University of Mumbai

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

Examinations Commencing from 23rd December 2020 to 6th January 2021 and from 7th January 2021 to 20th January 2021

Program: **Electronics and Telecommunication**

Curriculum Scheme: R2016

Examination: TE Semester VI

Course Code: ECC604 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.	What is the correct sequence of steps in image processing?
Option A:	Image acquisition->Image enhancement->Image restoration->Color image processing->Compression->Wavelets and multi resolution processing->Morphological processing->Segmentation->Representation & description->Object recognition
Option B:	Image acquisition->Image enhancement->Image restoration->Color image processing->Wavelets and multi resolution processing->Compression->Morphological processing->Segmentation->Representation & description->Object recognition
Option C:	Image acquisition->Image enhancement->Color image processing->Image restoration->Wavelets and multi resolution processing->Compression->Morphological processing->Segmentation->Representation & description->Object recognition
Option D:	Image acquisition->Image enhancement->Image restoration->Color image processing->Wavelets and multi resolution processing->Compression->Morphological processing->Representation & description->Segmentation->Object recognition
2.	Color image can be easily converted to gray image using one of following equations.
Option A:	Y = (0.299 x R) + (0.587 x G) + (0.114 x B)
Option B:	Y = (0.299 x R) - (0.587 x G) + (0.114 x B)
Option C:	Y = (0.299 x R) - (0.587 x G) - (0.114 x B)
Option D:	Y = (0.299 x R) + (0.587 x G) - (0.114 x B)
3.	The smallest discernible change in intensity level is called _____.
Option A:	Intensity Resolution
Option B:	Contour
Option C:	Saturation
Option D:	Contrast
4.	Which of the following is energy efficient transforms?
Option A:	Hit-or-Miss Transform
Option B:	Hough Transform

Option C:	DCT
Option D:	Power law transformation
5.	Which of the following can be used as a transform matrix?
Option A:	$A=\frac{1}{2}\begin{bmatrix}1 & 1 & 1 & 1\\ 1 & 1 & -1 & -1\\ \sqrt{2} & \sqrt{2} & 0 & 0\\ 0 & 0 & -\sqrt{2} & -\sqrt{2}\end{bmatrix}$
Option B:	$A=\frac{1}{2}\begin{bmatrix}1 & 1 & 1 & 1\\ 1 & 1 & -1 & -1\\ \sqrt{2} & -\sqrt{2} & 0 & 0\\ 0 & 0 & -\sqrt{2} & \sqrt{2}\end{bmatrix}$
Option C:	$A=\frac{1}{4}\begin{bmatrix}1 & 1 & 1 & 1\\ 1 & 1 & -1 & -1\\ \sqrt{2} & -\sqrt{2} & 0 & 0\\ 0 & 0 & -\sqrt{2} & -\sqrt{2}\end{bmatrix}$
Option D:	$A=\frac{1}{2}\begin{bmatrix}1 & 1 & 1 & 1\\ 1 & 1 & -1 & -1\\ \sqrt{2} & -\sqrt{2} & 0 & 0\\ 0 & 0 & -\sqrt{2} & \sqrt{2}\end{bmatrix}$
6.	Output of Median filtering for noisy image of $i = [20\ 20\ 20\ 20\ 100\ 20\ 20\ 20\ 20]$ is:
Option A:	$i = [20\ 20\ 20\ 20\ 100\ 20\ 20\ 20\ 20]$
Option B:	$i = [20\ 20\ 20\ 20\ 20\ 20\ 20\ 20\ 20]$
Option C:	$i = [100\ 100\ 100\ 100\ 100\ 100\ 100\ 100\ 100]$
Option D:	$i = [20\ 20\ 20\ 20\ 0\ 20\ 20\ 20\ 20]$
7.	Following are the properties of 2D DFT except_____
Option A:	Separable property
Option B:	Convolution property
Option C:	Periodicity property
Option D:	Non orthogonality property
8.	Sequence for calculating Histogram Equalization is:
Option A:	1)PDF, 2)CDF, 3)CDF*(L-1), 4)Round Off 5)Pixel Mapping
Option B:	1)CDF, 2)CDF*(L-1), 3)PDF, 4)Round Off 5)Pixel Mapping
Option C:	1)PDF, 2)CDF*(L-1), 3)CDF, 4)Pixel Mapping 5)Round Off
Option D:	1)CDF*(L-1), 2) Pixel Mapping , 3)PDF, 4) CDF 5)Round Off
9.	Salt and pepper noise can interchangeably be used with_____.
Option A:	Rayleigh noise
Option B:	Gamma noise
Option C:	Black noise

Option D:	Impulse noise
10.	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
11.	The application of Log transformation is used to
Option A:	Compress the histogram of the image
Option B:	Expand the visual ability to distinguish the distribution of gray levels when the gray levels in the original image are not distributed in the entire dynamic range
Option C:	Expand the visual ability to distinguish the distribution of gray levels when the gray levels in the original image are distributed in the entire dynamic range
Option D:	Stretch the shape of the histogram of the image
12.	Which property is applicable for the process of segmentation using an edge detection?
Option A:	Discontinuity
Option B:	Similarity
Option C:	Region growing
Option D:	Thresholding
13.	Horizontal line detection mask is:
Option A:	[-1-1-1; 2 2 2; -1-1-1]
Option B:	[2 -1 -1; 2 -1 -1; 2 -1 -1]
Option C:	[2 -1 -1; -1 2 -1; -1 -1 2]
Option D:	[-1 2 -1; -1 2 -1; -1 2 -1]
14.	The theory of mathematical morphology is based on_____
Option A:	Image size
Option B:	Set theory
Option C:	Probability
Option D:	Correlation
15.	In expression s = Tr, r in range 0 = < r = < L-1, s should be _____.
Option A:	Strictly monotonically increasing function
Option B:	Strictly monotonically decreasing function
Option C:	Linearly decreasing function
Option D:	Gaussian function
16.	To eliminate the small holes in the binary images, the appropriate operation is:
Option A:	Erosion
Option B:	Dilation
Option C:	Opening
Option D:	Closing
17.	This is a -1 -1 -1

