University of Mumbai

Examination June 2021

Examinations Commencing from 15th June 2021 to 26th June2021

Program: **Electronics and Telecommunication Engineering**

Curriculum Scheme: Rev2016

Examination: TE Semester VI

Course Code: ECC-504 and Course Name: Discrete Time Signal Processing

Time: 2 hour Max. Marks: 80

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Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	If the normalized transition width of a FIR filter using Hamming window is 0.1, the order N of the FIR filter is given as
Option A:	33
Option B:	31
Option C:	9
Option D:	10
2.	If an N-point sequence, If N=16, the total number of complex additions and multiplications using Radix-2 FFT are,
Option A:	64,80
Option B:	80,64
Option C:	64,32
Option D:	18,24
3.	Range of Round off error for sign magnitude binary number representation with B number of bits is given as -------
Option A:	$-\left(\frac{2^{-B}}{2}\right) \leq \epsilon_R \leq \left(\frac{2^{-B}}{2}\right)$
Option B:	$-\left(2^{-B}\right) \leq \epsilon_R \leq 0$
Option C:	$-\left(2^{-B}\right) \leq \epsilon_R \leq \left(2^{-B}\right)$
Option D:	$-\left(2^{+B}\right) \leq \epsilon_R \leq 0$
4.	The difference between butterworth and chebyshev filter pole location is
Option A:	Poles of butterworth filter lie on circle while poles of chebyshev filter lie on ellipse
Option B:	Poles of butterworth filter lie on ellipse while poles of chebyshev filter lie on circle
Option C:	Poles of butterworth filter lie on unit circle while poles of chebyshev filter lie on circle
Option D:	Poles of butterworth filter lie on ellipse and poles of chebyshev filter also lie on ellipse
5.	Compute the DFT of the Sequence, x(n)= {0,1,2,1 } at K=1
Option A:	X(1) = 2
Option B:	X(1) = -2
Option C:	X(1) = 1
Option D:	X(1) = -1

6.	An antisymmetric FIR filter with length N as even **does not pass** the frequency at $\omega = \frac{\pi}{3} rad/sec$. Give the location of the zeros of this filter
Option A:	$1\angle\frac{\pi}{3}$, $1\angle -\frac{\pi}{3}$ and 1
Option B:	$1\angle\frac{\pi}{3}$, $1\angle -\frac{\pi}{3}$ and -1
Option C:	$1\angle\frac{\pi}{3}$, $1\angle -\frac{\pi}{3}$, 1 and -1
Option D:	$1\angle\frac{\pi}{3}$, $1\angle -\frac{\pi}{3}$
7.	In the DTMF detection the _____ algorithm is used
Option A:	DIT-FFT
Option B:	DIF-FFT
Option C:	Geortzel's
Option D:	Chirpz
8.	The process of reducing the number of bits of a binary number is called _____
Option A:	Rounding
Option B:	Truncation
Option C:	Finite word
Option D:	Subtraction
9.	In DSP processors the convolution and correlation operations are performed in faster manner due to _____ hardware
Option A:	Multiple and accumulate unit (MAC)
Option B:	VLIW
Option C:	Multiple register structure
Option D:	Multiple processors
10.	Which filter has equi-ripple characteristics in the passband and varies monotonically in the stopband
Option A:	Type-I Chebyshev
Option B:	Type-II Chebyshev
Option C:	Butterworth
Option D:	Elliptical
11.	Design a Chebyshev filter with a maximum pass band attenuation of 2.5 dB at 20 rad/sec and a minimum stop band attenuation of 30 dB at 50 rad/sec
Option A:	2
Option B:	3
Option C:	1
Option D:	4
12.	The effect of coefficient quantization is less in _____ realization
Option A:	Direct Form I
Option B:	Direct Form II
Option C:	Cascade
Option D:	Parallel
13.	The convolution of two signals in time domain is equivalent to_____ of their spectra in frequency domain.
Option A:	Addition

Option B:	Multiplication
Option C:	Division
Option D:	Convolution
14.	The Complex valued phase factor/ Twiddle factor, W_N' can be expressed as,
Option A:	$W_N' = e^{-j2\pi N}$
Option B:	$W_N' = e^{\frac{-j2\pi}{N}}$
Option C:	$W_N' = e^{-j2\pi}$
Option D:	$W_N' = e^{-j2\pi kN}$
15.	If a signal sequence x(n) with frequency components between f1 and f2 is passed through a filter with a linear frequency response then its output is a
Option A:	Expanded version of input x(n)
Option B:	Compressed version of input x (n)
Option C:	Phase shifted version of input x(n)
Option D:	Delayed version of input x(n)
16.	Determine the order of the butterworth filter for the specifications Pass band gain = 1 dB Stop band gain = 30 dB Ωp = 200 rad/s and W Ωs = 600 rad/s.
Option A:	1
Option B:	2
Option C:	3
Option D:	4
17.	Consider a first order IIR filter $y(n) = x(n) + 0.5y(n-1)$. Find the dead band, if the length of the register is 4 bits
Option A:	0.125
Option B:	32
Option C:	0.417
Option D:	0.25
18.	In TMS320C67XX DSP processor how many functional units exists
Option A:	8
Option B:	6
Option C:	2
Option D:	4
19.	The Order N of Type I Linear phase FIR filters is _____ and it has _____ impulse response
Option A:	Odd, Symmetric
Option B:	Odd, Asymmetric
Option C:	Even, Symmetric
Option D:	Even, Asymmetric
20.	If a continuous time system has poles only in the left half of the S plane then the corresponding digital filter must have poles
Option A:	Only outside the unit circle

Option B:	Only inside the unit circle
Option C:	Anywhere on the z plane
Option D:	$2 \leq \|z\| \leq 3$

Q2	
A	**Solve any Two** **5 marks each**
i.	Draw the pole zero diagram of an antisymmetric FIR filter with number of coefficients (length) odd and passes the frequency $=\pi/2$. Also find its transfer function and identify the type of the linear phase filter
ii.	Obtain the expression for the variance of the output noise of a LTI digital system H(z) which is fed with a quantized input signal
iii.	Derive the Parsevals Energy theorem of DFT and also find the Energy of signal x(n)={1,2,3,4}
B	**Solve any One** **10 marks each**
i.	Design a digital Butterworth filter that satisfies following constraints using impulse invariant method. Assume Ts=1s. $0.8 \leq \|H(e^{jw})\| \leq 1 \quad 0 \leq w \leq 0.2\pi$ $\|H(e^{jw})\| \leq 0.2 \quad 0.6\pi \leq w \leq \pi$
ii.	Explain the architecture of TMS320C67XX DSP processor

Q3.	
A	**Solve any Two** **5 marks each**
i.	Derive an expression for Frequency response of Type 1 Linear phase FIR filter having a length N = 5.
ii.	Explain the application of DSP in Radar processing
iii.	What is meant by limit cycles in recursive system? What is dead band of a filter?
B	**Solve any One** **10 marks each**
i.	Derive the flow graph for N=2.3 composite FFT
ii.	Design type I Chebyshev filter for given specifications as α_p=2dB,α_s=12dB,Fp=1kHz & Fs=2KHz. Use BLT method. Assume T=1s.

University of Mumbai

Examination June 2021

Examinations Commencing from 15th June 2021 to 26th June2021

Program: **Electronics and Telecommunication Engineering**

Curriculum Scheme: Rev 2016

Examination: TE Semester VI

Course Code: ECC-504 and Course Name: Discrete Time Signal Processing

Time: 2 hour Max. Marks: 80

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Question Number	Correct Option (Enter either 'A' or 'B' or 'C' or 'D')
Q1.	A.
Q2.	C.
Q3.	A.
Q4	A.
Q5	B.
Q6	A.
Q7	C.
Q8.	B.
Q9.	A.
Q10.	A.
Q11.	B.
Q12.	C.
Q13.	B.
Q14.	B.
Q15.	D.
Q16.	D.
Q17.	A.
Q18.	A.
Q19.	A.
Q20.	B.

