

**University of Mumbai**  
**Examination 2020 under cluster \_7\_ (Lead College: SSJCOE)**

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

Program: BE Information Technology

Curriculum Scheme: Rev.2016

Examination: TE                      Semester: V

Course Code: ITC501 and Course Name: Microcontroller & Embedded Programming

Time: 2 hour

Max. Marks: 80

<b>Q1.</b>	<b>Choose the correct option for following questions. All the Questions are compulsory and carry equal marks</b>
1.	In real time operating system Select one
Option A:	all processes have the same priority
Option B:	a task must be serviced by its deadline period
Option C:	process scheduling can be done only once
Option D:	kernel is not required
2.	The RS pin acts as an
Option A:	input pin
Option B:	output pin
Option C:	any of the mentioned depending on the conditions
Option D:	input & output pin
3.	ASIC stands for
Option A:	Application-System Integrated Circuits
Option B:	Application-Specific Integrated Circuits
Option C:	Application-System Internal Circuits
Option D:	Application-Specific Inverter Circuits
4.	Which is the microcontroller used in Arduino UNO?
Option A:	ATmega328p
Option B:	ATmega2560
Option C:	ATmega32114
Option D:	AT91SAM3x8E
5.	How many bytes of bit addressable memory is present in 8051 based microcontrollers?
Option A:	8 bytes
Option B:	32 bytes
Option C:	6 bytes
Option D:	16 bytes
6.	CPSR stands for_____.
Option A:	Current Program Status Register
Option B:	Code Program Stack Register

Option C:	Code Process Status Register
Option D:	Current Program Stack Register
7.	Which is not a core of an Embdded System
Option A:	Microprocessor
Option B:	Programmable Logic Devices
Option C:	Application specific integrated system
Option D:	Software
8.	which of the following is not an Exception type of ARM7?
Option A:	IRQ
Option B:	FIQ
Option C:	SRQ
Option D:	Data Abort
9.	The BSR mode of 8255 is used to
Option A:	set individual ports
Option B:	reset individual ports
Option C:	Program individual port as an I/O port.
Option D:	set and reset individual port C pin
10.	MOV A, @ R1 will
Option A:	copy the contents of memory whose address is in R1 to the accumulator
Option B:	copy the accumulator to R1
Option C:	copy the accumulator to the contents of memory whose address is in R1
Option D:	copy R1 to the accumulator
11.	In RTOS Message, mailbox and queue is used for _____
Option A:	Memory Management
Option B:	Inter task communication
Option C:	Interrupt handling.
Option D:	Task scheduling
12.	How many registers are there in ARM7?
Option A:	35 register( 28 GPR and 7 SPR)
Option B:	37 registers(28 GPR and 9 SPR)
Option C:	37 registers(31 GPR and 6 SPR)
Option D:	35 register(30 GPR and 5 SPR)
13.	RISC stands for _____
Option A:	Restricted Instruction Sequencing Computer
Option B:	Restricted Instruction Sequential Compiler
Option C:	Reduced Instruction Set Computer
Option D:	Reduced Induction Set Computer
14.	In Mode ____ the timers of 8051 operates as 13-counters.
Option A:	2
Option B:	3

Option C:	1
Option D:	0
15.	Which is not the state of the process ?
Option A:	Blocked
Option B:	Running
Option C:	Ready
Option D:	Privileged
16.	Select the interrupt with the lowest priority
Option A:	External interrupt 0 (IE0)
Option B:	Serial port Interrupt(RI or TI)
Option C:	Timer interrupt 0 (TF0)
Option D:	External interrupt 1 (IE1)
17.	Arduino IDE consists of 2 functions. What are they?
Option A:	Build() and loop()
Option B:	Setup() and build()
Option C:	Setup() and loop()
Option D:	Loop() and build() and setup()
18.	Which bits of the PSW need to be programmed to select Register bank
Option A:	3,4
Option B:	4,5
Option C:	2,3
Option D:	5,6
19.	What is the data processing size of ARM7 ?
Option A:	8-bit
Option B:	16-bit
Option C:	24-bit
Option D:	32-bit
20.	Binary semaphore is also known as _____.
Option A:	Mutex
Option B:	Cluster
Option C:	Scheduler
Option D:	Spooling
<b>Q2.</b>	<b>A Solve any Two 5 marks each</b>
i.	What are the design metrics of an embedded systems
ii.	Draw & explain interfacing of ADC to 8051
iii.	Write short note on Real Time Operating System
	<b>B Solve any One 10 marks each</b>
i.	Draw & explain architecture of 8051 in detail
ii.	Explain different addressing modes of ARM7 with example
<b>Q3.</b>	<b>A Solve any Two 5 marks each</b>
i.	Discuss the major application areas of an Embedded System
ii.	Explain PSW Register of 8051 in detail

iii.	Draw & explain interfacing of 8255 to 8051
<b>B</b>	<b>Solve any One</b> <span style="float: right;"><b>10 marks each</b></span>
i.	Draw & explain interrupt structure of 8051 in detail
ii.	Discuss the various operating modes of ARM7 processor



**University of Mumbai**  
**Examination 2020 under cluster 7 (Lead College: SCSJCE)**

Examinations Commencing from 7<sup>th</sup> January 2021 to 20<sup>th</sup> January 2021

Program: **Information Technology**

Curriculum Scheme: **Rev 2016**

Examination: **TE Semester V**

Course Code: **ITC502** and Course Name: **Internet Programming**

Time: 2 hour

Max. Marks: 80

<b>Q1.</b>	<b>Choose the correct option for following questions. All the Questions are compulsory and carry equal marks</b>
1.	focus event occurs when
Option A:	The event occurs when an element gets focus
Option B:	The page has loaded
Option C:	Input fields are changed
Option D:	The user clicks on an element
2.	Which element is used in the <HEAD> section on an HTML / XHTMLpage, if we want to use an external style sheet file to decorate the page ?
Option A:	<src>
Option B:	<link>
Option C:	<style>
Option D:	<css>
3.	If we want to wrap a block of text around an image, which css property will we use ?
Option A:	wrap
Option B:	push
Option C:	float
Option D:	align
4.	var fruits = [ "apple", "orange", "mango" ]; is syntax for
Option A:	Array object
Option B:	Array
Option C:	object
Option D:	Object Array
5.	Which of the following Viewport Property sets the initial scaling factor?
Option A:	scale
Option B:	initial-scale
Option C:	minimum-scale
Option D:	user-scale
6.	What module introduces the ability to modify CSS property values over time, such as position or color, to create animated layouts?
Option A:	3D Transforms
Option B:	Animations
Option C:	2D Transforms

