > power AM; noise FM < noise AM b) BW of FM < BW of AM; power FM < power AM; noise FM < noise AM c) BW of FM > BW of AM; power FM < power AM; noise FM < noise AM d) BW of FM < BW of AM; power FM > power AM; noise FM > noise AM	
434.	Which of the following methods can be used for generating SSB-SC signals? a) Square-law modulator b) Switching modulator c) Frequency Discrimination Method d) Ring Modulator	c
435.	W.r.to the envelopes of the AM and FM modulated waves, which of the following is true a) Both are of constant amplitude b) Both vary according to the shape of the message signal. c) Envelope of AM is constant, FM is variable d) Envelope of AM varies and FM envelope is constant.	d
436.	Which of the following is true about the AM and FM propagation and commercial transmission bandwidth? a) AM = Ionospheric sky-wave; 550- 1650 kHz; FM = Ground-wave; 88-108 MHz b) AM = Ionospheric sky-wave; 550- 1650 kHz; FM = Line of sight; 88-108 MHz c) AM = Ground-wave; 550- 1650 kHz; FM = Ground-wave; 88-108 MHz d) AM = Line of Sight; 550- 1650 kHz; FM = Line of sight; 88-108 MHz	b
437.	Which modulation technique is not suitable for audio, video but is used for transmission of telephone signals? a) AM b) VSB-SC c) DSB-SC d) SSB-SC	d
438.	Find the value of Quantization noise in Watts, in a Pulse code modulation system when a signal of 0-16 volts amplitude is quantized using 3-bit quantization. a) 1/4 b) 1/3 c) 1/6 d) 1/12	b
439.	In a binary PCM system, the output signal-to-quantizing-noise ratio is to be held to a minimum of 40dB. Determine the number of required bits for the quantizer to satisfy the above requirement. a) n = 4 b) n = 8 c) n=5 d) n=7	d
440.	An FM station is operating at 100 MHz. Maximum frequency deviation is 75 kHz. If the highest modulating frequency is limited to 15 kHz, find the modulation index and approximate bandwidth required by the system. a) 10, 180kHz b) 5, 150kHz c) 5, 180kHz d) 10, 150kHz	c

| 441. | In the envelope of an AM wave, given Vmax = 30 volts and Vmin = 10 volts. Determine the modulation index and message signal amplitude.
a) 0.25, 10V b) 0.5, 10V c) 0.25, 20V d) 0.5, 20V | b |

Questio n No.	Question with choice	Answer
442.	If $f_X(x) = 0.4\delta(x+\alpha) + 0.6\delta(x-\alpha)$, Find Mean of X. a) 0.2α b) 0.3α c) 0.4α d) 0.5α	a
443.	If $f_X(x) = 0.4\delta(x+\alpha) + 0.6\delta(x-\alpha)$, Find Variance of X. a) $0.92\alpha^2$ b) $0.94\alpha^2$ c) $0.96\alpha^2$ d) $0.98\alpha^2$	c
444.	A Random Variable X has the distribution function $F_X(x) = \sum_{n=1}^{12} \frac{n^2}{650} u(x-n)$. What is the probability of random variable X taking a value 4. a) 16/650 b) 25/650 c) 36/650 d) 47/650	a
445.	A random variable X is known to be Poisson with b=4. What is the probability of the event $0 \le X \le 2$. a) 0.0915 b) 0.2381 c) 0.3718 d) None	b
446.	Let $Y = \frac{1}{4}\sum_{i=1}^{4} X_i$, where X_i are independent zero mean, unit variance random variables. What is the variance of Y.? a) 0.25 b) 0.5 c) 0.33 d) 1 b)	a
447.	1. A random variable X has the characteristic function $$\phi_X(w) = \left[1 - p + pe^{jw}\right]^N.$$ What is the mean of the random variable X. a) NP b. N^2P c. NP^2 d.None	a

448.	Let $Y = \dfrac{1}{3}\displaystyle\sum_{i=1}^{3} X_i$, where X_i are independent unit mean, unit variance random variables. What is the mean of Y.? a) 0.25 b) 0.5 c) 0.33 d) 1	d
449.	If X and Y are zero mean , unit variance Gaussian random variables find the Variance of newly transformed variable W = X + 3Y a) 4 b) 9 c) 10 d) None	c
450.	A transformation T is called monotonically decreasing if a) $T(X_1) > T(X_2)$ for $X_1 < X_2$ b) $T(X_1) = T(X_2)$ for $X_1 < X_2$ c) $T(X_1) < T(X_2)$ for $X_1 < X_2$ d) None	a
451.	If A and B are mutually exclusive events , $P(A \cap B) = \ldots\ldots$ a) 0 b) 1 c) $P(A \cap B) = P(A)P(B)$ d) None	a
452.	If $x_1[n]$ is odd signal and $x_2[n]$ is even signal then the product $x_1[n] x_2[n]$ is a) even b) odd c) neither even nor odd d) both even and odd	b
453.	The following signal is $$x(t) = e^{-at} u(t)$$ a) energy signal b) power signal c) neither energy nor power signal d)None	a
454.	Find the convolution to the following signals $x[n] = a^n u(n)$ $h(n) = \delta(n-2)$ a) $a^n u(n)$ b) $a^n u(n-2)$ c) $a^{n-2} u(n-2)$ d) $a^{n+2} u(n+2)$	c
455.	Calculate period to the following signal. $$x[n] = 2\cos\left(3n + \frac{\pi}{4}\right)$$	d

	a) π b) $2\pi/3$ c) 3 d) aperiodic	
456.	Calculate period to the following signal. $$x(t) = \cos\left(2t + \frac{\pi}{4}\right)$$ a) π b) 2π c) 2 d) aperiodic	a
457.	The following system is $$y(t) = x(t^2) + x^2(t-1)$$ a) Memory b) causal c) memory and causal d)None	c
458.	The following system is $$y(t) = x(t^2) + x^2(t)$$ a) Linear b) Time variant c) Linear and Time variant d)None	c
459.	For the given message signal $x(t) = \cos(100\prod t) + \sin^2(150\prod t)$, Find Nyquist period ? a) 100Hz b) 300Hz c) 150Hz d)None	b
460.	For the Given Causal system $H(z)$, Find first sample of the impulse response $h(0)$? $$H(z) = \frac{d_0}{1 + a_1 z^{-1} + a_2 z^{-2} + a_3 z^{-3}}$$ a) d_0 b) a_3 c) a_2 d) a_1	a
461.	Find the period of the signal $x[n] = (-1)^n$ a) 3 b) 2 c) 4 d) Aperiodic	b
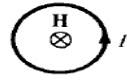
Q.No	Question with choice	Answer
462.	Every run length pair introduce new A. pixels B. matrix C. frames D. intensity	D
463.	Transforming difference between adjacent pixels is called A. mapping B. image compression C. image watermarking	A

	D. image equalization	
464.	Second derivative approximation says that it is nonzero only at A. ramp B. step C. onset D. edges	C
465.	Fourier transform of unit impulse at origin is A. undefined B. infinity C. 1 D. 0	C
466.	Principle tools used in image processing for a broad spectrum of applications A. low pass filtering B. intensity filtering C. spatial filtering D. high pass filtering	C
467.	To improve speed of convergence algorithm used is A. newton B. Raphson C. wiener D. newton-Raphson	D
468.	Probability density functions are always A. decreasing B. increasing C. positive D. negative	C
469.	Base of image pyramid contains A. low resolution B. high resolution C. intensity D. blurred portion	B
470.	Replacing object from its origin referred to as A. reflection	D

	B. compression C. decompression D. translation	
471.	Images usually gets corrupted during A. transmission B. degradation C. restoration D. acquisition	A
472.	Periodic noises arise from A. electrical interference B. gamma interference C. beta interference D. mechanical interference	A
473.	Correction of power law response is called A. alpha correction B. gamma correction C. beta correction D. pixel correction	B
474.	Image can be sharpened using A. low pass filter B. contouring C. erosion D. high pass filter	D
475.	Bit plane slicing is used in A. aortic angiogram B. radar C. contrast stretching D. MRI	A
476.	Process involved in linear spatial filtering is A. correlation B. convolution C. histogram equalization D. Both A and B	D
477.	Convolution of two functions means rotating one function at angle of A. 360	D

	B. 270 C. 90 D. 180	
478.	Hit-or-miss transformation is used for shape A. removal B. detection C. compression D. decompression	B
479.	Example of discontinuity approach in image segmentation is A. edge based segmentation B. boundary based segmentation C. region based segmentation D. Both A and B	D
480.	Morphology refers to A. pixels B. matrix C. frames D. shape	D
481.	Tomography is algorithm that uses images A. edges B. slices C. boundaries D. illumination	B

Question No.	Question with choice	Answer
482.	**Sea water has $\varepsilon_r = 80$, its permittivity is** (a) 1.162×10^{-10} F/m **(b) 7.074×10^{-10} F/m** (c)) 5.162×10^{-10} F/m (d) 81 F/m	(b)
483.	**Which of the following potential expression (s) does satisfy Laplace's Equation:** (a) $V_1 = 2x^2+5$ (b) $V_1 = x^2+y^2+5z^2-10$ (c) $V_1 = \rho z\sin\phi +\rho^2$ (d) $V_1 = x^2+y^2-2z^2 +10$	(d)
484.	**The expression for spherical capacitor with inner and outer radius as a**	(d)

and b is given by:

(a) $\dfrac{\ln(b/a)}{4\pi\varepsilon L}$ (b) $\dfrac{2\pi\varepsilon L}{\ln(b/a)}$ (c) $\dfrac{(\dfrac{1}{a}-\dfrac{1}{b})}{2\pi\varepsilon L}$ (d) $\dfrac{4\pi\varepsilon}{(\dfrac{1}{a}-\dfrac{1}{b})}$

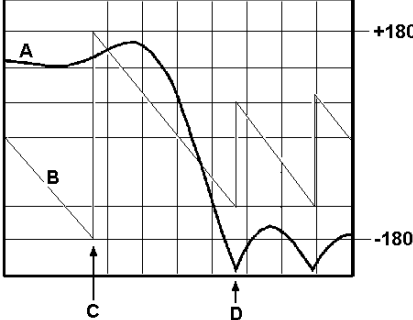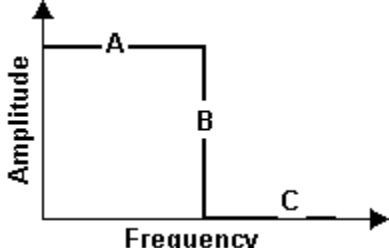|		
485.	**Identify the configuration in the given Figure that is not a correct representation of I and $\vec{H}$** (a) (b) (c) **(d)**	(d)
486.	**What is the unit of magnetic charge?** a) **A-m** b) Coulomb c) Ampere d) A-m^2	(a)
487.	**One of the following is not a source of Magnetostatics field:** a) A dc current in a wire b) A permanent magnet c) **An accelerated charge** d) The electric field linearly changing with time.	(c)
488.	$\nabla^2 \times \vec{A}$ **is given by :** (a) $\vec{H}$ (b) $\vec{B}$ (c) $\vec{J}$ (d) $-\mu_0 \vec{J}$	
489.	**Depth of penetration in free space is** **(a) Infinity** (b) $1/\alpha$ (c) 0 (d) small	(a)
490.	**The velocity of an EM wave (a) Inversely proportional to β** (b) inversely proportional to α (c) directly proportional to β (d) Directly proportional to α	(a)
491.	**The flux through each turn of a 100 turn coil is (t^3-2t) mWb, where t is in seconds. The induced emf at t = 2s is** (a) 1 V **(b) -1 V** (c) 4 mV (d) 0.4 V (e) -0.4 V	(b)
492.	. **The direction of propagation of EM wave is obtained from** **(a) $\vec{E}\times\vec{H}$** (b) $\vec{E}\bullet\vec{H}$ (c) $\vec{E}$ (d) $\vec{H}$	(a)
493.	**The electric field component of a wave in free space is given by** $\vec{E}=10\cos(10^7 t + kz)\hat{a}_y$ **it can be inferred that** (a) The wave propagates along $\hat{a}_y$ **(b) The wavelength λ = 188.5 (c) The wave**	(b) and (c)

	amplitude is 10 V/m (d) The wave number k = 0.33 rad/m (e) The wave attenuates as it travels.	
494.	**If wet soil has σ = 10^{-2} mho/m, ε$_r$ = 15, μ$_r$ = 1, f = 60 Hz, it is a** **(a) Good conductor** (b) good dielectric (c) semi- conductor (d) magnetic material	(a)
495.	**Poynting vector gives** **(a) Rate of energy flow** (b) direction of polarization (c) electric field (d) magnetic field.	(a)
496.	**What is the major factor for determining whether a medium is free space, lossless dielectric, lossy dielctric or good conductor?** (a) Attenuation Constant (b) Complex permittivity **(c) Loss tangent** (d) Reflection Coefficient.	(c)
497.	**Velocity of propagation of an EM wave in a lossless dielectric** (a) $\sqrt{\dfrac{\varepsilon_0}{\mu_0}}$ (b) $\dfrac{\mu_0}{\varepsilon_0}$ **(c)** $\dfrac{1}{\sqrt{\mu\varepsilon}}$ (d) 0	(c)
498.	**Which of these formulas is wrong ?** a) $B_{1n}=B_{2n}$ b) $B_2 = \sqrt{B_{2n}^2 + B_{2t}^2}$ **c)** $H_1=H_{1n} + H_{2n}$ d) $a_{n21} \times (\vec{H}_1 - \vec{H}_2) = \vec{K}$	(c)
499.	**Identify the statement that is not true for ferromagnetic materials** a) They have large χ_m. b) **They have fixed value of μ$_r$.** c) Energy loss is proportional to the area of the hysteresis loop. d) They loss their nonlinearity property above the Curie Temperature.	(b)
500.	Both ε_0 and χ_e are dimensionless: The statement is _____ and _____ respectively (a) True and False **(b) False and True** (c) True and True (d) False and False.	(b)

501.	The Relaxation time of mica (σ = 10^{-15} mho/m, ε_r =6) is (a) 5x 10^{-10} s (b) 10^{-6} s (c) 5 Hours (d) 10 Hours **(e) 15 Hours**	(e)

Questio n No.	Question with choice	Answer
502.	The force between two charges is 120 N. If the distance between the charges is doubled, the force will be (a) 60 N (b) 30 N (c) 40 N (d) 15 N	b
503.	The electric field intensity at a point situated 4 metres from a point charge is 200 N/C. If the distance is reduced to 2 metres, the field intensity will be (a) 400 N/C (b) 600 N/C (c) 800 N/C (d) 1200 N/C	c
504.	The lines of force due to charged particles are (a) always straight (b) always curved (c) sometimes curved (d) none of the above	b
505.	The electric field at a point situated at a distance d from straight charged conductor is (a) proportional to d (b) inversely proportional to d (c) inversely proportional to d (d) none of the above	b
506.	The direction of electric field due to positive charge is (a) away from the charge (b) towards the charge (c) both (a) and (b) (d) none of the above	a
507.	If the sheet of a bakelite is inserted between the plates of an air capacitor, the capacitance will (a) decrease (b) increase (c) remains unchanged (d) become zero	b
508.	A dielectric material must be (a) resistor (b) insulator (c) good conductor (d) semi conductor	b
509.	The total electric flux through any closed surface surrounding charges is equal to the amount of the charge enclosed". The above statement is associated with (a) Coulomb's square law (b) Gauss's law (c) Maxwell's first law (d) Maxwell's second law	b
510.	Three capacitors each of the capacity C are given. The resultant capacity 2/3 C can be obtained by using them (a) all in series (b) all in parallel (c) two in parallel and third in series with this combination (d) two in series and third in parallel across this combination	c
511.	The electrostatic force between two charges of one coulomb each and placed at a distance of 0.5 m will be (a) 36 x 10 N (b) 36 x 107 N (c) 36 x 108 N (d) 36 x 109 N	d
512.	Two infinite parallel plates 10 mm apart have maintained between them a potential difference of 100 V. The acceleration of an electron placed between them is	d

	(a) 0.56 x 1015 m/s2 (b) 1.5 x 1015 m/s2 (c) 1.6 x 1015 m/s2 (d) 1.76 x 1015 m/s2	
513.	The relative permittivity has the following units (a) F/m (b) m/F (c) Wb/m (d) no units	c
514.	The phenomenon of an uncharged body getting charged merely by the nearness of a charged body is known as (a) pholoelectric effect (b) chemical effect (c) magnetic effect (d) induction	d
515.	Electric displacement is a_____quantity. (a) scalar (b) vector (c) both of the above (d) none of the above	b
516.	In a travelling electromagnetic wave, E and H vector fields are (a) perpendicular in space . (b) parallel in space. (c) E is in the direction of wave travel. (d) H is in the direction of wave travel.	c
517.	The magnetic field intensity (in A/m) at the centre of a circular coil of diameter 1 metre and carrying current of 2 A is (a) 8. (b) 4. (c) 3. (d) 2	a
518.	A wave is incident normally on a good conductor. If the frequency of a plane electromagnetic wave increases four times, the skin depth, will (a) increase by a factor of 2. (b) decrease by a factor of 4. (c) remain the same (d) decrease by a factor of 2.	d
519.	In a dielectric-conductor boundary (interface), the tangential component of electric field is (a) E_t (b) $2E_t$ (c) zero (d) infinity	c
520.	The intrinsic impedance of free space is (a) 75 ohm. (b) 73 ohm. (c) 120 ohm. (d) 377ohm.	d
521.	During night which layer does not exist? (a) D layer (b) F1 layer (c) F2 layer (d) E layer	a

Question No.	Question with choice	Answer
522.	Curve B is the	A

a. Phase response of a Low pass filter
b. Amplitude response of a Low pass filter
c. Both of the above
d. None of the above

523.	This frequency response graph is for a a. Low pass filter b. High pass filter c. Band pass filter d. Band stop filter	A
524.	The DFT of $x(n)=\delta(n)$ a. 1 b. 0 c. $e^{-j2\pi/N}$ d. None of the above	A
525.	FFT algorithms - a. Eliminate redundant calculation and enable to analyse the spectral properties of a signal b. Enable the redundant calculation and redundant to analyse the spectral properties of a signal c. Increases the number of computations d. None of the above	A
526.	If the Fourier series coefficients of a signal are periodic then the signal must be a. Continuous-time, periodic b. discrete-time, periodic c. Continuous-time, non-periodic d. discrete-time, non-periodic	B
527.	The Fourier Transform of a rectangular pulse is a. Another rectangular pulse b. Triangular pulse c. Sinc function d. Impulse	C
528.	The property of Fourier Transform which states that the compression in time domain is equivalent to expansion in the frequency domain is a. Duality. b. Scaling. c. Time Scaling. d. Frequency Shifting	B

529.	The number of complex multiplications required for evaluating the DFT of a 64 point sequence is a. 2048 b. 1024 c. 4096 d. 256	C
530.	Which of the following statements are true about Butterworth filter a. The magnitude response of the Butterworth filter decreases monotonically as the frequency 'Ω increases from 0 to ∞ b. The magnitude response of the Butterworth filter closely approximates the ideal response as the order N increases. c. The poles of the Butterworth filter lie on a circle i. a,b ii. a,c iii. b,c iv. None of the above **v. All of them**	v
531.	Type II Chebyshev filters a. All-pole filters b. All-zero filters c. Pole-Zero filters d. None of the above	C
532.	The Normalized Butterworth polynomial of order 2 is _____ a) $s^2 + 2s + 1$ b) $s^2 + \sqrt{2}s + 1$ c) $s^2 + 2.414s + 1$ d) $s^2 + \sqrt{2}s + 2$	B
533.	A Chebsyhev filter implementation normally gives the lowest order compared to Butterworth filter assuming equal cutoff attenuation and stopband attenuation. (a). TRUE (b) FALSE	A
534.	At the cutoff frequency, the magnitude of the butterworth filter is _____times the maximum value. **a)** $\frac{1}{\sqrt{2}}$ b) $\frac{1}{\sqrt{3}}$ c) $\frac{1}{2\sqrt{3}}$ $d. \frac{1}{2\sqrt{2}}$	A
535.	In Butterworth approximation, the magnitude response approaches the ideal response as the order is increased. (a). TRUE (b) FALSE	A
536.	FIR filters are inherently stable, since no _____ are present in H(z) a) Poles b) zeros	A

	c) poles and zeros	

537.	IIR filters
	   a) Use feedback
	   b) Are sometimes called recursive filters
	   c) Can oscillate if not properly designed
	   d) All of the above
		D

538.	The DFT of a sequence $x(n) = \delta(n - n_0)$ is____
	   a) 1
	   b) $e^{j2\pi k n_0}$
	
	   c) $e^{\frac{-j2\pi k n_0}{N}}$
	   d) $e^{\frac{j2\pi k n_0}{N}}$
		C

539.	If $X(k)$ is DFT of a sequence $x(n)$ then DFT of real part of $x(n)$ is __
	   a) $X^*(k)$
	   b) $X^*(N - k)$
	
	   c) $\frac{1}{2}[X(k) + X^*(N - k)]$
	   d) $\frac{1}{2}[X(k) - X^*(N - k)]$
		C

540.	The peak _____ amplitude of the window is determined by the shape of the window, and it is essentially _____ of the window length.
	   a) side-lobe, independent
	   b) side-lobe, dependent
	   c) main-lobe, independent
	   d) main-lobe, dependent
		A

541.	If a signal is $x[n] = a^n u[n] - b^n u[-n - 1]$, then its ROC will be, a). $|a| < |z| < |b|$ b). $|a| < |z|$ c). $|a + b| < |z|$ d). $|z| < |b|$	A

Question No.	Question with choice	Answer
542.	A time invariant system is a system whose output ------------------- a) Increases with a delay in input b) Decreases with a delay in input c) Remains same with a delay in input d) Vanishes with a delay in input	C