	-1 8 -1 -1 -1 -1
Option A:	Point detection mask
Option B:	Line detection mask (horizontal)
Option C:	Line detection mask (vertical)
Option D:	Line detection mask (diagonal)
18.	What is recognition?
Option A:	It is process that assigns a label to an object based on its descriptors.
Option B:	It is process of search an image
Option C:	It is a process segmenting an image
Option D:	It is process of acquisition of an image
19.	Which is not a statistical approach of texture representation
Option A:	Third moment
Option B:	Entropy
Option C:	Uniformity
Option D:	Fourier spectrum
20.	Which of the following techniques of boundary descriptions have the physical interpretation of boundary shape?
Option A:	Fourier transform
Option B:	Statistical moments
Option C:	Laplace transform
Option D:	Curvature

Q.2 A	**Solve any Two** **5 marks each**
i.	Explain point processing enhancement techniques in brief.
ii.	Define mathematically a) Convolution property and b) Spatial shifting property of DFT.
iii.	Generate one Haar basis for N=2.
Q.2. B	**Solve any One** **10 marks each**
i.	Perform histogram equalization for 8x8 image whose gray levels vs. number of pixels is shown in the following table. Grey levels: 0 1 2 3 4 5 6 7 Pixel no.: 8 10 10 2 12 16 4 2
ii.	Perform i) Low pass filtering using Averaging filter with mirror padding and ii) Median filtering of image X. 0 5 4 7 120 5 5 4 7

Q.3	**Write Short notes (any two)**	**10 marks each**
i.	Support Vector Machine	
ii.	Statistical Texture discription method.	
Iii	Frequency domain image enhancement.	

University of Mumbai

Examination 2020 under cluster __ (Lead College: _____)

Examinations Commencing from 23rd December 2020 to 6th January 2021 and from 7th January 2021 to 20th January 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.	The conceptual Model is
Option A:	Dependent only on hardware
Option B:	Dependent only on software
Option C:	Dependent on both hardware and software
Option D:	Independent of both hardware and software
2.	Which join condition contains an equality operator:
Option A:	Equijoins
Option B:	Cartesian
Option C:	Natural
Option D:	Left
3.	Which one of the following attributes can be taken as primary key?
Option A:	Name
Option B:	Id
Option C:	Address
Option D:	Age
4.	Find the correct query to add columns to a table in SQL.
Option A:	ALTER TABLE TableName ADD ColumnName
Option B:	ALTER TABLE TableName ADD COLUMN ColumnName
Option C:	MODIFY TABLE TableName ADD ColumnName
Option D:	MODIFY TABLE TableName ADD COLUMN ColumnName
5.	Choose the correct statement for Projection Operation in Relational Algebra:
Option A:	It is used to select only few columns or all columns of a table as per requirements.
Option B:	This is binary operator.
Option C:	It is used to select some rows from table which satisfy the given condition.
Option D:	This is ternary operator.
6.	In Hierarchical model records are organized as
Option A:	Graph
Option B:	List
Option C:	Tree
Option D:	Links

7.	Find the correct query for pollution in increasing order of all cities of the given state.
Option A:	SELECT city FROM state ORDER BY pollution
Option B:	SELECT city, pollution FROM state
Option C:	SELECT city, pollution FROM state ORDER BY pollution
Option D:	SELECT city, pollution FROM state ORDER BY city
8.	The default timestamp ordering protocol generates schedules that are
Option A:	Recoverable
Option B:	Non-recoverable
Option C:	Starving
Option D:	Recoverable and Starving
9.	To overcome the problems with conventional file processing system, we need
Option A:	Data Storage System
Option B:	Data Processing System
Option C:	Data Evaluation System
Option D:	Data insertion System
10.	Which one of the following is used to define the structure of the relation, deleting relations and relating schemas?
Option A:	DDL (Data Definition Language)
Option B:	DML (Data Manipulation Language)
Option C:	Query
Option D:	Relational Schema
11.	Which of the following is not an integrity constraint?
Option A:	Not Null
Option B:	Positive
Option C:	Unique
Option D:	Check Predicate
12.	Choose incorrect statement for Two phase locking protocol
Option A:	It ensures conflict serializability.
Option B:	It is simple to implement and understand
Option C:	Deadlock may occur in two phase schedule.
Option D:	Cascaded roll back may not occur under two phase locking
13	Which of the following query is to retrieve total loan_amount for all the loans taken by each Customer of a bank.
Option A:	**SELECT** Customer_id, **FROM** Customer-Loan
Option B:	**SELECT** Customer_id, SUM(Amount) **FROM** Customer_Loan **GROUP BY** Customer_id
Option C:	**SELECT** Customer_id, Amount **FROM** Customer_Loan **GROUP BY** Customer_id
Option D:	**SELECT** Customer_id, SUM(Amount) **FROM** Customer_Loan