Option D:	Box Model
7.	Which feature lets you create your own vocabularies beyond HTML5 and extend your web pages with custom semantics?
Option A:	Geolocation
Option B:	Canvas
Option C:	Microdata
Option D:	WebSocket
8.	What is the replacement for cookies in HTML5?
Option A:	Web beacons
Option B:	Java scripts
Option C:	Local Storage
Option D:	Audio tag
9.	Which of these is a benefit JSON has over XML?
Option A:	JSON is more forgiving of poor formatting
Option B:	JSON has less markup requirements and therefore is lighter than XML
Option C:	JSON can be written poorly and still be parsed
Option D:	JSON does not need to be stored in a file to be sent remotely
10.	Which methods are used to send a request to a server?
Option A:	open() and send()
Option B:	open() and close()
Option C:	send() and back()
Option D:	send() and close()
11.	Following mashup use the user's web browser to combine and reformat the data.
Option A:	Web-based mashups
Option B:	Server-based mashups
Option C:	Ajax mashup
Option D:	JSON mashup
12.	JSON elements are separated by
Option A:	semi-colon
Option B:	line break
Option C:	comma
Option D:	white space
13.	What is the Django command to view a database schema of an existing (or legacy) database.
Option A:	manage.py inspectdb
Option B:	manage.py legacydb
Option C:	django-admin.py schemadump
Option D:	manage.py inspect
14.	Which architectural pattern does Django follow
Option A:	Model-View-Template
Option B:	Modified- View- Text
Option C:	Mode-Value-Template

Option D:	Model-View-Task
15.	Which of the following function returns the number of characters in a string variable?
Option A:	strlen(\$variable)
Option B:	count(\$variable)
Option C:	len(\$variable)
Option D:	strcount(\$variable)
16.	Which one of the following statements instantiates or creates the mysqli class?
Option A:	mysqli = new mysqli()
Option B:	\$mysqli->new(mysqli)
Option C:	\$mysqli = new mysqli()
Option D:	mysqli->new(mysqli)
17.	What will be the output of the following PHP code? <pre>&lt;?php     \$str = "Internet Programming";     echo wordwrap(\$str,5,"\n"); ?&gt;</pre>
Option A:	Internet
Option B:	Programming
Option C:	Internet Programming
Option D:	Inter
18.	Which of the following roles of web service architecture implements the service and makes it available on the Internet?
Option A:	Service Provider
Option B:	Service Requestor
Option C:	Service Registry
Option D:	Service Distributed
19.	Which of the following represents the registry of the web services?
Option A:	UDDI
Option B:	WSDL
Option C:	RPC
Option D:	RMI
20.	Which of the following XML documents are well-formed.
Option A:	<firstElement>some text goes here <secondElement>another text goes here</secondElement> </firstElement>
Option B:	<firstElement>some text goes here</firstElement> <secondElement> another text goes here</secondElement>
Option C:	<firstElement>some text goes here <secondElement> another text goes here</firstElement> </secondElement>
Option D:	</firstElement>some text goes here </secondElement>another text goes here <firstElement>



<b>Q2</b>	
<b>A</b>	<b>Solve any Two 5 marks each</b>
i.	Differentiate GET and POST method.
ii.	Write about different methods for implementing cascading style sheets?
iii.	What do you mean by JSON? Why use JSON over XML?
<b>B</b>	<b>Solve any One 10 marks each</b>
i.	Explain how session management is done in PHP. Explain how to create, access, modify session variables in PHP?
ii.	Explain XML and XSL with example?

<b>Q3.</b>	
<b>A</b>	<b>Solve any Two 5 marks each</b>
i.	Explain the features of Django Framework?
ii.	Explain DTD with example?
iii.	Write a PHP program to set the cookie and access the cookie?
<b>B</b>	<b>Solve any One 10 marks each</b>
i.	Explain in detail RUI implementation using AJAX with diagram?
ii.	Write code to process online Alumni information for your college. Create forms to get name, address, date of birth, and email id. Use check boxes for taking hobbies and radio buttons for selecting branch. Write JavaScript code to validate the following: <ul style="list-style-type: none"> <li>i. User has filled all the fields prior to form submission</li> <li>ii. Valid email-id (with '@' and '.')</li> <li>iii. Age validation using DOB (&gt;=22 years)</li> </ul>

**University of Mumbai**

**Examination 2020 under cluster 7 (Lead College: \_\_\_\_\_)**

**Examinations Commencing from 7<sup>th</sup> January 2021 to 20<sup>th</sup> January 2021**

**Program: Information Technology**

**Curriculum Scheme: Rev2016**

**Examination: TE Semester V**

Course Code: ITC503 and Course Name: Advanced Data Management Technology

Time: 2 hour

Max. Marks: 80

<b>Q1.</b>	<b>Choose the correct option for following questions. All the Questions are compulsory and carry equal marks</b>
1.	Which one of the following is not the types of entries in log records
Option A:	read
Option B:	write
Option C:	start
Option D:	end
2.	The operation of moving from coarser-granularity data to finer-granularity data is called as
Option A:	rollup
Option B:	drill down
Option C:	slicing
Option D:	dicing
3.	ETL represents following activities
Option A:	Extract, Transform and Load
Option B:	Eject, Transform and Load
Option C:	Extract, Transaction and Lock
Option D:	Explain, Transaction and Lock
4.	Which algorithm uses equality comparison on a key attribute with a primary index to retrieve a single record that satisfies the corresponding equality condition.
Option A:	Primary index equality on non key attribute
Option B:	Primary index equality on key attribute
Option C:	secondary index equality on non key attribute
Option D:	secondary index equality on key attribute
5.	Which of the following is NOT a valid access control mechanism?
Option A:	Discretionary Access Control.
Option B:	Subjective Access Control.
Option C:	Mandatory Access Control.
Option D:	Role Based Access Control.
6.	Transactions T1 and T2 concurrently perform some operations on the same data item and at least one of them is write operation then these transaction known as
Option A:	Non Conflicting
Option B:	Conflicting