543.	All causal systems must have the component of------------------------ a) Memory B) Time Invariance C) Stability D) Linearity	A
544.	An example of a discrete set of information/system is--------------------------- a) The trajectory of the Sun b) Data on a CD c) Universe time scale d) Movement of water through a pipe	B
545.	Is the system $y(t) = Rx(t)$, where R is an arbitrary constant, a memoryless system? a) Yes B) No C) Information is not sufficient to decide	B
546.	Should real time instruments like oscilloscopes be time invariant? a) Yes b) Sometimes c) Never d) They have no relation with time variance	A
547.	The type of systems which are characterized by input and the output quantized at certain levels are called as----------------- a) Analog b) Discrete c) Continuous d) Digital	B
548.	$y[n] = x[-n+2]$. Comment on its causality and linearity a) Causal and linear b) Non causal and non-linear c) Non causal and linear d) Causal and non-linear	C
549.	Comment on the stability and shift variance of $y[n] = x[n] + nx[n+1]$ a) Stable and Shift variant b) Stable and Shift Invariant c) Unstable and Shift variant d) Unstable and Shift Invariant	C
550.	i) For a causal discrete-time LSI system, the ROC of the system function includes infinity, say whether true or false; …………True………….. (ii) The Z transform of unit impulse function is 1 and the ROC is entire Z plane except z=0 say whether true or false; ……False………………..	
551.	If a signal is $x[n] = a^n u[n] - b^n u[-n-1]$, then its ROC will be, a). $\|a\| < \|z\| < \|b\|$ b). $\|a\| < \|z\|$ c). $\|a+b\| < \|z\|$ d). $\|z\| < \|b\|$	A
552.	$y[n] = x[2n]$. Comment on its causality and linearity a) Causal and linear b) Non causal and non-linear c) Non causal and linear d) Causal and non-linear	C
553.	Comment on the stability and shift variance of $y[n] = x[n]\cos(\omega n)$ a) Stable and Shift variant b) Stable and Shift Invariant c) Unstable and Shift variant d) Unstable and Shift Invariant	C

554.	$y(t) = x(t-2) + x(2-t)$. Comment on its causality: a) Causal b) Non causal	B
555.	Comment on the linearity of $y[n] = n * x[n]$ a) Linear b) Only additive c) Not scalable d) Non linear	D
556.	Which of the following systems is time invariant? a) $y(t) = x(2t) + x(t)$ b) $y(t) = x(t) + x(1-t)$ c) $y(t) = -x(t) + x(1-t)$ d) $y(t) = x(t) + x(t-1)$	D

557.	Determine the convolution sum of two sequences x(n) = {1, 2, 1, 3} and h(n)
	= {1, 2, 1, 1}
	        a) y(n) = {1,4,6,7,8,4,3} b) y(n) = {1,4,6,9,8,4,4}
	        c) y(n) = {1,4,6,8,9,4,3} d) y(n) = {1,4,6,8,9,3,3}
		C

558.	Determine the correlation between two sequences
	$x(n) = \delta(n) + 2\delta(n-1) + \delta(n-2),\ \ h(n) = 2\delta(n) + \delta(n-1) + 3\delta(n-2)$
	       a). {2,5,7,7,3} b). {2,5,7,5,2}
	       c). {3,7,7,5,2} d). {3,7,5,7,2}
		C

559.	A system is said to be defined as non - causal, when a) The output at the present depends on the input at an earlier time b) The output at the present does not depend on the factor of time at all c) The output at the present depends on the input at the current time d) The output at the present depends on the input at a time instant in the future	D
560.	$y(t) = sin(x(t-1))$: Comment on its memory aspects. a) Having memory b) Needn't have memory c) Memoryless system d) Time invariant system	A
561.	Does the system $h(t) = e^{-7t}$ correspond to a stable system? a) Yes b) No c) Marginally Stable	A

562. The signal $x(t) = \sin 15\pi t + \sin 20\pi t$ is

   a. Periodic   b. Not Periodic

c. Semi Periodic   d. None of the above   **b**

563. Which one of the following property of unit step function $\partial(t)$ is true

a. $\delta(at) = \dfrac{1}{|a|}\delta(t)$ b. $\delta(at) = |a|\delta(t)$

c. $\delta(at) = a$ d. $\delta(at) = 1$ **a**

564. The complex exponential Fourier representation of a signal $f(t)$ over the interval $(0, T)$ is

$$f(t) = \sum_{n=-\infty}^{\infty} \frac{3}{4 + (n\pi)^2} e^{jn\pi t}$$

   The numerical value of T is

a. 4   b. 1

c. 2   d. 0   **c**

565. Which one of the following property of Fourier transform is true

a. $f(t - t_0) = F(jw)e^{-jwt_0}$ b. $f(t - t_0) = F(jw)e^{jwt_0}$

c. $f(t - t_0) = F(jw)e^{-jwt_0^2}$ d. none of the above   **a**

566. Fourier transform of Gaussian pulse $f(t) = e^{-a^2 t^2}$ is

a. $\dfrac{\sqrt{\pi}}{2a} e^{-(\frac{\pi f}{a})^2}$ b. $\dfrac{\sqrt{\pi}}{a} e^{-(\frac{\pi f}{a})^2}$

c. $\dfrac{\sqrt{\pi}}{a} e^{-(\frac{\pi}{a})^2}$ d. $\dfrac{\pi}{a} e^{-(\frac{\pi}{a})^2}$ **b**

567. Laplace transform of $e^{-at}\cos\omega_0 t$ is

a. $\dfrac{s-a}{(s-a)^2 + \omega_0^2}$

b. $\dfrac{s-a}{(s-a)^2 - \omega_0^2}$

c. $\dfrac{s}{(s-a)^2 - \omega_0^2}$

d. $\dfrac{s+a}{(s+a)^2 + \omega_0^2}$

d

568. Z-transform of the signal $2^n u(n-2)$ is

a. $\dfrac{4z^{-2}}{1-2z^{-1}}$

b. $\dfrac{2z^{-2}}{1-2z^{-1}}$

c. $\dfrac{z^{-2}}{1-2z^{-1}}$

d. $\dfrac{4z^{-2}}{1-z^{-1}}$

a

569. The signal $y(t) = 7x(t) + 10$ is

a. Non-linear

b. ramp

c. Linear

d. none of the above

c

570. Which of the following distinguish FIR filter from IIR

a. Linear phase characteristics

b. order of the filter

c. efficiency

d. none of the above

a

571. If the cumulative distribution function is $F_X(x)$, then the probability density function $f_X(x)$ is given by

a. $\int F_X(x)dx$

b. $\dfrac{d}{dx} F_X(x)$

c. $\int F_X(-x)dx$

d. $\dfrac{d}{dx} F_X(-x)$

b

572. A signal $x(t) = 6\cos 10\pi t$ is sampled at the rate of 14Hz.To recover the original signal the cut-off frequency f_c of the ideal LPF should be

a. 5Hz < f_c < 9 Hz

b. 9Hz

c. 10Hz

d. 14 Hz

a

573. The stop band attenuation A_p for the design of Kaiser window is given by

a. $A_p = 10\log_{10} \dfrac{1-\delta_p}{1+\delta_p} dB$

b. $A_p = 10\log_{10} \dfrac{1+\delta_p}{1-\delta_p} dB$

c. $A_p = 20\log_{10} \dfrac{1+\delta_p}{1-\delta_p} dB$

d. $A_p = 20\log_{10} \dfrac{1-\delta_p}{1+\delta_p} dB$

c

574. The bilinear transformation $H(z) = \dfrac{0.0476(1+z^{-1})^2}{(1-0.9048z^{-1})^2}$ corresponds to which of the following

a. $H(s) = \dfrac{1}{(s+1)^2}$

b. $H(s) = \dfrac{1}{(s-1)^2}$

c. $H(s) = \dfrac{1}{(2s-1)^2}$

d. $H(s) = \dfrac{1}{(2s+1)^2}$

a

575. The quantization noise power of the digital filter, when the input signal is quantized to have eight bits is given by

a. $1 X 10^{-6}$

b. $1.27 X 10^{-6}$

c. $1.27 X 10^{-8}$

d. $1 X 10^{-8}$

b

576. The phenomenon spectral leakage is the result of

a. autocorrelation process

b. Fourier transform

c. Windowing

d. Quantization

c

577. Frequency resolution of the Bartlett method of power estimation for a quality factor $Q = 10$ and the length of the sample sequence 1000 is

a. 0.0009   b. 0.009

c. 0.09   d. 0.9   **a**

578. The discrete time system described by $y(n) = x(n^2)$ is

a. Causal, linear and time varying
b. Causal, non- linear and time varying
c. Non-causal, linear and time invariant
d. Non-causal, non-linear and time variant   **c**

579. The response of a Linear, time invariant, discrete-time system to a unit step input u(t) is the unit impulse $\delta(n)$ .The system response to a ramp input $nu(n)$ would be

a. u(n)   b. u(n-1)

c. $n\delta(n)$ d. $\sum_{k=0}^{\infty} k\delta(n-k)$ **d**

580. The units of the spectrum obtained by Fourier transforming the co-variance function of a stationary stochastic process is

a. Power per Hertz   b. Energy per Hertz
c. Power per second   d. Energy per second   **b**

581. Solution of Laplace's equation, which are continuous through the second derivative, are called

a. Bessel functions   b. Odd functions
c. Harmonic functions   d. Fundamental function   **c**

Question No.	Question with choice	Answer
582.	Radio channel used for transmission of information from the mobile to the base station is called as _____ (a) Forward Voice channel (b) Reverse Voice Channel (c) Forward Control Channel (d) Reverse Control Channel	b
583.	The process of transferring a mobile station from one base station to another is_____ (a) Switching (b) Channel Borrowing (c) Handoff (d) Call Setup	c
584.	_____ coordinates the routing of calls in a large service area. (a) Mobile equipment (b) Base Station (c) MSC (d) None of the above	c
585.	_____ is the expansion of GPRS. (a) Genuine packet radio System (b) Genuine packet radio System (c) General packet radio service (d) General packet radio Switching	c
586.	To which one of the following generations does CDMA belong? (a) First generation (b) Second generation	b

	(c) Third generation (d) Fourth generation	
587.	The cell having the same number in the adjacent cluster using the same set of RF channels are termed as (a) adjacent cell (b) Co channel cell (c) Macro cell (d) Selective Cell	b
588.	Higher value of Q is achievable in (a) big cluster size (b) small cluster size (c) medium cluster size (d) None of the above	a
589.	The process of transferring a channel from one base station to another is _____ (a) Switching (b) Channel Borrowing (c) Handoff (d) Call Setup	b
590.	The core concept used in Cellular technology is (a) TDM (b) Frequency Reuse (c) Code reuse (d) CDMA	b
591.	_____ denotes the traffic intensity the entire trunked radio system. (a) Traffic intensity (b) Grade of Service (c) Load (d) None of the above	c
592.	The coverage & capacity of CDMA system is more than that of GSM system (a) True (b) False (c) Equal (d) None of the above	a
593.	The technique adopted to increase the system capacity and reduce co-channel interference is (a) High power BTS (b) With Omnidirectional antenna (c) Sectorization (d) None of the above	c
594.	The remote and sparsely populated areas will be covered by (a) Microcell (b) Macrocell (c) Picocell (d) None of the above	b
595.	Real audio/video signal is a/an (a) Energy Signal (b) Power Signal (c) Deterministic Signal (d) Periodic Signal	a
596.	The type of access used in GSM technology is (a) FDMA/TDMA (b) CDMA (c) OFDMA (d) None of the above	a
597.	In a _____ handoff, a mobile station can communicate with two base stations at the same time (a) Hard (b) Soft (c) Medium (d) None of the above	b
598.	Which of the following is the communication system mainly suitable for wireless digital communication? (a) Analog input – analog transmission(b) Analog data – digital transmission (c) Digital data-digital transmission (d) Digital data-analog transmission	d
599.	The capacity of the wire-line system can be increased (a) By TDMA (b) By random access (c) By increasing the number of wires(d) By all the methods	d
600.	For real time voice transmission the suitable multiple access type is (a) Random access (b) Fixed assignment based access (c) Reservation access (d) None of the above	b
601.	In which of the following multiple access schemes, the frequency reuse	c

Question No.	Question with choice	Answer
	concept is utilized? (a) FDMA　　　　　　　(b) CDMA (c) SDMA　　　　　　　(d) None of the above	

Question No.	Question with choice	Answer
602.	Laplacian of a Scalar function F is (a) gradient of F (b) divergence of F (c) gradient of gradient of F (d) divergence of gradient of F	d
603.	Poisson's Equation relating the potential V at any point to the volume charge density ρ at that point states that (a) $\nabla^2 V = \dfrac{\partial}{\rho}$ (b) $\nabla^2 V = -\dfrac{\partial}{\rho}$ (c) $\nabla^2 V = -\varepsilon\rho$ (d) $\nabla^2 V = +\varepsilon\rho$	b
604.	Electric Flux inside a conducting sphere is (a) zero (b) uniform (c) minimum (d) maximum	a
605.	If the vector $\vec{A}$ and $\vec{B}$ are conservative, then (a) $\vec{A} \times \vec{B}$ is solenoidal (b) $\vec{A} \times \vec{B}$ is conservative (c) $\vec{A} + \vec{B}$ is solenoidal	a

	(d) $\vec{A} - \vec{B}$ is solenoidal	
606.	If the vector field F=($\alpha xy+\beta Z^3$)u$_x$ +(3x^2-γz)u$_y$+(3xz^2-y)u$_z$ is irrotational,then value of α,β andγ is (a) $\alpha = \beta = \gamma =1$ (b) $\alpha = \beta = 1,\gamma =0$ (c) $\alpha = 0,\beta = \gamma =1$ (d) $\alpha = \beta = \gamma =0$	a
607.	The electric field of an electromagnetic wave propagating in the positive z-direction is given by E=â$_x$ sin(ωt-βz) + â$_y$ sin(ωt-βz+Π/2).The wave is (a) linearly polarized in the z-direction. (b) elliptically polarized (c) left-hand circularly polarized (d) right-hand circularly polarized	c
608.	Equation $\nabla J = 0$ is called (a) Laplacian equation (b) Poisson's equation (c) Continuity equation for discrete currents (d) Kirchoff's node equation	c
609.	Boundary conditions at the interface between two dielectrics in an electric field are (a) D$_n$=0;E$_n$=0 (b) D$_n$=0;E$_t$=0 (c) D$_t$=0;E$_t$=0 (d) D$_t$=0;E$_n$=0 (where subscript n and t denote the normal and tangential components respectively)	b
610.	Intrinsic impedance of free space is given by	

	(a) $Z_o = \mu_o \varepsilon_o$ (b) $Z_o = \sqrt{\dfrac{\mu_o}{\varepsilon_o}}$ (c) $Z_o = \dfrac{\mu_o}{\varepsilon_o}$ (d) $Z_o = \sqrt{\mu_o \varepsilon_o}$	b
611.	In which direction is the plane wave $\overline{E} = 50 \sin(10^8 t + 2z)\, \hat{a}_y$ v/m,(where $\hat{a}_y$ is unit vector in y-direction),traveling? (a) Along y direction (b) Along -y direction (c) Along z direction (d) Along -z direction	d
612.	A single turn loop is situated in air,with a uniform magnetic field normal to its plane.The area of the loop is 5 m^2 and the rate of change of flux density is 2 Wb/m^2/s .what is the emf appearing at the terminals of the loop? (a) -5 V (b) -2 V (c) -0.4 V (d) 0 V	b
613.	Maxwell's divergence equation for the magnetic field is given by (a) $\nabla X B = 0$ (b) $\nabla . B = 0$ (c) $\nabla X B = \rho$ (d) $\nabla . B = \rho$	b
614.	Consider the following statements regarding maxwell's equations in differential form (symbols have the usual meanings) 1. For free space $\nabla X H = (\sigma + j\omega\varepsilon)E$	

	2. For free space $\nabla.D = \rho$		c
	3. For steady current $\nabla X H = J$		
	4. For static electric field $\nabla.D = \rho$		
	Of these statements:		
	(a) 1 and 2 are correct		
	(b) 2 and 3 are correct		
	(c) 3 and 4 are correct		
	(d) 1 and 4 are correct		
615.	The internal dimension of a coaxial capacitor is a = 1.2 cm, b = 4 cm and c = 40 cm.The homogeneous material inside the capacitor has the parameter $\varepsilon= 10^{-11}$ F/m,$\mu = 10^{-5}$ S/m.The electric field intensity is E = $(10^7 /\gamma)$ cos $(10^5 t)u_p$ V/m. The current density J is		
	(a) $(200/\rho)$ sin $(10^5$ t) u_ρ A/m^2		c
	(b) $(400/\rho)$ sin $(10^5$ t) u_ρ A/m^2		
	(c) $(100/\rho)$ cos $(10^5$ t) u_ρ A/m^2		
	(d) none of these		
616.	The depth of penetration of a wave in a lossy dielectric increase with increasing		
	(a) conductivity		
	(b) permeability		
	(c) wavelength		c
	(d) permittivity		
617.	The time averaged pointing vector,in $\dfrac{\omega}{m^2}$, for a wave with $\vec{E}$ =24 $e^{j(\omega t+\beta z)}$. $\vec{a}$ j in free space is		
	(a) - 2.4/Π $\vec{a}_z$		
			b

	(b) $2.4/\Pi \ \vec{a}_z$	
	(c) $4.8/\Pi \ \vec{a}_z$	
	(d) $- 4.8/\Pi \ \vec{a}_z$	
618.	When electromagnetic waves are reflected at an angle from a wall,their wave length along the wall is (a) same as in the free space (b) same as the wavelength perpendicular to the wall (c) shortened because of the doppler effect (d) greater than in the actual direction of propagation	d
619.	Transmission of power to a load over a transmission line achieves optimum value when standing-wave ratio (SWR) becomes (a) 2:1 (b) 1:2 (c) 1:1 (d) $1:\sqrt{2}$	c
620.	For an EM wave transmitted in a good dielectric having $\dfrac{\sigma}{\omega\varepsilon} \rangle\rangle 1$, the attenuation constant α and phase shift factor β are given by (a) $\alpha = \dfrac{\sigma}{2}\sqrt{\dfrac{\mu}{\varepsilon}}; \beta = \omega\sqrt{\mu\varepsilon}$ (b) $\alpha = \dfrac{\sigma}{2}\sqrt{\dfrac{\mu}{\varepsilon}}; \beta = \sqrt{\omega\mu\varepsilon}$ (c) $\beta = \sqrt{\dfrac{\mu}{\varepsilon}}; \beta = \sqrt{\dfrac{\omega\mu}{\varepsilon}}$ (d) $\beta = \sqrt{\dfrac{\varepsilon}{\mu}}; \beta = \sqrt{\dfrac{1}{\omega\mu\varepsilon}}$	a
621.	The EM field and current are concentrated close to the surface of the	

conductor. The phenomenon is called

(a) Faraday's effect

(b) Skin effect

(c) EM concentration effect

(d) Ohm's effect

b

Question No.	Question with choice	Answer
622.	Microwave antenna aperture efficiency depends on a. feed pattern b. antenna aperture c. surface losses d. sidelobe level	b
623.	If the antenna diameter in a radar system is increased by a factor of 9, then the maximum range will increase by a factor of a. $\sqrt{3}$ b. 3 c. 9 d. 81	c
624.	In antenna measurements the minimum separation distance between the antenna should be greater than a. $d/2\lambda$ b. $2\lambda/d$ c. $2\lambda^2/d$ d. $2d^2/\lambda$	d
625.	Noise temperature and gain are two important parameters of satellite antennas. Which one of the following antenna has the largest G/T ratio? a. parabolic reflector b. Cassegrian antenna c. pyramidal horn antenna d. dipole antenna	b
626.	The radiation resistance of Hertzian dipole antenna of length dl is a. $80\pi \left(\frac{dl}{\lambda}\right)^2 \Omega$ b. $80\pi \left(\frac{dl}{\lambda}\right)$ c. $80 \left(\frac{\lambda dl}{\pi}\right)$ d. $80 \left(\frac{\pi dl}{\lambda}\right)^2$	a
627.	If the minimum range is to be doubled in a radar, the peak power has to be increased by a factor of a. 2 b. 4 c. 8 d. 16	d
628.	Which of the following antenna produces circular polarization a. horn antenna b. helical antenna c. dipole antenna d. parabolic dish antenna	b
629.	A dipole antenna of length 0.1m radiates in air at a wavelength of 5m. If the peak current is 1A determine the radiation resistance a. 0.3158Ω b. 3.158 Ω c. 31.58 Ω d. 315.8 Ω	a

630.	A power gain test of a reference antenna and a test antenna resulted in the following data: input power to the reference antenna is 400 mW and input power to the test antenna is 100 mW. The power gain is
	    a. 6.02 dB b.62 .6 dB c. 26.6 dB
	    d 2.06 dB
		a

631.	An antenna with the efficiency of 95% is radiating 10W. The input power to the antenna is a. 20 .5 W b. 12.11W c. 10.52 W d. 9.92W	c
632.	A parabolic reflector antenna with a gain of 40 dB is required at a frequency of 4GHz. The overall efficiency is 0.65. The required diameter of the reflector is a. 4.9m b. 2.9m c. 7.2m d. 8.2m	b
633.	A TV transmitter antenna has a height of 169m and receive antenna has a height of 16m. The maximum distance through which the signal can be received by space wave propagation is a. 40 km b. 68 km c. 74 km d. 47 km	b
634.	A helical antenna has directivity of 18 dB, pitch angle of $12°$ and circumference equal to one wavelength. The number of turns of helix is a. 5 b. 20 c. 25 d. 15	b

635.	A thin wire at load end has dipole antenna with the impedance $73+j42.5\Omega$. Impedance of quarter wave transformer required to match this antenna with the transmission line of characteristic impedance 100Ω is
	    a. 91.9 Ω b. 133.7Ω c. 150Ω d.
	    180.2Ω
		a

636.	Which of the following antenna is frequency independent a. folded dipole b. half wave dipole c. helical d. log periodic	d
637.	The mode of propagation in microstrip antenna is a. TEM b. quasi TEM c. TE d. TM	d

638.	Cassegrain feed is used with parabolic reflector to
	    a. Increase the gain
	    b. Increase bandwidth
	    c. Reduce the size of main reflector
	    d. Allow feed to be placed at convenient location
		d