14.	Choose the correct option for Shared Lock 1) This lock is used when a transaction wants to only read data without performing modification to it from the database. 2) This lock is used by the DBMS when a transaction wants to write data in database.
Option A:	Option 1 is True and Option 2 is False
Option B:	Option 1 is True and Option 2 is True
Option C:	Option 1 is False and Option 2 is True
Option D:	Option 1 is False and Option 2 is False
15.	For Unique and Primary Key constraints which option is incorrect?
Option A:	A table can only have one primary key.
Option B:	The primary key column cannot have null values.
Option C:	A table can not have multiple unique keys.
Option D:	Unique key generates the non-clustered index.
16.	Which option is incorrect for TRUNCATE and DELETE command?
Option A:	The DELETE statement removes rows one at a time
Option B:	We can use 'where' clause with TRUNCATE.
Option C:	DELETE is a DML command.
Option D:	TRUNCATE removes all rows from a table.
17.	The attribute name could be structured as an attribute consisting of first name, middle and last name. This type of attribute is called
Option A:	Composite attribute
Option B:	Derived attribute
Option C:	Multivalued attribute
Option D:	Simple attribute
18.	Which is not DDL (data definition language) operation
Option A:	SQL create table
Option B:	Renaming a table
Option C:	Add a column to an existing table
Option D:	Update data into a table in SQL database
19.	Which is not the Aggregate function?
Option A:	SUM
Option B:	AVG
Option C:	ADD
Option D:	COUNT
20.	What is the correct sequence to generate Logical Data Model 1) Collect and analyze business requirement 2) Find Entities, Attributes and Business Rules 3) Create High level conceptual model 4) Generate Reports 5) Align all requirements and validate data model
Option A:	1-3-2-5-4
Option B:	1-2-3-4-5

Option C:	3-1-2-4-5
Option D:	1-2-5-3-4

Q2	**Solve any Two Questions out of Three** **10 Marks each**
A	Explain SQL constraints with the help of an example.
B	What do you mean by deadlock in database system? What are various techniques for deadlock prevention and detection?
C	Consider the following relations for database that keeps track of student enrolment in courses and books issued for each course. **STUDENT** (Ssn, Name, Subject, DOB) **COURSE** (Course_id, Name, Dept) **ENROLL** (Ssn, Course_id, Semester, Grade) **BOOK_ISSUED** (Course_id, Semester, ISBN) **TEXT** (ISBN, Title, Publisher, Author) Write following queries using relational Algebra: 1) Write a Query to select all courses available in institute. (2Marks) 2) Find all student details registered for course id 10. (2Marks) 3) Find all students belong to EXTC department (without join). (3Marks) 4) Find total number of students enrolled in EXTC department. (3Marks)

Q.3	**Solve any Two Questions out of Three** **10 Marks each**
A	Explain the advantages of database system over file system.
B	Explain concurrency control in database system with the help of any two protocols.
C	Write short note on a) Transaction State Diagram (5 Marks) b) Network Data Model (5 Marks)

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Examination 2020 under cluster 5 (Lead College: APSIT)

Examinations Commencing from 23rd December 2020 to 6th January 2021 and from 7th January 2021 to 20th January 2021

Program:EXTC

Curriculum Scheme: **Rev2016**

Examination: **TE** Semester VI

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

Time: 2 hour Max. Marks: 80

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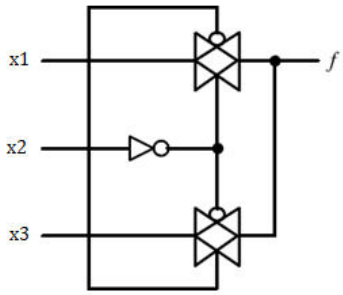
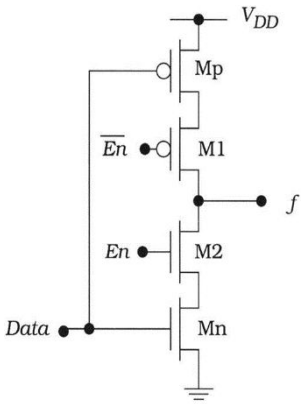
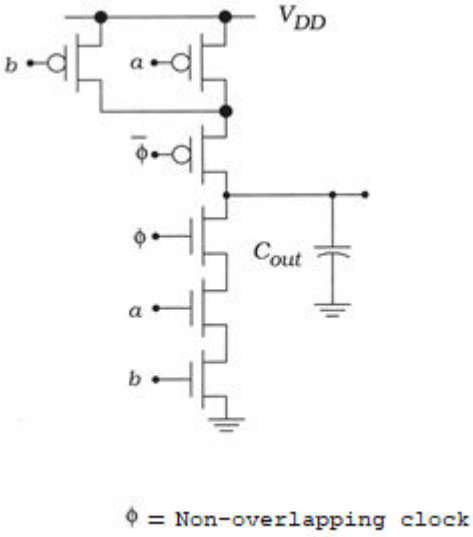
Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	Which color is used to represent a metal in a mask layout
Option A:	Blue
Option B:	Yellow
Option C:	Green
Option D:	Red
2.	Which of the following is not a feature of Static CMOS design style?
Option A:	Low power consumption
Option B:	Good noise margin
Option C:	Smaller area requirement
Option D:	Implementation of complement expression
3.	The following circuit implements 
Option A:	R-S Flip Flop
Option B:	2:1 Multiplexer
Option C:	NAND Gate
Option D:	J-K Flip Flop
4.	How many transistors are needed to implement a NOR based column decoder used for memory circuit with M column address bits?
Option A:	2^M
Option B:	M(2^M)
Option C:	(M+1)2^M
Option D:	2^(M+1)
5.	Sense amplifier is used in the memory circuits to,
Option A:	Amplify a small change in the column line current to read the data