Option C:	Overwriting
Option D:	Serializability
7.	_____ is an example of deferred data extract
Option A:	data capture when transaction occurs in source database
Option B:	real-time data capture
Option C:	data capture based on date
Option D:	data capture through triggers
8.	The total ordering of operations across groups ensures .....of transactions.
Option A:	Serializability
Option B:	Synchronization
Option C:	Atomicity
Option D:	Durability
9.	The write timestamp of item X is the timestamp of
Option A:	youngest transaction that has written X successfully
Option B:	oldest transaction that has written X successfully
Option C:	First transaction that has entered the concurrent execution
Option D:	Last transaction that has entered the concurrent execution
10.	By ' <i>spatial data</i> ' we mean data that has
Option A:	The values which are Complex
Option B:	The values which are Positional
Option C:	The values which are Graphic
Option D:	The values which are Decimal
11.	_____ may be a good solution for situations in which small to medium sized databases are the norm and application software speed is critical.
Option A:	OLAP
Option B:	ROLAP
Option C:	MOLAP
Option D:	Relational Databases
12.	Different types of time available in the Temporal database.
Option A:	Valid and Transaction Time
Option B:	Transaction and Bi-Tempoal Time
Option C:	Valid and Bi-Temporal Time
Option D:	Valid, Transaction as well as Bi-Temporal Time
13.	One transaction updates a database item and then the transaction fails for some reason . Meanwhile, the updated item is accessed (read) by another transaction before it is changed back to its original value . This is called as
Option A:	Lost update problem
Option B:	Temporary update problem
Option C:	Permanent update problem
Option D:	Incorrect summary problem
14.	The process of returning cleaned data to the source is called as
Option A:	Data Purging

Option B:	Backflushing
Option C:	Data Refresh
Option D:	Data Projection
15.	What are the advantages of Replication of data in Distributed database?
Option A:	Availability, Parallelism, Increased data transfer
Option B:	Availability, Parallelism, Reduced data transfer
Option C:	Availability, Increased parallelism and Cost of updates
Option D:	Availability, Increased data transfer, Cost of updates
16.	Which one of the following is not a disadvantages of Fragmentation are as follows
Option A:	When data from different fragments are required, the access speeds may be very high.
Option B:	In case of recursive fragmentations, the job of reconstruction will need expensive techniques.
Option C:	Lack of back-up copies of data in different sites may render the database ineffective in case of failure of a site.
Option D:	The end user is able to access any available copy of the data, and an end user's request is processed by any processor at the data location.
17.	One of the main heuristic rule in query optimization is
Option A:	Apply SELECT operation at the earliest.
Option B:	Apply PROJECT operation at the earliest.
Option C:	Apply SELECT and PROJECT operation at the earliest.
Option D:	Apply SELECT and PROJECT operations before applying the JOIN operation at the earliest
18.	Which of the following is true concerning a global transaction?
Option A:	The required data are at one local site and the distributed DBMS routes request as necessary
Option B:	The required data are located in at least one nonlocal site and the distributed DBMS routes request as necessary.
Option C:	The required data are at one local site and the distributed DBMS passes the request to only the local DBMS
Option D:	The required data are located in at least one nonlocal site and the distributed DBMS passes the request to only the local DBMS
19.	ER modeling is suitable for
Option A:	Data warehouse systems
Option B:	OLAP systems
Option C:	OLTP systems
Option D:	Any type of Data System
20.	Drawbacks of DAC are as below except
Option A:	Low level of data protection
Option B:	Obscure
Option C:	Vulnerable to malicious attacks,
Option D:	User Friendly

<b>Q2</b>	<b>Solve any Four out of Six</b>	<b>5 marks each</b>
A	Differentiate between data warehouse and data mart	
B	Explain recoverable , strict schedule with example	
C	Explain Replication in detail.	
D	Explain data transformation with example.	
E	Explain Nested Loop Join algorithm	
F	List out characteristics of Temporal Database	

### Option 2

<b>Q3.</b>	<b>Solve any Two Questions out of Three</b>	<b>10 marks each</b>
A	Describe ARIES recovery algorithm in detail	
B	Difference between Mandatory Access control and Discretionary access control also explain Access control list and access control list with respect to same.	
C	Explain Distributed Database architecture in detail?	

**University of Mumbai**  
**Examination 2021 under cluster 7 (Lead College:SSJCOE)**

Examinations Commencing from 7<sup>th</sup> January 2021 to 20<sup>th</sup> January 2021

Program: **BE(IT) Engineering**

Curriculum Scheme: Rev 2016

Examination: TE Semester V

Course Code: ITC 504 and Course Name: Cryptography and network security

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 _____ cipher reorders the plaintext characters to create a ciphertext.
Option A:	Substitution
Option B:	Transposition
Option C:	RSA
Option D:	Diffie-Hellman
2.	In security CIA stands for---
Option A:	Confidentiality, Integrity, Availability
Option B:	Central Intelligence Agency
Option C:	Cybersecurity Investigation Agency
Option D:	Cybersecurity, Internet, Accessibility
3.	Ramesh opens his fitness tracking app to start logging a workout. The app crashes, and he is unable to log his workout. Which part of CIA is broken?
Option A:	Confidentiality
Option B:	Integrity
Option C:	Availability
Option D:	Accountability
4.	To hide information inside a picture, what technology is used?
Option A:	Cryptography
Option B:	Steganography
Option C:	Image rendering
Option D:	Bit mapping
5.	Diffie-Hellman is _
Option A:	Encryption algorithm
Option B:	Decryption algorithm
Option C:	Key-Exchange Algorithm
Option D:	Substitution cipher
6.	AES uses a _____ bit block size and a key size of _____ bits.
Option A:	128; 128 or 256
Option B:	64; 128 or 192
Option C:	256; 128, 192, or 256
Option D:	128; 128, 192, or 256