639.	In microwave communication, sometimes microwave signals reach large distances by following earth's curvature. This phenomenon is called	d

	a. tropospheric scatter b. faraday effect c. ionospheric reflection d. ducting	
640.	A dipole antenna of $\lambda/8$ length has radiation resistance of 72 Ω an equivalent total loss resistance of 1.5Ω. The efficiency of the antenna is a. 0.89% b. 8.91% c. 89.1% d. 97.9%	d
641.	The radiation efficiency of the antenna is usually quite high. The reasons for this high efficiency are: a. Large radiation resistance and large antenna size b. Low internal impedance and large radiation resistance c. Small antenna size and low radiation impedance d. Low internal impedance and small antenna size	b

Question No.	Question with choice	Answer
642.	In bilinear transformation, the left-half s-plane is mapped to which of the following in the z-domain? a) Entirely outside the unit circle $\|z\|=1$ b) Partially outside the unit circle $\|z\|=1$ c) Partially inside the unit circle $\|z\|=1$ d) Entirely inside the unit circle $\|z\|=1$	d
643.	If x(n) is a real sequence and X(k) is its N-point DFT, then which of the following is true? a) X(N-k)=X(-k) b) X(N-k)=X*(k) c) X(-k)=X*(k) d) All of the mentioned	d
644.	If X(k) is the N-point DFT of a sequence x(n), then what is the DFT of x*(n)? a) X(N-k) b) X*(k) c) X*(N-k) d) None of the mentioned	c
645.	If x(n) is real and odd, then what is the IDFT of the given sequence? a) $j\frac{1}{N}\sum_{k=0}^{N-1} X(k)\sin\frac{2\pi kn}{N}$ b) $\frac{1}{N}\sum_{k=0}^{N-1} X(k)\cos\frac{2\pi kn}{N}$ c) $-j\frac{1}{N}\sum_{k=0}^{N-1} X(k)\sin\frac{2\pi kn}{N}$ d) None of the mentioned	a
646.	According to Time shifting property of z-transform, if X(z) is the z-transform of x(n) then what is the z-transform of x(n-k)? a)$z^{k}X(z)$ b)$z^{-k}X(z)$ c)X(z-k)	b

	d) X(z+k)		
647.	What is the kind of relationship between Ω and ω? a) Many-to-one b) One-to-many c) One-to-one d) Many-to-many	c
648.	If NB and NC are the orders of the Butterworth and Chebyshev filters respectively to meet the same frequency specifications, then which of the following relation is true? a) NC=NB b) NC<NB c) NC>NB d) Cannot be determined	b
649.	If the discrimination factor 'd' and the selectivity factor 'k' of a chebyshev I filter are 0.077 and 0.769 respectively, then what is the order of the filter? a) 2 b) 5 c) 4 d) 3	b
650.	The sum of number of maxima and minima in the pass band equals the order of the filter. a) True b) False	a
651.	What is the value of chebyshev polynomial of degree 3? a) $3x^3+4x$ b) $3x^3-4x$ c) $4x^3+3x$ d) $4x^3-3x$	d
652.	Chebyshev polynomials of odd orders are: a) Even functions b) Odd functions c) Exponential functions d) Logarithmic functions	b
653.	If H(s)= $1/(s^2+s+1)$ represent the transfer function of a low pass filter(not Butterworth) with a pass band of 1 rad/sec, then what is the system function of a lowpass filter with a pass band 10 rad/sec? a) $\dfrac{100}{s^2+10s+100}$ b) $\dfrac{s^2}{s^2+s+1}$ c) $\dfrac{s^2}{s^2+10s+100}$ d) None of the mentioned	a

654.	What is the cutoff frequency of the Butterworth filter with a pass band gain KP= -1 dB at ΩP= 4 rad/sec and stop band attenuation greater than or equal to 20dB at ΩS= 8 rad/sec? a) 3.5787 rad/sec b) 1.069 rad/sec c) 6 rad/sec d) 4.5787 rad/sec	d
655.	What is the lowest order of the Butterworth filter with a pass band gain of KP= -1 dB at ΩP= 4 rad/sec and stop band attenuation greater than or equal to 20dB at ΩS= 8 rad/sec? a)4 b)5 c)6 d)3	b
656.	Let $x_1(t)$ and $x_2(t)$ be periodic signals with fundamental periods T1 and T2 respectively. Which of the following must be a rational number for $x(t)=x_1(t)+x_2(t)$ to be periodic? a)T_1+T_2 b)T_1-T_2 c)T_1/T_2 d) T_1*T_2	c
657.	All energy signals will have an average power of: a) Infinite b) Zero c) Positive d) Cannot be calculated	b
658.	Which of the following is true regarding the number of computations required to compute an N-point DFT? a)N^2 complex multiplications and N(N-1) complex additions b)N^2 complex additions and N(N-1) complex multiplications c)N^2 complex multiplications and N(N+1) complex additions d) N^2 complex additions and N(N+1) complex multiplications	a
659.	If we split the N point data sequence into two N/2 point data sequences $f_1(n)$ and $f_2(n)$ corresponding to the even numbered and odd numbered samples of x(n) and $F_1(k)$ and $F_2(k)$ are the N/2 point DFTs of $f_1(k)$ and $f_2(k)$ respectively, then what is the N/2 point DFT X(k) of x(n)? a)$F_1(k)+F_2(k)$ b)$F_1(k)-W_N{}^k F_2(k)$ c)$F_1(k)+WNk_N{}^k F_2(k)$ d) None of the mentioned	c

Question No.	Question with choice	Answer
660.	Physically realizable and stable IIR filters cannot have linear phase. a) True b) False	a
661.	If M and N are the orders of numerator and denominator of rational system function respectively, then how many memory locations are required in direct form-I realization of that IIR filter? a)M+N+1 b)M+N c)M+N-1 d) M+N-2	a

Question No.	Question with choice	Answer
662.	The operating frequency of an air filled rectangular wave guide can be calculated from the successive the successive minima method. If the operating frequency is f, to compute λ the following relationship hold good (a) $\lambda^2 = \lambda_c^{\,2} + \lambda_g^{\,2}$ (b) $\dfrac{1}{\lambda^2} = \dfrac{1}{\lambda_c^{\,2}} + \dfrac{1}{\lambda_g^{\,2}}$ (c) $\lambda_g = \lambda + \lambda_c$ (d) None	b
663.	The radiation pattern we measure for a horn antenna is of E-plane type. At what condition we will say it is an E-plane type. (a) The electric field of the radiating horn is parallel to ground. (b) The electric field of the radiating horn is perpendicular to ground. (c) The magnetic field of the radiating horn is parallel to ground.. (d) None of these.	b
664.	The distance between the transmitting and receiving antenna should be (a) $> \dfrac{2D^2}{\lambda}$ (b) $\le \dfrac{D^2}{\lambda}$ (c) $= \dfrac{D}{\lambda}$ (d) None Where D is the broader dimension of the horn and λ free space wavelength for the operating frequency.	a
665.	What is the advantage of Wilkinson power divider over other power dividers? [ ] (a) Lossless (b) Matched (c) Reciprocal (d) Isolation	d

666.	For Wilkinson power divider, one of the following is not correct.
	   (a) Three ports are matched (b) network is lossless (c) $S_{32}=S_{23}$
	    (d) No power dissipation in resistors
		b

667.	How many isolation resistors are required for 4-way Wilkinson power divider? (a) 4 (b) 3 (c) 5 (d)2	a

668.	For Maximum gain amplifier design, what kind of matching been proposed? (a) Resistive matching (b) Complex matching (c) Conjugate matching (d) lattice matching.	c
669.	What is the condition for a transistor to be "Unconditionally stable"? (a) K>1, Δ=1 (b) k>1, Δ<1 (c) K>1, Δ>1 d) μ=1, Δ=1	b
670.	The parameter that can be measured at microwave frequencies is (a) Current (b) Power (c) Voltage (d) Transmission and reflection Coefficient	d
671.	The relation between reflection coefficient and VSWR is (a) $\Gamma = \dfrac{VSWR-1}{VSWR+1}$ (b) $\Gamma = \dfrac{VSWR+1}{VSWR-1}$ (c) $\Gamma = \dfrac{1-VSWR}{1+VSWR}$ (d) $\Gamma = \dfrac{1+VSWR}{1-VSWR}$	a
672.	The frequency range for X- band is (a) 1- 2 GHz (b) 4- 8 GHz (c) 2- 4 GHz (d) 8- 12 GHz	d
673.	When one port of a three port circulator is terminated with a matched load it can be used as (a) Transmission line (b)Isolator (c) Direction coupler (d)Power divider	a
674.	One of the following devices is a four port microwave device (a) E- plane bend (b) 90 degree twist (c) Directional coupler (d) PIN modulator	c
675.	In RADAR, one of the following microwave devices is used to route outgoing and incoming signals between antenna, transmitter and receiver. (a) Circulator (b)Isolator (c) Magic Tee (d) Attenuator	a
676.	The microwave device in which power entering any port is transmitted to the next port in rotation is called (a) Slotted line waveguide (b) Matched termination (c)Circulator (d) Direction coupler	c
677.	The forbidden energy gap of GaAs is (a) 1.43 ev (b) 1.34 ev (c) 1.21 ev (d) 0.7 ev	a

678.	Which of the following diode operates on avalanche process? (a) Tunnel diode (b) IMPATT diode (c) Gunn diode (d) BARITT	b
679.	8. Which of the following diode is having negative resistance region in its VI characteristics? (a) Tunnel diode (b) Gunn diode (c) IMPATT diode (d) All	d
680.	Scattering parameters are important at microwave frequencies because, (a) Easy to measure V& I (b) make use of short & open circuits (c) easy to apply KVL & KCL (d) none	d
681.	What is the scattering matrix of a matched Isolator (a) $S_{11}=0, S_{12}=0, S_{21}=0, S_{22}=0$ (b) $S_{11}=0, S_{12}=1, S_{21}=0, S_{22}=0$ (c) $S_{11}=0, S_{12}=0, S_{21}=1, S_{22}=0$ (d) $S_{11}=0, S_{12}=1, S_{21}=1, S_{22}=0$	c

Question No.	Question with choice	Answer
682	The parallel wire transmission line is an example of (a) a balanced line (b) an unbalanced line (c) both (a) and (b) (d) none of these	**(b)an unbalanced line**
683	For lossless line, (a) $\alpha=0, \beta=0$ (b) $\alpha=0, \beta\neq0$ (c) $\alpha\neq0, \beta=0$ (d) $\alpha\neq0, \beta\neq0$	**(b)$\alpha=0, \beta\neq0$**
684	The input impedance of a $\lambda/2$ transformer is (a) terminal impedance (b) terminal admittance (c) characteristics impedance (d) none of these	**(a)terminal impedance**

685	The reflection coefficient of a transmission line with a short-circuited load is (a) 0 (b) ∞ (c) $0.1\angle 0°$ (d) 0.1	**(a)0**
686	The characteristic impedances Z_0 of a transmission line is given by, (where R, L, G, C are the unit length parameters) (a) $(R + j\omega L)/(G + j\omega C)$ (b) $(R + j\omega L)(G + j\omega C)$ (c) $(R+ j\omega L)^2 / (G +j\omega C)$ (d) $[(R+ j\omega L)/ (G +j\omega C)]^{1/2}$	**(d)[(R+ jωL)/ (G +jω C)]$^{1/2}$**
687	The reflection coefficient over the normalized Z_l (a) $(Z_l - 1)/ (Z_l +1)$ (b) $(Z_l + 1)/ (Z_l -1)$ (c) $(Z_s - 1)/ (Z_s +1)$ (d) none of these	**(a)(Z$_l$- 1)/ (Z$_l$ +1)**
688	In the left half of the Smith chart, the resistance and reactance values are (a) less than 1 (b) more than 1 (c) both (a) and (b) (d) Zero	**(a)less than 1**
689	Travel to length λg/2 over the line corresponds to rotation over smith chart by (a) 180° (b) 360° (c) 90° (d) 270°	**(b)360°**
690	A long transmission line is energized at then sending end and is kept open circuited at the receiving end. The magnitudes of the sending end voltage Vs and of the receiving end voltage Vr satisfy the following relationship: (a) Vs =Vr (b) Vs is greater than Vr (c) Vs is less than Vr (d) None of these	**(c)Vs is less than Vr**
691	The surge impedance of a double-circuit power transmission line is (a) 40 ohms (b) 200 ohms	**(b)200 ohms**

	(c) 400 ohms (d) 800 ohms	
692	The velocity factor of a transmission line depends on (a) Temperature (b) skin effect (c) Relative permittivity of dielectric (d) Doppler effect	**(c)Relative permittivity of dielectric**
693	In circular waveguide the dominat mode is (a) TE_{10} (b) TE_{11} (c) TE_{20} (d) TE_{21}	**(b)TE$_{11}$**
694	In a TWT the amplitude of resultant wave travelling down the helix (a) increases exponentially (b) increases linearly (c) decreases exponentially (d) is almost constant	**(a)increases exponentially**
695	Which of the following lines is non-radiating? (a) Open two wire (b) Coaxial (c) Both (d) None of the above	**(b)Coaxial**
696	A quarter wave line open circuited at far end behaves as (a) Inductance (b) L and C in parallel (c) Capacitance (d) L and C in series	**(d)L and C in series**
697	A line is excited by a 100 V dc source. If reflection coefficients at both ends are 1 each then (a) there will be no oscillations on line (b) there will be only 1 or 2 oscillations on line (c) there will be a finite number of oscillations on line (d) the oscillations will continue indefinitely	**(d)The oscillation will continue indefinitely**

698	In a klystron amplifier dc electron velocity is v0 and dc electron charge density is r0 the dc beam current is (a) $\rho_0 v_0$ (b) ρ_0/v_0 (c) v_0/ρ_0 (d) $(v_0/\rho_0)^2$	**(a)$\rho_0 v_0$**
699	A space between two cavities in two cavity klystron is (a) Drift space (b) Free space (c) Running Space (d) Normal Space	**(a)Drift space**
700	Where is the resistive load placed in a directional coupler? (a) front end of the primary (b) front end of the secondary (c) back end of the primary (d) back end of the secondary	**(d)back end of the secondary**
701	Given the frequency and dimensions of 5 GHz and 7 cm by 9 cm respectively, the beam of the pyramidal horn is about. (a) 27 degrees (b) 52 degrees (c) 60 degrees (d) 80 degrees	**(b)52 degrees**

Question No.	Question with choice	Answer
702.	Two digital filters can be operated in cascade. Or, the same effect can be achieved by a. Adding their coefficients b. Subtracting their coefficients c. Convolving their coefficients d. Averaging their coefficients and then using a Blackman window	c
703.	FFT algorithms a. Eliminate redundant calculation and enable to analyse the spectral properties of a signal b. Enable the redundant calculation and redundant to analyse the spectral properties of a signal c. Increases the number of computations d. None of the above	a

704.	If the Fourier series coefficients of a signal are periodic then the signal must be a. Continuous-time, periodic b. Discrete-time, periodic c. Continuous-time, non-periodic d. Discrete-time, non-periodic	b
705.	Coefficient symmetry is important in FIR filters because it provides a. a smaller transition bandwidth b. less passband ripple c. less stopband ripple d. a linear phase response	d
706.	The property of Fourier Transform which states that the compression in time domain is equivalent to expansion in the frequency domain is a. Duality. b. Scaling. c. Time Scaling. d. Frequency Shifting.	b
707.	Correlation a. Gives a measure of similarity between two data sequences. b. increases the dis-similarity between two data sequences c. a & b d. none of the above	a
708.	The system having input x(n) related to output y(n) as $y(n) = \log_{10}|x(n)|$ is: a. nonlinear, causal, stable. b. linear, noncausal, stable. c. nonlinear, causal, not stable. d. linear, noncausal, not stable	a
709.	The region of convergence of the z-transform of the signal $2^n u(n) - 3^n u(-n-1)$ a. is z > 1. b. is z < 1. c. is 2 < z < 3 . d. does not exist.	C
710.	A continuous-time periodic signal $x(t)$, having a period T, is convolved with itself. The resulting signal is a. not periodic b. periodic having a period T c. periodic having a period $2T$ d. periodic having a period $T/2$	b
711.	The period of the signal x(t)=10sin12πt+4cos18 πt is a. π/4 b. 1/6 c. 1/9 d. 1/3	d
712.	The auto-correlation function of a rectangular pulse of duration T is	d

	a. a rectangular pulse of duration T. b. a rectangular pulse of duration 2T. c. a triangular pulse of duration T. d. a triangular pulse of duration 2T.	
713.	If the Nyquist rate for $x_a(t)$ is Ω_s , what is the Nyquist rate for $dx_a(t)/dt$ a. $d\Omega_s$ /df b. Ω_s c. $\Omega_s/2$ d. $2\Omega_s$	b
714.	If the Nyquist rate for $x_a(t)$ is Ω_s , what is the Nyquist rate for $x_a(2t)$ a. $2\Omega_s$ b. $\Omega_s/2$ c. Ω_s d. Ω_s /4	a
715.	If the Nyquist rate for $x_a(t)$ is Ω_s, what is the Nyquist rate for $x_a^2(t)$ a. $2\Omega_s$ b. $\Omega_s/2$ c. Ω_s d. $\Omega_s/4$	a
716.	If the Nyquist rate for $x_a(t)$ is Ω_s, what is the Nyquist rate for $x_a(t)Cos(\Omega_0 t)$ a. $\Omega_s + 2\Omega_0$ b. $\Omega_s * 2\Omega_0$ c. $\Omega_s /2\Omega_0$ d. $\Omega_s - 2\Omega_0$	a
717.	The impulse response of a system is $h(n)= a^n u(n)$. The condition for the system to be BIBO stable is a. a is real and positive. b. a is real and negative. c. a > 1. d. a < 1.	d
718.	If R1 is the region of convergence of x(n) and R2 is the region of convergence of y(n), then the region of convergence of x(n) convoluted y(n) is a. R1+R2. b. R1−R2. c. R1∩R2. d. R1∪R2.	c
719.	The continuous time system described by $y(t) = x(t^2)$ is a. causal, linear and time varying. b. causal, non-linear and time varying. c. non causal, non-linear and time-invariant. d. non causal, linear and time-invariant.	d
720.	$x(n)=a^{\lvert n \rvert}$, a<1 is a. an energy signal. b. a power signal. c. neither an energy nor a power signal. d. an energy as well as a power signal.	a
721.	The system characterized by the equation $y(t) = a\,x(t) + b$ is a. linear for any value of b. b. linear if b > 0. c. linear if b < 0.	d

	d. non-linear.	
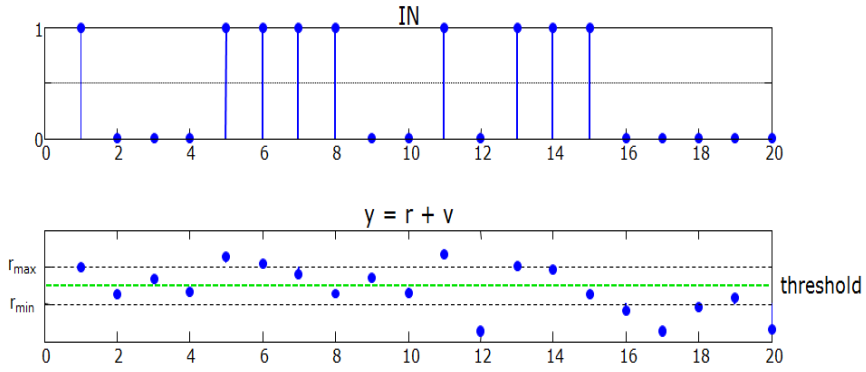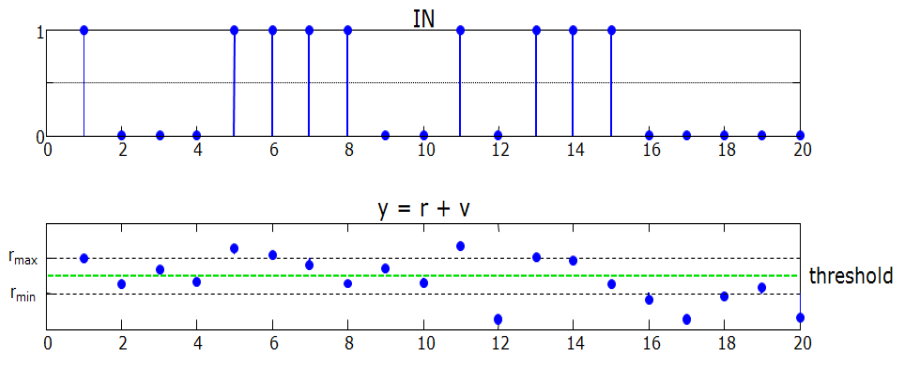
Question No.	Question with choice	Answer

722.	Microwave refers to alternating current with frequencies in the range
	    a. 3MHz to 3GHz
	    b. 3GHz to 3000GHz
	    c. 300MHz to 300GHz
	    d. 3KHz to 300MHz
		B

723.	Wilkinson power divider doesn't have one of the following properties
	    a. Isolation between output ports
	    b. All ports are matched
	    c. Lossless when all ports are matched
	    d. Non-reciprocal when all ports are matched
		D

724.	180 quadrature hybrid coupler is also called as
	    a. 3dB branch line coupler
	    b. Rat-race coupler
	    c. Coupled line coupler
	    d. Lange Coupler
		B

725.	Ferrite materials are referred with
	    a. Faraday's Law
	    b. Maxwell polarization
	    c. Faraday Rotation
	    d. Bose-Einstein condensation
		C

726.	Which one is called as 'Analog calculator'
	    a. Magic Tee
	    b. E-plane Tee
	    c. Branch line coupler
	    d. Directional coupler
		A

727.	Electron movement in Magnetron is
	    a. Cylindrical
	    b. Cyclic
	    c. Curl
	    d. Parabolic
		B

728.	Resistive power divider is
	    a. Lossy network
	    b. Non-reciprocal network
	    c. Unmatched network
	    d. Lossless network
		A