Option B:	Sense the change in capacitance of the column line to read the data
Option C:	Sense change in the column line current to read the data
Option D:	Amplify a small change in the column line voltage to read the data
6.	Identify the circuit 
Option A:	Inverter
Option B:	AND gate
Option C:	NAND gate
Option D:	Tristate
7.	Identify the circuit  ϕ = Non-overlapping clock
Option A:	Dynamic NAND
Option B:	Clock-CMOS NAND
Option C:	Dynamic NOR
Option D:	Clock-CMOS NOR
8.	The power consumption of a dynamic RAM is
Option A:	More than that of static RAM
Option B:	Equal to that of a static RAM
Option C:	Less than that of a static RAM
Option D:	Zero
9.	One column in RAM contains
Option A:	2 sense amplifiers

Option B:	1 sense amplifiers
Option C:	3 sense amplifiers
Option D:	4 sense amplifiers
10.	Which one of the following circuit gives non-complementary output
Option A:	CMOS
Option B:	Dynamic CMOS
Option C:	NORA
Option D:	Domino
11.	_____ is a phenomenon of pulsing a voltage on one of the lines induce a stray signal on all lines that are coupled to it.
Option A:	Interconnect
Option B:	Capacitance
Option C:	Crosstalk
Option D:	Electro-migration
12.	Power supply distribution grid is
Option A:	Set of RC components that provide voltages within circuit
Option B:	Set of metal lines that provide the voltages to every part of the circuit
Option C:	Set of passive components to test the circuit
Option D:	Grid to check contacts
13.	The different models of ESD testing are
Option A:	Human body ,tube, Charged device
Option B:	Human body, Machine
Option C:	Human body, Machine , Charged device
Option D:	Charged device, Human body, discharged device
14.	The number of MOSFETs used in 4X4 barrel shifter is
Option A:	8
Option B:	16
Option C:	44
Option D:	32
15.	The number of AND gates and OR gates to evaluate carry bits for 8-bit Carry look ahead adder are:
Option A:	72,8
Option B:	36,16
Option C:	72,16
Option D:	36,8
16.	Which design is preferred in n-bit adder?
Option A:	many pass transistors with suitable buffer
Option B:	many pass transistors in series
Option C:	many pass transistors without suitable buffer
Option D:	many pass transistors in parallel
17.	An Antifuse programming technology is predominantly associated with
Option A:	SPLDs

Option B:	FPGAs
Option C:	CPLDs
Option D:	SOC
18.	PLA is used to implement
Option A:	A complex sequential circuit
Option B:	A simple sequential circuit
Option C:	A complex combinational circuit
Option D:	A simple combinational circuit
19.	In FSM, any bit output not explicitly assigned any value in a state is implicitly assigned
Option A:	Zero
Option B:	One
Option C:	Invalid
Option D:	Error
20.	RTL mainly focuses on describing the flow of signals between
Option A:	Logic gates
Option B:	Registers
Option C:	Clock
Option D:	Inverter

Q2	
A	**Solve any Two** **5 marks each**
i.	Design Datapath for parallel FIR filter.
ii.	Draw Mirror full adder circuit using CMOS
iii.	Compare CMOS, Dynamic CMOS and Domino logic style
B	**Solve any One** **10 marks each**
i.	Design 4x4 bit NOR based ROM array to store the following data in the given memory locations. Memory Address | Data 1000 | 1010 0100 | 1110 0010 | 1001 0001 | 1100
ii.	Design 3-bit carry look ahead circuit using pseudo NMOS. Write propagate and generate equations and Write HDL program for it

Q3	
A	**Solve any Two** **5 marks each**
i.	Explain 1-T DRAM with diagram
ii.	Explain clock distribution scheme
iii.	Draw and explain ASIC design flow
B	**Solve any One** **10 marks**

	each
i.	Design the following 1. 4:1 Mux using Transmission gate 2. Master slave D flip flop using Transmission gate and Tristate buffer
ii.	Design RTL for laser based distance measure. Draw HLSM, FSM.

University of Mumbai

Examination 2020 under cluster 5(Lead College: A.P.Shah Institute of Technology,Thane)

Examinations Commencing from 23rd December 2020 to 6th January 2021

Program: BE Electronics and Telecommunication Engineering

Curriculum Scheme: Rev/2016

Examination: TE Semester VI

Course Code: ECCDLO6022 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**
1.	Noise figure for a receiver is defined as the ratio of
Option A:	(S/N) ratio at the input to (S/N)ratio at the output
Option B:	(S/N) ratio at the output to (S/N)ratio at the Input
Option C:	S/N ratio at the input
Option D:	S/N ratio at the output
2.	Which radarscope plots target echo amplitude versus range on rectangular coordinates for some fixed direction? It is also used primarily for tracking radar applications than for surveillance radars.
Option A:	PPI Scope
Option B:	B scope
Option C:	A scope
Option D:	F scope
3.	The conversion loss of a mixer is defined as
Option A:	Ratio of available RF power to available IF power
Option B:	Ratio of available IF power to available RF power
Option C:	Product of available RF and IF power
Option D:	sum of available RF and IF power
4.	The intensity modulated map like circular display that gives target location in polar coordinates
Option A:	F scope
Option B:	A scope
Option C:	B scope
Option D:	PPI
5.	One of the following is a crossed field device
Option A:	Magnetron
Option B:	Travelling wave Tube
Option C:	Two cavity klystron
Option D:	Reflex klystron
6.	Cross-field amplifier (CFA) is vary close associate of
Option A:	magnetron
Option B:	Helix Travelling wave tube