University of Mumbai

Examination 2020 under cluster VESIT, Chembur **(Lead College:** A. P. Shah Institute of Technology (APSIT), Thane**)**

Program: **Electronics and Telecommunication**

Curriculum Scheme: R2016

Examination: TE Semester VI

Course Code: ECC 604 and Course Name: Image Processing and Machine Vision

Time: 2 hour Max. Marks: 80

Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	Which of the following color models is used for printers?
Option A:	CMYK
Option B:	RGB
Option C:	RCB
Option D:	CMR
2.	What are the basic necessary quantities that are used to describe the quality of a chromatic light source?
Option A:	Chrominance and wavelength
Option B:	Wavelength and frequency
Option C:	Radiance, brightness and luminance
Option D:	Contrast and dullness
3.	128X128 image with 64 gray levels requires _____bits of storage.
Option A:	4096
Option B:	8192
Option C:	12288
Option D:	98304
4.	To make the central Fourier spectrum, which operation is carried out on the input image.
Option A:	Rotation
Option B:	Scaling image by factor 2
Option C:	Multiplying image by (-1)^(x+y) where x, y are coordinates of pixel.
Option D:	Adding 128 to each pixel
5.	Following statement is true for the discrete cosine transform except_____
Option A:	Has real valued basis matrix
Option B:	Provides best energy compaction
Option C:	Does not provide image compression
Option D:	Is widely used in JPEG images
6.	Which of the following is a 4-point DFT matrix?
Option A:	$F = [+1 \ +1 \ +1 \ +1;\ +1 \ -i \ -1 \ +i;\ +1 \ +1 \ -1 \ +i;\ 1 \ -1 \ -1 \ -i\ ]$

Option B:	$F = [+1 \ +1 \ +1 \ +1; \ +1 \ -i \ -1 \ +i; \ +1 \ +1 \ +1 \ +i; -1 \ -1 \ -1 \ -i \ ]$
Option C:	$F = [+1 \ +1 \ +1 \ +1; \ +1 \ +i \ -1 \ -i; \ +1 \ +1 \ -1 \ -i; \ 1 \ -1 \ -1 \ +i \ ]$
Option D:	$F = [+1 \ +1 \ +1 \ +1; \ +1 \ -i \ -1 \ +i; \ -1 \ +1 \ -1 \ +i; \ +1 \ -1 \ +1 \ -i \ ]$
7.	What is the sum of all the components of a normalized histogram?
Option A:	-1
Option B:	0
Option C:	Size of image
Option D:	1
8.	The response of the smoothing linear spatial filter is_____
Option A:	Sum of image pixel in the neighborhood filter mask
Option B:	Difference of image in the neighborhood filter mask
Option C:	Product of pixels in the neighborhood filter mask
Option D:	Average of pixels in the neighborhood of filter mask
9.	Correction of power law response is called _____.
Option A:	Alpha correction
Option B:	Gamma correction
Option C:	Beta correction
Option D:	Pixel correction
10.	Histogram equalization on already Histogram equalized image will produce:
Option A:	Improvement in quality of an image
Option B:	Degrade quality of an image
Option C:	No change in quality of an image
Option D:	Blurring of an image
11.	Which of the following is the valid response when we apply a first derivative?
Option A:	Non-zero at flat segments
Option B:	Zero at the onset of gray level step
Option C:	Zero in flat segments
Option D:	Zero along ramps
12.	To set the average value of an image zero, which of the following coefficients should be 0 in the frequency domain representation of an image?
Option A:	F(0, 0)
Option B:	F(0, 1)
Option C:	F(1, 0)
Option D:	F(1, 1)
13.	In morphological operations, the Structuring element SE is viewed as
Option A:	Correlation mask
Option B:	Convolution mask
Option C:	Low pass filter
Option D:	High pass filter

14.	Which operator is used to detect isolated points in segmentation?
Option A:	Laplacian operator
Option B:	Prewitt operator
Option C:	Sobel operator
Option D:	Robert cross gradient
15.	Following are various type of mean filters except
Option A:	Arithmetic mean filter
Option B:	Geometric mean filter
Option C:	Sequence mean filter
Option D:	Harmonic mean filter
16.	What is an output image after applying a contra harmonic mean filter on the input image?
Option A:	Degraded image
Option B:	Original image
Option C:	Restored image
Option D:	Plane image
17.	Fourier approach for _____concept: convert 2D spectrum into 1D graphs.
Option A:	Texture Descriptor
Option B:	Regional Descriptor
Option C:	Parametric Descriptor
Option D:	Topological Descriptor
18.	Which of the following is the useful descriptor of a boundary, whose value is given by the ratio of length of the major axis to the minor axis?
Option A:	Radius
Option B:	Perimeter
Option C:	Area
Option D:	Eccentricity
19.	In object recognition, the sensed object properties are called as_____
Option A:	Classes
Option B:	Patterns
Option C:	Labels
Option D:	Objects
20.	The original support vector classifier was developed for….
Option A:	Non-linearly separable classes
Option B:	Linear separation of two classes
Option C:	Non-separable classes
Option D:	Multi-class classification

Q.2 A	**Solve any Two** **5 marks each**
i.	Justify DCT is real and orthogonal.
ii.	Draw and explain fundamental steps in digital image processing.

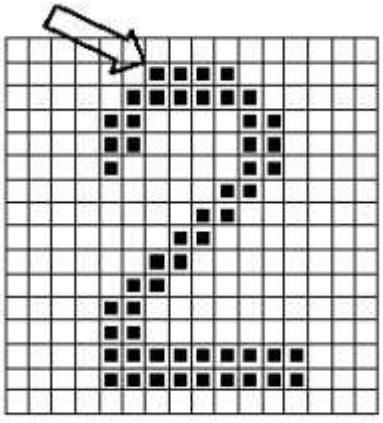
iii.	Generate Haar transform matrix for N=2.
Q.2. B	**Solve any One** **10 marks each**
i.	Perform histogram equalization for the image shown below and give the equalized image.

4	4	4	4	4
4	2	5	4	3
3	5	5	5	3
3	4	5	4	3
4	4	4	4	4

ii. Segment following image using split and merge algorithm. Predicate: T1= 100 and T2=200.

10	20	200	222	20	10	200	222
10	20	200	222	20	10	200	222
30	40	130	120	200	222	130	120
30	40	130	120	200	222	130	120
130	120	10	20	20	10	10	20
130	120	10	20	20	10	10	20
30	40	130	120	10	20	200	222
30	40	130	120	10	20	200	222

Q.3	**Attempt (any two)** **10 marks each**
i.	Write a short note on Support Vector Machine.
ii.	Explain Statistical Texture description method.
iii	Find chain code and shape number using 8 code connectivity for the following image. Arrow shows the starting point for chain code.