7.	Formula for cipher text using RSA algorithm is_ where c= ciphertext, p=plaintext, e= encryption key, n= block size, d=decryption key
Option A:	$P=C^e \text{ mod } n$
Option B:	$C=P^e \text{ mod } n$
Option C:	$C=P^d \text{ mod } n$
Option D:	$P=C^d \text{ mod } n$
8.	Which of the following is true for the RC5 algorithm? i) Has variable number of rounds ii) Has fixed Key length iii) High memory Requirements iv) Uses only primitive computational operations commonly found on microprocessors
Option A:	(i) and (iv)
Option B:	(i)(ii) and (iv)
Option C:	(i) iv)
Option D:	(i) (ii) and (iii)
9.	It is an electronic file that is used to identify people and resources over a insecure channel or internet.
Option A:	Digital certificate
Option B:	Digital signature
Option C:	Public key infrastructure
Option D:	Public key certificate
10.	What do you call the process in which a user is identified via a username and password
Option A:	Authentication
Option B:	Authorization
Option C:	Accounting
Option D:	Auditing
11.	What is the value of ipad in the HMAC structure?
Option A:	00110010
Option B:	00111110
Option C:	10110110
Option D:	01110110
12.	The DSS signature uses which hash algorithm?
Option A:	SHA-1
Option B:	DES
Option C:	MD5
Option D:	AES
13.	Needham- Schroder protocol uses ____
Option A:	A secrete key known to sender and authentication server
Option B:	A secrete key known to receiver and authentication server
Option C:	A secrete key and public key
Option D:	Digital signature
14.	It is the basic tool for observing the messages exchanged between executing

	protocol entities.
Option A:	Packet analyser
Option B:	Packet filter
Option C:	Packet network
Option D:	Packet sniffer
15.	This type of attack takes place when the attacker is on the same subnet whose target is to see the sequence and acknowledgement of the packets.
Option A:	Blind spoofing
Option B:	Man-In-middle attack
Option C:	Non blind spoofing
Option D:	Denial of service attack
16.	It is the system that associates domain names with IP addresses
Option A:	IP spoofing
Option B:	ARP spoofing
Option C:	DNS spoofing
Option D:	IP sniffing
17.	In this kind of attack a smurf program is used to make network inoperable. Usually IP address broadcasting is done.
Option A:	UDP attack
Option B:	ICMP attack
Option C:	Passive attack
Option D:	DNS attack
18.	It is barrier place between inside and outside network to protect organization from inside and outside hackers.
Option A:	Gateways
Option B:	Firewall
Option C:	Intrusion detection system
Option D:	Switches
19.	After the encryption stage in SSL, the maximum length of each fragment is
Option A:	$2^{14}+1028$
Option B:	$2^{14}+2048$
Option C:	$2^{16}+1028$
Option D:	$2^{16}+2048$
20.	In _____, the cryptographic algorithms and secrets are sent with the message.
Option A:	IPsec
Option B:	PGP
Option C:	SSL
Option D:	TLS



<b>Q2</b>	
<b>A</b>	<b>Solve any Two</b> <span style="float: right;"><b>5 marks each</b></span>
i.	<i>Explain playfair cipher with the help of example.</i>
ii.	<i>Explain DNS spoofing with example</i>
iii.	<i>Write short note on MD5.</i>
<b>B</b>	<b>Solve any One</b> <span style="float: right;"><b>10 marks each</b></span>
i.	<i>Explain DES algorithm in detail.</i>
ii.	<i>What is PKI? Explain the architecture and components of PKI in detail</i>

<b>Q3.</b>	
<b>A</b>	<b>Solve any Two</b> <span style="float: right;"><b>5 marks each</b></span>
i.	<i>Compare between steganography and cryptography.</i>
ii.	<i>Explain Needham Schroeder protocol</i>
iii.	<i>What is asymmetric key cryptography ? Discuss RSA algorithm</i>
<b>B</b>	<b>Solve any One</b> <span style="float: right;"><b>10 marks each</b></span>
i.	<i>Why there is need of firewall? Explain different types of firewalls and the limitations of firewall</i>
ii.	<i>Explain Kerberos protocol in detail.</i>

**University of Mumbai**  
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Program: Information Technology

Curriculum Scheme: Rev2016

Examination: TE Semester V

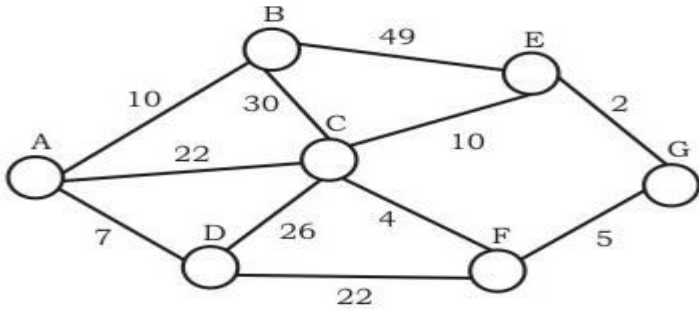
Course Code: ITDLO5011 and Course Name: Advanced Data Structures & Analysis of Algorithms  
 Time: 2 hour Max. Marks: 80

<b>Q1.</b>	<b>Choose the correct option for following questions. All the Questions are compulsory and carry equal marks</b>
1.	Which one of the following is Substitution method
Option A:	Forward
Option B:	Linked list
Option C:	Master's
Option D:	Stack
2.	Recursion is a method in which the solution of a problem depends on _____
Option A:	Smaller instances of the same problem
Option B:	Larger instances of the same problem
Option C:	Larger instances of different problems
Option D:	Smaller instances of different problems
3.	Which of the following is NOT recurrence method
Option A:	Substitution Method
Option B:	Master's Theorem
Option C:	Array
Option D:	Tree Method
4.	What is probabilistic analysis for hire assistant example?
Option A:	$T(n)=O(n/2)$
Option B:	$T(n)=O(n)$
Option C:	$T(n)=O(\log n)$
Option D:	$T(n)=O(1)$
5.	A _____ is a special Tree-based data structure in which the tree is a complete binary tree.
Option A:	Graph
Option B:	Heap
Option C:	List
Option D:	Stack
6.	Which is not an application of Topological Sorting
Option A:	Ordered Statistics
Option B:	Finding prerequisite of a task
Option C:	Finding Deadlock in an Operating System
Option D:	Finding Cycle in a graph