Option C:	Multicavity Klystron
Option D:	Coupled cavity TWT
7.	The phase velocity of RF field's axial component in the TWT slow-wave structure is
Option A:	equal to the velocity of the electrons
Option B:	slightly less than the velocity of the electrons
Option C:	slightly greater than the velocity of the electrons
Option D:	equal to the velocity of light in vacuum
8.	The main advantage of TWT over a multi-cavity klystron is
Option A:	greater bandwidth
Option B:	more efficient
Option C:	higher number of modes
Option D:	higher output power
9.	Repellar electrode is associated with which microwave tube
Option A:	Reflex Klystron
Option B:	Multicavity klystron
Option C:	Gyroton
Option D:	Cross field amplifier
10.	The oscillating frequencies of different modes of magnetrons are not same and are quite close to each other, which results in
Option A:	helping focusing
Option B:	providing attenuation
Option C:	improving bunching
Option D:	Mode Jumping
11.	_____ is a single cavity klystron tube that operates as on oscillator by using a reflector electrode after the cavity.
Option A:	Backward wave oscillator
Option B:	Reflex klystron
Option C:	Travelling wave Tube
Option D:	Magnetron
12.	Magnetrons are commonly used as radar transmitters because
Option A:	it is easily cooled
Option B:	it is light
Option C:	it is a handy device
Option D:	high power can be generated and transmitted to aerial directly from oscillator
13.	Sequential lobing means
Option A:	Switching antenna beam alternatively between two positions
Option B:	Range detection
Option C:	Measure of velocity
Option D:	Measure of Doppler Shift
14.	The radar that uses more than one beam simultaneously to measure the angular position of the target on a single pulse is
Option A:	lobe switching

Option B:	sequential lobing
Option C:	conical scan
Option D:	monopulse
15.	Glint means
Option A:	Range accuracy
Option B:	Target phase fluctuations
Option C:	Phase inaccuracy
Option D:	**Velocity fluctuations**
16.	The following technique keeps the beam pointed at the target to improve angle accuracy and it is based on the principle that the radar receiver will get maximum returned signal strength.
Option A:	**Lobe switching or sequential switching**
Option B:	**Monopulse**
Option C:	**Conical Scan**
Option D:	**Low angle tracking**
17.	Tracking information is obtained by
Option A:	Stationary beam
Option B:	Scanning the beam
Option C:	Suitable receiver
Option D:	Suitable beamwidth of stationary beam
18.	Phase difference between adjacent resonators in an N-resonator travelling magnetron is given by, where n is an integer
Option A:	(2π/N) radians
Option B:	(2πn/N) radians
Option C:	2πn radians
Option D:	n/N radians
19.	The most serious drawback of Solid state sources is its
Option A:	Low Power
Option B:	long, failure free life
Option C:	amplitude control of the transmitted waveform
Option D:	wide bandwidth
20.	The following is not used as a TWT slow-wave structure
Option A:	coupled cavity
Option B:	Helix line
Option C:	corrugated waveguides
Option D:	periodic permanent magnet

Q2.	**Solve any Two Questions out of Three** **10 marks each**
A	What do you mean by radar cross section (RCS)? Explain RCS of sphere.
B	Derive radar range equation.
C	Describe probability of detection and false alarm in radar system.
Q3.	**Solve any Two Questions out of Three** **10 marks each**

A	Describe receiver noise and signal to noise ratio in RADAR.
B	Describe radar frequencies and various radar applications.
C	Draw and explain the RADAR block diagram.

University of Mumbai

Examination 2020 under cluster 5 (Lead College: APSIT)

Program: Electronics & Telecommunications

Curriculum Scheme: Rev 2016

Examination: TE Semester VI

Course Code: ECCDLO6024 and Course Name: Audio Processing

Time: 2 hours 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.	Voiced sounds are _____.
Option A:	Noisy
Option B:	Loud
Option C:	Periodic
Option D:	Non-periodic
2.	Which of the following is done to convert a continuous time signal into discrete time signal?
Option A:	Differentiating
Option B:	Sampling
Option C:	Integrating
Option D:	Modulating
3.	In discrete time model of speech production, the voiced sounds are synthesized as _____
Option A:	Train of pulses
Option B:	Random noise generator
Option C:	Train of periodic pulses
Option D:	Triangular wave generator
4.	The resonant frequencies of Vocal tract tube are called _____
Option A:	Resonants
Option B:	Variants
Option C:	Formants
Option D:	Pitch
5.	The sampled frequency less than the Nyquist rate is called
Option A:	under sampling
Option B:	over sampling
Option C:	critical sampling
Option D:	Nyquist sampling
6.	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
7.	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
8.	The process of multiplication of a speech signal by a window which yields a set of speech samples weighted by the shape of the window is called
Option A:	Quantizing
Option B:	Windowing
Option C:	Filtering
Option D:	Sampling
9.	We expect the short time energy to reflect the
Option A:	amplitude variations of speech signal
Option B:	type of speech
Option C:	frequency variations of speech signal
Option D:	phase variations of speech signal
10.	Spectrum flatteners are used to
Option A:	Widen the spectrum
Option B:	Remove the effects of vocal tract transfer function
Option C:	Flatten the spectrum
Option D:	For center clipping
11.	If the zero-crossing rate is high, the speech signal is generally
Option A:	Voiced
Option B:	Unvoiced
Option C:	Loud
Option D:	Dependent on the speaker
12.	The _____ is a function of time and frequency that indicates how the spectral content of a signal evolves over time.
Option A:	STFT
Option B:	DFT
Option C:	FFT
Option D:	DTFT
13.	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
14.	The disadvantage of Fourier Transforms (FT, DTFT, DFT) is that they do not clearly indicate how the _____ of a signal changes with time.

