Sample Questions

Computer Engineering

Subject Name: System Programming and Compiler Construction   **Semester: VI**

Multiple Choice Questions

	Choose the correct option for following questions. All the Questions carry equal marks
1.	Which of the following is designed to control the operations of a computer?
Option A:	Application Software
Option B:	**System Software**
Option C:	Utility Software
Option D:	User
2.	A person who designs the programs in a software package is called :
Option A:	User
Option B:	Software Manager
Option C:	System Developer
Option D:	**System Programmer**
3.	Assembler is used as a translator for?
Option A:	**Low level language**
Option B:	High Level Language
Option C:	COBOL
Option D:	C
4.	They normally interact with the system via the user interface provided by the application software.
Option A:	Programmers
Option B:	Developers
Option C:	**Users**
Option D:	Testers
5.	Storage mapping is done by_____
Option A:	Linker
Option B:	**Compiler**
Option C:	Loader
Option D:	Operating system
6.	Interpreter is used as a translator for _____
Option A:	Low level language
Option B:	**High Level Language**
Option C:	COBOL
Option D:	C

7.	A system program that set up an executable program in main memory ready for execution is
Option A:	**Loader**
Option B:	Linker
Option C:	Assembler
Option D:	load and go
8.	The __ of a system includes the program s or instructions.
Option A:	Icon
Option B:	**Software**
Option C:	Hardware
Option D:	Information
9.	Instructions which won't appear in the object program are called as
Option A:	Redundant instructions
Option B:	Exceptions
Option C:	Mnemonic opcode
Option D:	**Assembler Directives**
10.	The last statement of the assembly program should be
Option A:	STOP
Option B:	RETURN
Option C:	TERMINATE
Option D:	**END**
11.	Translator for low level programming language were termed as
Option A:	**Assembler**
Option B:	Compiler
Option C:	Linker
Option D:	Loader
12.	The Macro processor is also called as _____
Option A:	**Preprocessor**
Option B:	Postprocessor
Option C:	Debugger
Option D:	Translator
13.	In parameterised macro , the parameter is mapped using____
Option A:	**by position**
Option B:	by keyword
Option C:	by reference
Option D:	by string
14.	The linker is a software that is used for_____
Option A:	**Creating signle executable load module**
Option B:	Execcuting the program
Option C:	Creating link between program and data
Option D:	Helping loader to load program in memory

15.	Which is not a function of a loader
Option A:	Allocation
Option B:	**Translation**
Option C:	Relocation
Option D:	Loading
16.	Which of the following software always resides in main memory?
Option A:	Text editor
Option B:	Assembler
Option C:	Linker
Option D:	**Loader**
17.	**What type of data structure is used by shift reduce parser**
Option A:	linked list
Option B:	**Stack**
Option C:	Queue
Option D:	Pointer
18.	We can optimize code by
Option A:	**Dead code elimination**
Option B:	Common subprogram
Option C:	Copy intermediate loop
Option D:	Loop declaration
19.	Local and loop optimization in turn provide motivation for
Option A:	**Data flow analysis**
Option B:	Constant folding
Option C:	Pee hole optimization
Option D:	DFA
20.	Compiler can check _____ error
Option A:	Logical
Option B:	**Syntax**
Option C:	both a and b
Option D:	Content

Descriptive Questions

What is the forward reference problem? Explain single pass assembler with flowchart.
Explain multi pass assembler in detail
Show machine code generated for following assembly level program along with data structures entries
Explain single pass macro processor
Explain the working of macro processor along with the data structures used in it
Explain the working of DLL loader in detail.

