Module Name : PhD Electronic and Communication Engineering-E
Exam Date : 18-Sep-2020 Batch : 09:00-11:00

Sr. No.	Client Question ID	Question Body and Alternatives	Marks	Negative Marks
Objective Question				
1	1	A standard air filled rectangular waveguide has dimensions a =7.21 cm and b=3.4 cm. The type of mode that can be used to transmit electromagnetic wave with wavelength λ =10cm is A1 : TE_{10} A2 : TE_{11} A3 : TE_{20} A4 : TE_{21}	4.0	1.00
Objective Question				
2	2	The operating frequency of TRAPATT diode is A1 : 11-20 GHz A2 : 1-10 GHz A3 : 31-40 GHz A4 : 21-30 GHz	4.0	1.00
Objective Question				
3	3	The most appropriate value of the radiation resistance of a quarter wave monopole antenna is A1 : 120 Ω A2 : 73 Ω A3 : 36.5 Ω A4 : 50.7 Ω	4.0	1.00
Objective Question				
4	4	A transmission line of 50 ohm characteristic impedance is terminated with a 100ohm resistance. The minimum impedance measured on the line is equal to	4.0	1.00

		A1 : 100 Ω A2 : 75 Ω A3 : 50 Ω A4 : 25 Ω		
Objective Question				
5	5	Wave Tilt occurs in A1 : Ground Wave Propagation A2 : Space Wave Propagation A3 : Ionospheric Propagation A4 : Under-Water Propagation	4.0	1.00
Objective Question				
6	6	The depth of penetration of wave in a lossy dielectric increases with increasing A1 : Conductivity A2 : Wavelength A3 : Permeability A4 : Permittivity	4.0	1.00
Objective Question				
7	7	When electromagnetic waves are propagated in a waveguide A1 : They travel along the broader walls of the guide A2 : They travel through the dielectric without touching the walls A3 : They are reflected from the walls but do not travel along them A4 : They travel along all four walls of the waveguide	4.0	1.00

Objective Question				
8	8	Waveguides are used mainly for microwave signals because A1 : They depend on straight line propagation which applies to microwaves only A2 : Losses would be too heavy at lower frequencies A3 : There are no generators powerful enough to excise them at lower frequencies A4 : They would be too bulky at lower frequencies	4.0	1.00
Objective Question				
9	9	The line of sight communication requires the transmit and receive antenna to face each other. If the transmit antenna is vertically polarized for best reception, the receive antenna should be A1 : Vertically polarized A2 : Horizontally polarized A3 : At 45 with respect to horizontal polarization A4 : At 45 with respect to vertical polarization	4.0	1.00
Objective Question				
10	10	The magnitude of open circuit and short circuit input impedances of a transmission line are 100 Ω and 25Ω respectively. The characteristic impedance of the line is A1 : 25 Ω A2 : 50 Ω A3 : 75 Ω A4 : 100 Ω	4.0	1.00
Objective Question				
11	11	The phase velocity of the TE_{10} mode in an air filed rectangular waveguide is A1 : Equal to C A2 : Less than C A3 : Greater than C	4.0	1.00

		A4 : None of these		
Objective Question				
12	12	When the free space wavelength of signal equals the cut off wavelength of the waveguide, the characteristics impedance of the waveguide becomes A1 : Negligible A2 : 1KΩ A3 : 300KΩ A4 : Infinite	4.0	1.00
Objective Question				
13	13	One can provide two or more voice circuits on the same carrier by using A1 : ISB system A2 : SSB-SC system A3 : DSB-SC system A4 : SSB with pilot carrier	4.0	1.00
Objective Question				
14	14	A signal of maximum frequency of 8 KHz is sampled at Nyquist rate. The time intervals between two successive samples will be A1 : 6.25 µsec A2 : 62.5 µsec A3 : 125 µsec A4 : 1250 µsec	4.0	1.00
Objective Question				
15	15	A communication channel has bandwidth of 5KHz and if signal-to-noise ratio is 5, the corresponding channel capacity will be A1 : 5000 bits/sec A2 : 2000 bits/sec	4.0	1.00