Option A:	Amplitude
Option B:	Frequency
Option C:	Gain
Option D:	Energy
15.	The similarity between Fourier transform and z transform is that
Option A:	Both convert discrete time domain signal to frequency domain
Option B:	Both convert digital signal to analog signal
Option C:	Both convert analog to digital signal
Option D:	Both convert sine to cosine waves
16.	Neural Networks have interconnections of processing elements known as
Option A:	Weights
Option B:	Neurons
Option C:	Axons
Option D:	Soma
17.	Difference signal x(n)-x(n-1) is quantized in
Option A:	a differential coding
Option B:	a uniform quantizing
Option C:	instantaneous companding
Option D:	step processing
18.	Most energy in voiced speech is at _____ frequency.
Option A:	Low
Option B:	High
Option C:	High and very high
Option D:	Low and high
19.	The fundamental frequency of the vocal fold vibrations during voiced sounds is called _____.
Option A:	Resonants
Option B:	Formants
Option C:	Glides
Option D:	Pitch
20.	Which of the following is common independent variable for speech signal
Option A:	Time
Option B:	Spatial coordinates
Option C:	Force
Option D:	Pressure

Q2	Solve any Four out of Six 5 marks each
A	Draw the source system model of a speech production system.
B	Explain how vowels and diphthongs are produced.
C	What are the advantages of short and long windows?
D	What are the applications of speech recognition?
E	Explain the use of short time average magnitude difference function.
F	Compare STFT with FT.

Q3	Solve any Four out of Six 5 marks each
A	Which features can be used for speech and silence discrimination?
B	Explain basic discrete signals.
C	What is a vowel triangle?
D	What is the need of quantizing speech signals?
E	What are the applications of neural networks in speech processing?
F	What is the need of auditory modeling?

University of Mumbai

Examination 2020 under cluster 5 (Lead College: APSIT)

Examinations Commencing from 23rd December 2020 to 6th January 2021 and from 7th January 2021 to 20th January 2021

Program: Electronics and Telecommunication Engineering

Curriculum Scheme: Rev 2016

Examination: Third Year Semester VI

Course Code: ECC601 and Course Name: Microcontrollers and Applications

Time: 2 hour Max. Marks: 80

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Q1. **(40 Marks)**	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	How many clock cycle are present in one machine cycle of microcontroller 8051 ?
Option A:	4
Option B:	6
Option C:	8
Option D:	12
2.	Port's Names of 8051 are
Option A:	PA, PB, PC Upper and PC lower
Option B:	PA, PB, PC, and PD
Option C:	P0, P1, P2 and P3
Option D:	P0 and P1
3.	Microcontroller 8051 has …. bit data bus
Option A:	8
Option B:	16
Option C:	20
Option D:	12
4.	In 8051, which of the following interrupt doesn't clear interrupt flag bit automatically after jumping to interrupt vector?
Option A:	External hardware interrupt -0 (INT0)
Option B:	Serial Communication interrupt
Option C:	Timer-0
Option D:	External hardware interrupt-1 (INT1)
5.	TB8 bit of SCON register of 8051 is
Option A:	Timer interrupt bit
Option B:	Timer-2 with auto reload bit
Option C:	9th bit of data
Option D:	Stop bit of data frame
6.	In 8051, which instruction is of Register indirect Addressing mode?
Option A:	MOV R0,40H
Option B:	MOV A,R0

Option C:	MOV A,@R0
Option D:	MOV A,#30H
7.	In 8051, what is the result in A after execution of instruction ADD A,#0EBH if A=45H
Option A:	35H
Option B:	30H
Option C:	13H
Option D:	33H
8.	In 8051, "MUL AB" instruction generates result of size_____
Option A:	8bit
Option B:	32bit
Option C:	16bit
Option D:	10bit
9.	In 8051, meaning of instruction CJNE A,B,NOT_EQUAL is_____
Option A:	Compare A & B
Option B:	Compare A & B & jump label NOT_EQUAL
Option C:	Compare A & B if not equal jump to label NOT_EQUAL
Option D:	Compare A & B & declare as NOT_EQUAL
10.	An 8051 based microcontroller has operating frequency = 12 MHz, external program memory = 32 KB, external data memory = 32 KB and chip size = 8KB. How may chips will be required?
Option A:	4
Option B:	256
Option C:	8
Option D:	32
11.	In 8051, for a TMOD register, Timer / Counter 0, Mode1. For this selection TMOD register should be set to ?
Option A:	01H
Option B:	FCH
Option C:	4BH
Option D:	82H
12.	Which line will instruct that the LCD that the microcontroller is sending command/data?
Option A:	DB0
Option B:	RW
Option C:	RS
Option D:	EN
13.	In ARM processor, the highest exception priority is given to _____.
Option A:	Prefetch Abort
Option B:	Reset
Option C:	FIQ
Option D:	IRQ

14.	What do you mean by ‘Banked registers’?
Option A:	Collection of registers
Option B:	Accessing different group of registers through program
Option C:	Additional group of registers that can be used if needed
Option D:	Access to the limited number of registers based on the mode of operation
15.	If I flag in CPSR is ‘1’,then which of the following statement is correct?
Option A:	IRQ is enabled
Option B:	FIQ is enabled
Option C:	IRQ is disabled
Option D:	FIQ is disabled
16.	Which flag is not there in ARM-7?
Option A:	Zero
Option B:	Carry
Option C:	Overflow
Option D:	Auxiliary Carry
17.	In ARM, after execution of the RSB r3, r1, r2 instruction, result will be stored in
Option A:	r1 register
Option B:	r2 register
Option C:	r3 register
Option D:	Accumulator register
18.	In ARM, RSC r0, r1, r2 instruction will perform following operation
Option A:	r0:=r2–r1-!C
Option B:	r0:=r2–r1+!C
Option C:	r0:=r2+r1+C–1
Option D:	r0:=r2–r1+C–2
19.	To control the direction of control pins in LPC2148, ____ command is used.
Option A:	IOCLR
Option B:	IOPIN
Option C:	IODIR
Option D:	IOSET
20.	In PWM 10% duty cycle means that the signal is ___
Option A:	ON for 90% of the period and OFF the other 10%.
Option B:	ON for 10% of the period and OFF the other 10%.
Option C:	ON for 90% of the period and OFF the other 90%.
Option D:	ON for 10% of the period and OFF the other 90%.