729.	If a 3db coupler is fed with -20dB of input power, what is the power expected at port-3 a. -40dB	D

	b. -17dB c. +13dB d. -23dB	
730.	What is the operating frequency of Bluetooth devices a. 3.1GHz b. 2.15GHz c. 855MHz d. 2.45GHz	D
731.	Junction effect is identified in a. Gunn diode b. Circulator c. E-plane Tee d. Magic Tee	C
732.	For a matched reciprocal three port network, one the following is impossible a. Input reflection coefficient as zero b. Lossless when input is matched c. Any port can be input d. All ports are matched	D
733.	A lossless microwave network should have S matrix of a. Unit matrix b. Zero Matrix c. Unitary matrix d. Reciprocal matrix	C
734.	Circulator is a a. Matched lossless device b. Unmatched and non-reciprocal device c. Non-reciprocal and lossy device d. Matched lossy device	A
735.	Characteristics impedance of QWT to match 100Ω load to 50Ω source is a. 3.353Ω b. 35.358Ω c. 7.787Ω d. 70.710Ω	D
736.	Transmission line equations are also called a. Telegraph equations b. Maxwell's Equations c. RADAR range equations d. Friss Transmission equations	A
737.	Among the following which is non-reciprocal two port network a. Circulator b. Coupler c. Isolator d. Diode	C

738.	The dominant mode is rectangular wave guide is
	    a. TEM
	    b. TE10
	    c. TM10
	    d. TM11
		B

739.	Slotted Section is not useful to measure
	    a. Impedance
	    b. Wavelength
	    c. Frequency of operation
	    d. Input power
		D

740.	If reflection coefficient measured across a load is 0.1, then the return loss is
	    a. 20dB
	    b. 40dB
	    c. 30dB
	    d. 10dB
		A

741.	Among these which one is not a planar transmission line
	    a. Microstrip line
	    b. Strip line
	    c. Coaxial line
	    d. Co-planar line
		C

Question No.	Question with choice	Answer
742.	To increase the data transmission rate, the bit time should be a) Shorter b) longer	a
743.	The main role of the transmitter in a communications system is a) To translate the information to a physical waveform b) To recover the information from a physical waveform c) To provide the medium over which the physical waveform travels	a
744.	If we choose a longer bit time, which of the following statements about bit rate and BER is generally true a) Bit rate increases, BER increases b) Bit rate increases, BER decreases c) Bit rate decreases, BER increases d) Bit rate decreases, BER decreases	d
745.	Consider a repetition code where code words are formed by repeating each bit five times. What is the minimum Hamming distance for this code? a) 5 b) 3 c) 4 d) 1	a

746.	Consider a repetition code where code words are formed by repeating each bit five times. Suppose we wish to detect and correct errors in each received code word. What is the maximum number of bit errors that we can detect? a) 1 b) 2 c) 3 d) 4	d
747.	Consider a repetition code where code words are formed by repeating each bit five times. Suppose we wish to detect and correct errors in each received code word. What is the maximum number of bit errors that we can correct? a) 1 b) 2 c) 3 d) 4	b
748.	Suppose we sample a signal at frequency Fs. If we collect 1500 samples in 5 seconds, what is Fs in Hz? a) 300 b) 400 c) 350 d) 4500	a
749.	If each character in a 45 character text message is encoded using an 8-bit ASCII code, how many bits would be required to encode the entire message? a) 480 b) 360 c) 420 d) 440	b
750.	For a (8, 4 ,3) block code, which one of the following statements is incorrect? a) Each codeword contains 4 message bits b) The code rate is 0.5 c) We can detect 3 bit errors d) We can detect and correct 1 bit errors	c
751.	Compact discs record two channels (left and right) of music at a sampling frequency of Fs=44.1kHz. If each sample is encoded with 16 bits, and one byte is 8 bits, how many bytes are required to store one minute of music? a) 10584000 b) 20584000 c) 10584456 d) 10594000	a
752.	Consider a system that uses 8-bit ASCII codes to encode letters. How long will it take to transmit the bit sequence encoding "Good Morning" (not including quotation marks) if we use a bit time of 4 samples per bit, and transmit samples at a rate of 1MHz? Represent the answer in μs . a) 384 b) 484 c) 300 d) 458	a
753.	Consider a repetition code where code words are formed by repeating each bit five times. Suppose we receive the following bitstream. 00000111100001111110110001110011111000001 If we assume that we can both detect and correct errors, what was the original bit stream? a) 01010111 b) 11010110	c

	c) 01010110 d) 01010100	
754.	Consider the figure, where input and output of a channel is given. Estimate the BER of the communication channel. Express the BER as a ratio lying between 0 and 1. a) 0.3 b) 0.1 c) 0.4 d) 0.2	d
755.	Consider the figure, where input and output of a channel is given. How many bit errors are made? . a)3 b)10 c)4 d)2	c
756.	Assume that a student took a final exam with an equal number of "easy" and "hard" questions. Assume that the student made errors on only 12% of the "easy" questions, but made errors on 24% of the "hard" questions. If a question is selected at random (all questions have equal probability of being selected), what is the probability that the student made an error on that question? a) 0.12 b) 0.18 c) 0.22 d) 0.41	b
757.	Suppose that the test is made easier. There are twice as many "easy" questions as "hard" questions. If the probability of error on the "easy" and "hard" questions remains the same, what is the probability the student makes an error on a randomly selected question? a) 0.12 b) 0.18	d

c) 0.22

d) 0.16

758.

The figure below shows an example set of input and output bit streams from a binary channel.

n	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
IN	0	0	0	1	1	0	0	1	1	0	0	1	1	0	1	0	1	1	1	1
OUT	1	0	0	1	1	0	1	1	1	0	1	1	1	0	1	0	0	1	1	0

Estimate the bit error rate (BER) of this channel.

    a) 0.25
    b) 0.2
    c) 0.6
    d) 0.8

a

759.

The figure below shows an example set of input and output bit streams from a binary channel.

n	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
IN	0	0	0	1	1	0	0	1	1	0	0	1	1	0	1	0	1	1	1	1
OUT	1	0	0	1	1	0	1	1	1	0	1	1	1	0	1	0	0	1	1	0

Estimate the probability the transmitter sends a 0 bit

    a) 0.45
    b) 0.42
    c) 0.85
    d) 0.8

a

760.

The figure below shows an example set of input and output bit streams from a binary channel.

n	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
IN	0	0	0	1	1	0	0	1	1	0	0	1	1	0	1	0	1	1	1	1
OUT	1	0	0	1	1	0	1	1	1	0	1	1	1	0	1	0	0	1	1	0

Estimate the probability of an error if a 0 bit is transmitted

a)0.33

b)0.22

c)0.21

d)0.32

a

761.

The figure below shows an example set of input and output bit streams from a binary channel.

b

n	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
IN	0	0	0	1	1	0	0	1	1	0	0	1	1	0	1	0	1	1	1	1
OUT	1	0	0	1	1	0	1	1	1	0	1	1	1	0	1	0	0	1	1	0

Estimate the probability of an error if a 1 bit is transmitted

a)   0.12

b)   0.18

c)   0.22

d)   0.16

Question No.	Question with choice	Answer
762.	An additive white Gaussian process $X(t)$ is passed through an ideal bandpass filter of center frequency 100 MHz and bandwidth 2 MHz. Let $X(t)$ have a power spectral density of $\dfrac{N_0}{2}$ and the output of BPF is $P(t)$. The variance of $P(t)$ is (a) $10^6 N_0$ (b) $\dfrac{N_0}{2}$ (c) $2 \times 10^6 N_0$ (d) N_0	(a)
763.	If the autocorrelation function of a random process $X(t)$ is given by $R_X(\tau) = e^{-2}|\tau|$. Power spectral density of $X(t)$ is (a) $\dfrac{1}{1+4\pi^2 f^2}$ (b) $\dfrac{1}{1+\pi^2 f^2}$ (c) $\dfrac{1}{4+\pi^2 f^2}$ (d) $\dfrac{2}{1+4\pi^2 f^2}$	(b)
764.	In mobile IP, which of the following is a router that maintains a list of registered mobile nodes in a visitor list (a) Foreign Agent (b) Home Agent (c) Correspondent Node (d) All of them	(b)
765.	IEEE 802.15.2 describes the coexistence of WPAN with	(c)

	(a) Wired devices (b) Optical Devices (c) Wireless Devices (d) All of them	
766.	Method available for contention free channel access in WBAN is (a) Polling (b) Strobing (c) Cyclic broadcast (d) All of the above	(d)
767.	In a communication system, transmitter operates at a frequency of 850 MHz with a power of 125 mW. This transmitter communicates with the receiver having received power of 1 µ W. The distance between the transmitter and receiver is (a) 7.63 km (b) 7.63 m (c) 8.57 m (d) 9.93 m	(d)
768.	For wavelength upto 1 µm, the predominant loss mechanism in fibre is (a) UV absorption loss (b) Rayleigh scattering loss (c) Radiative loss (d) IR absorption loss	(b)
769.	Assuming a Gaussian frequency response, the 3dB optical bandwidth for an LED corresponding to a 3 dB electrical bandwidth of 50 MHz will be (a) 25 MHz (b) 100 MHz (c) 70.7 MHz (d) 50 MHz	(c)
770.	Modal dispersion is comparatively less in graded index fibres than step index fibres due to (a) Reduced relative refractive index difference (b) Reduced value of core refractive index (c) Increased value of core radius (d) Reduced path length differences by self-focusing action	(d)
771.	In a GaAs laser diode, R1=R2=0.34 for uncoated facets and material absorption α is 10/cm. The threshold gain K_{th} for a laser diode of length 500 µm and width 10 µm is (a) 31.5/cm (b) 21.5/cm (c) 11.5/cm (d) 20.5/cm	(a)
772.	For a pump wavelength of 980 nm (for a typical EDFA), the pump absorption	(c)

	cross-sectional area is 3.1×10^{-25} m^2 and the spontaneous emission lifetime is 12 ms. If the signal to be amplified is of 1536 nm and the signal absorption and emission cross-sectional area are both 4.644×10^{-25} m^2, the threshold pump intensity can be evaluated as (a) 23.67 MW/m^2 (b) 13.17 MW/m^2 (c) 54.51 MW/m^2 (d) 11.67 MW/m^2	
773.	A GRIN fibre with parabolic refractive index profile core has a refractive index at the core axis of 1.5 and relative index difference at 1%. Calculate maximum possible core diameter that allows single mode operation at λ=1.3 µm. (a) 3.3 µm (b) 6.6 µm (c) 1.1 µm (d) 9.9 µm	(b)
774.	In a GSM system, eight channels co-exist in 200 kHz bandwidth using TDMA. A GSM based cellular operator is allocated 5 MHz bandwidth. Assuming a frequency reuse factor of 1/5 (five-cell repeat pattern), the maximum of simultaneous channels that can exist in one cell is (a) 200 (b) 100 (c) 50 (d) 40	(d)
775.	The signal $\cos\omega_c t - 0.5\cos\omega_m t\sin\omega_c t$ is (a) FM only (b) AM only (c) both AM and FM (d) neither AM or FM	(c)
776.	Diversity technique is a method for improving which of the following message signal by utilizing two or more communication channels with different characteristics? (a) Error detection capability (b) Error correction capability (c) Reliability (d) All are correct	(c)
777.	A CDMA system is designed based on DS spread spectrum with a processing gain of 1000 and BPSK modulation scheme. If user has equal power and the desired level of performance of an error probability of 10^{-6}, the number of user will be (a) 89 (b) 117 (c) 147	(d)

	(d) 216	
778.	A rate 1/2 convolution code with $d_{frec} = 10$ is used to encode a data requeence occurring at a rate of 1 kbps. The modulation is binary PSK. The DS spread spectrum sequence has a chip rate of 10 MHz. The coding gain is (a) 7 dB (b) 12 dB (c) 14 dB (d) 24 dB	(a)
779.	A direct sequence spread binary phase-shift keying system uses a feedback shift register of Length 19 for the generation of PN sequence. The system is required to have an average probability of symbol error due to externally generated interfering signals that does not exceed 10^{-5}. The Antijam margin is (a) 47.5 dB (b) 93.8 dB (c) 86.9 dB (d) 12.6 dB	(c)
780.	In a CD player, the sampling rate is 44.1 kHz and the samples are quantized using a 16-bit/sample quantizer. The resulting number of bits for a piece of music with a duration of 50 minutes is (a) 1.39×10^9 (b) 4.23×10^9 (c) 8.46×10^9 (d) 12.23×10^9	(b)
781.	A receiver is operated at a temperature of 300 K. The transistor used in the receiver has an average output resistance of 1 kΩ. The Johnson noise voltage for a receiver with a bandwidth of 200 kHz is (a) 0.8 µV (b) 1.8 µV (c) 4.3 µV (d) 12.6 µV	(b)

Question No.	Question with choice	Answer
782.	For three events A1, A2 , A3 they are said to be independent allover axis if and only if they are independent as a triple then P(A1 ∩ A2 ∩ A3) = a) P (A1) P (A2) b) P (A1) P (A2) P(A3) c) P (A2) P (A3) d) P (A1) P (A3)	b
783.	Let A be any event defined on a sample space S , then P(A) is a) -1 b) 1 c) 0 d) ∞	b

784.	A discreet RV is one having
	   a) Continuous values $\qquad$ b) 1, 2
	
	   c) $-\infty$ to 0 $\qquad$ d) only discreet
		d

785.	The normalized third central moment is known as
	   a) Mean $\qquad$ b) Skewness of density function
	
	   c) Standard Deviation $\qquad$ d) Variance of density function
		b

786.	Two dimensional product space is known as
	   a) Vector $\qquad$ b) Range of sample space
	
	   c) Sample Space $\qquad$ d) Phasor
		b

787.	The second central moment is also known as a) Variance b) Standard deviation c) Mean d) Skew	a
788.	$\qquad$ MGF is given by X(V)= a) $E[e^v]$ $\qquad$ b) $E[e^{vX}]$ $\qquad$ c) $e^V x$ $\qquad$ d) $E(e^{2x})$	b
789.	Joint Distribution Function $F_{XY}(\infty, \infty)$ = a) 1 b) 2 c) 0 d) -1	a

790.	The PDF of sum of a large number of RV's approaches a distribution
	   a) Rayleigh $\qquad$ b) Uniform $\qquad$ c) $\qquad$ Gaussian
	   d) Poisson
		c

791.	The conditional probability of an event
	   a) P(A/B) $\qquad$ b) P(AB) $\qquad$ c)P(B/A)
	   d)P(A+B)
		a

792.	For three events A1, A2 , A3 they are said to be the independent by all pairs and are also independent as a triple then $P(A_1 \cap A_2 \cap A_3)$ a)P(A2)P(A3) $\qquad$ b)P(A1)P(A2) $\qquad$ c)P(A2) $\qquad$ d)P(A1)P(A3)	d
793.	$F_X(-\infty)$ a) ∞ b) 1 c) 0.5 d) 0	D
794.	Let S1 and S2 be the sample space of the sub experiments. If S1 has M elements and S2 has N elements , then combined sample space S will have a) M elements $\qquad$ b) N elements c) ∞ d) MN elements	d
795.	65. For the events to be independent, they must have an intersection of a) non zero $\qquad$ b) P(A) $\qquad$ c) 0 $\qquad$ d) ∞	c

796.	If events A and C are mutually exclusive P(AUC / B) is equal to
	   a) P(A/B) + P(C)
	   b) P(B/A) + P(C)
		d

	c) P(A) + P(C/B) d) *d) P(A/B) + P(C/B)*	
797.	Given that P(A)= 0.9, P(B)= 0.89,P(A∩B)=0.75 then P(AUB) is *a) 0.95* b) 9.5 c) 0.958 d) 0.095	a
798.	The relation between conditional probability P(A/B) and P(B/A) is derived using one of the following theorems a) Bernoulli b) Maxwell c) De Moirés *d) Bayer's*	d
799.	A mixed random RV is one having a)discrete values only b) - ∞ to 0 only c) *both continuous and discrete* d) continuous values only	c
800.	If events A and B are statistically independent then P(A/B) *a) P(A)* b) 0 c) 1 d) P(B)	a
801.	**For mutually exclusive events the joint probability is** **a) 1 b) 0 c) ∞ d) 0.5**	b

Question No.	Question with choice	Answer

802.	Total internal reflection takes place if the light ray strikes the interface at an angle with what relationship to the critical angle?
	
	     a. Less than
	
	     b. Grater than
	
	     c. Equal to
	
	     d. Zero
		b. Grater than

803.	What parameter of light detector determines the range or system length that can be achieved for a given wavelength?
	
	     a. Transit time
	
	     b. Spectral response
	
	     c. Dark current
		b. Spectral response

	d. Responsitivity	
804.	92. How many longitudinal modes can fall within a laser's gain bandwidth? a. 2 b. 5 c. 9 d. No fixed limit, dependent on bandwidth and mode spacing	d. No fixed limit, dependent on bandwidth and mode spacing
805.	90. The ultrapure glass used to manufacture optical fibers is approximately ___pure a. 99.9 % b. 99.99 % c. 99.999 % d. 99.9999 %	b. 99.99 %
806.	89. Coherence of laser light is important for _____ a. Light propagation b. Getting laser light to pass through air c. Drilling holes d. Holography	d. Holography
807.	86. An important requirement for successful transmission system using light a. Powerful, reliable light source b. Strong glass c. Reliable, high cost transmission medium d. Powerful regenerators	a. Powerful, reliable light source

808.	85. Which fiber-optic system is better? a. 3 repeaters b. 8 repeaters c. 11 repeaters d. 20 repeaters	a. 3 repeaters
809.	84. The product of the bit rate and distance of a fiber-optic system is 2 Gbits km/s. What is the maximum rate at 5 km? a. 100 Mbits/s b. 200 Mbits/s c. 400 Mbits/s d. 1000 Gbits/s	c. 400 Mbits/s
810.	72. Which of the following is not a factor in cable light loss? a. Reflection b. Absorption c. Scattering d. Dispersion	a. Reflection
811.	Fiber-optic cables with attenuations of 1.8, 3.4, 5.9, and 18 dB are linked together. The total loss is a. 7.5 dB b. 19.8 dB c. 29.1 dB d. 650 dB	b. Spectral response
812.	Which of the following is the fastest light sensor a. PIN photodiode	d.Avalanche photodiode

	b. Photovoltaic diode c. Phototransistor d. Avalanche photodiode	
813.	A fiber-optic cable has a loss of 15 dB/km. The attenuation in a cable, 100 ft long is a. 4.57 dB b. 9.3 dB c. 24 dB d. 49.2 dB	a. 4.57 dB
814.	Which type of fiber-optic cable has the least modal dispersion? a. Single mode step-index b. Multimode step-index c. Single-mode graded-index d. Multimode graded-index	a. Single mode step-index
815.	A popular light wavelength in fiber-optic cable is a. 0.7 um b. 1.3 um c. 1.5 um d. 1.8 um	c. 1.3 um
816.	The wavelength of visible light extends from a. 0.8 to 1.0 nm b. 400 to 750 nm c. 200 to 660 nm	b. 400 to 750 nm

	d. 700 to 1200 nm	
817.	Which of the following is not a major benefit of fiber-optic cable? a. Immunity from interference b. No electrical safety problems c. Excellent data security d. Lower cost	b. No electrical safety problems
818.	The speed of light in plastic compared to the speed of light in air is a. Slower b. Faster c. The same d. Either lower or faster	a. Slower
819.	Which of the cable length has the highest attenuation? a. 1 km b. 2 km c. 95 ft d. 5500 ft	b. 2 km
820.	Which of the following is not a common type of fiber-optic cable? a. Single-mode step-index b. Multimode graded-index c. Single-mode graded-index d. Multimode step-index	c. Single-mode graded-index

821.	Which of the following is not a common application of fiber-optic cable? a. Computer networks b. Long-distance telephone systems c. Closed circuit TV d. Consumer TV	d. Consumer TV

Question No.	Question with choice	Answer

822.	Amplitude modulation is the process of
	  a. superimposing a low frequency on a high frequency
	  b. superimposing a high frequency on a low frequency
	  c. carrier interruption
	  d. frequency shift and phase shift
		a

823.	One of the following types of noise becomes a great importance at high frequencies. Is the
	  a. shot noise
	  b. random noise
	  c. impulse noise
	  d. transit-time noise
		d

824.	Indicate the false statement
	  a. HF mixers are generally noisier than HF amplifiers
	  b. Impulse noised voltage is independent of the bandwidth
	  c. Thermal noise is independent of the frequency at which it is measured
	  d. Industrial noise is usually of the impulse type
		a

825.	The value of the resistor creating thermal noise is doubled. The noise power generated is therefore
	  a. halved
	  b. quadrupled
	  c. double
	  d. unchanged
		d

826.	Indicate the noise whose source is in a category different from that of the other three.
	  a. solar noise
	  b. cosmic noise
	  c. atmospheric noise
	  d. galactic noise
		c

827.	Which of the following is the most reliable measurement for comparing amplifier noise characteristics?
	    a. signal-to-noise ratio
	    b. noise factor
	    c. shot noise
	    d. thermal noise agitation
		b

828.	The modulation index of an AM is changed from 0 to 1. The transmitted power is
	    a. unchanged
	    b. halved
	    c. doubled
	    d. increase by 50percent
		d

829.	One of the advantages of base modulation over collector modulation of a transistor class C amplifier
	    a. the lower the modulating power required
	    b. high power output per transistor
	    c. better efficiency
	    d. better linearity
		a

830.	Amplitude modulation is used for broadcasting because
	    a. it is more noise immune than other modulation system
	    b. compared with other system it requires less transmitting power
	    c. its use avoids receiver complexity
	    d. no other modulation system can provide the necessary bandwidth for high fidelity
		c

831.	In the spectrum of a frequency modulated wave
	    a. the carrier frequency disappears when the modulation index is large
	    b. the amplitude of any sideband depends on the modulation index
	    c. the total number of sidebands depend on the modulation index
	        the carrier frequency cannot disappear
		b

832.	The difference between the phase and frequency modulation
	    a. is purely theoretical because they are the same in practice
	    b. is too great to make the two system compatible
	    c. lies in the poorer audio response of the phase modulation
	    d. lies in the different definitions of the modulation index
		d