University of Mumbai

Examination 2021

Program: BE Electronics and Telecommunication Engineering

Curriculum Scheme: Revised 2016

Examination: Third Year Semester VI

Course Code: ECC604 and Course Name: Image Processing and Machine Vision

Time: 2 hours Answer key Max. Marks: 80

Question	Correct Option (Enter either 'A' or 'B' or 'C' or 'D')
Q1.	A
Q2.	C
Q3.	D
Q4	C
Q5	C
Q6	A
Q7	D
Q8.	D
Q9.	B
Q10.	C
Q11.	C
Q12.	A
Q13.	B
Q14.	A
Q15.	C
Q16.	C

Q17.	A
Q18.	D
Q19.	B
Q20.	B

University of Mumbai

Examination 2021 under cluster 5 (Lead College: APSIT)

Examinations Commencing from 01st June 2021

Program: Electronics and Telecommunication Engineering

Curriculum Scheme: Rev 2016

Examination: TE Semester VI

Course Code: ECC 601 and Course Name: Microcontroller & Applications

Time: 2 hour Max. Marks: 80

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Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	Which interrupt has the default highest priority in 8051?
Option A:	IE0
Option B:	TF0
Option C:	IE1
Option D:	TF1
2.	A high on the Reset Pin for _____ machine cycles resets the 8051 processor.
Option A:	One
Option B:	Two
Option C:	Three
Option D:	Four
3.	Identify the type of addressing mode used in the following instruction : ANL A, #0AH
Option A:	Direct Addressing Mode
Option B:	Indirect Addressing Mode
Option C:	Immediate Addressing Mode
Option D:	External Addressing Mode
4.	The total number of steps required to rotate one complete rotation of 360˚ is called as _____?
Option A:	Half Stepping
Option B:	Full Stepping
Option C:	Steps per Revolution
Option D:	Rpm
5.	Which of the following data types is not supported by the ARM Processors
Option A:	Half Byte
Option B:	Byte
Option C:	Word
Option D:	Half Word
6.	The process of fetching the next instruction while the current instruction is being executed is called as _____?
Option A:	Execute
Option B:	Compiling
Option C:	Pipelining

Option D:	Decoding
7.	For a TMOD register, Timer / Counter 0, Mode1. For this selection TMOD register should be set to which of the following?
Option A:	01H
Option B:	FCH
Option C:	4BH
Option D:	82H
8.	Identify the type of addressing mode for the given ARM instruction : **LDR R0, [R1,R2]**
Option A:	Register indirect addressing mode
Option B:	Relative register indirect addressing mode
Option C:	Base indexed indirect addressing mode
Option D:	Base with scaled register addressing mode
9.	What operation will the given ARM instruction perform after being executed : **SBC**
Option A:	Subtract
Option B:	Subtract with carry
Option C:	Reverse Subtract
Option D:	Reverse Subtract with carry
10.	_____ is a method by which the data can be received or transmitted using a single pin of microcontroller.
Option A:	Data Serialization
Option B:	Checksum Byte
Option C:	SFR
Option D:	Data Transmission
11.	Which port of 8051 has higher order Address bus multiplexed?
Option A:	Port0
Option B:	Port1
Option C:	Port2
Option D:	Port3
12.	In 8051, what is the vector address for Serial Interrupt?
Option A:	0003
Option B:	000b
Option C:	0013
Option D:	0023
13.	In 8051, "**DIV AB**" instruction numerator must be placed in register _____
Option A:	A
Option B:	B
Option C:	R0
Option D:	R2
14.	In 8051, what value must R4 have in order for the following instruction not to jump? **CJNE R4, #75,NEXT**
Option A:	74

Option B:	75
Option C:	73
Option D:	0
15.	How many maximum characters can be displayed on a 16x2 LCD at a time?
Option A:	16
Option B:	8
Option C:	32
Option D:	64
16.	Fixed instruction length is a feature of one of the following architectures.
Option A:	CISC
Option B:	RISC
Option C:	X86
Option D:	X51
17.	In an 8051 microcontroller, Which of these instructions can move the contents of the accumulator to external RAM?
Option A:	MOV @DPTR, A
Option B:	MOVX @Ri, A
Option C:	MOV A, @Ri
Option D:	MOVX @DPTR, A
18.	In order for pin P0.5 to function as GPIO pin, what should be the value of corresponding PINSEL Bits?
Option A:	10
Option B:	01
Option C:	00
Option D:	11
19.	The address of the reset interrupt in interrupt vector table of ARM7 is
Option A:	0X00000000
Option B:	0X00000004
Option C:	0X00000008
Option D:	0X0000000C
20.	Barrel shifter in ARM7 is used to perform which of the following operations?
Option A:	shift and rotate
Option B:	Data transfer
Option C:	Data store
Option D:	Data sorting

Q2	**Solve any Four out of Six** **5 marks each**
A	Write a program to copy the value 55H into RAM memory locations 40H to 41H using: (a) direct addressing mode, (b) register indirect addressing mode without a loop, and (c) with a loop.

B	Explain following ARM instructions: 1) AND R1, R1, #5 2) LDR R0, [R2] 3) EOR R1, R0, #1 4) MVN R2, #05 5) ADD R2, R3, R3, LSL #2
C	Differentiate between RISC and CISC design.
D	Explain 8051 Assembler directives.
E	Draw and explain the interrupt structure of 8051.
F	Explain SWI instruction in ARM7 with example.

Q3	**Solve any Four out of Six** **5 marks each**
A	Explain Addressing modes of 8051 with examples.
B	Explain Bit Addressable I/O Programming of an ARM processor.
C	Suppose a LED is interfaced with P0.0 of ARM. Write an embedded C language program to blink this LED with certain delay. Software generated delay may be used.
D	Explain Addressing modes of ARM7 Processor with examples in each.
E	Differentiate between Microprocessor & Microcontroller
F	Draw & Explain data flow model of ARM7.

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University of Mumbai

Examination 2020 under cluster 5 (Lead College: APSIT)

Examinations Commencing from 01st June 2021

Program: Electronics and Telecommunication Engineering

Curriculum Scheme: Rev 2016

Examination: TE Semester VI

Course Code: ECC 601 and Course Name: Microcontroller & Applications

Time: 2 hour Max. Marks: 80

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Question Number	Correct Option (Enter either 'A' or 'B' or 'C' or 'D')
Q1.	A
Q2.	B
Q3.	C
Q4	C
Q5	A
Q6	C
Q7	A
Q8.	C
Q9.	B
Q10.	A
Q11.	C
Q12.	D
Q13.	A
Q14.	B
Q15.	C
Q16.	B
Q17.	D
Q18.	C
Q19.	A
Q20.	A

Q2. Solve any Four out of Six: (5 marks each)

A) 8051 assembly language program:

```
(a)
    MOV A,#55H  ;load A with value 55H
    MOV 40H,A   ;copy A to RAM location 40H
    MOV 41H.A   ;copy A to RAM location 41H
(b)
    MOV A,#55H  ;load A with value 55H
    MOV R0,#40H ;load the pointer. R0=40H
    MOV @R0,A   ;copy A to RAM R0 points to
    INC R0      ;increment pointer. Now R0=41h
    MOV @R0,A   ;copy A to RAM R0 points to
(c)
       MOV A,#55H     ;A=55H
       MOV R0,#40H    ;load pointer.R0=40H,
       MOV R2,#02     ;load counter, R2=3
AGAIN: MOV @R0,A      ;copy 55 to RAM R0 points to
       INC R0         ;increment R0 pointer
       DJNZ R2,AGAIN ;loop until counter = zero
```

1 Mark

2 Marks

2 Marks

B) Explain following ARM instructions:
Marking Scheme: (1 Mark each)

1) AND R1, R1, #5
   - R1 = R1 AND 5.
2) LDR R0, [R2]
   - Load R0 with contents of memory location pointed by R2.
3) EOR R1, R0, #1
   - R1 = R0 OR 1
4) MVN R2, #05
   - R2 = NOT 05
5) ADD R2, R3, R3, LSL #2
   - R2 = R3 + (R3 + 4)

C) Differentiate between RISC and CISC design.
Marking Scheme: (1 Mark each differentiation)

D) Explain 8051 Assembler directives
Marking Scheme: (1 Mark for each Assembler directive with explanation)

E) Draw and explain the interrupt structure of 8051.
Marking Scheme: (2 Mark for diagram & 3 Marks for explanation)

F) Explain SWI instruction in ARM7 with example
Marking Scheme: (3 Marks for explanation & 2 Marks for example)

Q3. **Solve any Four out of Six: (5 marks each)**

A) Explain Addressing modes of 8051 with examples
Marking Scheme: (1 Mark for Addressing mode)

B) Explain Bit Addressable I/O Programming of an ARM processor.
Marking Scheme: (2 Marks for Diagram & 3 Marks for explanation)

C) Program to blink LED:
Marking Scheme: (3 Marks for logic, 2 Marks for correct program)

D) Addressing modes of ARM7 Processor with example
Marking Scheme: (1 Mark for each Addressing modes of ARM7 Processor with example)

E) Differentiate between Microprocessor & Microcontroller
Marking Scheme: (1 Mark for each difference).