		A3 : 18000 bits/sec A4 : 11000 bits/sec		
Objective Question				
16	16	The minimum required bandwidth for transmission of n signals , each band-limited to f_m Hz is A1 : f_m/2Hz A2 : f_mHz A3 : f_m /2n Hz A4 : 2n f_m Hz	4.0	1.00
Objective Question				
17	17	If E_b the energy per bit of a binary digital signal is 10^{-6} Watt-sec and one sided power spectral density of the White noise N_o is 10^{-5}W/Hz, then the output SNR of the matched filter is A1 : 13 dB A2 : 25 dB A3 : 37 dB A4 : 48 dB	4.0	1.00
Objective Question				
18	18	The angle modulated signal is given by $s(t) = \cos 2\pi(2\times10^6 t + 30\sin 150t + 40\cos 150t)$ .The maximum frequency deviation in radian/sec is A1 : 750 A2 : 7500 A3 : 75000 A4 : 750000	4.0	1.00
Objective Question				
19	19	A signal has a bandwidth of 1 MHz. It is sampled at a rate 50% higher than the Nyquist rate and quantized into 256 level using a μ-low quantizer with μ = 225. It was found that a sampling rate 20% above the rate would be adequate. So the	4.0	1.00

		maximum SNR, that can be realized without increasing the transmission bandwidth, would be A1 : 60.4 dB A2 : 70.3 dB A3 : 50.1 dB A4 : 40.5 dB		
Objective Question				
20	20	At a given probability of error, binary coherent FSK is inferior to binary coherent PSK by A1 : 0 dB A2 : 1 dB A3 : 2 dB A4 : 3 dB	4.0	1.00
Objective Question				
21	21	How many AM broadcast stations can be accommodated in a 100KHz bandwidth if the highest frequency modulating a carrier is 5KHz A1 : 10 A2 : 30 A3 : 50 A4 : 70	4.0	1.00
Objective Question				
22	22	In a single sideband suppressed carrier AM system, the modulation index is changed from 0 to 1, the power content of the signal A1 : will increase by 50 percent A2 : will increase by 25 percent A3 : will be doubled A4 will be quadrupled	4.0	1.00

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Objective Question				
23	23	Four voice signals, each limited to 4KHz and sampled by Nyquist rate are converted into binary PCM using 256 quantization levels. The bit transmission rate for the time division multiplexed signal will be A1 : 8Kbps A2 : 32 Kbps A3 : 256Kbps A4 : 512Kbps	4.0	1.00
Objective Question				
24	24	Compression in PCM refers to relative compression of A1 : Lower signal frequencies A2 : Higher signal frequencies A3 : Lower signal amplitudes A4 : Higher signal amplitudes	4.0	1.00
Objective Question				
25	25	The maximum data rate supported by IEEE 802.11 b at 2.4GHz is A1 : 11 Mbps A2 : 54 Mbps A3 : 100 Mbps A4 : 125 Mbps	4.0	1.00
Objective Question				
26	26	A normal GSM has 3 start bits, 3 stop bits, 26 training bits for allowing adaptive equalization, 8.25 guard bits and 2 bursts of 58 bits of encrypted data which is transmitted at 270.833Kbps in the channel. A1 : 417.66 frames/sec A2 : 216.66 frames/sec	4.0	1.00

		A3 : 318.66 frames/sec A4 : 519.66 frames/sec		
Objective Question				
27	27	The frame length of WCDMA is given by A1 : 2ms A2 : 5ms A3 : 10ms A4 : 20 ms	4.0	1.00
Objective Question				
28	28	If the coherence bandwidth of the channel is smaller than the bandwidth of the signal, then the type of fading is A1 : Flat fading A2 : Slow fading A3 : Fast fading A4 : Frequency selective fading	4.0	1.00
Objective Question				
29	29	CDMA 2000 1xEV provides high speed data access with channel allocation of A1 : 1.25 MHz A2 : 5 MHz A3 : 25 MHz A4 : 50 MHz	4.0	1.00
Objective Question				
30	30	The types of modulation used in IS-95 (CDMA) is A1 : GFSK A2 : QPSK	4.0	1.00