833.	Indicate the false statement regarding the Armstrong modulation system,
	    a. the system is basically phase and not frequency modulation.
	    b. AFC is not needed, as the crystal oscillator is used.
	    c. Frequency multiplications must be used
	
	    d. Equalization is unnecessary
		d

834.	When the modulating frequency is doubled, the modulation index is halved, and the modulating voltage remains constant. The modulation system is a. amplitude modulation	c

		b. phase modulation c. frequency modulation d. any one of the three	

835.		In broadcast super heterodyne receiver, the
		    a. local oscillator operates below the signal frequency
		    b. mixer input must be tuned to the signal frequency
		    c. local oscillator frequency is normally double the IF
		    d. RF amplifier normally works at 455KHz above the carrier frequency
			a

836.		A super heterodyne receiver with an IF of 450KHz is tuned to a signal at 1200KHz. The image frequency is
		    a. 750KHz
		    b. 900KHz
		    c. 1650KHz
		    d. 2100KHz
			d

837.		Indicate the false statement. The super heterodyne receiver replaced the TRF receiver because the latter suffered from
		    a. gain variation over the frequency coverage range
		    b. insufficient gain and sensitivity
		    c. inadequate selectivity at high frequencies
		    d. instability
			b

838.		The image frequency of a super heterodyne receiver
		    a. is created within the receiver itself
		    b. is due to insufficient adjacent channel rejection
		    c. is not rejected by the IF tuned circuits
		
		    d.is independent of the frequency to which the receiver is tuned
			c

839.		One of the main functions of the RF amplifier in a super heterodyne receiver is to
		    a. provide improved tracking
		    b. permit better adjacent-channel rejection
		    c. increase the tuning range of the receiver
		
		    d. improve the rejection of the image frequency
			d

840.		The local oscillator of a broadcast receiver is tuned to a frequency higher that the incoming frequency
		    a. to help the image frequency rejection
		    b. to permit easier tracking
		    c. because otherwise an intermediate frequency could not be produced
		
		    d.to allow adequate frequency coverage without switching
			d

841.		If the intermediate frequency is very high (indicate the false statement)
		    a. image frequency rejection is very good
		    b. the local oscillator need to be extremely stable
		    c. the selectivity will be poor
			d

842.   A small signal amplifier
    a) Uses only a portion of its load line
    b) Always has an output signal in the mV range
    c) Goes into saturation once on each input cycle
    d) Is always a common emitter

    amplifier Answer: a

843.   If a 10mV signal is applied to the base of the CC circuit, the output signal is approximately
    e) 100mV
    f) 150mV
    g) 1.5V
    h) 10mV

    Answer: d

844.   A certain class A amplifier has a current gain of 75 and a voltage gain of 50. The power gain is
    i) 1.5
    j) 125
    k) 3750
    l) 25

    Answer: c

845.   The transistors in a class B amplifier are biased
    m) Into cutoff
    n) In saturation
    o) At midpoint
    p) Right at cutoff

    Answer: a

846.   A certain CD amplifier with $R_S = 1k\Omega$ has a transconductance of $6000\mu S$. The voltage gain is
    q) 1
    r) 0.86
    s) 0.98
    t) 6 Answer:

    b

847.   The high frequency response of an amplifier is determined in part by
a) The gain bandwidth product
b) The bypass capacitor
c) The internal transistor capacitances
d) The roll off

Answer: c

848.   An oscillator differs from an amplifier because
e) It has more gain
f) It requires no input signal
g) It requires no dc supply
h) It always has the same output

Answer: b

849.   If $A_d = 3500$ and $A_{CM} = 0.35$, the CMRR is
i) 1225
j) 10,000
k) 80 dB
l) Answers (b) and (c)

Answer: d

850.   In Class AB power amplifier, the output stage conducts for
a) $0°$ to $360°$
b) $180°$ to $360°$
c) less than 180
d) more than $90°$

Answer: b

851.   If the f_T of the transistor used in a certain amplifier is 75 MHz and the bandwidth is 10 MHZ, the voltage gain must be
a) 750
b) 7.5
c) 10
d) 1 Answer:

b

852.   In a certain oscillator, Av = 50, the attenuation of the feedback circuit must be
e) 1
f) 0.01
g) 10
h) 0.02

Answer: d

Questio n No.	Question with choice	Answer
853.	Which of the following is zero in static condition? a. grad div b. div grad c. curl grad d. curl curl	c
854.	An infinite length of uniform line charge has ρl = 10pC/m and it lies along the z axis. Determine the electric field E at (4, 3, 3) a. 18 a_ρmV/m b. 1.8 a_ρmV/m c. 180 a_ρmV/m d. 280 a_ρmV/m	c
855.	Maxwell's first equation in static form is given by a. $\rho_v = \nabla \cdot D$ b. $\rho_v = \nabla \times D$ c. $\rho_v = \nabla + D$ d. $\rho_v = \nabla - D$	a
856.	A point charge, Q = 10nC is at the origin. The estimated potential difference at A (1,0,0) with respect to B (2,0,0) is a. 50 V b. 45 V c. 30 V d. -45 V	b
857.	Maxwell's second equation is given by a. $\nabla \times E = 0$ b. $\nabla + E = 0$ c. $\nabla - E = 0$ d. $\nabla / E = 0$	a
858.	A charge density of 10nC/m^2 is distributed on a plane z = 10m, the electric field intensity at the origin is a. $-180\pi\ a_z$ b. $-18\pi\ a_z$ c. $180\pi\ a_z$ d. $18\pi\ a_z$	b
859.	Given field $A = 3x^2yz\ a_x + x^3z\ a_y + (x^3y - 2z)\ a_z$, it can be said that **A** is a. Harmonic b. Solenoidal c. Conservative d. Divergenceless	d
860.	A charge of 10 pC is at rest in free space. The potential at a point A, 10 cm away from the charge will be a. 0.9 V b. 0.545 V c. -0.9 V d. 0. 2 V	a
861.	Plane z = 10m carries charge 20nC/m2. The electric Field intensity at the origin is a. $-10a_z$V/m b. $-18\pi\ a_z$ V/m c. $-72\pi\ a_z$ V/m d. $-360\pi\ a_z$	d
862.	Maxwell's third equation is given by a. $\nabla \cdot B = 0$ b. $\nabla \times B = 0$ c. $\nabla + B = 0$ d. $\nabla - B = 0$	a
863.	Stokes theorem relates ____ integral to a _____ integral. a. volume, surface b. volume,line c line, surface d. all of these.	c
864.	The electric flux density $D = 2x^3 a_x$ C/m^2. The volume charge density at P(3mm,-2mm,4mm) is a. 54 C/m^3 c. 54 mC/m^3 b. 54 μC/m^3 d. 54 nC/m^3	a
865.	Divergence theorem is applicable for a ____ that is bounded by a _____. a.volume, surface b. surface volume c. surface,line d. line, surface	a
866.	Plane y = 0 carries a uniform current of 30a$_z$ mA/m. At (1,10,-2), the magnetic field intensity is _____ a. -15a$_x$ mA/m c. 15a$_x$ mA/m b. -15a$_y$ mA/m c. 15a$_y$ mA/m	a

867.	If a charge of 2C is placed in an electric field of 2V/m the force on the charge is i) 0 ii) 4N iii) 1N iv)) 2N	a

868.	If both the medium are dielectrics, then boundary conditions is given as _____
	
	     a. $E_{1t} + E_{2t} = 0$ c. $E_{1t} \times E_{2t} = 0$
	     b. $E_{1t} - E_{2t} = 0$ d. None of the above
		a

869.	The z-axis carries filamentary current of 10π A along a_z. Which of these is incorrect?
	     a. $H = -a_x$ A/m at (0,5,0) c. $H = -0.8a_x -0.6a_y$ A/m at (-3,4,0)
	     b. $H = a_\varphi$ A/m at (5, $\pi/4$,0) d. $H = -a_\varphi$ A/m at (5, $3\pi/2$,0)
		a

870.	If the flux density is 10 Wb/ m^2 and the area of the coil is 2m^2, the flux is a. 20 Wb b. Wb c. 10 Wb d. 40 Wb	d
871.	Boundary conditions for normal component in magnetostatic field is a) B1n=B2n b) B1n+B2n c) B1n /B2n d) B1n X B2n=0	a
872.	Maxwell's fourth equation is given by a) $\nabla \times B = H$ b) $\nabla \times H = B$ c) $\nabla \times H = J$ d) $\nabla \times J = H$	c

1. When transistors are used in digital circuits they usually operate in the:
A. active region
B. breakdown region
C. saturation and cutoff regions
D. linear region

Ans : C

2. Three different Q points are shown on a dc load line. The upper Q point represents the:
A. minimum current gain
B. intermediate current gain
C. maximum current gain
D. cutoff point

Ans : C

3. A transistor has a β_{DC} of 250 and a base current, I_B, of 20 μ A. The collector current, I_C, equals:
A. 500 μ A
B. 5 mA
C. 50 mA
D. 5 A

Ans : B

4.In a C-E configuration, an emitter resistor is used for:
   A.stabilization
   B.ac signal bypass
   C.collector bias
   D.higher gain

Ans : B

5.Voltage-divider bias provides:
   A.an unstable Q point
   B.a stable Q point
   C.a Q point that easily varies with changes in the transistor's current gain
   D.a Q point that is stable and easily varies with changes in the transistor's current gain

Ans : A

6.To operate properly, a transistor's base-emitter junction must be forward biased with reverse bias applied to which junction?
A.collector-emitter   B.base-collector
C.base-emitter   D.collector-base

Ans : D

7. The ends of a load line drawn on a family of curves determine:
A.saturation and cutoff
B.the operating point
C.the power curve
D.the amplification factor

Ans : A

8. The Q point on a load line may be used to determine:
   A.V_C B.V_{CC}
   C.V_B D.I_C

Ans : C

9. A transistor may be used as a switching device or as a:
   A. fixed resistor
   B. tuning device
   C. rectifier
   D. variable resistor

Ans : D

10. Which is beta's current ratio?
A. I_C/I_B B. I_C/I_E
C. I_B/I_E D. I_E/I_B

Ans : A

11 . A collector characteristic curve is a graph showing:
A. emitter current (I_E) versus collector-emitter voltage (V_{CE}) with (V_{BB}) base bias voltage held constant

B. collector current (I_C) versus collector-emitter voltage (V_{CE}) with (V_{BB}) base bias voltage held constant

C. collector current (I_C) versus collector-emitter voltage (V_C) with (V_{BB}) base bias voltage held constant

D. collector current (I_C) versus collector-emitter voltage (V_{CC}) with (V_{BB}) base bias voltage held constant

Ans : B

12. When a silicon diode is forward biased, what is V_{BE} for a C-E configuration?
A. voltage-divider bias
B. 0.4 V
C. 0.7 V
D. emitter voltage

Ans : C

13. What is the current gain for a common-base configuration where $I_E = 4.2$ mA and $I_C = 4.0$ mA?

A. 16.80   B. 1.05
C. 0.20   D. 0.95

Ans : D

14. With a PNP circuit, the most positive voltage is probably:

A. ground   B. V_C
C. V_{BE} D. V_{CC}

Ans : A

15. The symbol h_{fe} is the same as:

A. β_{DC}
B. α_{DC}
C. hi-fi
D. β_{ac}

Ans : A

16.. Most of the electrons in the base of an NPN transistor flow:

A. out of the base lead
B. into the collector
C. into the emitter
D. into the base supply

Ans : B

17. In a transistor, collector current is controlled by:

A.collector voltage
B.base current
C.collector resistance
D.all of the above

Ans : B

18. Total emitter current is:
   A.$I_E - I_C$
   B.$I_C + I_E$
   C.$I_B + I_C$
   D.$I_B - I_C$

Ans : C

19. If a transistor operates at the middle of the dc load line, a decrease in the current gain will move the Q point:
   A.off the load line
   B.nowhere
   C.up
   D.down

Ans : D

20. Which is the higher gain provided by a C-E configuration?
   A.voltage   B.current
   C.resistance   D.Power

Ans : D

1.   The signal $x(t) = \sin 15\pi t + \sin 20\pi t$ is
a. Periodic   b. Not Periodic

c. Semi Periodic   d. None of the above   **b**

2. Which one of the following property of unit step function $\partial(t)$ is true

a. $\delta(at) = \dfrac{1}{|a|}\delta(t)$

b. $\delta(at) = |a|\delta(t)$

c. $\delta(at) = a$

d. $\delta(at) = 1$

a

3. The complex exponential Fourier representation of a signal $f(t)$ over the interval $(0, T)$ is

$$f(t) = \sum_{n=-\infty}^{\infty} \frac{3}{4+(n\pi)^2} e^{jn\pi t}$$

The numerical value of T is

a. 4

b. 1

c. 2

d. 0

c

4. Which one of the following property of Fourier transform is true

a. $f(t-t_0) = F(jw)e^{-jwt_0}$

b. $f(t-t_0) = F(jw)e^{jwt_0}$

c. $f(t-t_0) = F(jw)e^{-jwt_0^2}$

d. none of the above

a

5. Fourier transform of Gaussian pulse $f(t) = e^{-a^2 t^2}$ is

a. $\dfrac{\sqrt{\pi}}{2a} e^{-(\frac{\pi f}{a})^2}$

b. $\dfrac{\sqrt{\pi}}{a} e^{-(\frac{\pi f}{a})^2}$

c. $\dfrac{\sqrt{\pi}}{a} e^{-(\frac{\pi}{a})^2}$

d. $\dfrac{\pi}{a} e^{-(\frac{\pi}{a})^2}$

b

6. Laplace transform of $e^{-at}\cos\omega_0 t$ is

a. $\dfrac{s-a}{(s-a)^2 + \omega_0^2}$

b. $\dfrac{s-a}{(s-a)^2 - \omega_0^2}$

c. $\dfrac{s}{(s-a)^2 - \omega_0^2}$

d. $\dfrac{s+a}{(s+a)^2 + \omega_0^2}$ **d**

7. Z-transform of the signal $2^n u(n-2)$ is

a. $\dfrac{4z^{-2}}{1-2z^{-1}}$

b. $\dfrac{2z^{-2}}{1-2z^{-1}}$

c. $\dfrac{z^{-2}}{1-2z^{-1}}$

d. $\dfrac{4z^{-2}}{1-z^{-1}}$ **a**

8. The signal $y(t) = 7x(t) + 10$ is

a. Non-linear

b. ramp

c. Linear

d. none of the above **c**

9. Which of the following distinguish FIR filter from IIR

a. Linear phase characteristics

b. order of the filter

c. efficiency

d. none of the above **a**

10. If the cumulative distribution function is $F_X(x)$, then the probability density function $f_X(x)$ is given by

a. $\int F_X(x)dx$

b. $\dfrac{d}{dx} F_X(x)$

c. $\int F_X(-x)dx$

d. $\dfrac{d}{dx} F_X(-x)$ **b**

11. A signal $x(t) = 6\cos 10\pi t$ is sampled at the rate of 14Hz.To recover the original signal the cut-off frequency f_c of the ideal LPF should be

a. 5Hz < f_c < 9 Hz   b. 9Hz

c. 10Hz   d. 14 Hz

<div align="right">a</div>

12. The stop band attenuation A_p for the design of Kaiser window is given by

a. $A_p = 10\log_{10} \dfrac{1-\delta_p}{1+\delta_p} dB$

b. $A_p = 10\log_{10} \dfrac{1+\delta_p}{1-\delta_p} dB$

c. $A_p = 20\log_{10} \dfrac{1+\delta_p}{1-\delta_p} dB$

d. $A_p = 20\log_{10} \dfrac{1-\delta_p}{1+\delta_p} dB$

<div align="right">c</div>

13. The bilinear transformation $H(z) = \dfrac{0.0476(1+z^{-1})^2}{(1-0.9048z^{-1})^2}$ corresponds to which of the following

a. $H(s) = \dfrac{1}{(s+1)^2}$

b. $H(s) = \dfrac{1}{(s-1)^2}$

c. $H(s) = \dfrac{1}{(2s-1)^2}$

d. $H(s) = \dfrac{1}{(2s+1)^2}$ a

14. The quantization noise power of the digital filter, when the input signal is quantized to have eight bits is given by

a. $1 X 10^{-6}$ b. $1.27 X 10^{-6}$

c. $1.27 X 10^{-8}$ d. $1 X 10^{-8}$ b

15. The phenomenon spectral leakage is the result of

a. autocorrelation process   b. Fourier transform

c. Windowing   d. Quantization   c

16. Frequency resolution of the Bartlett method of power estimation for a quality factor $Q = 10$ and the length of the sample sequence 1000 is

a. 0.0009   b. 0.009

c. 0.09   d. 0.9   **a**

17. The discrete time system described by $y(n) = x(n^2)$ is

     a. Causal, linear and time varying
     b. Causal, non- linear and time varying
     c. Non-causal, linear and time invariant
     d. Non-causal, non-linear and time variant   **c**

18. The response of a Linear, time invariant, discrete-time system to a unit step input u(t) is the unit impulse $\delta(n)$ .The system response to a ramp input $nu(n)$ would be

a. u(n)   b. u(n-1)

c. $n\delta(n)$ d. $\sum_{k=0}^{\infty} k\delta(n-k)$ **d**

19. The units of the spectrum obtained by Fourier transforming the co-variance function of a stationary stochastic process is

a. Power per Hertz   b. Energy per Hertz

c. Power per second   d. Energy per second

                                                                             b

20. Solution of Laplace's equation, which is continuous through the second derivative, is

called

a. Bessel functions   b. Odd functions

c. Harmonic functions   d. Fundamental function   **c**

21. $\delta(n) =$

   a) $u(n)u(n-1)$
   b) $u(n) + u(n-1)$
   c) $u(n) - u(n-1)$
   d) $u(n-1) - u(n)$ **c**

22. A signal is an energy signal if

   a. E = 0, P = 0   b. E = infinite, P = finite

   c. E = finite, P = 0   d. E = finite, P = infinite   **c**

23. VLIW architecture differs from conventional P-DSP in which of the following aspects?

   a. instruction cache   b. number of functional units

   c. use pipelining   d. Parallelism   **b**

24. The number of complex multiplication involved in the direct computation of 8 – point DFT is

   a. 8   b. 64

   c. 16   d. 56   **b**

25. If the DFT of a real signal is X (k)= {1, 2-j, 2, 2+j }. What is its signal energy?

a. 15   b. 7

c. 12   d. not defined   **a**

1. In an open loop control system
(a) Output is independent of control input
(b) Output is dependent on control input
(c) Only system parameters have effect on the control output
(d) None of the above
Ans: a

2. For open control system which of the following statements is incorrect ?
(a) Less expensive
(b) Recalibration is not required for maintaining the required quality of the output
(c) Construction is simple and maintenance easy
(d) Errors are caused by disturbances
Ans: b

3. A control system in which the control action is somehow dependent on the output is known as
(a) Closed loop system
(b) Semiclosed loop system
(c) Open system
(d) None of the above
Ans: a

4. In closed loop control system, with positive value of feedback gain the overall gain of the system will
(a) decrease
(b) increase
(c) be unaffected
(d) any of the above
Ans: a

5. Which of the following is an open loop control system ?
(a) Field controlled D.C. motor
(b) Ward leonard control
(c) Metadyne
(d) Stroboscope
Ans: a

6. Which of the following statements is not necessarily correct for open control system ?
(a) Input command is the sole factor responsible for providing the control action
(b) Presence of non-linearities causes malfunctioning
(c) Less expensive
(d) Generally free from problems of non-linearities
Ans: b

7. In open loop system
(a) the control action depends on the size of the system
(b) the control action depends on system variables
(c) the control action depends on the input signal
(d) the control action is independent of the output
Ans: d

8 _____has tendency to oscillate.
(a) Open loop system
(b) Closed loop system
(c) Both (a) and (b)
(d) Neither (a) nor (b)
Ans: b

9. A good control system has all the following features except
(a)   good stability
(b)   slow response
(c) good accuracy
(d) sufficient power handling capacity
Ans: b

10.   A car is running at a constant speed of 50 km/h, which of the following is the feedback element for the driver?
(a)   Clutch
(b)   Eyes
(c) Needle of the speedometer
(d) Steering wheel
(e) None of the above
Ans: c

11.   The initial response when the output is not equal to input is called
(a)   Transient response
(b)   Error response
(c)   Dynamic response
(d)   Either of the above
Ans: a

12.   A control system working under unknown random actions is called
(a)   computer control system
(b)   digital data system
(c) stochastic control system
(d) adaptive control system
Ans: c

13.   An automatic toaster is a _____ loop control system.
(a)   open
(b)   closed
(c) partially closed
(d) any of the above
Ans: a

13. An automatic toaster is a _____ loop control system.
(a) open
(b) closed
(c) partially closed
(d) any of the above
Ans: a

14. Any externally introduced signal affecting the controlled output is called a
(a) feedback
(b) stimulus
(c) signal
(d) gain control
Ans: b

15. A closed loop system is distinguished from open loop system by which of the following ?
(a) Servomechanism
(b) Feedback
(c) Output pattern
(d) Input pattern
Ans: b

16 _____is a part of the human temperature control system.
(a) Digestive system
(b) Perspiration system
(c) Ear
(d) Leg movement
Ans: b

17. By which of the following the control action is determined when a man walks along a path ?
(a) Brain
(b) Hands
(c) Legs
(d) Eyes
Ans: d

18 _____is a closed loop system.
(a) Auto-pilot for an aircraft
(6) Direct current generator
(c) Car starter
(d) Electric switch
Ans: a

19. Which of the following devices are commonly used as error detectors in instruments ?
(a) Vernistats
(b) Microsyns
(c) Resolvers
(d) Any of the above

Ans: d

20. Which of the following should be done to make an unstable system stable ?
(a)   The gain of the system should be decreased
(b)   The gain of the system should be increased
(c)   The number of poles to the loop transfer function should be increased
(d)   The number of zeros to the loop transfer function should be increased
Ans: b

21   _____increases the steady state accuracy.
(a)   Integrator
(b)   Differentiator
(c)   Phase lead compensator
(d)   Phase lag compensator
Ans: a