7.	In which of the following graph Topological Sort can be implemented?
Option A:	Directed Acyclic Graphs
Option B:	Undirected Cyclic Graphs
Option C:	Directed Cyclic Graphs
Option D:	Undirected Acyclic Graphs
8.	In most of the cases, topological sort starts from a node which has
Option A:	Maximum Degree
Option B:	Minimum Degree
Option C:	Any degree
Option D:	Zero Degree
9.	Matrix A is of order 3*4 and Matrix B is of order 4*5. How many elements will be there in a matrix A*B multiplied recursively.
Option A:	12
Option B:	15
Option C:	16
Option D:	20
10.	What is the worst case time complexity of merge sort?
Option A:	$O(n \log n)$
Option B:	$O(n^2)$
Option C:	$O(n^2 \log n)$
Option D:	$O(n \log n^2)$
11.	Given an array arr = {45, 77, 89, 90, 94, 99,100} and key = 100; What are the mid values (corresponding array elements) generated in the first and second iterations?
Option A:	90 and 99
Option B:	90 and 100
Option C:	89 and 94
Option D:	94 and 99
12.	Kruskal's algorithm is used to find
Option A:	Single Source Shortest Path
Option B:	Graph Traversal
Option C:	Minimum Spanning Tree
Option D:	All pair shortest Path
13.	Which of the following is not greedy problem?
Option A:	Container loading
Option B:	Fractional Knapsack
Option C:	Flow Shop Scheduling
Option D:	Job Sequencing with deadlines
14.	What is the optimal storage on tapes value when n=3, (I1, I2, I3) = (5, 10, 3)?
Option A:	29
Option B:	31
Option C:	34
Option D:	43

15.	Which is not correct solution method of Flow shop scheduling problem?
Option A:	Branch and Bound
Option B:	Dynamic Programming
Option C:	Greedy algorithm
Option D:	Heuristic algorithm
16.	Which of the following are the characteristics of dynamic programming approach?
Option A:	Overlapping sub problems
Option B:	Greedy approach
Option C:	Optimal substructure
Option D:	Both optimal substructure and overlapping sub problems
17.	When a problem can be solved by combining optimal solutions to non-overlapping problems, the strategy is called
Option A:	Recursion
Option B:	Divide and Conquer
Option C:	Memorization
Option D:	Greedy
18.	What is the time complexity of the above dynamic programming implementation of the longest common subsequence problem where length of one string is “m” and the length of the other string is “n”?
Option A:	$O(n)$
Option B:	$O(m)$
Option C:	$O(m+n)$
Option D:	$O(mn)$
19.	What is the worst case running time of Rabin Karp Algorithm?
Option A:	$\Theta(n)$
Option B:	$\Theta(n-m)$
Option C:	$\Theta((n-m+1)*m)$
Option D:	$\Theta(n * \log m)$
20.	Which of the following is a substring of “engineering”
Option A:	engg
Option B:	gineer
Option C:	ning
Option D:	eiee

<b>Q2.</b> <b>(20 Marks Each)</b>	<b>Solve any Two Questions out of Three</b>	<b>10 marks each</b>
A	Explain Probabilistic Analysis & Randomized Algorithm with the help of example.	
B	Sort the following numbers using Heap Sort. [25,67,56,32,12,96,82,44]. Show the contents of the array after every iteration. Also Derive time complexity for the same.	
C	Explain Strassen's matrix multiplication rules. Solve the following example with the help of Strassen's matrix multiplication. $A = \begin{bmatrix} 3 & 4 \\ 5 & 6 \end{bmatrix}$ $B = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$	

<b>Q3.</b> <b>(20 Marks Each)</b>	<b>Solve any Two Questions out of Three</b>	<b>10 marks each</b>
A	Explain Minimum Spanning Tree. Find Minimum spanning tree of the following graph using prims and kruskals algorithm. 	
B	Explain 0/1 knapsack problem using dynamic programming approach.	
C	Explain Rabin Karp Algorithm with a suitable example.	

**University of Mumbai**  
**Examination 2020 under cluster 7**

Examinations Commencing from 7<sup>th</sup> January 2021 to 20<sup>th</sup> January 2021

Program: **Information Technology**

Curriculum Scheme: Rev2016

Examination: TE Semester V

Course Code: ITDLO5012                      and                      Course Name: **Image Processing**

Time: 2 hour

Max. Marks: 80

<b>Q1.</b>	<b>Choose the correct option for following questions. All the Questions are compulsory and carry equal marks</b>
1.	The image has pixel range [0 to L-1], where L represents
Option A:	Number of Grey levels
Option B:	Number of bits
Option C:	Maximum Grey value
Option D:	Minimum Grey value
2.	Given an image of size M x N, M is defined as
Option A:	Number of columns
Option B:	Number of colors
Option C:	Number of rows
Option D:	Number of pixels
3.	_____ is not a type of distance.
Option A:	Euclidean distance
Option B:	Checkbox distance
Option C:	Chessboard distance
Option D:	City-Block distance
4.	Median filter is used to remove _____
Option A:	Gaussian noise
Option B:	Salt and pepper noise
Option C:	Thermal noise
Option D:	Flicker noise
5.	Method generating a processed image having specified histogram is called _____
Option A:	Histogram enhancement
Option B:	Histogram normalization
Option C:	Histogram matching
Option D:	Histogram equalization
6.	Ringling effect is observed in the output image when it is enhanced in frequency domain using _____
Option A:	Ideal High pass filter
Option B:	Butterworth Low pass filter
Option C:	Gaussian High pass filter
Option D:	Ideal Low pass filter