F) Explain of data flow model of ARM7
Marking Scheme: (2 Mark for Diagram & 3 Marks for Explaining)

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University of Mumbai
Examination 2021

Examinations Commencing from 01st June 2021

Program: Electronics and Telecommunication Engineering

Curriculum Scheme: Rev2016

Examination: TE Semester VI

Course Code: ECCDLO 6022 and Course Name: Radar Engineering

Time: 2 hour Max. Marks: 80

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Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks. 2 marks each**
1.	The term radar cross section defines the:
Option A:	Amount of energy scattered by unwanted objects
Option B:	Power radiating ability of the radar
Option C:	Scattering ability of the target
Option D:	Cross section of radar area through which energy is emitted
2.	***Pr*** received by the Radar depends on the effective aperture
Option A:	A_e of target
Option B:	A_e of Receiver
Option C:	A_e of clock pulse
Option D:	A_e of transmitter
3.	The minimum Doppler shift is equal to
Option A:	100khz
Option B:	Zero
Option C:	Infinity
Option D:	Transmitter frequency
4.	Which statement regarding CW Doppler radar is wrong?
Option A:	it does not use duplexer
Option B:	it gives continuous transmission
Option C:	it gives accurate measurement of relative velocity
Option D:	it is capable of measuring target range
5.	MTI radar operating at 5 GHz has a PRF of 800 pps. The lowest blind speed is
Option A:	64 m/sec
Option B:	48 m/sec
Option C:	36 m/sec
Option D:	24 m/sec
6.	The characteristic of the magnetron output pulse that relates to accurate range measurement is its
Option A:	Amplitude
Option B:	Decay time
Option C:	Duration
Option D:	Rise time

7.	Electron-bombarded semiconductor has following technology
Option A:	Vacuum tube
Option B:	Semiconductor
Option C:	Hybrid Vacuum tube –semiconductor
Option D:	Metal semiconductor
8.	The attenuator is used in the traveling-wave tube to
Option A:	prevent saturation
Option B:	prevent oscillations
Option C:	help bunching
Option D:	increase gain
9.	What are the two basic kinds of cross-field amplifiers (CFAs)?
Option A:	Cross beam and perpendicular beam
Option B:	Injected beam and distributed emission
Option C:	Reticulated beam and focused beam
Option D:	Mad beam and upset beam
10.	PPI in a radar system stands for
Option A:	plan position indicator
Option B:	pulse position indicator
Option C:	plan position image
Option D:	prior position identification
11.	The noise figure *Fn* of a linear network may be defined as
Option A:	$Fn = N_{out}/kT_0B_nG$
Option B:	$Fn = N_{IN}/kT_0B_nG$
Option C:	$Fn = N_{out}/kT_0B_n$
Option D:	$Fn = N_{IN}/kT_0B_n$
12.	Which of the following diodes is used as a detector in radar?
Option A:	GUNN diode
Option B:	Schottky diode
Option C:	IMPATT diode
Option D:	Tunnel diode
13.	Higher PRF in radar will
Option A:	Increase the range of the radar
Option B:	Make weak signal discernible
Option C:	Improve the signal-to-noise ratio of the system
Option D:	Decrease the range of radar
14.	The time interval between the successive clock pulses is called
Option A:	speed
Option B:	maximum unambiguous range time
Option C:	minimum range
Option D:	pulse repetition time
15.	CW radar used to detect
Option A:	stationary target

Option B:	non stationary target
Option C:	density of target
Option D:	length of target
16.	What are clutters?
Option A:	The echo signals due to non-stationary objects
Option B:	The echo signals due to stationary objects such as plane and missile
Option C:	The echo signals due to error
Option D:	The echo signals due to stationary objects such as land and sea
17.	The difference between the target position and reference direction is
Option A:	angular position
Option B:	reference position
Option C:	angular error
Option D:	reference error
18.	B-scope radar display is more suitable for
Option A:	Multiple target detection radar
Option B:	Military Radars.
Option C:	Manually tracking Radar.
Option D:	non stationary target detection radar
19.	Radar uses what form of energy to detect planes, ships and land masses
Option A:	Sound energy
Option B:	Visible light
Option C:	Infrared radiation
Option D:	Electromagnetic energy
20.	After a target has been acquired, the best scanning system for tracking is
Option A:	conical
Option B:	spiral
Option C:	nodding
Option D:	helical

Q2 **(20 Marks Each)**	

A	**Solve any Two**	**5 marks each**
i.	Explain PPI.	
ii.	Explain Amplification process in TWT.	
iii.	Explain the concept of Doppler Shift. How it is implemented in Radars.	
B	**Solve any One**	**10 marks each**
i.	Explain Monopulse tracking in detail.	
ii.	Draw and explain Delay Line Canceller along with its frequency response.	

Q3. **(20 Marks Each)**		
A	**Solve any Two**	**5 marks each**
i.	Explain Superheterodyne Receiver.	
ii.	Explain Maximum Unambiguous Range. How it is related to PRF.	
iii.		
B	**Solve any One**	**10 marks each**
i.	Compare low power transmitter and high power transmitter and List the advantages of solid state RF power source.	
ii.	Explain Pulse Doppler Radar with a suitable diagram.	

University of Mumbai
Examination 2021

Examinations Commencing from 01st June 2021

Program: Electronics and Telecommunication Engineering

Curriculum Scheme: Rev2016

Examination: TE Semester VI

Course Code: ECCDLO 6022 and Course Name: Radar Engineering

Time: 2 hour Max. Marks: 80

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Question Number	Correct Option (Enter either 'A' or 'B' or 'C' or 'D')
Q1.	**C**
Q2.	**B**
Q3.	**B**
Q4	**D**
Q5	**B**
Q6	**D**
Q7	**C**
Q8.	**A**
Q9.	**B**
Q10.	**A**
Q11.	**A**
Q12.	**B**
Q13.	**C**
Q14.	**D**
Q15.	**B**
Q16.	**D**
Q17.	**C**
Q18.	**B**
Q19.	**D**
Q20.	**A**

University of Mumbai

Examination 2021 under cluster 5 (Lead College: APSIT)