		: A3 : GMSK A4 : DQPSK		
Objective Question				
31	31	The speech coding used in D-AMPS is A1 : QCELP A2 : RPE-LTE A3 : VSELP A4 : None of these	4.0	1.00
Objective Question				
32	32	Under normal operating conditions, GaAs LED will have a forward voltage between A1 : 3.1 and 5V A2 : 5.1 and 7V A3 : 0 and 1V A4 : 1.1 and 3V	4.0	1.00
Objective Question				
33	33	In an optical fiber, the concept of Numerical Aperture is applicable in describing the ability of _____ A1 : Light Collection A2 : Light Scattering A3 : Light Dispersion A4 : Light Polarization	4.0	1.00
Objective Question				
34	34	In Kerr effect, induced index change has its proportionality with respect to A1 : one fourth of electric field	4.0	1.00

		A2 : square of electric field A3 : cube root of electric field A4 : cube of electric field		
Objective Question				
35	35	For a photo-diode with responsivity of 0.50A/W and optical power of about 12μW, What would be the value of generated photocurrent? A1 : 12μA A2 : 9μA A3 : 6μA A4 : 3μA	4.0	1.00
Objective Question				
36	36	In the fiber optic link, power transfer from one fiber to another and from fiber to detector must take place with _____ coupling efficiency A1 : Unpredictable A2 : Stable A3 : minimum A4 : maximum	4.0	1.00
Objective Question				
37	37	If a fiber operates at 1400nm with the diameter of about 10 μm, n_1 = 1.30, Δ = 0.80% , V = 3.5, then how many modes will it have? A1 : 6.125 A2 : 9.655 A3 : 12.950 A4 : 16.550	4.0	1.00

Objective Question

38	38	A system with an input $x(t)$ and output $y(t)$ is described the relation $y(t) = tx(t)$. This system is A1 : Non-linear and time-invariant A2 : Non-linear and time-varying A3 : Linear and time-invariant A4 : Linear and time-varying	4.0	1.00

Objective Question

39	39	The Fourier series of an odd periodic function contains only A1 : Even harmonics A2 : Odd harmonics A3 : Sine terms A4 : Cosine terms	4.0	1.00

Objective Question

40	40	If G(f) represents the Fourier transform of a signal g(t) which is real and odd symmetric in time, then A1 : G(f) is real and non-negative A2 : G(f) is complex A3 : G(f) is real A4 : G(f) is imaginary	4.0	1.00

Objective Question

41	41	Which of the following signals is periodic? A1 : $s(t) = \cos 2t + \cos 3t + \cos 5t$ A2 : $s(t) = \exp(-7t) \sin 10\pi t$ A3 : $s(t) = \cos 2t \cos 4t$	4.0	1.00

		A4 : None of the above		
Objective Question				
42	42	For an N-point FFT algorithm with $N=2^m$, which one of the following statements is TRUE? A1 : It is not possible to construct a signal flow graph with both input and output in normal order. A2 : Computation of a butterfly requires only one complex multiplication. A3 : Number of butterflies in the m^{th} state is N/m 3600 samples/sec. A4 : In-place computation requires storage of only 2N node data	4.0	1.00
Objective Question				
43	43	The impulse response $h[n]$ of a linear time invariant system is given by $h[n]=u[n+3]=u[n-2]-2u[n-7]$ where $u[n]$ is the unit step sequence. The above system A1 : Unstable and not causal A2 : Causal but unstable A3 : Stable but not causal A4 : Stable and causal	4.0	1.00
Objective Question				
44	44	A causal system having the transfer function $H(s)=\frac{1}{s+2}$ is excited with $10u(t)$. The time at which the output reaches 99% of its steady state value is A1 : 2.9 sec A2 : 2.7sec A3 : 2.5 sec A4 : 2.3sec	4.0	1.00
Objective Question				
45	45	The type of interpolation where for each new location the intensity of the immediate pixel is assigned is	4.0	1.00

		A1 : Nearest Neighbour Interpolation A2 : Bilinear Interpolation A3 : Cubic Interpolation A4 : Bicubic Interpolation		
Objective Question				
46	46	The smallest discernible change in intensity level is called _____ A1 : Contour A2 : Intensity Resolution A3 : Saturation A4 : Contrast	4.0	1.00
Objective Question				
47	47	Which of the following is a second-order derivative operator? A1 : Histogram A2 : Gaussian A3 : Laplacian A4 : None of these	4.0	1.00
Objective Question				
48	48	Which of the following fails to work on dark intensity distributions? A1 : Power Law Transformation A2 : Laplacian Transform A3 : Gaussian Transform A4 : Histogram Equalization	4.0	1.00
Objective Question				