7.	Image enhancement techniques are _____ in nature.
Option A:	Objective
Option B:	Descriptive
Option C:	Decisive
Option D:	Subjective
8.	Discrete Fourier Transform gives _____ present in an input image.
Option A:	grey levels
Option B:	bits
Option C:	frequencies
Option D:	pixels
9.	Convolution in spatial domain becomes _____ in frequency domain.
Option A:	Addition
Option B:	Subtraction
Option C:	Division
Option D:	Multiplication
10.	Homomorphic filter uses _____ operator.
Option A:	Log
Option B:	Gamma
Option C:	Dilation
Option D:	Erosion
11.	The origin in a 3x3 structuring element is generally present at _____
Option A:	Center
Option B:	Top right
Option C:	Bottom left
Option D:	Top left
12.	In image compression, the technique where information ignored by the human eye is called as _____
Option A:	coding redundancy
Option B:	spatial redundancy
Option C:	temporal redundancy
Option D:	irrelevant information
13.	In _____ operation we first perform dilation followed by erosion
Option A:	Opening
Option B:	Closing
Option C:	Hit or Miss transformation
Option D:	Thinning
14.	In lossy compression process, the information is _____.
Option A:	retained
Option B:	replicated
Option C:	separated
Option D:	lost
15.	The 3x3 mask [-1, 2, -1; -1, 2, -1; -1, 2, -1] detects _____ line.

Option A:	Horizontal
Option B:	+45 degree
Option C:	Vertical
Option D:	-45 degree
16.	The summation of element of Prewitt mask is _____
Option A:	0
Option B:	1
Option C:	-1
Option D:	9
17.	In case of boundary descriptors, the angle between major axis and minor axis is _____
Option A:	0
Option B:	45
Option C:	60
Option D:	90
18.	In HSI, I is defined as _____
Option A:	$R+G+B$
Option B:	$(R+G+B)*3$
Option C:	$(R+G+B)/3$
Option D:	$R+(G+B)*3$
19.	Select the incorrect statement related to HSI:
Option A:	H value can be divided by 360 degree
Option B:	Saturation measure of purity of color
Option C:	Intensity is the gray level value of the color
Option D:	SI values are in the range of [0, 1]
20.	_____ is not a performance measure in the CBIR system.
Option A:	Entropy
Option B:	F-measure
Option C:	Sensitivity
Option D:	Specificity



<b>Q2</b>	<b>Solve any Two Questions out of Three</b>	<b>10 marks each</b>
A	Explain with a diagram the fundamental steps in digital Image processing.	
B	Prove that the basis matrix for DFT is unitary. Also find the DFT of the sequence $x(n) = \{1, 2, 3, 4\}$ .	
C	Explain with suitable example: i) Hough Transform ii) Statistical Moments	

<b>Q3</b>	<b>Solve any Two Questions out of Three</b>	<b>10 marks each</b>
A	Explain any three point processing techniques with example.	
B	Explain Opening and Closing operations with an example.	
C	Write short notes on: i) HSI color model ii) Digital watermarking	

## University of Mumbai

### Examination 2020 under cluster \_\_ (Lead College: \_\_\_\_\_)

Examinations Commencing from 23<sup>rd</sup> December 2020 to 6<sup>th</sup> January 2021 and from 7<sup>th</sup> January 2021  
to 20<sup>th</sup> January 2021

Program: **Information Technology**

Curriculum Scheme: Rev2016

Examination: TE Sem-V

Course Code: ITDLO5013 and Course Name: E-Commerce & E-Business

Time: 2 hour

Max. Marks: 80

Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry equal marks
1.	_____ is often thought simply to refer to buying and selling using the Internet; people immediately think of consumer retail purchases from companies such as Amazon, Flipkart.
Option A:	Doing Business
Option B:	Data commerce (d-commerce)
Option C:	Electronic commerce (e-commerce)
Option D:	Trading Business
2.	_____ is the transformation of key business processes through the use of Internet technologies
Option A:	e-business
Option B:	Business
Option C:	Trading
Option D:	Commerce
3.	_____ are software such as Microsoft Internet Explorer and Mozilla Firefox which we use to access the information on the WWW that is stored on web servers
Option A:	HTTP
Option B:	Java
Option C:	PHP
Option D:	Web browsers
4.	PHP is an example of _____ scripting language.
Option A:	in-side
Option B:	Browse-side
Option C:	client-side
Option D:	server-side
5.	_____ is a “glue” between client and server parts of an application.
Option A:	System Software
Option B:	Package
Option C:	Firmware
Option D:	Middleware
6.	_____ refers to whether the payment method is anonymous. In other

	words, this is concerned with whether a third party can trace back who was involved in the payment transaction
Option A:	Originality
Option B:	Anonymity
Option C:	Safety
Option D:	Security
7.	SET Protocol is _____ for credit card payment.
Option A:	Secure Electronic Protocol.
Option B:	Systematic Elective Prototype
Option C:	Simple Element Payment
Option D:	Single Entity Point
8.	_____ in which sensitive messages are encrypted so that they are kept confidential.
Option A:	Privacy
Option B:	Authenticity
Option C:	Confidentiality
Option D:	Security
9.	_____ is refers to a registered holder of the credit card who is a buyer
Option A:	Agent
Option B:	Seller
Option C:	Owner
Option D:	Cardholder
10.	_____ models specifically describe different techniques for generation of income.
Option A:	Revenue
Option B:	Market Place
Option C:	Process
Option D:	Supply Chain
11.	_____ is a Attracting visitors to a web site or promoting a brand through reaching them via search engines or advertising on other sites.
Option A:	Selling
Option B:	Marketing
Option C:	Customer acquisition
Option D:	Buying
12.	_____ analysis examines current and projected customer use of each digital channel and different services within different target markets
Option A:	Supply
Option B:	Buy
Option C:	Sell
Option D:	Demand
13.	The SOSTAC framework is used for _____
Option A:	E-marketing planning