Examinations Commencing from 01st June 2021

Program: Electronics and Telecommunication Engineering

Curriculum Scheme: Rev 2016

Examination: TE Semester VI

Course Code: ECC603 and Course Name: Antenna and Radio Wave Propagation

Time: 2 hour Max. Marks: 80

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Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	The far field is indicated by the presence of
Option A:	r term
Option B:	1/r term
Option C:	$1/r^2$ term
Option D:	$1/r^3$ term
2.	An antenna has a field pattern E (θ) =cos θ cos 2θ. The first null beam width of the antenna is:
Option A:	45^0
Option B:	90^0
Option C:	180^0
Option D:	120^0
3.	The following is an advantage of microstrip antennas
Option A:	low gain
Option B:	low efficiency
Option C:	Small size
Option D:	Low directivity
4.	The radiation resistance of folded dipole with four arms is
Option A:	73 Ω
Option B:	292 Ω
Option C:	657 Ω
Option D:	1168 Ω
5.	A circular loop antenna has a diameter of 1.5 λ has radiation resistance of
Option A:	270 Ω
Option B:	2790 Ω
Option C:	27.9 Ω
Option D:	27 Ω
6.	Antenna is a _____ element.
Option A:	Passive
Option B:	Active
Option C:	Resistive
Option D:	Capacitive

7.	If the length of an antenna is changed from 2 meters to 2.5 meters, its resonant frequency will
Option A:	Increase
Option B:	Depend on the velocity factor so the resonant frequency can either be increased or decreased
Option C:	Unchanged
Option D:	Decrease
8.	Increasing the width _____ the impedance, while length affects the _____ in the MSA.
Option A:	Decreases, frequency
Option B:	Increases, frequency
Option C:	Decreases, beamwidth
Option D:	Increases, beamwidth
9.	For end-fire array, the progressive phase shift should be
Option A:	Zero
Option B:	Infinite
Option C:	Finite
Option D:	-βd
10.	In log periodic antenna, the impedance is periodic with
Option A:	The logarithm of the frequency
Option B:	The logarithm of the gain
Option C:	The logarithm of the directivity
Option D:	The logarithm of the power
11.	The overall radiation pattern of an array does not depend on
Option A:	Geometrical pattern of placing array elements
Option B:	Polarization of the antenna
Option C:	Distance between individual elements
Option D:	Excitation of the individual element of an array
12.	In pattern multiplication of identical isotropic sources
Option A:	The field patterns are added and phase pattern are multiplied
Option B:	The field and phase pattern gets added
Option C:	The field patterns are multiplied and phase pattern are added
Option D:	The field and phase pattern gets multiplied
13.	If a linear uniform array consists of 7 isotropic elements separated by λ/4, what would be the directivity of a broadside array in dB?
Option A:	6.53 dB
Option B:	7.99 dB
Option C:	8.55 dB
Option D:	5.44 dB
14.	HPBW of H-plane horn with aperture dimension 10 λ in degrees is ____
Option A:	56
Option B:	67
Option C:	5.6

Option D:	6.7
15.	The grid wired corner reflector are used
Option A:	To increase the bandwidth
Option B:	To reduce the weight of the antenna system
Option C:	To achieve circular polarization
Option D:	To reduce height of antenna
16.	If an EM wave whose frequency is 30 MHz is incident with an angle of 60^0 , MUF is
Option A:	60 MHz
Option B:	20 MHz
Option C:	30 MHz
Option D:	10 MHz
17.	If the length of aperture in a pyramidal horn antenna is 10 cm and δ for the design is 0.25. Then, the flaring angle of the pyramidal horn is:
Option A:	30
Option B:	25.4
Option C:	45
Option D:	60
18.	Ground wave is effective when the transmitting and receiving antennas are
Option A:	Vertically polarized
Option B:	Horizontally polarized
Option C:	Elliptically polarized
Option D:	Circularly polarized
19.	In the two-antenna method of an antenna gain measurement system,
Option A:	Two antennas should have different gain
Option B:	Two antennas should have same gain
Option C:	Two antennas should have same impedance
Option D:	Two antennas should have same radiation pattern
20.	Horn is treated as a/an _____ antenna.
Option A:	Linear
Option B:	Planar
Option C:	Aperture
Option D:	Array

Q2	**Solve any Two Questions out of Three**	**10 marks each**

A	Design dipole antenna at frequency 3 GHz, diameter of antenna is less than λ/10. Compare dipole, monopole and folded dipole antennas.
B	Design rectangular microstrip antenna for 2.45 GHz. Select substrate refractive index ε_r = 2.32, h = 1.6 mm, tan δ = 0.001.
C	Write a short note on feeding methods of parabolic antenna. A 64 meter diameter parabolic reflector fed by a non-directional antenna at 1430 MHz. Calculate Half Power Beamwidth (HPBW) and First Null Beamwidth(FNBW).

Q3	**Solve any Two Questions out of Three** **10 marks each**
A	Explain the working principle of Yagi-Uda antenna and draw its radiation pattern. Mention its applications.
B	Derive Friss transmission formula. State its significance in wireless communication. A radio link has a 15 W transmitter connected to an antenna of 2.5 m^2 effective aperature at 5 GHz. The receiving antenna has an effective aperature of 0.5 m^2 and is located at a 15 km line of sight distance from the transmitting antenna. Assuming lossless, matched antennas, find the power delivered to the receiver.
C	Define critical frequency, Maximum usable frequency, Virtual height and Skip distance. Derive the relation between MUF and Skip distance.

University of Mumbai

Examination 2020 under cluster 5 (Lead College: APSIT)

Examinations Commencing from 01st June 2021

Program: Electronics and Telecommunication Engineering

Curriculum Scheme: Rev 2016

Examination: TE Semester VI

Course Code: ECC603 and Course Name: Antenna and Radio Wave Propagation

Time: 2 hour Max. Marks: 80

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Question Number	Correct Option (Enter either 'A' or 'B' or 'C' or 'D')
Q1.	B
Q2.	B
Q3.	C
Q4	D
Q5	B
Q6	A
Q7	D
Q8.	A
Q9.	D
Q10.	A
Q11.	B
Q12.	C
Q13.	D
Q14.	D
Q15.	B
Q16.	A
Q17.	B
Q18.	A
Q19.	B
Q20.	C

University of Mumbai

Examination 2020 under cluster 5 (Lead College: APSIT)

Program: Electronics and Telecommunication Engineering

Curriculum Scheme: Rev 2016

Examination: TE Semester VI

Course Code: ECCDLO6024 and Course Name: Audio Processing

Time: 2 hour Max. Marks: 80

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For the students: All the Questions are compulsory

Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	For a given speech bandwidth, the minimum sampling rate is fixed by the _____theorem.
Option A:	Chirp
Option B:	Goertzel
Option C:	Sampling
Option D:	Parseval's
2.	The critical bandwidth of auditory range is
Option A:	0 to 30KHz
Option B:	0 to 20KHz
Option C:	0 to 10KHz
Option D:	0 to 40 KHz
3.	The data rate of sampled and quantized audio signal is
Option A:	$I = F.f_s$
Option B:	$I = G.f_s$
Option C:	$I = B.f_s$
Option D:	$I = B.f_f$
4.	Adding first order fixed or adaptive prediction improved the SNR by about_____ over adaptive differential PCM system.
Option A:	3dB
Option B:	2dB
Option C:	4dB
Option D:	8dB
5.	What is an important factor of audio enhancement?
Option A:	To remove or suppress noise or echo.
Option B:	To remove original signal
Option C:	To add Gaussian noise
Option D:	To multiply Gaussian noise
6.	What is short time Fourier transform?
Option A:	Computing the signal for every time duration
Option B:	Computing the Fourier Transform of signal for every short time duration
Option C:	Computing the FT of signal for every long time duration
Option D:	Computing the convolution of signal for every long time duration