Q2. **(20 Marks)**	**Solve any Two Questions out of Three** **10 marks each**
A	Explain 8051 timer using TMOD and block diagram.
B	Suppose common cathode 7-segment display is interfaced with 8051. Develop Assembly language program for 8051 to display 0 to 9 decimal numbers on 7-segment display with some delay between two numbers.

C	Draw and explain data flow model of ARM7.

Q3. **(20 Marks Each)**	**Solve any Two Questions out of Three** **10 marks each**
A	Explain Interrupt structure of 8051.
B	Develop an ARM assembly language program to read two 32 numbers bit numbers stored consecutively starting at 0x40000000. Add, subtract and multiply the two numbers and store result in next consecutive memory location starting 0x40000008.
C	Explain ARM addressing modes of ARM7 Processor with example in each.

University of Mumbai

Examination 2020 under cluster 5 (Lead College: APSIT)

Examinations Commencing from 23rd December 2020 to 6th January 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.	…….. protocol is a popular example of a link-state routing protocol.
Option A:	SPF
Option B:	BGP
Option C:	RIP
Option D:	OSPF
2.	The physical layer translates logical communication requests from the …… into hardware specific operations
Option A:	data link layer
Option B:	network layer
Option C:	transport layer
Option D:	application layer
3.	In TDM, the transmission rate of the multiplexed path is usually _____ the sum of the signal sources.
Option A:	greater than
Option B:	less than
Option C:	equal to
Option D:	not related to
4.	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
5.	Wi-MAX stands for _____
Option A:	wireless maximum communication
Option B:	worldwide interoperability for microwave access
Option C:	worldwide international standard for microwave access
Option D:	wireless internet maximum communication
6.	ICMP stands for _____
Option A:	Internet Coordinate Message Protocol
Option B:	Internet Control Message Protocol
Option C:	Interconnect Control Message Protocol

Option D:	Interconnect Coordinate Message Protocol
7.	In TCP, one end can stop sending data while still receiving data This is called a _____.
Option A:	half-close
Option B:	half-open
Option C:	one-way termination
Option D:	both way termination
8.	Find the class of address 14.23.120.8.
Option A:	Class B
Option B:	Class C
Option C:	Class A
Option D:	Class D
9.	In HDLC, the S-frame does not contain which field?
Option A:	Flag
Option B:	Address
Option C:	Information
Option D:	Control
10.	Each connection in the TCP connection management Finite State Machine is in the _____state initially.
Option A:	LISTEN
Option B:	CONNECT
Option C:	CLOSED
Option D:	ESTABLISHED
11.	The maximum throughput for pure ALOHA is ……..
Option A:	12.2
Option B:	18.4
Option C:	36.8
Option D:	33.8
12.	The physical layer concerns with
Option A:	bit-by-bit delivery
Option B:	process to process delivery
Option C:	application to application delivery
Option D:	segment by segment
13.	Which of the following tasks is not done by data link layer?
Option A:	framing
Option B:	error control
Option C:	flow control
Option D:	channel coding
14.	The frames used for exchanging session management and control information between communicating devices in HDLC are
Option A:	I-frame
Option B:	U-frame
Option C:	S-frame

Option D:	A-frame
15.	To deliver a message to the correct application program running on a host, which address must be consulted?
Option A:	Port
Option B:	IP
Option C:	MAC
Option D:	Checksum
16.	Which transmission media has the highest transmission speed in a network?
Option A:	coaxial cable
Option B:	twisted pair cable
Option C:	optical fiber
Option D:	electrical cable
17.	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
18.	In the …….. method, the stations in a network are organized in a logical ring.
Option A:	polling
Option B:	token passing
Option C:	reservation
Option D:	Checksum
19.	In IPv4, which class has the greatest number of addresses in each block?
Option A:	C
Option B:	D
Option C:	B
Option D:	A
20.	Which of the following is false with respect to TCP?
Option A:	Connection-Oriented
Option B:	Process-To-Process
Option C:	Transport Layer Protocol
Option D:	Unreliable

Q2. (20 Marks)	
A	**Solve any Two** **5 marks each**
i.	Explain Connection establishment in TCP using three way handshaking.
ii.	Explain any one scheduling method used in Medium access control.
iii.	What is data transparency? How it can be overcome using bit stuffing.
B	**Solve any One** **10 marks each**
i.	Explain the OSI-RM model and functions of each layer.
ii.	Explain Distance Vector Algorithm.

Q3.(20 Marks)	
A	**Solve any Two** **5 marks each**
i.	Explain Selective repeat ARQ protocol.
ii.	List and explain various Timers in TCP.
iii.	Explain DSL.
B	**Solve any One** **10 marks each**
i.	Explain the Classfull addresses of IPV4 with net-id and host-id
ii.	Explain Congestion control in TCP.