Draw and Explain the various phases of compilers with suitable example.
Modify the given grammar and construct a Predictive parser table explaining each step. E->E+T|T   T->T*V|V   V-> id.
For a given grammar below, Construct operator precdence relation matrix, assuming *, + are binary operators and 'id' is terminal symbol, and E as Non terminal. E->E+E E->E*E E->id   Apply operator precedence parsing algorithm for the statement ' id + id * id'
Consider the following grammar: S --> aSbS | bSaS | Epcillon. 1. Frame the transition table and action / goto table of the given grammar. 2. Demonstrate if the grammar is LR(0) or not.
Explain the working of shift reduce parser along with suitable example
Explain the different forms of intermediate codes used by Compiler.
What is code optimization? Explain machine dependent code optimisation techniques with suitable example
Explain machine independent code optimization techniques with suitable example
Discuss various issues that occur in the code generation phase of the compiler.
Explain the difference between Compiler and Interpreter
Define the various system softwares used in compilers
What is the need of system softwares?
Explain various data structures used in assembler design
What is the need of an assembler to be multi pass?
Explain various types of statements used in assembler design
What are the different functions performed by macroprocessor?
Explain Parameterized macro with suitable example
Explain conditional macro with suitable example.
What are the different functions performed by loader
Enlist different types of noodles and explain compile and go loader in detail
Explain the working of absolute loader.
What do you mean by relocation? Explain relocating loader in detail.
Explain the difference between linking loader and linkage editor.
Explain the working of compiler phases for following expression Position = initial + rate * 60.
Explain the role of finite automata in lexical analysis
Design DFA for given finite automata.   (a+b)*abb
Differentiate between top down and bottom up parser.
Define synthesized and inherited attributes used in Syntactic analysis of compiler.
Generate three address code for the following logical expression. If a<b then 1 else 0
Design quadruple and triple for following expression a=(b+c)*(d+e)
Design DAG representation for given expression. a=(a+b)*(a-c)
Explain flow graphs and basic blocks in detail.
Write a short note on LEX and YACC.

Class & Sem: TE- VI   Subject: CSS (Cryptography and System Security)

Multiple Choice Questions

	Choose the correct options for following questions. All the questions carry equal marks.
1.	The assurance that a given entity is involved and currently active in a communication session is called as _____
Option A.	Message authentication
Option B.	Entity Authentication
Option C.	Authentication
Option D.	All of the above
2.	The Application Layer includes which protocol.
Option A.	ICMP
Option B.	UDP
Option C.	SMTP
Option D.	ARP
3.	How many algorithms does digital signature consist of?
Option A.	2
Option B.	3
Option C.	4
Option D.	5
4.	A cryptographic hash function is an equation used to verify the _____ of data.
Option A.	variety
Option B.	validity

Option C.	veracity
Option D.	None of the above.
5.	The DES Algorithm Cipher System consists of _____rounds (iterations) each with a round key.
Option A.	12
Option B.	18
Option C.	9
Option D.	16
6.	Which is not a component of Public key infrastructure(PKI)?
Option A.	Client
Option B.	CRL
Option C.	CA
Option D.	KDC
7.	The method of converting plaintext into cipher text by using an algorithm and a key is called as _____
Option A.	Eavesdropping
Option B.	Encryption
Option C.	Decryption
Option D.	Cryptography
8.	The _____ cipher is a symmetric-key based encryption technique that uses digraph Substitution cipher.
Option A.	p[layfair
Option B.	Hill
Option C.	Vignere
Option D.	Keyed
9.	In symmetric-key cryptography, the key locks and unlocks the box is

Option A.	same
Option B.	shared
Option C.	private
Option D.	public
10.	An algorithm used in encryption is referred to as cipher.
Option A.	True
Option B.	False
11.	A small program that changes the way a computer operates.
Option A.	worm
Option B.	trojan
Option C.	bomb
Option D.	virus
12.	Which of the following is not a transport layer vulnerability?
Option A.	mishandling of undefined , poorly defined
Option B.	the vulnerability that allows fingerprinting & other enumeration of host information
Option C.	overloading of transporting layer mechanisms
Option D.	unauthorized network access
13.	TCP/IP model does not have _____ layer but OSI model have this layer
Option A.	session layer
Option B.	transport layer
Option C.	application layer
Option D.	network layer
14.	Which one is the strong attack mechanism?
Option A.	chosen plaintext attack
Option B.	chosen cipher text
Option C.	brute force attack