7.	What level of improvement can be achieved over a fixed quantizer?
Option A:	6dB
Option B:	10dB
Option C:	12dB
Option D:	4dB
8.	How many variable used in Short Time Fourier Transform defined as
Option A:	4
Option B:	1
Option C:	2
Option D:	3
9.	Zero Crossing Rate provide spectral information at
Option A:	High Cost
Option B:	Medium Cost
Option C:	Low Cost
Option D:	Very High Cost
10.	Which are partially captured by the triphone model?
Option A:	Articulation effects only
Option B:	Coarticulation effects only
Option C:	Both Articulation & Coarticulation effects
Option D:	Sound effects
11.	The interface between an analog signal and a digital processor is
Option A:	D/A converter
Option B:	A/D converter
Option C:	Modulator
Option D:	Demodulator
12.	The sampling technique having the minimum noise interference
Option A:	Natural Sampling
Option B:	Flat top Sampling
Option C:	Instantaneous Sampling
Option D:	Linear Sampling
13.	The speech signal is obtained after
Option A:	Analog to digital conversion
Option B:	Digital to Analog conversion
Option C:	Modulation
Option D:	Quantization
14.	It is convenient to determine the response of a linear system to a superposition of sinusoids or complex exponentials using
Option A:	Laplace representation
Option B:	Z domain representation
Option C:	Goertzel theorem
Option D:	Fourier representation

15.	The fundamental frequency of the vocal fold vibrations during voiced sounds is called _____
Option A:	Resonant
Option B:	Variants
Option C:	Formants
Option D:	Pitch
16.	The commonly used uniform quantizers are:
Option A:	Midtread and start tread
Option B:	Midriser and Midtread
Option C:	Midriser and Start riser
Option D:	Midtread and start riser
17.	The smallest perceptual unit of speech is _____
Option A:	Phoneme
Option B:	Syllable
Option C:	Consonant
Option D:	Plosive
18.	Spectrum flatteners are used to
Option A:	widen the spectrum
Option B:	remove the effects of the vocal tract transfer function
Option C:	flatten the spectrum
Option D:	for center clipping
19.	The type of _____ you use affects the time-frequency resolution of the STFT.
Option A:	Scale
Option B:	Pitch
Option C:	Window
Option D:	recorder
20.	Analysis of speech signal in vocoders is done at the _____.
Option A:	Receiver
Option B:	Amplifier
Option C:	Transmitter
Option D:	Channel

Q2	**Solve any Four out of Six** **5 marks each**
A	What is the need of auditory modeling?
B	What is the need for nonlinear smoothening?
C	Differentiate Speech between silence using energy & Zero crossings.
D	What is acoustic phonetics?
E	Explain PCM to ADPCM conversion.
F	Compare STFT with FT.

Q3	**Solve any Two Questions out of Three** **10 marks each**
A	Explain filter bank summation method for short time synthesis of speech signals.
B	Describe Differential Quantization with the help of a block diagram.
C	With a neat block diagram, analyze human speech production mechanisms.

University of Mumbai

Examination 2020 under cluster 5(Lead College: APSIT)

Program: Electronics and Telecommunication Engineering

Curriculum Scheme: Rev 2016

Examination: TE Semester VI

Course Code: ECCDLO6024 and Course Name: Audio Processing

Time: 2 hour Max. Marks: 80

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Question Number	Correct Option (Enter either 'A' or 'B' or 'C' or 'D')
Q1.	C
Q2.	B
Q3.	C
Q4	C
Q5	A
Q6	B
Q7	A
Q8.	C
Q9.	C
Q10.	B
Q11.	B
Q12.	A
Q13.	B
Q14.	D
Q15.	D
Q16.	B
Q17.	A
Q18.	B
Q19.	C
Q20.	C

University of Mumbai

Examination 2020 under cluster 5 (Lead College: APSIT)

Examinations Commencing from 01st June 2021

Program: **Electronics & Telecommunication**

Curriculum Scheme: Rev 2016

Examination: TE Semester VI

Course Code: ECC 602 and Course Name: Computer Communication Network (CCN)

Time: 2 hour Max. Marks: 80

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Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	TCP packet is encapsulated in a……
Option A:	UDP Datagram
Option B:	IP Datagram
Option C:	TCP Segment
Option D:	Frame
2.	Encryption and Decryption are the functions of the following layer of OSI model.
Option A:	Transport
Option B:	Session
Option C:	Data link layer
Option D:	Presentation
3.	RJ-45 UTP Cable has ……. Cables.
Option A:	5 pair
Option B:	4 pair
Option C:	2 pair
Option D:	3 pair
4.	Which OSI layer allows the transmission and reception of data segments to a session layer in addition to the provision of flow control, sequence numbering and message acknowledgment?
Option A:	Network Layer
Option B:	Session Layer
Option C:	Transport Layer
Option D:	Application Layer
5.	A Link Control Protocol (LCP) is used for …….
Option A:	Establishing, configuring and testing the data-link connection
Option B:	Establishing and configuring different network-layer protocols
Option C:	Testing the different network-layer protocols
Option D:	Provides for multiplexing of different network-layer protocols
6.	In ……methods no station is superior to other stations and none is assigned the control over another.
Option A:	Random access
Option B:	Control access

Option C:	Channelization
Option D:	Back pressure
7.	Which field helps to check rearrangement of the fragments?
Option A:	Offset
Option B:	Flag
Option C:	TTL
Option D:	Identifier
8.	When 2 or more bits in a data unit has been changed during the transmission, the error is called……..
Option A:	random error
Option B:	burst error
Option C:	inverted error
Option D:	double error
9.	During error reporting, ICMP always reports error messages to --------.____
Option A:	Destination
Option B:	Source
Option C:	Next router
Option D:	Previous router
10.	Default network mask for CLASS B is
Option A:	255.0.0.0
Option B:	255.255.0.0
Option C:	255.255.255.0
Option D:	255.255.255.255
11.	Physical or logical arrangement of network is -------.____
Option A:	Topology
Option B:	Routing
Option C:	Networking
Option D:	Control
12.	Which Transmission media are widely used in the backbone of networks?
Option A:	Unshielded Twisted Pair (UTP)
Option B:	Shielded Twisted Pair (STP)
Option C:	Optical Fiber
Option D:	Wireless
13.	In _____, the chance of collision can be reduced if a station senses the medium before trying to use it.
Option A:	CSMA
Option B:	MA
Option C:	CDMA
Option D:	FDMA
14.	ICMP is primarily used for _____
Option A:	error and diagnostic functions
Option B:	Addressing

Option C:	Forwarding
Option D:	Routing
15.	What is the length of TTL field in IPv4 header format?
Option A:	8 bits
Option B:	16 bits
Option C:	4 bits
Option D:	12 bits
16.	What are the Methods to move data through a network of links and switches?
Option A:	Packet switching and Line switching
Option B:	Circuit switching and Line switching
Option C:	Line switching and bit switching
Option D:	Packet switching and Circuit switching
17.	WAN stands for _____
Option A:	World area network
Option B:	Wide area network
Option C:	Web area network
Option D:	Web access network
18.	Which of these is not a type of error-reporting message?
Option A:	Destination unreachable
Option B:	Source quench
Option C:	Router error
Option D:	Time exceeded
19.	A client that wishes to connect to an open server tells its TCP that it needs to be connected to that particular server. The process is called _____
Option A:	Active open
Option B:	Active close
Option C:	Passive close
Option D:	Passive open
20.	In segment header, sequence number and acknowledgement number fields refer to-----
Option A:	Byte number
Option B:	Buffer number
Option C:	Segment number
Option D:	Acknowledgment

Q2. (20 Marks)	
A	**Solve any Two** **5 marks each**
i.	Explain the features of TCP.
ii.	Draw the IPV4 header.
iii.	Explain Selective repeat ARQ protocol.
B	**Solve any One** **10 marks each**
i.	Classify Multiple access protocols. Discuss various scheduling medium access control techniques

ii.	Explain in brief DSL and HFC.