22. A.C. servomotor resembles
(a)   two phase induction motor
(b)   Three phase induction motor
(c)   direct current series motor
(d)   universal motor
Ans: a

23.   As a result of introduction of negative feedback which of the following will not decrease ?
(a)   Band width
(b)   Overall gain
(c)   Distortion
(d)   Instability
Ans: a

24.   Regenerative feedback implies feedback with
(a)   oscillations
(b)   step input
(c)   negative sign
(d)   positive sign
Ans: d

25.   The output of a feedback control system must be a function of
(a)   reference and output
(b)   reference and input
(e)   input and feedback signal
(d)   output and feedback signal
Ans: a

26   _____is an open loop control system.
(a)   Ward Leonard control
(b)   Field controlled D.C. motor

(c) Stroboscope
(d) Metadyne
Ans: b

1. The diffusion potential across a PN junction
   a. Decreases with increasing doping concentration
   b. Increases with decreasing band gap
   c. Does not depend on doping concentration
   d. Increases with increase in doping concentrations

Ans: d

2. In a P^+N junction diode under reverse bias, the magnitude of electric field is maximum at
   a. The edge of the depletion region on P side
   b. The edge of the depletion region on N side
   c. The P^+N junction
   d. The centre of the depletion region on the N side

Ans: C

3. Which of the following is NOT associated with a PN junction?
   a. Junction capacitance
   b. Charge storage capacitance
   c. Depletion capacitance
   d. Channel length modulation

Ans:d

4. In the circuit below, the diode is ideal. The voltage V is given by
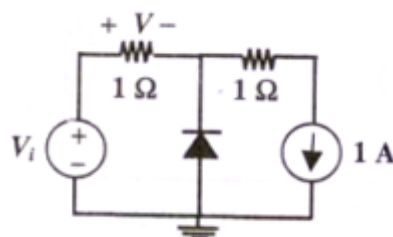
   a. Min(V_i,1)
   b. Max(V_i,1)

c. Min(-V$_i$,1)
d. Max(-V$_i$,1)

Ans: d

5. A silicon PN junction is forward biased with a constant current at room temperature. When the temperature is increased by 10°C, the forward bias voltage across the PN junction
    a. Increases by 60 mV
    b. Decreases by 60 mV
    c. Increases by 25 mV
    d. Decreases by 25 mV

Ans: d

6. 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

Ans: b

7. For small signal ac operation, a practical forward biased diode can be modeled as
    a. Resistance and capacitance in series
    b. Ideal diode and resistance in parallel
    c. Resistance and ideal diode in series
    d. Resistance

Ans:d

8. In the figure, assume that the forward voltage drops to the PN diode D1 and Schottky diode D2 are 0.7 volts and 0.3 volts respectively. If ON denotes conducting state of the diode and OFF denotes the non conducting state of the diode, then in the circuit,
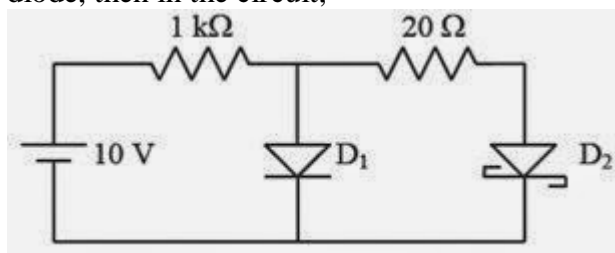
    a. Both are ON
    b. D$_1$ is ON and D$_2$ is OFF
    c. Both are OFF
    d. D$_1$ is OFF and D$_2$ is ON

Ans:d

9. A 741 OP-AMP has a gain-bandwidth product of 1 MHz. A non-inverting amplifier using this OP-AMP and having a voltage gain of 20 dB will exhibit a −3 dB bandwidth of

    a. 50 kHz

c. 100/17 kHz
d. 1000/7.07 kHz

Ans: b

10. If the input to the ideal comparator shown in the figure is a sinusoidal signal of 8 volts peak to peak, without any DC component, then the output of the comparator has a duty cycle of

a. 1/2
b. 1/3
c. 1/6
d. ½
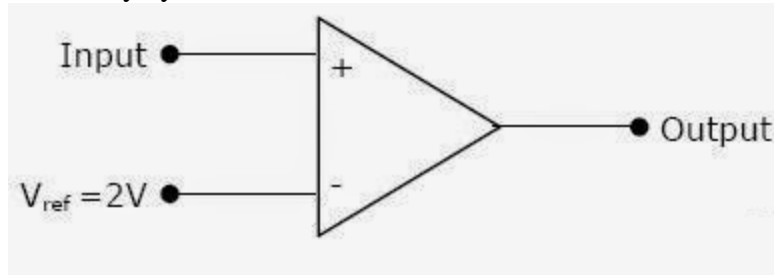
Ans:b

11. A BJT is said to be operating in the saturation region, if
   a.   Both the junctions are reverse biased
   b.   Base emitter junction is in reverse biased, and base collector junction is forward biased
   c.   Base emitter junction is in forward biased, and base collector junction is reverse biased
   d.   Both the junctions are forward biased

Ans:d

12. The Ebers – Moll model is applicable to
   a.   Bipolar junction transistors
   b.   nMOS transistors
   c.   Unipolar Junction transistors
   d.   Junction field effect transistors

Ans: a

13. In bipolar junction transistor(BJT), at room temperature, if the emitter current is doubled, then the voltage across its base emitter junction
   a.   Doubles
   b.   Halves
   c.   Increases by about 20 mV
   d.   Decreases by about 20 mV

Ans:c

14. If a transistor is operating with both of its junctions forward biased, but with the collector base forward bias greater than the emitter base forward bias, then it is operating in the
    a.   Forward active mode
    b.   Reverse active mode
    c.   Reverse saturation mode
    d.   Forward saturation mode

Ans: b

15. In a multistage RC coupled amplifier, the coupling capacitor
    a.   limits the low frequency response
    b.   limits the high frequency response
    c.   does not affect the frequency response
    d.   blocks the DC component without affecting the frequency response

Ans:a

16. For a BJT, the common base current gain $\alpha = 0.98$ and the collector base junction reverse bias saturation current, $I_{CO} = 0.6$ μA. This BJT is connected in the common emitter mode and operated in the active region with a base current (I_B) of 20 μA. The collector current I_C for this mode of operation is
    a.   0.98 mA
    b.   0.99 mA
    c.   1.0 mA
    d.   1.01 mA

Ans: d

17. In the circuit shown, the silicon BJT has $\beta = 50$. Assume VBE = 0.7 volts and VCEsat = 0.2 volts. Which one of the following statements is correct?
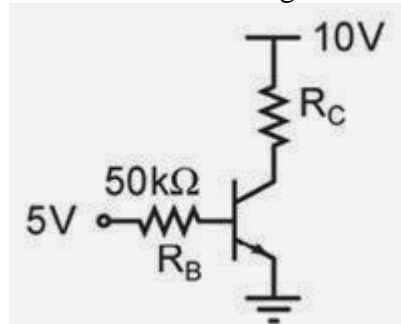
    a.   For $R_C = 1$ kΩ, the BJT operates in the saturation region
    b.   For $R_C = 3$ kΩ, the BJT operates in the saturation region
    c.   For $R_C = 20$ kΩ, the BJT operates in the cutoff region
    d.   For $R_C = 20$ kΩ, the BJT operates in the linear region

Ans: b

18. In the following transistor circuit, VBE = 0.7 volts, re = 25 mV/IE, β and all the capacitances are very large. The value of DC current IE is
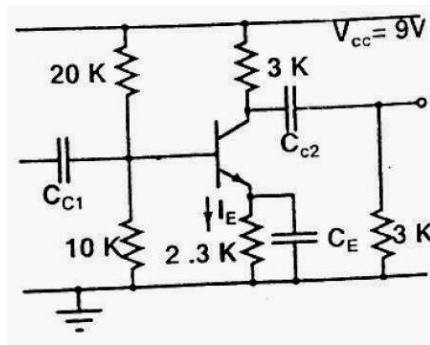
a. 1 mA
b. 2 mA
c. 5 mA
d. 10 mA

Ans:a

19. An amplifier is assumed to have a single pole high frequency transfer function. The rise time of its output response to a step function input is 35 nsec. The upper - 3 dB frequency (in MHz) for the amplifier to a sinusoidal input is approximately at

    a. 4.55
    b. 10
    c. 20
    d. 28.6

Ans: b

20. The current gain of a bipolar transistor drops at high frequencies because of
    a. Transistor capacitances
    b. High current effects in the base
    c. Parasitic inductance effects
    d. The Early Effect

Ans: a

21. Generally, the gain of a transistor amplifier falls at high frequencies due to the
    a. Internal capacitance of the device
    b. Coupling capacitor at the input
    c. Skin effect
    d. Coupling capacitor at the output

Ans: a

22. An n-channel JFET has a pinch off voltage $V_P = -5$ volts, $V_{DSmax} = 20$ volts, and $g_m = 2$ mA/V. The minimum ON resistance is achieved in the JFET for …………

a. $V_{GS} = -7$ volts and $V_{DS} = 0$ volts
b. $V_{GS} = 7$ volts and $V_{DS} = 0$ volts
c. $V_{GS} = 0$ volts and $V_{DS} = 20$ volts
d. $V_{GS} = -7$ volts and $V_{DS} = 20$ volts

Ans: b

23. The action of a JFET in its equivalent circuit can best be represented as a
   a. Current controlled current source
   b. Current controlled voltage source
   c. Voltage controlled current source
   d. Voltage controlled voltage source

Ans: c

24. In MOSFET devices, the N-channel type is better than the P-channel type in the following respects
   a. It has better noise immunity
   b. It is faster
   c. It is TTL compatible
   d. It has better drive capability

Ans: b

25. The effective channel length of a MOSFET in saturation decreases with increase in
   a. Gate voltage
   b. Drain voltage
   c. Source voltage
   d. Body voltage

Ans: b

1. Assuming zero initial condition, the response y(t) of the system given below to a unit step input u(t) is

(A) $u(t)$

(B) $tu(t)$
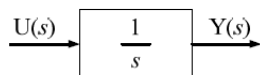
(C) $\dfrac{t^2}{2}u(t)$

(D) $e^{-t}u(t)$

Ans. D

2. The circuit shown is a
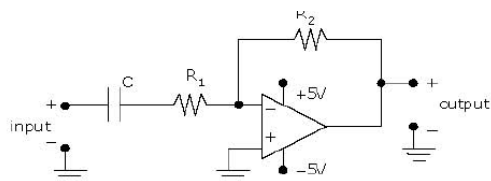
(A) Low pass filter with $f_{3dB} = \dfrac{1}{(R1+R2)C}$ Hz

(B) (B) High pass filter with $f_{3dB} = \dfrac{1}{R1C}$ Hz

(C) Low pass filter with $f_{3dB} = \dfrac{1}{R1C}$ Hz

(D) High pass filter with $f_{3dB} = \dfrac{1}{(R1+R2)C}$ Hz

Ans. B

3. Transfer function of compensator is given as $G_c(s) = \dfrac{s+a}{s+b}$. G_c is lead compensator if

    (A) a=l, b=2

    (B) a=3, b=2

    (C) a=-3,b=-1

    (D) a=3, b=1

    Ans. A

4. The feedback system shown below oscillates at 2Hz, when
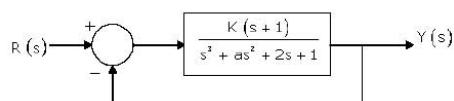
    (A) K=2 and a=0.7 5

    (B) K=3 and a=0.75

    (C) K=4 and a=O.5

    (D) K=2 and a=O .5

    Ans. A

5. The I-V characteristics of the diode in the circuit given below are:
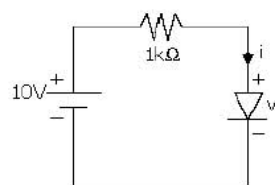
$$I = \begin{cases} \dfrac{V - 0.7}{5.0} A & \text{if } V \geq 0.7V \\ 0A & \text{if } V < 0.7 \end{cases}$$

The current in the circuit is

(A) l0 mA

(B) 9. 3mA

(C) 6.67 mA

(D) 6.2mA

Ans. D

6. The open-loop transfer function of a unity negative feedback control system is given by

$G(s) = \dfrac{1}{(s+5)^3}$. The value of K for the damping ratio ç to be 0.5 corresponding to the

dominant closed-loop complex conjugate pair is

(A) 250

(B) 125

(C) 75

(D) 50

Ans. B

7. The first two rows of Routh's table of a third-order characteristic equation are

s^2 3   3
s^1 4   4

It can be inferred that the system has

(A) one real pole in right half of s-plane

(B) a pair of complex conjugate poles in the right half of s-plane

(C) a pair of real poles symmetrically placed around s=0

(D) a pair of complex conjugate poles on the imaginary axis of the s-plane

Ans. D

8. The conventional way of expressing vibration is in terms of

(A) Richter scale

(B) Acceleration due to gravity

(C) Speed of sound

(D) Atmospheric pressure

Ans. B

9. The average power delivered to an impedance (4-j3)Ω by a current 5 cos (100πt + 100) A is

    (A) 44.2 W

    (B) 50 W

    (C) 62.5W

    (D) 125 W

    Ans. B

10. A system with transfer function is excited by $G(s) = \dfrac{(s^2 + 9)(s + 2)}{(s+1)(s+3)(s+4)}$ is excited by

sin(wt). the steady state output of the system is zero at

(A) w = 1rad/sec

(B) w = 2rad/sec

(C) w = 3rad/sec

(D) w = 4rad/sec

Ans. C

11, The bridge method commonly used for finding mutual Inductance is:

(A) Heaviside Campbell bridge

(B) Scherlng bridge

(C) De Sauty bridge

(D) Wien bridge

Ans. A

12. An analog voltmeter uses external multiplier settings. With a multiplier setting of 20kΩ, It reads 440V and with a multiplier setting of 80kΩ, it reads 352V. For a multiplier setting of 40kΩ, the voltmeter reads:

(A) 371 V

(B) 383V

(C) 394V

(D) 406V

Ans. D

13. A control system working under unknown random actions is called

(A) computer control system

(B) digital data system

(C) stochastic control system

(D) adaptive control system

Ans. C

14. The transfer function of a system is defined as:

    (A) The laplace transform of the impulse response

    (B) Laplace transform of the step response

    (C) Laplace transform of the ramp response

    (D) Laplace transform of the sinusoidal input

Ans. A

15. Control Systems are normally designed with damping factor:

(A) Less than unity

(B) More than unity

(C) Zero

(D) Unity

Ans. A

16. Error Constants of a system are measure of:

(A) Relative stability

(B) Transient state response

(C) Steady state response

(D) Steady state as well as transient state response

Ans. A

17. Introduction of integral action in the forward path of a unity feedback system results in

(A) Marginally stable system

(B) System with no steady state error

(C) System with increase stability margin

(D) System with better speed of response

Ans. A

18. The differentiator has a transfer function whose

    (A) Phase increases linearly with frequency

    (B) Amplitude remains constant

    (C) Amplitude increases linearly with frequency

    (D) Amplitude decreases linearly with frequency

Ans. A

19. The Fourier transform of a signal h(t) is $H(j\omega) = (2\cos\omega)(\sin2\omega)/\omega$. The value of h(0)

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

Ans. C

20. An open loop system represented by the transfer function $G(s) = (s-1) / (s+2)(s+3)$ is

(A) Stable and of the minimum phase type
(B) Stable and of the non-minimum phase type
(C) Unstable and of the minimum phase type
(D) Unstable and of the non-minimum phase type

Ans. B

12. In the differential mode,
    a) Opposite polarity signals are applied to the inputs
    b) The gains is 1
    c) The outputs are different amplitudes
    d) Only one supply voltage is used

    Answer: a

13. The bandwidth of an amplifier is determined by
    a) The midrange gain
    b) The critical frequencies
    c) The roll off rate
    d) The input capacitances

    Answer: b

14. In a certain CS amplifier, $V_{DS} = 3.2\ V_{rms}$ and $V_{GS} = 280mV_{rms}$. The voltage gain is
    a) 1
    b) 11.4
    c) 8.75
    d) 3.2

    Answer: b

15. A certain CE amplifier has a voltage gain of 100. If the emitter bypass capacitor is removed,
    a) The circuit will become unstable
    b) The voltage gain will decrease
    c) The voltage gain will increase
    d) The Q-point will shift

    Answer: b

16. In a common source amplifier, the output voltage is
    a) 180 degrees out of phase with the input
    b) In phase with the input
    c) Taken at the source
    d) Answers (a) and (c)

    Answer: a

17. A class A amplifier is biased with a centered Q point at $V_{CEQ} = 5V$ and $I_{CEQ} = 10mA$. The maximum output power is
    a) 25mW
    b) 50mW
    c) 10mW
    d) 37.5mW

    Answer: a

18. When the Q-point of an inverting Class A amplifier is closer to saturation than cutoff and the input sine wave is gradually increased, clipping on the output will appear on
   a) The positive peaks
   b) The negative peaks
   c) Both peaks simultaneously
   d) None   of   the   answers

   Answer: b

19. All oscillators are based on
   a) Positive feedback
   b) Negative feedback
   c) Piezoelectric effect
   d) High   gain

   Answer: a

20. The wein bridge oscillator's feedback circuit is
   a) An RL circuit
   b) An LC circuit
   c) A voltage divider
   d) A   lead-lag   circuit

   Answer: d

1. Which of the system is causal?
      A. $y(n) = x(n) + [1/x(n-1)]$
      B. $y(n) = |x(3n)|$
      C. Both (a)and (b)
      D. None of the above
         Ans. A

2. Which of the following system is time variant?

   A. $y(n) = x(n) + x(-n-1)$
   B. $y(n) = x(-n)$
   C. Both (a)and (b)
   D. None of the above
      Ans. C

3. Input sequence is {1,2,1,2} and the impulse response is {3,2,1,2} then the output is

   A. {3,8,8,12,9,4,4}
   B. {9,7,12,8,12}
   C. {12,12,12,12}
   D. None of the above
      Ans. A

4. Which of the given system is linear?
   A. $y(n) = x(n) + [1/x(n-1)]$

B. $y(n) = x2(n)$
C. $y(n) = n\ x(n)$
D. None of the above
   Ans. C

5. $y(n) = 1$ for $n \geq 0$ and it is $= 0$ for $n < 0$. This way of representing a signal is called as
   _____

   A. Graphical
   B. Sequential
   C. Functional
   D. None of the above

   Ans. C

6. Fast convolution techniques
   A. overlap save
   B. overlap add
   C. a & b
   D. none of above

   Ans. C

7. If a linear phase filter has a phase response of 40 degrees at 200 Hz, what will its phase response be at a frequency of 400 Hz (assuming that both frequencies are in the passband of the filter)?

   A. 35 degrees

   B. 40 degrees

   C. 45 degrees

   D. 80 degrees

   Ans. D

8. TMS320C50 is based on

   A . Harvard architecture
    B. Von Neumann architecture
    C. VLIW Architecture
    D. None of the above

Ans. A

9. The factor that do not influence the selection of the processor

   A.   Architecture
   B.   Logics involved in processing
   C.   Both the above
   D.   None of the above

Ans. B

10. Which is not the property of FIR filter?

   A.   FIR is always stable
   B.   A realizable filter can always be obtained
   C.   FIR filter has a linear phase response
   D.   FIR filter has a linear magnitude response
        Ans. D

11. Decreased performance is the disadvantage of
   A.   Harvard architecture
   B.   Von Neumann architecture
   C.   VLIW Architecture
   D. None of the above

        Ans. B

12. The factor that influence the selection of the processor
   A.   Word length
   B.   Manufacturer
   C.   Logics involved in processing
   D.   None of the above

        Ans. A

13. IIR filters

   A.   use feedback
   B.   are sometimes called recursive filters
   C.   can oscillate if not properly designed
   D.   all of the above

        Ans. D
14. Two digital filters can be operated in cascade. Or, the same effect can be achieved by

   A.   adding their coefficients
   B.   subtracting their coefficients
   C.   convolving their coefficients
   D.   averaging their coefficients and then using a rectangular window

        Ans. C

15. More memory consumption is required by

   A.   Harvard architecture
   B.   Von Neumann architecture
   C.   VLIW Architecture
   D.   All of the above

Ans. C

16. The output of two digital filters can be added. Or, the same effect can be achieved by

    A.   adding their coefficients
    B.   subtracting their coefficients
    C.   convolving their coefficients
    D.   averaging their coefficients and then using a Blackman window

    Ans. A

17. Z transform is evaluated on a unit _____ corresponds to the Fourier transform.

    A. Impulse
    B. Sequence
    C. Circle
    D. None of the above

    Ans. C

18. Determine the convolution sum of two sequences x(n) = {3, 2, 1, 2} and h(n) = {1, 2, 1, 2}
    A. y(n) = {3,8,8,12,9,4,4}
    B. y(n) = {3,8,3,12,9,4,4}
    C. y(n) = {3,8,8,12,9,1,4}
    D. y(n) = {3,8,8,1,9,4,4}

    Ans. A

19. Sampling theorem:
    A. fm<fs
    B. fs>fm
    C. fs>=2fm
    D. fs=2fm

    Ans. C

20. Application of Convolution:

    A. FIR Filtering
    B. Addition
    C. Manipulation
    D. None of these

    Ans. A

1. **Velocity of propagation of an EM wave in a lossless dielectric**

(a) $\sqrt{\dfrac{\varepsilon_0}{\mu_0}}$ (b) $\dfrac{\mu_0}{\varepsilon_0}$ **(c)** $\dfrac{1}{\sqrt{\mu\varepsilon}}$ (d) 0

2. **Poynting Vector is given by**

(a) $\vec{E}\times\vec{H}$ (b) $\vec{E}\bullet\vec{H}$ (c) $\vec{H}\times\vec{E}$ (d) $\vec{H}\bullet\vec{E}$

3. **The wavelength of a wave with a propagation constant = $0.1\pi + j\,0.2\pi$**

(a) 10 m (b) 20 m (c) 30 m (d) 25 m

4. **The intrinsic impedance of the medium whose $\sigma = 0$, $\varepsilon_r = 9$, $\mu_r = 1$ is**

(a) 40 $\pi\Omega$ (b) 9Ω (c) $120\ \pi\Omega$ (d) $60\ \pi\Omega$

5. **Given that $\vec{H} = 0.5e^{-0.1x}\sin(10^6 t - 2x)\hat{a}_z$ A/m, which of these statements are incorrect?**

(a) $\alpha = 0.1$ Np/m **(b) $\beta = -2$ rad/m** (c) $w = 10^6$ rad/s (d) The wave travels along a_x.