Option B:	Purchasing Planning
Option C:	Selling Planning
Option D:	Buying Planning
14.	_____ analysis for e-business is primarily concerned with its e-business capabilities, i.e. the degree to which a company has in place the appropriate technological and applications infrastructure and financial and human resources to support it.
Option A:	Data
Option B:	Resource
Option C:	Company
Option D:	Fund
15.	_____ is a relatively simple yet powerful tool that can help organizations analyze their internal resources in terms of strengths and weaknesses and match them against the external environment in terms of opportunities and threats
Option A:	Fund Analysis
Option B:	SWOT analysis
Option C:	Data Analysis
Option D:	Business Analysis
16.	_____ for e-businesses are a concise summary defining the scope and broad aims of digital channels in the future, explaining how they will contribute to the organization and support customers and interactions with partners.
Option A:	Management Document
Option B:	Fact sheet
Option C:	Review of Business
Option D:	Vision or mission statements
17.	Value is added through providing better-quality products and services to an organization's customers is known as _____
Option A:	Adding value
Option B:	Adding Customer
Option C:	Adding Client
Option D:	Adding money
18.	_____ involves the coordination of all supply activities of an organization from its suppliers and delivery of products to its customers.
Option A:	Human Resource Management (HRM)
Option B:	Supply chain management (SCM)
Option C:	Customer Relationship Management (CRM)
Option D:	Enterprise Relationship Planning (ERP)
19.	The _____ is illustrated by a manufacturer who perhaps develops an innovative product and then identifies a suitable target market. A distribution channel is then created to push the product to the market.
Option A:	Bull Market
Option B:	Pull Market
Option C:	Pull Model
Option D:	Push Model

20.	The _____, which is focused on the customer's needs and starts with analysis of their requirements through market research and close cooperation with customers and suppliers in new product development
Option A:	Push Model
Option B:	Pull model
Option C:	Bull Market
Option D:	Pull Market

<b>Q2</b> (20 Marks)	<b>Solve any Two Questions out of Three</b>	<b>10 marks each</b>
A	<i>Explain in Detail SET Protocol for credit card payment with its network architecture</i>	
B	<i>List in Detail Different types of electronic marketing.</i>	
C	<i>Write a Detailed note on Challenges of E Business.</i>	

<b>Q3</b> (20 Marks)	<b>Solve any Two Questions out of Three</b>	<b>10 marks each</b>
A	<i>You are assigned to a Government Health Department Project. This Project is based on Beds Availability in Covid 19 (Corona) Hospitals. Design and Develop Website for same.</i>	
B	<i>You are heading a project based on the Health Insurance Management System. Design and Develop Website for same.</i>	
C	<i>Write a Detailed note on E- Procurement.</i>	

**University of Mumbai**

**Examination 2020 under cluster 07**

**Examinations Commencing from 23<sup>rd</sup> December 2020 to 6<sup>th</sup> January 2021 and from 7<sup>th</sup> January 2021 to 20<sup>th</sup> January 2021**

**Program: Information Technology**

Curriculum Scheme: Rev2016

Examination: TE Semester V

Course Code: ITDLO5014 Course Name: IT Enabled Services

Time: 2 hour

Max. Marks: 80

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<b>Q1.</b>	<b>Choose the correct option for following questions. All the Questions are compulsory and carry equal marks</b>
1.	3 D framework for business and IT alignment focus on
Option A:	Discipline, Design and Drive
Option B:	Data, Design, and Deployment
Option C:	Discipline, Design and Development
Option D:	Design, Data and Development
2.	Which is not the framework for Business and IT alignment
Option A:	Communication School
Option B:	Architecture School
Option C:	Technology School
Option D:	Coder School
3.	Perspective of Communication School is
Option A:	Planning
Option B:	Process
Option C:	Performance
Option D:	People
4.	Perspective of Architecture School is
Option A:	Planning
Option B:	Process
Option C:	Performance
Option D:	People
5.	Which SITP approach emphasis on understanding the current system
Option A:	Bottom-up evaluative approach
Option B:	Creative approach
Option C:	Top-down analytical approach
Option D:	Judgmental approach
6.	Which SITP approach evaluates internal and external factors
Option A:	Bottom-up evaluative approach
Option B:	Creative approach
Option C:	Top-down analytical approach
Option D:	Judgmental approach
7.	Which SITP approach was prominent in pre internet days
Option A:	Rockart's critical success factor CSF
Option B:	IBM business system planning BSP
Option C:	Porter's value chain analysis
Option D:	Scenario planning

8.	As per Nolan, how many stages are there in IT adoption
Option A:	10
Option B:	5
Option C:	9
Option D:	6
9.	Which is component driven framework for IT technology management
Option A:	TOGAF
Option B:	TRM
Option C:	SIB
Option D:	BBIB
10.	Who takes care of all the projects of the organization
Option A:	Program Management Office
Option B:	Project Management office
Option C:	Process management office
Option D:	HR department
11.	Who owns incident ownership
Option A:	Backend team
Option B:	Maintenance team
Option C:	Service desk team
Option D:	Testing team
12.	Which document describes the agreed service offered
Option A:	Service catalogue
Option B:	Service level agreement
Option C:	Operational level agreement
Option D:	Service level requirement
13.	A formal signed agreement describing service provision
Option A:	Service catalogue



Option B:	Service level agreement
Option C:	Operational level agreement
Option D:	Service level requirement
14.	A document covering service and its specifications asked by the customer to meet its business needs
Option A:	Service catalogue
Option B:	Service level agreement
Option C:	Operational level agreement
Option D:	Service level requirement
15.	A formal signed agreement defining external support requirements with external vendors
Option A:	Underpinning contract
Option B:	Service level agreement
Option C:	Operational level agreement
Option D:	Service level requirement
16.	PHP command to display text on screen
Option A:	Put
Option B:	Write
Option C:	out
Option D:	echo
17.	PHP stands for
Option A:	Higher text preprocessor
Option B:	Hypertext preprocessor
Option C:	HugeText preprocessor
Option D:	HeavyText preprocessor
18.	PHP script is executed on
Option A:	Client
Option B:	Server
Option C:	Browser
Option D:	Mobile
19.	PHP file have extension
Option A:	.phh

Option B:	.hph
Option C:	.php
Option D:	.pph
20.	ERP integrates
Option A:	Functional areas
Option B:	Nonfunctional areas
Option C:	Technical areas
Option D:	Non-Technical areas

**University of Mumbai**

**Examination 2020 under cluster 07**

**Examinations Commencing from 23<sup>rd</sup> December 2020 to 6<sup>th</sup> January 2021 and from 7<sup>th</sup> January 2021 to 20<sup>th</sup> January 2021**

Program: **Information Technology**

Curriculum Scheme: Rev2016

Examination: TE Semester V

Course Code: ITDLO5014 Course Name: IT Enabled Services

Time: 2 hour

Max. Marks: 80

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<b>Q2. A</b>	<b>Solve any Two</b>	<b>10 marks each</b>
i.	What is IT strategy? Describe reasons for formulation of IT Strategy?	
ii.	Explain the term Service level agreement	
iii.	Explain the concepts of UDDI, WSDL and SOAP.	