Q3.(20 Marks)	
A	**Solve any Two** **5 marks each**
i.	An organization is granted the block 211.17.180.0/24. The administrator wants to create 32 subnets. i) Find the subnet mask. ii) Find the number of addresses in each subnet. iii) Find the first and last address in subnet 1. iv) Find the first and last addresses in subnet 32.
ii.	Differentiate between Bus Topology and Ring Topology.
iii.	Explain the functions of Data Link Layer.
B	**Solve any One** **10 marks each**
i.	Explain the different error reporting messages in ICMP with message format.
ii.	Explain the Transition States of TCP with a neat diagram.

University of Mumbai

Examination 2020 under cluster 5 (Lead College: APSIT)

Examinations Commencing from 01st June 2021

Program: **Electronics & Telecommunication**

Curriculum Scheme: Rev 2016

Examination: TE Semester VI

Course Code: ECC 602 and Course Name: Computer Communication Network (CCN)

Time: 2 hour Max. Marks: 80

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Question Number	Correct Option (Enter either 'A' or 'B' or 'C' or 'D')
Q1.	B
Q2.	D
Q3.	B
Q4	C
Q5	A
Q6	A
Q7	A
Q8.	B
Q9.	B
Q10.	B
Q11.	A
Q12.	C
Q13.	A
Q14.	A
Q15.	A
Q16.	D
Q17.	B
Q18.	C
Q19.	A
Q20.	A

University of Mumbai

Examination 2021 under cluster 5(Lead College: APSIT)

Examinations Commencing from 01st June 2021

Program: Electronics and Telecommunication Engineering

Curriculum Scheme: Rev2016

Examination: TE Semester VI

Course Code: ECCDLO6023 and Course Name: Database Management System

Time: 2 hour Max. Marks: 80

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Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	Which one of the following categories of commands provides the ability to receive information from the database and to insert tuples into, delete tuples from, and modify tuples in the database?
Option A:	DML (Data Manipulation Language)
Option B:	DDL (Data Definition language)
Option C:	Query
Option D:	Relational Schema
2.	Which of the following is not a valid data model?
Option A:	Object Oriented Data Model
Option B:	Structured Data Model
Option C:	Hierarchical Data Model
Option D:	Entity-Relation Data Model
3.	A transaction completes its execution is said to be
Option A:	Saved
Option B:	Loaded
Option C:	Rolled
Option D:	Committed
4.	Concurrency control manager ensures
Option A:	Consistency of the data
Option B:	Fast retrieval of the data
Option C:	Large storage availability for the Data
Option D:	Easy way to use DBMS
5.	Granting of authorization for data access is function of
Option A:	Database Programmer
Option B:	Database Administrator
Option C:	Special user
Option D:	Naive user
6.	What is a technique used to retrieve data and refer to the database through an application program?
Option A:	Query

Option B:	Transaction
Option C:	Polling
Option D:	Trigger
7.	Degree of Relationships defines the
Option A:	Number of participating entities in a relationship
Option B:	Validity of the relationship between entities
Option C:	No. of dependent entities in a Relation
Option D:	No. of attributes related with other entities
8.	Which of the following is not a valid constraint?
Option A:	Domain constraint
Option B:	Key constraint
Option C:	Referential integrity constraint
Option D:	Time constraint
9.	Which of the following Relational Algebra operations does not use a binary operator?
Option A:	Union
Option B:	Difference
Option C:	Cartesian product
Option D:	Rename
10.	Which of the following is not correct Data Definition Language command?
Option A:	CREATE
Option B:	ALTER
Option C:	DELETE
Option D:	UPDATE
11.	Which of the following is not a transaction state?
Option A:	Partially committed
Option B:	Aborted
Option C:	End
Option D:	Committed
12.	Which of the following is used to denote the selection operation in relational algebra?
Option A:	Pi (Greek)
Option B:	Sigma (Greek)
Option C:	Lambda (Greek)
Option D:	Omega (Greek)
13.	Which of the following normal forms deal with the atomic values of the domain?
Option A:	1NF
Option B:	2NF
Option C:	3NF
Option D:	BCNF
14.	Which of the following is not an Aggregate function?
Option A:	Min
Option B:	Max

Option C:	Select
Option D:	Avg
15.	To remove a relation from an SQL database, we use the _____ command.
Option A:	Delete
Option B:	Purge
Option C:	Remove
Option D:	Drop table
16.	Which of the following operations is used if we are interested in only certain columns of a table?
Option A:	Projection
Option B:	Selection
Option C:	Union
Option D:	Join
17.	What type of join is needed when you wish to include rows that do not have matching values?
Option A:	Equi-join
Option B:	Natural join
Option C:	Outer join
Option D:	Inner join
18.	A _____ consists of a sequence of query and/or update statements.
Option A:	Transaction
Option B:	Commit
Option C:	Rollback
Option D:	Transition state
19.	In the _____ normal form, a composite attribute is converted to individual attributes.
Option A:	First
Option B:	Second
Option C:	Third
Option D:	Fourth
20.	AS' clause is used in SQL for
Option A:	Selection operation
Option B:	Rename operation
Option C:	Join operation
Option D:	Projection operation

Q2 A	**Solve any Two** **5 marks each**
i.	Differentiate between file system and database system with an example.
i.	Draw the state transition diagram and explain the meaning of each state in short.

ii.	Write down the SQL queries for the following case Emp (Emp_id, Emp_name, Emp_city, Dept_id) Dept (Dept_id, Dept_name, Dept_loc) Works_on (Emp_id, Dept_id, Emp_salary) a) Find the name of an employee with Emp_id=9; b) Find the name of department in which employee living city is same as Dept_loc. c) Give 10% raise in salary to all employee working in Mumbai location.
iii.	Explain role of the Database Administrator.
Q2 B	**Solve any One** **10 marks each**
i.	Explain the following Relational operator with the help of the suitable example. 1. Select (σ) 2. Project(π) 3. Rename(ρ) 4. Cartesian product(X)
ii.	What do you understand by Joins? Explain following terms with example a. Theta join b. Natural join c. Left outer join d. Right outer join e. Full outer join

Q3. A	**Solve any Two** **5 marks each**
i.	What are ACID properties in DBMS? Explain in detail.
ii.	What do you understand by the concurrent execution of the transaction? Mention any two advantages of the concurrency.
iii.	What do you understand by schedule? Give an example of a serializable schedule.
Q3. B	**Solve any One** **10 marks each**
i.	Explain the following terms with a proper example. a. Relation b. Entity c. Domain d. Attribute *e.* Weak entity set
ii.	Explain the following with suitable example. 1. Time stamp-based concurrency protocol and 2. 2PL based concurrency protocol.