University of Mumbai

Examination 2020 under cluster 5 (Lead College: APSIT)

Examinations Commencing from 23rd December 2020 to 6th January 2021 and from 7th January 2021 to 20th January 2021

Program: **Electronics and Telecommunication**

Curriculum Scheme: Rev2016

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 two marks.**
1.	According to Webster's dictionary, what is an antenna?
Option A:	Impedance matching device
Option B:	Sensor of electromagnetic waves
Option C:	Transducer between guided wave & free space wave
Option D:	Metallic device for radiating or receiving radio waves
2.	Which theorem can be applied to both circuit and field theories?
Option A:	Equality of patterns
Option B:	Equality of impedance
Option C:	Equality of effective lengths
Option D:	Reciprocity theorem
3.	Fresnel region exists when
Option A:	$R \leq 0.62\sqrt{(D\text{^}3/\lambda)}$
Option B:	$R \geq 0.62\sqrt{(D\text{^}3/\lambda)}$ and $R < (2D\text{^}2)/\lambda$
Option C:	$R \geq (2D\text{^}2)/\lambda$
Option D:	$R \geq 0.62\sqrt{(D\text{^}3/\lambda)}$
4.	The beam width for a half wave dipole antenna is :
Option A:	90°
Option B:	180°
Option C:	50°
Option D:	250°
5.	Under which conditions of charge does the radiation occur through a wire antenna?
Option A:	For a charge with no motion
Option B:	For a charge moving with uniform velocity with straight & infinite wire
Option C:	For a charge oscillating in time motion
Option D:	For a charge with uniform motion
6.	Dipole antenna is symmetrical in nature where the two ends are at equal potentials with respect to _____ point.
Option A:	Initial
Option B:	Eventual
Option C:	Mid

Option D:	Final
7.	What would happen if the rms value of induced emf in loop acquires an angle θ = 90° :
Option A:	Wave is incident in direction of plane of the loop with induced maximum voltage
Option B:	Wave is incident normal to plane of the loop with no induced voltage
Option C:	Wave is incident in opposite direction of plane of the loop with minimum voltage
Option D:	Wave is incident in Parallel direction of plane of the loop with minimum voltage
8.	An Array antennas are mostly used in
Option A:	Mobile phone
Option B:	Wi-Fi
Option C:	Weather forecasting
Option D:	Bluetooth
9.	In Yagi-Uda antenna, most preferred feed (driven) element is
Option A:	Folded dipole
Option B:	Dipole
Option C:	Monopole
Option D:	Microstrip
10.	In N identical element uniform array antenna, by only changing the phase of each element,
Option A:	gain increase
Option B:	gain decrease
Option C:	direction of radiation pattern unchanged
Option D:	direction of radiation pattern change
11.	In an uniform End-fire array antenna, to avoid any grating lobes, the maximum spacing (dmax) between the elements should be
Option A:	dmax > λ/2.
Option B:	dmax < λ.
Option C:	dmax < λ/2.
Option D:	dmax > 2λ.
12.	Driven element in Yagi-Uda antenna is use to provide
Option A:	Voltage amplification
Option B:	Power amplification
Option C:	Temperature control
Option D:	Impedance matching
13.	Horn is treated as a/an _____ antenna.
Option A:	linear
Option B:	planar
Option C:	aperture
Option D:	array
14.	If the corner reflector antenna is used as a passive target for radar or communication applications, it will return the signal exactly in the same direction

	as it received it when its included angle is
Option A:	45 deg
Option B:	90 deg
Option C:	180 deg
Option D:	0 deg
15.	Microstrip antennas have _____ efficiency
Option A:	High
Option B:	low
Option C:	excellent
Option D:	moderate
16.	Major operational disadvantage of microstrip antennas is
Option A:	poor polarization purity
Option B:	low profile
Option C:	conformable to planar and nonplanar surfaces
Option D:	mechanically robust
17.	Which layer has the atmospheric conditions exactly opposite to that of standard atmosphere?
Option A:	Depression layer
Option B:	Regression layer
Option C:	Inversion layer
Option D:	Invasion layer
18.	By which name/s is an ionospheric propagation, also known as?
Option A:	Sea wave propagation
Option B:	Ground wave propagation
Option C:	Sky wave propagation
Option D:	Ultra Wave propagation
19.	Formation of Ionization Layers, namely D, E and F layers, where D region heights ranges from
Option A:	50 to 90 Km
Option B:	90 to 140 Km
Option C:	140 to 250 Km
Option D:	250 to 400Km
20.	What is the highest layer of the atmosphere?
Option A:	ionosphere
Option B:	stratosphere
Option C:	ozone layer
Option D:	troposphere

Q2	
A	**Solve any Two** **5 marks each**
i.	Describe different lobes of an antenna radiation pattern with appropriate diagram.
ii.	Draw and explain Yagi-Uda antenna.
iii.	With neat diagram explain parabolic reflector antenna.
B	**Solve any One** **10 marks each**
i.	Given, a broadside array of 10 elements, each separated by distance λ/4. Find all nulls, maxima, half power point and minor lobe maxima of the array.
ii.	Derive expression for power radiated and radiation resistance of small dipole antenna.

Q3	
A	**Solve any Two** **5 marks each**
i.	With neat diagram explain polarization measurement.
ii.	Draw and explain rectangular Horn antenna , list applications of the same.
iii.	What are different feed mechanisms of microstrip antenna, explain any one with neat diagram.
B	**Solve any One** **10 marks each**
i.	What is space wave propagation? In this propagation, if height of transmitter and receiver antennas are 600m and 500 m respectively, find the maximum distance between them over which LOS link will work.
ii.	Draw and explain helical antenna with radiation pattern and both modes**.**