<b>Q3. A</b>	<b>Solve any Two</b>	<b>10 marks each</b>
i.	Enlist Characteristics of Business Strategy.	
ii.	What is ITIL? Also explain Service Support Processes of ITIL.	
iii.	What is insourcing, outsourcing? Explain the difference between insourcing & outsourcing.	

University of Mumbai  
 Examination 2020 under cluster 4 (PCE)  
 Program: Information Technology  
 Curriculum Scheme: Rev2016  
 Examination: TE Semester V

Course Code: ITDLOC5015 and Course Name: Computer Graphics & Virtual Reality  
 Time: 2 hour Max. Marks: 80

<b>Q1.</b>	<b>Choose the correct option for following questions. All the Questions are compulsory and carry equal marks</b>
1.	Types of CRT are __ and __
Option A:	Random, Raster
Option B:	Raster, Scalar
Option C:	Vector, Random
Option D:	Symmetric, Asymmetric
2.	Video devices with reduced volume, weight and power consumption are collectively known as.....
Option A:	Light weight monitors
Option B:	Flat-panel displays
Option C:	CRT
Option D:	Portable display
3.	The process of digitizing a given picture definition into a set of pixel-intensity for storage in the frame buffer is called
Option A:	Rasterization
Option B:	Encoding
Option C:	Scan conversion
Option D:	True color system
4.	How scan-line polygons fill algorithm works?
Option A:	By intersecting polygon at even edges
Option B:	By intersecting scanline with polygon edges
Option C:	By intersecting scanline with polygon center
Option D:	By intersecting polygon at odd edges
5.	Which neighbouring pixels are considered in 4-connected method?
Option A:	Left,Right,Diagonal Left,Diagonal Right
Option B:	Top,Bottom,Diagonal Top,Diagonal Bottom
Option C:	Left,Bottom
Option D:	Left, Right, Top, Bottom
6.	What is the use of getpixel() function?
Option A:	Sets the color of the pixel
Option B:	Modifies the color of the pixel
Option C:	Returns the color of the pixel
Option D:	Changes the color of the pixel

7.	If the scaling factors values $s_x$ and $s_y < 1$ then
Option A:	It reduces the size of object
Option B:	It increases the size of object
Option C:	It stunts the shape of an object
Option D:	It does not affect the shape of an object
8.	Which clipping algorithm uses parametric equations?
Option A:	Cohen Sutherland clipping algorithm
Option B:	Sutherland Hodgeman clipping algorithm
Option C:	Liang Barsky clipping algorithm
Option D:	Midpoint clipping algorithm
9.	The 4-bit code of bottom-right region of the window is _____
Option A:	1001
Option B:	0101
Option C:	1010
Option D:	0110
10.	When projection lines are perpendicular to the view plane then such type of projection is called as.....
Option A:	Parallel
Option B:	Perspective
Option C:	Orthographic
Option D:	Oblique
11.	Moving a point or series of points from initial position to final position is called as.....
Option A:	Warping
Option B:	Morphing
Option C:	Tweening
Option D:	Dissolve
12.	OpenGL stands for ___
Option A:	Open Graphical Library
Option B:	Outer Graphics Library
Option C:	Output Graphics Library
Option D:	Open Graphics Library
13.	A _____ is a display device, worn on head as a part of helmet that has a small display optic.
Option A:	HD
Option B:	MD
Option C:	HMD
Option D:	ARD
14.	Wearable computing device in the form of computerized eyeglasses.
Option A:	HMD
Option B:	Helmets
Option C:	Smart Glasses

Option D:	VR Glasses
15.	Tracking devices are also called_____
Option A:	6-angular-of-freedom devices
Option B:	6-degree-of-freedom devices
Option C:	6-direction-of-freedom devices
Option D:	6-views-of-freedom devices
16.	_____ enables humans to interface with the machine without any mechanical devices
Option A:	Sign Language
Option B:	Commands
Option C:	Hand movements
Option D:	Gesture Recognition
17.	The VR system should support the frame rate of at least _____ frame/s.
Option A:	15
Option B:	10
Option C:	30 or more
Option D:	20
18.	A VRML comment is a ___comment that must be on the first line of any VRML file
Option A:	multi-line
Option B:	paragraph
Option C:	single-line
Option D:	description in detail
19.	_____is the earliest version of VRML
Option A:	VRML1.0
Option B:	VRML97
Option C:	X3D
Option D:	VRML87
20.	VGA is an acronym used for
Option A:	Video graphics arrangement
Option B:	Video graphics add-on
Option C:	Visual graphics array
Option D:	Video graphics array

<b>Q2</b>	<b>Solve any Two Questions out of Three</b>	<b>10 marks each</b>
A	Explain midpoint circle algo and generate a circle with radius 10 and center at origin.	
B	Explain different motion control methods.	
C	Explain Sutherland - Hodgeman polygon clipping algorithm and state its disadvantage.	

<b>Q3.</b>	<b>Solve any Four out of Six</b>	<b>5 marks each</b>
A	Write a note on Fractals.	

B	Write a note Scan line fill algo.
C	Explain Key frame animation
D	Explain B-spline curve.
E	Explain various image representation techniques
F	Discuss the applications of Computer Graphics