

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

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.	

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

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.	Inmethods 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.
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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.

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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

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 $E(\theta) = \cos \theta \cos 2\theta$. 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:	$-\beta d$
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 $\lambda/4$, 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 10λ 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° , 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
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A	Design dipole antenna at frequency 3 GHz, diameter of antenna is less than $\lambda/10$. Compare dipole, monopole and folded dipole antennas.
B	Design rectangular microstrip antenna for 2.45 GHz. Select substrate refractive index $\epsilon_r = 2.32$, $h = 1.6$ mm, $\tan \delta = 0.001$.
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 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

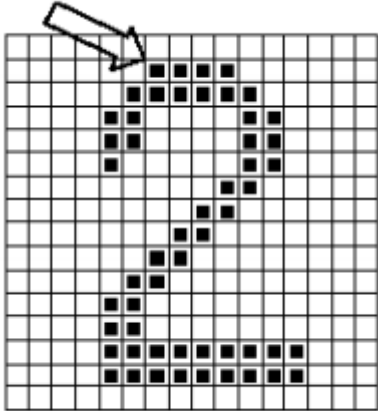
Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry equal marks
1.	Which of the following color models is used for printers?
Option A:	CMYK
Option B:	RGB
Option C:	RCB
Option D:	CMR
2.	What are the basic necessary quantities that are used to describe the 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:	$F = \begin{bmatrix} +1 & +1 & +1 & +1; \\ +1 & -i & -1 & +i; \\ +1 & +1 & -1 & +i; \\ 1 & -1 & -1 & -i \end{bmatrix}$

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.	<p>Perform histogram equalization for the image shown below and give the equalized image.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td>4</td><td>4</td><td>4</td><td>4</td><td>4</td></tr> <tr><td>4</td><td>2</td><td>5</td><td>4</td><td>3</td></tr> <tr><td>3</td><td>5</td><td>5</td><td>5</td><td>3</td></tr> <tr><td>3</td><td>4</td><td>5</td><td>4</td><td>3</td></tr> <tr><td>4</td><td>4</td><td>4</td><td>4</td><td>4</td></tr> </table>	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																																							
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ii.	<p>Segment following image using split and merge algorithm. Predicate: T1= 100 and T2=200.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td>10</td><td>20</td><td>200</td><td>222</td><td>20</td><td>10</td><td>200</td><td>222</td></tr> <tr><td>10</td><td>20</td><td>200</td><td>222</td><td>20</td><td>10</td><td>200</td><td>222</td></tr> <tr><td>30</td><td>40</td><td>130</td><td>120</td><td>200</td><td>222</td><td>130</td><td>120</td></tr> <tr><td>30</td><td>40</td><td>130</td><td>120</td><td>200</td><td>222</td><td>130</td><td>120</td></tr> <tr><td>130</td><td>120</td><td>10</td><td>20</td><td>20</td><td>10</td><td>10</td><td>20</td></tr> <tr><td>130</td><td>120</td><td>10</td><td>20</td><td>20</td><td>10</td><td>10</td><td>20</td></tr> <tr><td>30</td><td>40</td><td>130</td><td>120</td><td>10</td><td>20</td><td>200</td><td>222</td></tr> <tr><td>30</td><td>40</td><td>130</td><td>120</td><td>10</td><td>20</td><td>200</td><td>222</td></tr> </table>	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
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Q.3	Attempt (any two) 10 marks each
i.	Write a short note on Support Vector Machine.
ii.	Explain Statistical Texture description method.
iii	<p>Find chain code and shape number using 8 code connectivity for the following image. Arrow shows the starting point for chain code.</p> 

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
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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.