University of Mumbai

Examination 2020 under cluster 5(Lead College: APSIT)

Examinations Commencing from 01st June 2021

Program: Electronics and Telecommunication Engineering

Curriculum Scheme: Rev2016

Examination: TE Semester VI

Course Code: ECCDLO6023 and Course Name: Database Management System

Time: 2 hour Max. Marks: 80

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Question Number	Correct Option (Enter either 'A' or 'B' or 'C' or 'D')
Q1.	A
Q2.	B
Q3.	D
Q4	A
Q5	B
Q6	A
Q7	A
Q8.	D
Q9.	D
Q10.	C
Q11.	C
Q12.	B
Q13.	A
Q14.	C
Q15.	D
Q16.	A
Q17.	C
Q18.	A
Q19.	A
Q20.	B

University of Mumbai

Examination 2021 under cluster 5(Lead College: APSIT)

Examinations Commencing from 01st June 2021

Program: Electronics and Telecommunication Engineering

Curriculum Scheme: Rev2016

Examination: TE Semester VI

Course Code: ECCDLO 6021 and Course Name: Digital VLSI Design

Time: 2 hour Max. Marks: 80

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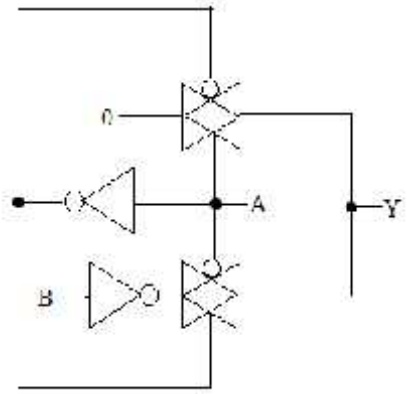
Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	Which of the following statement is not true?
Option A:	Two metal lines can cross each other at the same layer
Option B:	When a polysilicon crosses a diffusion region, it represents a MOSFET
Option C:	Stick diagrams do not represent dimensions of MOSFET
Option D:	Stick diagrams do not represent parasitic in the circuit
2.	What of the following is not a feature of Static CMOS design style?
Option A:	Low power consumption
Option B:	Smaller area requirement
Option C:	Implementation of complement expression
Option D:	Good noise margin
3.	 The above circuit is
Option A:	NOR gate
Option B:	NAND gate
Option C:	XOR gate
Option D:	AND gate
4.	Which of the following is not a dynamic design style
Option A:	Domino logic
Option B:	NORA logic
Option C:	C^2MOS logic
Option D:	Pseudo nMOS logic

5.	The loss of output voltage level due to charge sharing problem in dynamic CMOS design can be prevented using
Option A:	Voltage bootstrapping
Option B:	Evaluation transistor
Option C:	Weak pull-up
Option D:	Parallel output capacitor
6.	In a NOR based ROM, data bit '1' is stored using,
Option A:	Absence of a transistor
Option B:	Presence of a transistor
Option C:	Series combination of transistor
Option D:	Parallel combination of transistor
7.	SRAM stores data using,
Option A:	Charge on the capacitor
Option B:	Modulating threshold voltage of a MOSFET
Option C:	Magnetic field
Option D:	Cross coupled inverters
8.	What of the following is true about NAND flash and NOR flash,
Option A:	NOR flash has better fabrication density than NAND flash
Option B:	NOR flash have faster read operations
Option C:	In NAND flash, cells are connected in parallel
Option D:	NOR flash endure for more erase cycles than NAND flash
9.	Carry Select Adder overcomes latency by,
Option A:	Avoiding rippling of carry from LSB to MSB
Option B:	Aiding the propagation of carry bit around an adder
Option C:	Simultaneous MSB-half addition with both possible values of LSB-half carry
Option D:	Predicting the carry
10.	What is the formula for calculating carry bit c_{i+1} in the addition of a_i and b_i using Carry Look Ahead Adder?
Option A:	$a_i.b_i$
Option B:	$c_i \square p_i$
Option C:	$g_i + p_i c_i$
Option D:	$a_i \square b_i$
11.	Which of the following is the best suitable for addition of 7 multi-bit numbers
Option A:	Carry Skip Adder
Option B:	Carry Look Ahead Adder
Option C:	Ripple Carry Adder
Option D:	Carry Save Adder
12.	The output of 8X4 barrel shifter after performing 3 bit logical left shift operation on 11010111
Option A:	1101
Option B:	0101
Option C:	1011
Option D:	0111

13.	IO Circuits and clock generation and distribution do not determine,
Option A:	Feature size
Option B:	Signal Integrity
Option C:	Compatibility with other IC technology
Option D:	Inter IC communication speed
14.	Random skew, drift and jitter form the clock distribution network are proportional to
Option A:	The clock frequency
Option B:	The network delay
Option C:	The duty cycle of the clock
Option D:	Circuit architecture
15.	The essence of ESD protection is,
Option A:	To provide a controlled discharge path for high voltage to avoid damaging of gate oxide
Option B:	To create a barrier to avoid damaging of gate oxide
Option C:	To provide a controlled discharge path for high voltage to avoid damaging of diffusion region
Option D:	To create a barrier to avoid damaging of diffusion region
16.	Capacitive or inductive coupling causes interference called,
Option A:	Dispersion
Option B:	Return path effect
Option C:	Crosstalk
Option D:	Inter Symbolic Interference
17.	Programmable Array Logic (PAL) have,
Option A:	Fixed AND plane and programmable OR plane
Option B:	Fixed AND plane and fixed OR plane
Option C:	Programmable AND plane and fixed OR plane
Option D:	Programmable AND plane and programmable OR plane
18.	FPGA stands for
Option A:	Fast Programmable Gate Array
Option B:	Field Programmable Gate Array
Option C:	Fast Programmable Gate Arrangement
Option D:	Field Programmable Gate Arrangement
19.	What is the proper sequence of the steps to design a Custom Single Purpose Processor
Option A:	HLSM-Controller FSM-Datapath Design- Connect the datapath to controller
Option B:	HLSM- Connect the datapath to controller - Datapath Design-Controller FSM
Option C:	HLSM-Datapath Design-Controller FSM - Connect the datapath to controller
Option D:	HLSM-Datapath Design-Connect the datapath to controller-Controller FSM
20.	How does controller FSM differ from HLSM?
Option A:	FSM have fewer states than HLSM

Option B:	Condition for state transition in FSM is a signal status, whereas HLSM have logical condition
Option C:	FSM do not have external control inputs, HLSM have external control inputs
Option D:	In FSM state transition can happen without an event, in HLSM the transition can happen only on the occurrence of an event

Q2	
A	**Solve any Two** **05 marks each**
i.	Implement 4X4 NAND based ROM array to store '1001', '0011', '0101', '0010' in the memory
ii.	Implement 4:1 MUX using transmission gate
iii.	Write HDL code for D Flip Flop with asynchronous 'Reset' input. If the reset signal is '1', the output is '0'.
B	**Solve any One** **10 marks each**
i.	Draw JK flip flop using CMOS and explain the working.
ii.	Draw 3-T DRAM Cell and explain the following operations in brief with appropriate diagram. a) Write '1' b) Write '0' c) Read '1' d) Read ''0
Q3.	
A	**Solve any Two** **05 marks each**
i.	Explain ESD in brief Explain any one protection network with appropriate diagram.
ii.	Implement a Full Adder using PAL.
iii.	Draw a 3 bit array multiplier.
B	**Solve any One** **10 marks each**
i.	Explain the Carry Look Ahead Adders in brief. Write the expression for carry generate and propagate circuit for 4 bit adder. Implement the same using domino logic.
ii.	Design a 'Laser Based Distance Measurement System' using the RTL design process.

University of Mumbai

Examination 2020 under cluster 5(Lead College: APSIT)

Examinations Commencing from 01st June 2021

Program: Electronics and Telecommunication Engineering

Curriculum Scheme: Rev2016

Examination: TE Semester VI

Course Code: ECCDLO 6021 and Course Name: Digital VLSI Design

Time: 2 hour Max. Marks: 80

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Question Number	Correct Option (Enter either 'A' or 'B' or 'C' or 'D')
Q1.	A
Q2.	B
Q3.	A
Q4	D
Q5	C
Q6	A
Q7	D
Q8.	B
Q9.	A
Q10.	C
Q11.	D
Q12.	C
Q13.	A
Q14.	B
Q15.	A
Q16.	C
Q17.	C
Q18.	B
Q19.	D
Q20.	B