6. **If wet soil has $\sigma = 10^{-2}$ mho/m, $\varepsilon_r = 15$, $\mu_r = 1$, $f = 10$ GHz, it is a**

(a) Good conductor **(b) good dielectric** (c) semi- conductor (d) magnetic material

7. **For free space,**

(a) $\sigma = \inf$ **(b) $\sigma = 0$** (c) $J \neq 0$ (d) $\mu_r = 0$

8. **Given that $A = a_x + \alpha a_y + a_z$ and $B = \alpha a_x + a_y + a_z$, if A and B are normal to each other,**

α is (i) -2 (ii) -1/2 (iii) 1 (iv) 2

9. **The Poynting Vector physically denotes the power density leaving or entering a given volume in a time varying field.**

(a) True (b) false (c) Not always true (d) Not always false.

10. **Both ε_0 and χ_e are dimensionless: The statement is _____ and _____ respectively**

(a) **True and False** **(b) False and True** (c) **True and True** (d) **False and False.**

11. **The Relaxation time of mica ($\sigma = 10^{-15}$ mho/m, $\varepsilon_r = 6$) is**

(a) 5x 10^{-10} s (b) 10^{-6} s (c) 5 Hours (d) 10 Hours (e) 15 Hours

12. The electric susceptibility of a dielectric is 4, its permittivity is

(a) 2.26×10^{-9} F/m (b) 4.42×10^{-7} F/m (c) 5 F/m (d) 1.26×10^{-3} F/m

13. Which of the following potential does not satisfy Laplace's Equation:

(a) $V_1 = 2x+5$ (b) $V_1 = x^2+y^2+5z^2-10$ (c) $V_1 = 3x+7$ (d) $V_1 = x^2+y^2-2z^2+10$

14. Which one of these statements is not characteristic of static magnetic field:

(a) It is solenoidal (b) It is conservative (c) It has no sinks or sources (d) Magnetic flux lines are always closed.

15. The unit of Electric Field is

(a)N/C (b)N-C (c)C/N (d)N

16. Dot product of a_x and a_φ is

(a) $-\cos\phi$ (b) $\cos\phi$ (c) $-\sin\phi$ (d) $\sin\phi$.

17. The Frequency range of UHF band is

(a)30-300 Hz   (b)20-200MHz (c)30-3000 MHz (d)20-200KHz

18. Given A = $-6a_x + 3 a_y + 2 a_z$, the projection of A along a_y is

(a) -12 (b) 7 (c) -3 (d) 3

19. Plane z = 10m carries charge 20nC/m^2. The electric Field intensity at the origin is

(a) $-10a_z$ V/m (b) $-18\pi a_z$ V/m (c) $-72\pi a_z$ V/m (d) $-360\pi a_z$

20. Dot product of a_z and a_φ is (a) $-\cos\phi$ (b) $\cos\phi$ **(c) 0** (d) $\sin\phi$.

21. Given field $A = 3x^2yz\ a_x + x^3z\ a_y + (x^3y - 2z)\ a_z$, it can be said that A is

   (a) Harmonic (b) Divergenceless (c) Solenoidal **(d) Conservative**

22. A charge of 10 pC is at rest in free space. The potential at a point A, 10 cm away from the charge will be

(a) 0.9 V (b) 0.545 V (c) -0.9 V (d) 0. 2 V

23. A charge density of $10nC/m^2$ is distributed on a plane z = 10m, the electric field intensity at the origin is

(a) $-180\pi\ a_z$ (b) $-18\pi\ a_z$ (c) $180\pi\ a_z$ (d) $18\pi\ a_z$

24. Dot product of a_x and a_r is

(a) $-\sin\theta\cos\phi$ **(b) $\sin\theta\cos\phi$** (c) 0 (d) $\sin\phi\cos\theta$.

25. If $H = 4a_p - 3a_\phi + 5a_z$ at $(1,\ \pi/2,\ 0)$, in cylindrical co-ordinates the component of H parallel to surface p = 1 is

   (a) $4a_p$ (b) $5a_z$ (c) $-3a_\phi$ **(d)$-3a_\phi + 5\ a_z$**

1. What is the Vs for a series RLC ckt when I_T = 3 mA, VL = 30V, VC = 18V, and R =1KΩ
   A) 3.00 V
   B) 12.37 V
   C) 34.98 V
   D) 48.00 V

   Ans. B

2. How much current will flow in a 100 Hz series RLC circuit if V_S = 20 V, R_T = 66 ohms
   and X_T = 47 ohms?
   A) 1.05 A
   B) 303 mA
   C) 247 mA
   D) 107 mA
       Ans. C

3. What is the total current in the circuit given?
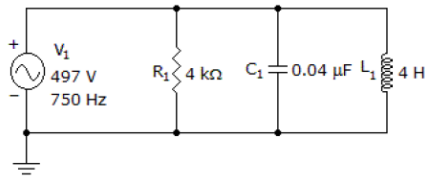
   A) 56.6 mA
   B) 141 mA
   C) 191 mA
   D) 244 mA

       Ans. B

4. What is the resonant frequency in the given circuit?
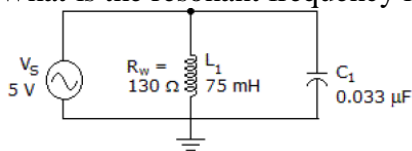
   A) 11.6 Hz
   B) 275.8 Hz
   C) 1.5 kHz
   D) 3.2 kHz

       Ans. D

5. When XC = XL the circuit:
   A) draws maximum current
   B) applied voltage is zero
   C) is at resonance
   D) draws minimum current

   Ans. C

6. In a series RLC circuit the current can be found using:
   A) I = V(across resistance)/R
   B) I = V(across source) / Z
   C) Both of the above
   D) None of the above

   Ans. C

7. What would be the power factor for an RLC circuit that acts inductively?

   A. +90 degrees leading
   B. one
   C. zero
   D. −90 degrees lagging

   Ans. C

8. What is the approximate phase angle in a series RLC circuit when V_C = 117 V, V_R = 14.5V, and V_L = 3.3 V?
   A) −45.0 degrees
   B) -82.7 degrees
   C) −90.0 degrees
   D) −172.7 degrees

   Ans. B

9. Which statement best describes reactance in a series RLC circuit?
   A) Capacitive reactance is always dominant
   B) Inductive reactance is always dominant
   C) Resistance is always dominant
   D) The larger of the two reactances is dominant

Ans. D

10. What is the true power consumed in a 30 V series RLC circuit if $Z = 20\Omega$ and $R=10\Omega$?
    A) 15 W
    B) 22.5 W
    C) 30 W
    D) 45 W

    Ans. B

11. Filters used to reject the 50Hz noise picked up from power lines are called
    A) Low pass filters
    B) High pass filters
    C) Band pass filters
    D) Notch Filters

    Ans. D

12. Which amplifier rejects any common mode signal that appears simultaneously at both amplifier input terminals?
    A) Ac coupled amplifier
    B) dc amplifier
    C) differential amplifier
    D) carrier amplifier

    Ans. C

13. For accurate measurement of the current source signals, which of the statements is true?
    A) The source output should be small compared with the receiver input signal
    B) The source output should be large compared with the receiver input signal
    C) The source input should be small compared with the receiver output signal
    D) The source input should be large compared with the receiver output signal

    1. Ans. B

14. Light beam oscilloscope recorders use _____ amplifiers

A) Ac coupled
B) Chopper stabilized dc
C) Carrier
D) dc bridge

Ans. B

15. Gain of instrumentation amplifier is calculated using_____
A) R_2/R_1
B) $1+ (2R/R_g)$
C) $(1+2R_g) /R$
D) $1+ (2R_g/R)$

Ans. B

16. Which type of modulation is adopted in carrier amplification?
A) Phase modulation
B) Amplitude modulation
C) Frequency modulation
D) None of the above

Ans. B

17. _____ offers highest isolation voltage.
   A) Transformer coupled amplifier
   B) Capacitance coupled amplifier
   C) Opto-isolated amplifier
   D) None of the above

Ans. B

18. The filter which has a figure of merit _____, has the narrowest band pass.
   A) Q=1
   B) Q=5
   C) Q=10
   D) Q=20

Ans. D

19. The preamplifiers used for EMG are _____ type.
   A) Carrier
   B) Chopper stabilized
   C) isolated
   D) Differential

   Ans. D

20. How many pick-up surfaces are available down the side of one needle in EMG recording?
   A) 16
   B) 13
   C) 14
   D) 12

Ans. C

1. An instruction used to set the carry flag in a computer can be classified as
   a. Data transfer
   b. Arithmetic
   c. Logical
   d. Program control

   ANSWER: [d-Program control]
2. An 8085 microprocessor based system uses a 4K x8 bit RAM whose starting address is AA00H. The address of the last byte in this RAM is
   a. 0FFFH
   b. 1000H
   c. B9FFH
   d. BA00H
   ANSWER: [c-B9FFH]

3. In a microprocessor, the service routine for a certain interrupt starts from a fixed location of memory which cannot be externally set, but the interrupt can be delayed or rejected. Such an interrupt is
   a. non-maskable and non-vectored
   b. maskable and non-vectored
   c. non-maskable and vectored
   d. maskable and vectored

   ANSWER: [d-maskable and vectored]

4. 8085 microprocessor has _____ address lines and _____ data lines
   a. 16 bit, 16 bit
   b. 8 bit ,8 bit
   c. 8 bit,16 bit
   d. 16 bit,8 bit

   ANSWER: [d-16 bit, 8 bit]
5. In 8085 which of the following interrupt has the highest priority
   a. RST 5.5
   b. TRAP
   c. INTR
   d. RST 7.5
   ANSWER:[b-TRAP]

6. 8086 can access maximum of _____ MB of memory.
   a. 1
   b. 2
   c. 3
   d. 4
   ANSWER: [a-1]

7. In 8051,execution of following instructions selects which bank
   SETB PSW.3
   CLR PSW.4
   a. 0
   b. 1
   c. 2
   d. 3
   ANSWER: [b-1]
8. What is the value present in Accumulator and Carry, after executing the following program?
   ORG 0H
   MOV A,#4FH
   MOV B,#6FH
   SUBB A,B
   END
   a. A0 and 1
   b. E0 and 1
   c. E0 and 0
   d. A0 and 0
   ANSWER: [b- E0 and 1]

9. What is the value present in Accumulator, after executing the following program?
   ORG 0H
   MOV A,#0AAH
   SETB PSW.7
   RRC A
   RRC A
   END

   a. 45H
   b. 54H
   c. A6H
   d. 6AH
   ANSWER: [d- 6AH]

10. Bit addressable address range of the 8051- RAM memory is
    a. 20-7Fh
    b. 20-2Fh
    c. 30-3FH
    d. 20-3Fh
    ANSWER: [b.20-2FH]

11. In 8051 microcontroller , moving the value 02H to TMOD register configures
    a. Timer 0 in Mode 1
    b. Counter 0 in Mode 1
    c. Timer 0 in Mode 2
    d. Timer 1 in Mode 2
    ANSWER: [c-Timer 0 in Mode 2]

12. To generate a square wave of 1.2kHz , What is the initial value to be loaded to timer 1 operated in mode 1.Assume the XTAL=11.0592 MHz.

    a. FE7FH
    b. 6745H
    c. DC45H
    d. FC00H
    ANSWER: [a. FE7FH]

13. _____ bit should be set to double the baud rate in 8051.
    a. TCON
    b. PCON
    c. SMOD
    d. TMOD
    ANSWER: [c-SMOD]

14. How many interrupt sources are available in 8051?
    a. 3
    b. 4
    c. 5

d. 6
<mark>ANSWER: [d-6]</mark>

15. What value should be moved to TH1 register to set the baud rate to 600
    a. -12
    b. -6
    c. -24
    d. -48
<mark>ANSWER: [d--48]</mark>

16. How many serial communications interrupts are available in 8051.
    a. 1
    b. 2
    c. 3
    d. 4
<mark>ANSWER: [a-1]</mark>

17. To identify a level triggered interrupt in INT1 (External interrupt 1) of 8051, this pin
    should be pulled down more than _____ machine cycles.
    a. 1
    b. 2
    c. 3
    d. 4
<mark>ANSWER: [d-4]</mark>

18. In 8051, Timer 1 interrupt vector address is
    a. 13H
    b. 0Bh
    c. 23h
    d. 1Bh
<mark>ANSWER: [d-1BH]</mark>

19. Given the value of IP register is 04H, among the following which one has the highest
    priority
    a. External Interrupt 0
    b. Timer 1
    c. External Interrupt 1
    d. Timer 0
<mark>ANSWER: [c-External Interrupt 1]</mark>

20. When data is supplied to data pins, _____ must be applied to the Enable pin of
    the LCD (Liquid Crystal Display) to latch the data present at the data pins.
    a. Low to high pulse
    b. Low pulse
    c. High to Low pulse
    d. High pulse
<mark>ANSWER: [c-High to Low Pulse]</mark>

21. The following bit of IE (Interrupt Enable) should be set to enable all the interrupts in
    8051.
    a) IE.3
    b) IE.5
    c) IE.7

d) IE.6

22. In 8051 microcontroller, INT0 and INT1 interrupts are _____ by default
   a) Positive edge triggered
   b) Level 1 triggered
   c) Level 0 triggered
   d) Negative Edge triggered

   ANSWER: [c- Level 0 triggered]

23. RETI instruction clears the following flags
   a. TI,RI,TF0 and TF1
   b. TF0,TF1,TCON.1 and TCON.3
   c. TI,RI,TCON.1 and TCON.3
   d. TI,RI,TF0,TF1,TCON.1 and TCON.3

   ANSWER: [b- TF0, TF1, TCON.1 and TCON.3]

24. Assume IE(Interrupt Enable)Register has configured with the value of 98H, then
   a) Serial communication and external interrupt 1 are enabled
   b) Timer 0 and External interrupt 0 are enabled
   c) Timer 1 and Serial communication interrupts are enabled
   d) Timer 0 and Serial communication interrupts are enabled

   ANSWER: [c- Timer 1 and Serial communication interrupts are enabled]

25. The following value should be moved to IP(Interrupt priority)Register to assign Higher priority to Serial communication Interrupt.
   a. 03H
   b. 10H
   c. 20H
   d. 01H
   ANSWER: [b-10H]

1. A bulb in a staircase has two switches, one switch being at the ground floorand the other one at the first floor. The bulb can be turned ON and also can be turned OFF by any one of the switches irrespective of the state of theother switch. The logic of switching of the bulb resembles
   (A) an AND gate
   (B) an OR gate
   (C) **an XOR gate**
   (D) a NAND gate

Ans. C.

2. In a forward biased pn junction diode, the sequence of events that best describes the mechanism of current flow is
   (A) injection, and subsequent diffusion and recombination of minority carriers
   (B) injection, and subsequent drift and generation of minority carriers
   (C) extraction, and subsequent diffusion and generation of minority carriers
   (D) extraction, and subsequent drift and recombination of minority carriers

   Ans. A

3. In IC technology, dry oxidation (using dry oxygen) as compared to wet oxidation (using steam or water vapor) produces
   (A) superior quality oxide with a higher growth rate
   (B) inferior quality oxide with a higher growth rate
   (C) inferior quality oxide with a lower growth rate
   (D) superior quality oxide with a lower growth rate

   Ans. D

4. In a voltage-voltage feedback as shown below, which one of the followingstatements is TRUE if the gain k is increased?
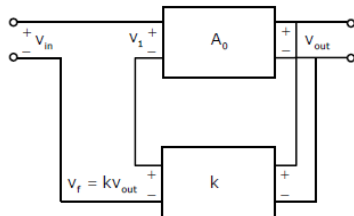
   (A) The input impedance increases and output impedance decreases
   (B) The input impedance increases and output impedance also increases
   (C) The input impedance decreases and output impedance also decreases
   (D) The input impedance decreases and output impedance increases
   Ans. A

5. In a MOSFET operating in the saturation region, the channel length modulationeffect causes
   (A) an increase in the gate-source capacitance
   (B) a decrease in the Transconductance
   (C) a decrease in the unity-gain cutoff frequency
   (D) a decrease in the output resistance

Ans. D

6. The small-signal resistance (i.e., dV_B / dI_D) in $k\Omega$ offered by the n-channelMOSFET M shown in the figure below, at a bias point of $V_B = 2$ V is (device datafor M: device Transconductance parameter $kN = \mu_N C_{ox}(W/L) = 40\ \mu A / V^2$ threshold voltage $V_{TN}=1$ V, and neglect body effect and channel length modulation effects)
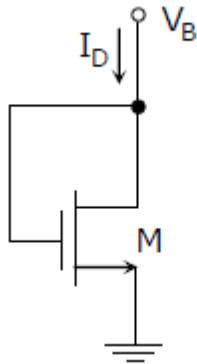
(A) 12.5
(B) **25**
(C) 50
(D) 100

Ans. B

7. A silicon bar is doped with donor impurities $N_D = 2.25 \times 10^{15}$ atoms / cm^3 . Given the intrinsic carrier concentration of silicon at T = 300 K is $n_i = 1.5 \times 10^{10}$ cm^{-3}. Assuming complete impurity ionization, the equilibrium electron and hole concentrations are
(A) $n_0 = 1.5 \times 10^{16}$ cm^{-3} , $p_0 = 1.5 \times 10^5$ cm^{-3}
(B) $n_0 = 1.5 \times 10^{10}$ cm^{-3} , $p_0 = 1.5 \times 10^{15}$ cm^{-3}
(C) $n_0 = 2.25 \times 10^{15}$ cm^{-3} , $p_0 = 1.5 \times 10^{10}$ cm^{-3}
(D) $n_0 = 2.25 \times 10^{15}$ cm^{-3} , $p_0 = 1 \times 10^5$ cm^{-3}

Ans. D

8. An increase in the base recombination of a BJT will increase
(A) the common emitter dc current gain β
(B) the breakdown voltage BV$_{CEO}$
(C) the unity-gain cut-off frequency f_T
(D) thetransconductanceg$_m$

Ans. B

9. In CMOS technology, shallow P-well or N-well regions can be formed using
   (A) low pressure chemical vapour deposition
   (B) low energy sputtering
   (C) low temperature dry oxidation
   (D) low energy ion-implantation

   Ans. D

10. The feedback topology in the amplifier circuit (the base bias circuit is not shown for simplicity) in the figure is
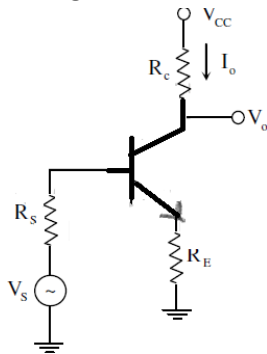
    (A)   Voltage shunt feedback
    (B)   **Current series feedback**
    (C)   Current shunt feedback
    (D)   Voltage series feedback

    Ans. B

11. In the differential amplifier shown in the figure, the magnitudes of the common-mode anddifferential-mode gains are A_{cm} and A_d, respectively. If the resistance R_E is increased, then
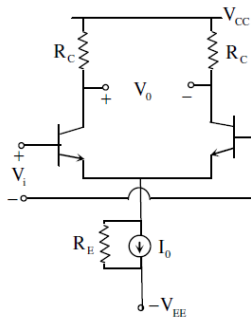
(A) A_{cm} increases

(B) **common-mode rejection ratio increases**

(C) A_d increases

(D) common-mode rejection ratio decreases

Ans. B

12. A cascade connection of two voltage amplifiers A1 and A2 is shown in the figure. The openloop gain A_{vo}, input resistance R_{in}, and output resistance R_O for A1 and A2 are as follows:

A1: $A_{VO} = 10, R_{in} = 10k\Omega, R_o = 1k\Omega$

A2 : $A_{VO} = 5, R_{in} = 5k\Omega, R0 = 200\Omega$ The approximate overall voltage gain V_{in} / V_{out} is _____.
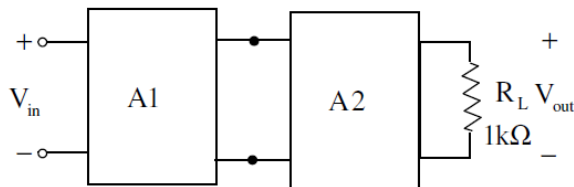
(A) 24

(B) 30

(C) **34**

(D) None

Ans. C

13. When a silicon diode having a doping concentration of $N_A = 9 \times 10^{16}$ cm^{-3} on p-side and $N_D = 1 \times 10^{16}$ cm^{-3} on n-side is reverse biased, the total depletion width is found to be 3 µm. Given that the permittivity of silicon is 1.04×10^{-12} F/cm, the depletion width on the p-side and the maximum electric field in the depletion region, respectively, are

(A) 2.7µm and 2.3×10^5 V/cm

(B) 0.3µm and 4.15×10^5 V/cm

(C) 0.3µm and 0.42×10^5 V/cm

(D) 2.1µm and 0.42×10^5 V/cm

Ans. B

14. For the n-channel MOS transistor shown in the figure, the threshold voltage V_{Th} is 0.8 V. Neglect channel length modulation effects. When the drain voltage $V_D = 1.6$ V, the drain current I_D was found to be 0.5 mA. If V_D is adjusted to be 2 V by changing the values of R and V_{DD}, the new value of I_D (in mA) is
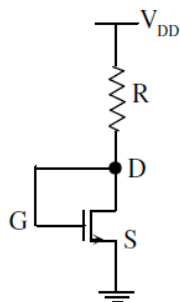
(A) 0.625
(B) 0.75
(C) 1.125
(D) 1.5