49	49	Final step of enhancement lies in _____ of the sharpened image A1 : Increase dynamic range A2 : Increase range of contrast A3 : Increase range of brightness A4 : None of these	4.0	1.00
Objective Question				
50	50	Which of the following is the primary objective of sharpening of an image? A1 : Blurring the image A2 : Highlight fine details in the image A3 : Increase the brightness of the image A4 : Decrease the brightness of the image	4.0	1.00
Objective Question				
51	51	What is the name of process used to correct the power-law response phenomena? A1 : Beta correction A2 : Alpha correction A3 : Gamma correction A4 : Pie correction	4.0	1.00
Objective Question				
52	52	The effective dielectric constant of a micro strip line with relative permittivity being equal to 2.6 with a width of 5mm and thickness equal to 8mm is given by A1 : 3.16 A2 : 2.62 A3 : 2.43 A4 : 1.97	4.0	1.00

Objective Question				
53	53	The mask in a hybrid microwave circuit is made of A1 : Rubylith A2 : Silicon A3 : Quartz A4 : Arsenic	4.0	1.00
Objective Question				
54	54	To fabricate a low frequency circuit using the hybrid microwave IC methodology, the material with _____ is preferred. A1 : low dielectric constant A2 : high dielectric constant A3 : low resistivity A4 : high resistivity	4.0	1.00
Objective Question				
55	55	The mode of propagation in a Microstrip Line is A1 : Quasi TE mode A2 : TE mode A3 : Quasi TEM mode A4 : TEM mode	4.0	1.00
Objective Question				
56	56	What is the maximum device handling capacity of serial standard protocol RS485 in terms of drivers and receivers on a single line? A1 : 8 A2 : 10 A3 16	4.0	1.00

		: A4 : 32		
Objective Question				
57	57	Which development tool has the potential to allocate the specific addresses so as to load the object code into memory? A1 : Locator A2 : Loader A3 : Linker A4 : Library	4.0	1.00
Objective Question				
58	58	Which operations are not feasible to perform by simulator programs in accordance to real time programming? A1 : Memory operations A2 : I/O operations A3 : Register operations A4 : Debugging operations	4.0	1.00
Objective Question				
59	59	Which functioning element of microcontroller generates and transmits the address of instructions to memory through internal bus? A1 : Instruction Decoding Unit A2 : Timing and Control Unit A3 : Program Counter A4 : Arithmetic Logic Unit	4.0	1.00
Objective Question				
60	60	What is the possible range of current limiting resistor essential for lightening the LED in certain applications after pressing the push-button? A1 : 25-55 Ω	4.0	1.00

		A2 : 55-110 Ω A3 : 110-220 Ω A4 : 220-330 Ω		
Objective Question				
61	61	How is the address and data buses removed in external memory type of microcontrollers? A1 : Through multiplexing by external latch & ALE signal A2 : Through multiplexing by external latch & DLE signal A3 : Through demultiplexing by external latch & ALE signal A4 : Through demultiplexing by external latch & DLE signal	4.0	1.00
Objective Question				
62	62	What does the RAM location at 44H indicates about the seven-segment code? A1 : 7-segment code for the fourth character A2 : 7-segment code for the third character A3 : Display of select code for fourth display A4 : Display of select code for third display high	4.0	1.00
Objective Question				
63	63	The magnitude of the charge of a hole is A1 : Zero A2 : Equal to that of proton A3 : Equal to that of electron A4 : Equal to that of neutron	4.0	1.00
Objective Question				
64	64	What is associated with random motion due to thermal agitation in the movement of holes and electrons in a silicon crystal? A1 Recombination	4.0	1.00