Ans. C

15. Consider the state space system expressed by the signal flow diagram shown in the figure
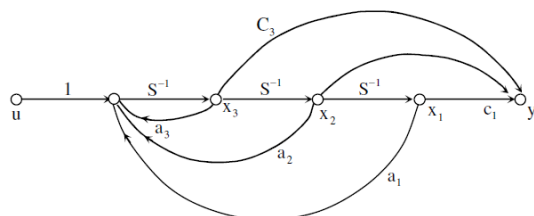
The corresponding system is
(A) always controllable
(B) always observable
(C) always stable
 (D) always unstable

Ans. A

1. The Fourier transform of the exponential signal $e^{j\omega_0 t}$ is
   a) a constant
   b) a rectangular gate
   c) an impulse
   d) a series of impulses
2. The unit impulse response of a linear time invariant system is the unit step function u(t). For t>0, the response of the system to an excitation $e^{-at} u(t), a > 0$, will be
   a) ae^{-at}
   b) $\frac{1-e^{-at}}{a}$
   c) $a(1 - e^{-at})$

d) $1 - e^{-at}$

3. The auto-correlation function of a rectangular pulse of duration T is
   a) a rectangular pulse of duration T
   b) a rectangular pulse of duration 2T
   c) a triangular pulse of duration T
   d) a triangular pulse of duration 2T

4. The system characterized by the equation y(t)=ax(t)+b is
   a) linear for any value of b
   b) linear if b>0
   c) linear if b<0
   d) non-linear

5. If $x(t) \xrightarrow{HT} \hat{x}(t); \hat{X}(\omega) = F[\hat{x}(t)]$ and $\hat{X}(\omega) = |X(\omega)|e^{j\hat{\theta}(\omega)}$ then
   a) $|\hat{X}(\omega)| = -|X(\omega)|$
   b) $X(\omega) = \overline{X(\omega)}$
   c) $|\hat{X}(\omega)| = |X(\omega)| and \hat{\theta}(\omega) = -90°$
   d) $|\hat{X}(\omega)| = |X(\omega)| and \hat{\theta}(\omega) = 90°$

6. For distortionless transmission, system bandwidth must be equal to
   a) signal bandwidth
   b) two times signal bandwidth
   c) ½ of signal bandwidth
   d) infinite

7. $\frac{dy(t)}{dt} + 2ty(t) = t^2 x(t)$ is for a

   a) linear system
   b) non-linear system
   c) linear, time varying, static system
   d) linear, time varying, dynamic system

8. If a signal x(t) is differentiated 'm' times to produce an impulse then its Fourier coefficients will be proportional to,
   a) n^m
   b) $\frac{1}{n^{m-1}}$
   c) $\frac{1}{n^m}$
   d) n^{m-1}

9. The transfer function of a distortionless network is
   a) $H(\omega) = ke^{j\omega t_d}$
   b) $H(\omega) = ke^{-j\omega t_d}$
   c) $H(\omega) = kx(t - t_0)$

d) $H(\omega) = k$

10. The signals $x_1(t)$ and $x_2(t)$ are both band limited to $(-\omega_1, +\omega_1)$ and $(-\omega_2, +\omega_2)$ respectively. The Nyquist sampling rate for the signal $x_1(t)x_2(t)$ will be
   a) $2\omega_1$ if $\omega_1 > \omega_2$
   b) $2\omega_2$ if $\omega_1 < \omega_2$
   c) $2(\omega_1+ \omega_2)$
   d) $(\omega_1+ \omega_2)/2$

11. A band pass signal extends from 1KHz to 2 KHz. The minimum sampling frequency needed to retain all information in the sampled signal is
   a) 1 KHz
   b) 2 KHz
   c) 3 KHz
   d) 4 KHz

12. Choose the function f(t), -∞<t<+∞, for which a Fourier series cannot be defined
   a) 3 sin(25t)
   b) 4 cos(20t+3)+3 sin(10t)
   c) exp(-|t|)sin(25t)
   d) 1

13. If G(f) represents the Fourier transform of a signal g(t) which is real and odd symmetric in time, then
   a) G(f) is complex
   b) G(f) is imaginary
   c) G(f) is real
   d) G(f) is real and non-negative

14. Hilbert transform of $[\cos\omega_1 t+\sin\omega_2 t]$ is
   a) $\sin\omega_1 t-\cos\omega_2 t$
   b) $\cos\omega_1 t+\sin\omega_2 t$
   c) $\cos\omega_1 t-\sin\omega_2 t$
   d) $\sin\omega_1 t+\sin\omega_2 t$

15. The ROC of a causal signal $x(t)$ is,
   a) entire s-plane
   b) region in between two abscissa of convergence
   c) right of abscissa of convergence
   d) left of abscissa of convergence

16. If $x(t)$ and $X(s)$ are Laplace transform pairs, then Laplace transform of $\frac{x(t)}{t}$ is,
   a) $\int_0^\infty X(s)\, ds$
   b) $\int_s^\infty X(s)\, ds$
   c) $\frac{1}{s}\int_0^\infty X(s)\, ds$
   d) $\frac{1}{s}\int_s^\infty X(s)\, ds$

17. If $x(t)$ is periodic with period T, then Laplace transform of $x(t)$ is defined as,

a) $\frac{1}{1-e^{-sT}} \int_0^T x(t)e^{-st} \, dt$

b) $\frac{1}{1+e^{-sT}} \int_0^T x(t)e^{-st} \, dt$

c) $\frac{1}{1-e^{sT}} \int_0^T x(t)e^{-st} \, dt$

d) $\frac{1}{1+e^{sT}} \int_0^T x(t)e^{-st} \, dt$

18. The inverse Laplace transform of $X(s) = \frac{4}{s+5}$ for ROC $Re\{s\} > -4$ and $Re\{s\} < -4$ are respectively.

   a) $4e^{-5t}u(t) \ and \ 4e^{-5t}u(-t)$

   b) $4e^{5t}u(t) \ and \ 4e^{5t}u(-t)$

   c) $4e^{-5t}u(t) \ and - 4e^{-5t}u(-t)$

   d) $-4e^{-5t}u(t) \ and - 4e^{-5t}u(t)$

19. The convolution of $u(t) \ with \ u(t)$ will be equal to,

   a) $\delta(t)$

   b) $u(t)$

   c) $t\,u(t)$

   d) $t^2\,u(t)$

20. The ROC of the sequence $x(n) = u(-n)$ is,

   a) $|z| > 1$

   b) $|z| < 1$

   c) No ROC

   d) $-1 < |z| < 1$

21. The system function $H(z) = \frac{z^3 - 2z^2 + z}{z^2 + 0.25z + 0.125}$ is,

   a) Causal

   b) Unstable but causal

   c) Noncausal

   d) Cannot be defined

22. If all the poles of the system function $H(z)$ have magnitude smaller than 1, then the system will be,

   a) stable

   b) unstable

   c) BIBO stable

   d) a and c

23. The Z-transform is a,

   a) finite series

   b) infinite power series

   c) geometric series

   d) both a and c

24. An LTI system with impulse response, $h(n) = (-a)^n \, u(n) \ and - a < -1$ will be,

   a) stable system

   b) unstable system

   c) anticausal system

d) neither stable nor causal

1) The reliability of an instrument refers to,
   a) Measurement changes due to temperature variation,
   b) Degree to which repeatability continues to remain within specific limits,
   c) Life of instrument,
   d) The extent to which the characteristics remain linear

2) The degree of reproducibility among several independent measurement of the same vaule under reference conditions is known as
   a) Accuracy,
   b) Precision,
   c) Linearity,
   d) Calibration.

3) The errors committed by a person in the measurement are,
   a) Gross errors,
   b) Random errors,
   c) Instrumental errors,
   d) Environmental errors.

4) A linear variable differential transformer (LVDT) is
   a) A displacement transducer,
   b) An impedance matching transformer,
   c) A differential temperature sensor,
   d) An auto transformer

5) In order to reduce the effect of fringing in a capacitive transducer,
   a) The transducer is shielded and the shield is kept at ground potential,
   b) A guard ring is provided and it is kept at ground potential,
   c) The transducer is shielded and the shield is kept at same potential as the moving plate,
   d) A guard ring is provided and it is kept at the same potential as the moving plate.

6) A resistance potentiometer has a total resistance of 10 kΩ and is rated at 4 W. If the range of potentiometer is 0 to 100 mm, then its sensitivity in V/mm is
   a) 1.0
   b) 2.0
   c) 2.5
   d) 25

7) A semiconductor strain gauge,
   a) Has a much higher gauge factor that that of metal wire gauge,

b) Employs piezoelectric property of undoped silicon,

c) Does not require temperature compensation,

d) Exhibits very little gauge factor variation as compared to that of metal wire gauges.

8) All metal resistive strain gauges have a gauge factor nearly 2.5 because
   a) Young's modulus is the same for all metals and alloys,
   b) Poisson's ration is the same for all metals and alloys,
   c) the conductivity of metal changes with the applied strain in the elastic region in the same way,
   d) The conductivity of the material is independent of the applied strain.

9) A strain gauge is attached to a bar of 20 cm which is subjected to a tensile force. The nominal resistance of strain gauge is 100Ω. The changes in resistance and elongation in the bar measured are $0.35\ \Omega$ and 0.2 mm respectively. The gauge factor is the strain gauge is,
   a) 2
   b) 3.5
   c) 10
   d) 100

10) A piezoelectric type accelerometer has a sensitivity of 100 v/g. the transducer is subjected to a constant acceleration of 5g. The steady state output of the transducer will be
    a) 0 V
    b) 100 mV
    c) 0.5 V
    d) 5V

11) The torque in a rotating shaft is measured using strain gauges. The strain gauges must be positioned on the shaft such that the axes of the strain gauges are at,
    a) 0° with respect to the axis of the shaft,
    b) 30° with respect to the axis of the shaft,
    c) 45° with respect to the axis of the shaft,
    d) 90° with respect to the axis of the shaft.

12) In a thermocouple element heat energy transferred to the hot junction is converted to electrical energy by
    a) Johnson's effect,
    b) Seebeck effect,
    c) Hall effect,
    d) Faraday effect.

13) Thermistor shows,
    a) Positive resistance characteristics,
    b) Negative resistance characteristics,

c) Positive temperature characteristics,
d) Negative temperature characteristics.

14) Non-contact type temperature sensor is
   a) Thermocouple,
   b) Radiation pyrometer,
   c) Thermistor,
   d) RTD.

15) T-type thermocouple is made of
   a) Chromel-alumel
   b) Copper-constantan
   c) Iron-constantan
   d) Iron-copper

16) The performance of a capacitive level indicator is severely affected by dirt, because it changes the
   a) Area of the plate
   b) Distance between the plates
   c) Dielectric constant
   d) Level of the liquid

17) A gas chromatograph is used for
   a) Measuring the flow rate of a gas,
   b) Measuring the temperature of a gas,
   c) Measuring the pressure of a gas,
   d) Analysing the composition of a gas.

18) The signal conditioning stage after a piezoelectric sensor would be
   a) DC bridge,
   b) Phase sensitive detector,
   c) Charge amplifier,
   d) Cold junction compensation.

19) The temperature being sensed by anegative temperature oefficient (NTC) type thermistor is linearly increasing. Its resistance will
   a) Linearly increase with temperature,
   b) Exponentially increase with temperature,
   c) Linearly decrease with temperature,
   d) Exponentially decrease with temperature,

20) In a capacitive type hygrometer, the variation in humidity is measured as a variation in
   a) Area between the plates,
   b) Distance between the plates,

c) Dielectric constant between the plates,
d) Density between the plates.

ANSWERS:

Q.No	Answer
1)	b
2)	b
3)	a
4)	a
5)	d
6)	b
7)	a
8)	c
9)	b
10)	a
11)	c
12)	b
13)	c
14)	b
15)	b
16)	c
17)	d
18)	c
19)	d
20)	c

1. Microcontrollers are
   a) ASIP

   b) GPP

   c) DSP

   d) ADSP

   Answer: A

2. The most common type of microcontroller
   a)CISC

b) RISC

c) Instruction

d) ALL

3. An embedded system must have
   a) Hard disk

   b) Processor and memory

   c) Operating system

   d) Processor and input-output unit(s)

4. Count interval =
   a) $p \times \delta T$ interval

   b) PxT

   c) PTxδ interval

   d) PδxT interval

5. The _____protocol control method requires the servant to assert an acknowledge, line to indicate to the master the data is read in a data transfer.
   a) Strobe   b) Standard   c) Handshake   d) Fixed

6. HDLC
   a) High-level Direct Link Control
   b) High-level Data Link Control
   c) High-link Data Link Control
   d) High-level Data Line Control

7. The potential which exists in a p-n junction to cause drift of charge carriers is called
   (a) contact potential

   (b) diffusion potential

   (c) ionisation potential

   (d) threshold potential

8. Wave mechanics in electron theory is also known as
   (a) Eienstein theory

   (b) Quantum mechanics

   (c) Bohr mechanics

   (d) Classical theory

9. Fermi level in Intrinsic semiconductor lies
       (a) close to conduction band

       (b) In the middle

       (c) close to valence band

       (d) None of the these

Answer: C

10. A diode which is formed by using lightly doped GaAs or silicon witil metal is called
       (a) Zener diode

       (b) Schottky diode

       (c) Varactor diode

       (d) tunnel diode

Answer: B

11. Special types of diodes in which transition time and storage time are made small are called ...
       (a) Snap diodes

       (b) Rectifier diodes

       (c) Storage diodes

       (d) Memory' diodes

Answer: A

12. The Circuit which converts undirectional flow to D.C. is called
       (a) Rectifier circuit

       (b) Converter circuit

       (c) filter circuit

       (d) Eliminator

Answer: C

13. For ideal Rectifier and filter circuits, % regulations must be ...
    (a) 1%

    (b) 0.1 %

    (c) 5%

    (d) 0%

Answer: D

14. The value of current that flows through RL in a *'n'* section filter circuit at no load is
    (a) infinite

    (b) 0.1 rnA

    (c) 0

    (d) few rnA

Answer: C

15. As reverse bias voltage is increased, for a diode, the base width at the junction
    (a) decreases

    (b) increases

    (c) remains same

    (d) none of these

Answer: B

16. The forward break over voltage is symbolically represented as, (For SCR)
    (a) V_{BO}

    (b) V_{BOO}

    (c) V_{BR}

    (d) V_{FBO}

Answer: D

17. Insulated Gate Field Effect Transistor (IGFET) is a ...

(a) Normal JFET device

(b) n-channel J FET device

(c) p-channel JFET device

(d) MOSFET device

Answer: D

18. The resistor which is connected in series with source resistance Rs to reduce distortion in JFET amplifier circuits is called
(a) Swamping resistor

(b) swinging resistor

(c) bias resistor

(d) distortion control resistor

Answer: A

19. When the input is symmetrical, to operate the BJT in active region, the quiescent point is chosen .
(a) at the top edge of the load line

(b) at the bottom edge of the load line

(c) at the centre of the load line

(d) can be chosen any where on the load line

Answer: C

20. AC load line is also known as ....
(a) dynamic load line

(b) variable load line

(c) quiescent load line

(d) active load line

Answer: A

1. Band tailing causes absorption of photons of energy................
   (a) Lower than E_g
   (b) Equal to E_g
   (c) Greater than E_g
   (d) None

Ans. C

2. In Franz-Keldysh effect, the band gap of the semiconductor ....with increasing field strength.
   (a) Decreases
   (b) increases
   (c) remains same
   (d) None

   Ans. C

3. Momentum of a photon is ....than that of phonon.
   (a) Equal
   (b) lesser
   (c) greater
   (d) None

Ans. B

4. The selection rule for transitions in multiple quantum well is.......................
   (a) $\Delta n=1$
   (b) $\Delta n=2$
   (c) $\Delta n=0$
   (d) None

Ans. C

5. The LH and HH are degenerate at.............................
   (a) k=1
   (b) k=0
   (c) k=-1
   (d) None

Ans. B

6. Band-to-band transitions in indirect bandgap semiconductors require...................
   (a) phonons

      (b) photons

      (c) holes

      (d) None

Ans. A

7. Total recombination lifetime in direct bandgap semiconductors……………………..than that of indirect bandgap semiconductors.
      (a) more
      (b) less
      (c) equal
      (d) None

Ans. B

8. In a non-absorbing medium, the refractive index is equal to………………
      (a) $\varepsilon^{1/2}$
      (b) $\varepsilon^{1/3}$
      (c) $\varepsilon^{1/4}$
      (d) None

Ans. A

9. Mean lifetime of a photon is ………………………..proportional to the absorption coefficient.
      (a) Directly
      (b) inversely
      (c) no relation
      (d) None

Ans.B

10. Semiconductor at absolute zero behaves like a …………………………
      (a) Metal
      (b) superconductor
      (c) Insulator
      (d) None

Ans. C

11. The threshold current density of an injection laser…………………………with temperature.
      (a) decreases
      (b) increases
      (c) unchanged
      (d) None

Ans. B

12. For high internal quantum efficiency of an LED the radiative recombination time should be
    …………………………..
    (a) low
    (b) high
    (c) no change
    (d) none

Ans. A

13. Higher order transverse modes in a semiconductor (SC) laser cavity can be controlled by
    reducing…………………………of the cavity.
    (a) Length
    (b) width
    (c) layer thickness
    (d) none

Ans. B

14. For Fabry-Perot resonance, the length of the laser cavity should be an integral multiple of …..
    (a) $\lambda/3$
    (b) $\lambda/5$
    (c) $\lambda/2$
    (d) None

Ans. C

15. 3dB electrical band width is…………………………..than 3 dB electrical bandwidth in anfibre optic
    communications system.
    (a) smaller
    (b) greater
    (c) equal to
    (d) none

Ans. A

16. the thermal noise of a pin photodiode is ……………………proportional to the load resistance.
    (a) directly
    (b) inversely
    (c) not related
    (d) none

Ans. B

17. The statistics of monochromatic radiation arriving at a detector follows…………….distribution.
    (a) Binomial
    (b) Gaussian
    (c) Poisson's
    (d) None

Ans. C

18. The reverse bias voltage in an avalanche is ……………….than that of a pin photodiode.
    (a) larger
    (b) smaller
    (c) equal to
    (d) none

Ans. A

19. ……………………in conjunction with single mode fibres are preferred for long haul-off communication links.
    (a)LEDs
    (b)laser diodes
    (c) incandescent bulbs
    (d) none

    Ans. B

20. ………………enables better light coupling into single mode fibres.
    (a) surface emitting LED
    (b) incandescent bulbs
    (c)edge emitting LED
    (d) none.
    Ans. C

        21. m The output of an LED……………………..with modulation frequency.
    (a) Remains same
    (b) increases
    (c) decreases
    (d) None

Ans. C

21. Microcontrollers are
    a) ASIP

    b) GPP

    c) DSP

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Answer: C

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    (d) 0%

Answer: D

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        (b) variable load line

        (c) quiescent load line

        (d) active load line

1. When the port lines of a port in 8051 are to be used as input lines then the value that must be written to the port address is
        a) F0H
        b) 0FH
        c) FFH
        d) 00H

Answer: c

2. Which of the following is bit-addressable register in 8051?
        a) SBUF
        b) PCON
        c) TMOD
        d) SCON

Answer: d

3. Among the four groups of register banks in 8051, the number of groups that can be accessed at a time is
        a) 1
        b) 2
        c) 3
        d) all the four

Answer: a

4. The pulses at T0 or T1 pin of 8051are counted in
   a) timer mode
   b) counter mode
   c) idle mode
   d) power down mode

Answer: b

5. The serial port interrupt of 8051 is generated if
   a) RI is set
   b) RI and TI are set
   c) either RI or TI is set
   d) RI and TI are reset

Answer: c

6. The external interrupt that has the lowest priority among the following in 8051 is
   a) TF0
   b) TF1
   c) IE1
   d) IE0

Answer: c

7. Among the five interrupts generated by 8051, the lowest priority is given to the interrupt
   a) IE0
   b) TF1
   c) TF0
   d) RI

Answer: d

8. The address register of 8051 for storing the 16-bit addresses can only be
   a) stack pointer
   b) data pointer
   c) instruction register
   d) accumulator

Answer: b

9. All conditional jumps of 8051 are
   a) absolute jumps
   b) long jumps
   c) short jumps
   d) none

Answer: c

10. The absolute jump instruction of 8051 is intended mainly for a jump within a memory space of
    a) 2 bytes
    b) 2 Kbytes
    c) 2 Mbytes
    d) none

Answer: b

11. The LJMP instruction of 8051 is very useful in programming in the external code memory space of
    a) 32 MB
    b) 64 MB
    c) 32 KB
    d) 64 KB

Answer: d

12. The mnemonic used to perform a subtraction of source with an 8-bit data and jumps to specified relative address if subtraction is non-zero in 8051 is
    a) DJNZ
    b) CJNE

c) JZ
d) JNC

Answer: b

13. The type of operand that is not allowed to use in boolean instructions of 8051 is
    a) direct register operands
    b) indirect register operands
    c) immediate bit
    d) none

Answer: c

14. In Boolean instructions of 8051, the flag that is the only allowed destination operand for two operand instructions is
    a) overflow flag
    b) underflow flag
    c) auxiliary flag
    d) carry flag

Answer: d

15. After reset, the stack pointer(SP) is initialized to the address of
    a) internal ROM
    b) internal RAM
    c) external ROM
    d) external RAM

Answer: b

Bold ones are answers:

16. After reset, PC and DPTR register are initialized to address_____.
    a) 08H, 07H
    b) 09H, 07H
    c) 0H, 0H
    d) 06H, 07H

Ans. C

17. How many bytes space does the instruction MOV A,#76H occupy?

a) one byte

b) two bytes

c) three bytes

d) one word

Ans. B

18. 8051 can support a maximum capacity of ROM memory.
a) 32 KB
b) 64 KB
c) 4 KB
d) 8 KB

Ans. B

19. The 8051 has _____ parallel and _____ serial ports.

a) 8, 2

b) 4, 2

c) 4, 1

d) 8, 1

Ans. C

20. After the execution of the instruction DIV AB, quotient will be stored in _____register and remainder in _____register.

a) **A register , B register**

b) B register, A register

c) AB register, C register

d) B register, AC register

Ans. A