		: A2 : Doping A3 : Drift A4 : Diffusion		
Objective Question				
65	65	Recombination refers to_____ A1 : Annihilation of holes and electrons A2 : Ionization of impurity atom A3 : Breaking of pair-bond A4 : Thermionic emission	4.0	1.00
Objective Question				
66	66	The electron mobility of Silicon at 300K is A1 : 2200 cm^2/(V-s) A2 : 1400 cm^2/(V-s) A3 : 980cm^2/(V-s) A4 : 450cm^2/(V-s)	4.0	1.00
Objective Question				
67	67	In a MOS capacitor with an oxide layer thickness of 10mm. The maximum depletion layer thickness is 100mm. the permittivities of the semiconductor and the oxide layer are ε_s and ε_{ox} respectively. Assume $\frac{\varepsilon_s}{\varepsilon_{ox}}$ =3, then ratio of the maximum capacitance to the minimum capacitance of this MOS capacitor is A1 : 2.15 A2 : 3.42 A3 : 4.33	4.0	1.00

		A4 : 5.24		
Objective Question				
68	68	The bandgap of Gallium Arsenide(GaAs) at 300K is A1 : 0.66eV A2 : 1.12eV A3 : 1.35eV A4 : 1.44eV	4.0	1.00
Objective Question				
69	69	The percentage of reduction in power dissipation by _____ is achieved by using SOI MOSFET A1 : 66% A2 : 55% A3 : 44% A4 : 33%	4.0	1.00
Objective Question				
70	70	In modern MOSFET, the material used for the gate is A1 : High purity silica A2 : Heavily doped polycrystalline silicon A3 : High quality silicon A4 : Epitaxial grown silicon	4.0	1.00
Objective Question				
71	71	The overall delay of nMOS inverter pair is A1 : τ A2 : 3τ	4.0	1.00

		A3 : 5τ A4 : 7τ		
Objective Question				
72	72	K Shell means A1 : Fourth orbit A2 : Third orbit A3 : Second orbit A4 : First orbit	4.0	1.00
Objective Question				
73	73	Lifetime is the amount of time between the creation and disappearance of A1 : free electron A2 : proton A3 : neutron A4 : ion	4.0	1.00
Objective Question				
74	74	Diffusion or storage capacitance is the term used to refer to A1 : The reverse bias capacitance of a diode A2 : The forward bias capacitance of a diode A3 : The breakdown capacitance of a zener diode A4 : The effective capacitance of the rectifier	4.0	1.00
Objective Question				
75	75	The drain of an n-channel MOSFET is shorted to the gate so that $V_{GS}=V_{DS}$. The threshold voltage V_{th} of the MOSFET is 1V. If the drain current (I_D) is 1ma for $V_{GS}=2V$, then for $V_{GS}=3V$, I_D is A1 : 2mA	4.0	1.00

		A2 : 3mA A3 : 4mA A4 : 6mA		
Objective Question				
76	76	The difficulty in achieving high doping concentration leads to A1 : distribution error A2 : error in doping A3 : error in concentration A4 : error in variation	4.0	1.00
Objective Question				
77	77	As die size shrinks, the complexity of making the photo masks A1 : increases A2 : decreases A3 : remains the same A4 : cannot be determined	4.0	1.00
Objective Question				
78	78	In CMOS fabrication, the photoresist layer is exposed to _____ A1 : Visible light A2 : Ultraviolet light A3 : Infrared light A4 : Fluorescent	4.0	1.00
Objective Question				
79	79	Among the VHDL features, which language statements are executed at the same time in parallel flow? A1 Sequential	4.0	1.00

		: A2 : Net-list A3 : Concurrent A4 : Test-bench		
Objective Question				
80	80	In VLSI design, which process deals with the determination of resistance & capacitance of interconnections? A1 : Floor planning A2 : Placement & Routing A3 : Testing A4 : Extraction	4.0	1.00
Objective Question				
81	81	According to body effect, substrate is biased with respect to A1 : Source A2 : Drain A3 : Gate A4 : SiO_2 layer	4.0	1.00
Objective Question				
82	82	Transconductance of MOS device can be increased by_____ A1 : decreasing the width A2 : increasing the width A3 : increasing the length A4 : decreasing the length	4.0	1.00
Objective Question				
83	83	Surface inversion occurs when gate voltage is	4.0	1.00

		A1 : Less than zero A2 : Lesser than the threshold voltage A3 : Equal to the threshold voltage A4 : Greater than the threshold voltage		
Objective Question				
84	84	CMOS has A1 : high noise margin A2 : high power dissipation A3 : high complexity A4 : high packaging density	4.0	1.00
Objective Question				
85	85	The chemical used for shielding the active areas to achieve selective oxide growth is A1 : Silicon Nitride A2 : Silver Nitride A3 : Polysilicon A4 : Hydrofluoric acid	4.0	1.00
Objective Question				
86	86	Two fair dices are thrown simultaneously. The probability that the sum of numbers on the dice exceeds 8 is A1 : $\frac{11}{36}$ A2 : $\frac{10}{36}$ A3 : $\frac{7}{36}$ A4 : $\frac{4}{36}$	4.0	1.00

Objective Question				
87	87	Lifetime of an electric bulb is a random variable with density $f(x) = kx^2$ where x is measured in years. If the minimum and maximum lifetimes of bulb are 1 and 2 years respectively, then the value of k is A1 : 0.231 A2 : 0.357 A3 : 0.428 A4 : 0.519	4.0	1.00
Objective Question				
88	88	If the standard deviation of the speed of vehicles in a highway is 8.8kmph and the mean speed of the vehicles is 33kmph. The coefficient of variation in speed is A1 : 0.1867 A2 : 0.1517 A3 : 0.3646 A4 : 0.2666	4.0	1.00
Objective Question				
89	89	Which among the below mentioned standard PDFs is/are applicable to discrete random variables? A1 : Poission Distribution A2 : Gaussian Distribution A3 : Rayleigh Distribution A4 : Exponential Distribution	4.0	1.00
Objective Question				
90	90	What would happen if the two events are statistically independent ? A1 : Conditional as well as elementary probabilities will exhibit no change A2 Conditional probability becomes equal to the elementary probability	4.0	1.00

		: A3 : Conditional probability becomes less than the elementary probability A4 : Conditional probability becomes more than the elementary probability		
Objective Question				
91	91	Mutually Exclusive events _____ A1 : Contain all sample points A2 : Contain all common sample points A3 : Does not contain any common sample point A4 : Does not contain any sample point	4.0	1.00
Objective Question				
92	92	Which property is exhibited by the auto-correlation function of a complex valued signal? A1 : Commutative property A2 : Distributive property A3 : Associative property A4 : Conjugate property	4.0	1.00
Objective Question				
93	93	If E denotes the expectation, the variance of a random variable X is A1 : $E(X^2)-(E(X))^2$ A2 : $E(X^2)$ A3 : $(E(X))^2$ A4 : $2E(X)$	4.0	1.00
Objective Question				
94	94	Runs scored by batsman in 5 one day matches are 50, 70, 82, 93, and 20. The standard deviation is _____ A1 : 25.89	4.0	1.00

		A2 : 25.79 A3 : 25.69 A4 : 25.59		
Objective Question				
95	95	The expected value of a discrete random variable ‘x’ is given by _____ A1 : $P(x)$ A2 : $\sum P(x)$ A3 : $\sum x\,P(x)$ A4 : 1	4.0	1.00
Objective Question				
96	96	A coin is tossed up 4 times. The probability that tails turn up in 3 cases is _____ A1 : 1/6 A2 : 1/4 A3 : 1/3 A4 : 1/2	4.0	1.00
Objective Question				
97	97	A man walking at the rate of 6 km/hr crosses a bridge in 15 minutes. The length of the bridge is _____. A1 : 1500m A2 : 1400m A3 : 1350m A4 : 1200m	4.0	1.00
Objective Question				
98	98	5 years ago, sister’s age was 5 times the age of her brother and the sum of present ages of sister and brother is 34 years. What will be the age of her brother after 6 years?	4.0	1.00

		A1 : 20 Years A2 : 15 Years A3 : 12 Years A4 : 10 Years		
Objective Question				
99	99	S.P. of 10 candles is same as C.P. of 12 candles. Find the gain percent. A1 : 11 % A2 : 15 % A3 : 20 % A4 : 25 %	4.0	1.00
Objective Question				
100	100	6, 24, ___ , 120, 210, 336 A1 : 95 A2 : 84 A3 : 72 A4 : 60	4.0	1.00