Option D.	man in the middle attack
15.	Which layer filters the proxy firewall?
Option A.	application
Option B.	network
Option C.	transport
Option D.	none of the above
16.	GCD(a,b) = GCD(b,a mod b)
Option A.	true
Option B.	false
Option C.	cannot be determined
Option D.	none
17.	Does the set of residue classes (mod 3) form a group with respect to modular addition?
Option A.	yes
Option B.	no
Option C.	cant say
Option D.	insufficient data
18.	Public key encryption is advantageous over Symmetric key Cryptography because of ————
Option A.	speed
Option B.	space
Option C.	key exchange
Option D.	key length
19.	Rail Fence Technique is an example of
Option A.	substitution
Option B.	transposition

Option C.	product cipher
Option D.	ceasar cipher
20.	Which one of the following can be considered as the class of computer threats?
Option A.	DoS attack
Option B.	Phishing
Option C.	Soliciting
Option D.	Both A and C
21.	Which of the following is considered as the unsolicited commercial email?
Option A.	Virus
Option B.	Malware
Option C.	Spam
Option D.	All of the above
22.	It can be a software program or a hardware device that filters all data packets coming through the internet, a network, etc. it is known as the_____
Option A.	Antivirus
Option B.	Firewall
Option C.	Cookies
Option D.	Malware
23.	Which one of the following refers to the technique used for verifying the integrity of the message?
Option A.	Digital Signature
Option B.	Decryption Algorithm
Option C.	Protocol
Option D.	Message Digest
24.	Which of the following is not a type of scanning?
Option A.	Xmas Tree Scan

Option B.	Cloud Scan
Option C.	Null Scan
Option D.	SYN Stealth
25.	The field that covers a variety of computer networks, both public and private, that are used in everyday jobs.
Option A.	Artificial Intelligence
Option B.	ML
Option C.	Network Security
Option D.	IT
26.	Which of these is a part of network identification?
Option A.	User ID
Option B.	Password
Option C.	OTP
Option D.	fingerprint
27.	Secure Hash Algorithm -1 (SHA-1) has a message digest of
Option A.	160 bits
Option B.	512 bits
Option C.	628 bits
Option D.	820 bits
28.	A hash function guarantees the integrity of a message. It guarantees that the message has not been_____
Option A.	replaced
Option B.	over view
Option C.	changed
Option D.	violated
29.	A Digital Signature is required:

Option A.	for non repudiation of communication by a sender
Option B.	for all email sending
Option C.	for all DHCP Server
Option D.	for FTP transactions
30.	_____ uses pretty good privacy (PGP) algorithm.
Option A.	Electronic Mails
Option B.	File encryption
Option C.	Both Electronic Mails and File Encryption
Option D.	None of the above
31.	What is the gcd value of the pair (88 and 220) using Euclid algorithm.
Option A:	22
Option B:	44
Option C:	11
Option D:	88
32.	What is the gcd value of the pair (400 and 60) and the values of s and t using extended Euclidean algorithm.
Option A:	gcd = 20, s = 1, t = -7
Option B:	gcd = 20, s = -1, t = -7
Option C:	gcd = 20, s = 1, t = 7
Option D:	gcd = 20, s = -1, t = 7
33.	What is the ciphertext after encrypting the plaintext "secure" with key value = 15 by using additive cipher technique.
Option A:	htrgjt
Option B:	hsrgjs
Option C:	hsrjgs
Option D:	htrjgt
34.	What is the ciphertext after encrypting the plaintext "he is attacking" by using keyword 'program' in Vigenere cipher technique.

Option A:	wv wy rtfpytoeg
Option B:	xw xz sugquzpfh
Option C:	wv wy rtfptyoeg
Option D:	vw yw sugquxmfh
35.	What is the ciphertext after encrypting the plaintext "programmer" with keyword "network" by using playfair cipher technique.
Option A:	LATIKBPYYKAU
Option B:	LATIKBPVVKAU
Option C:	LATIKBPXXKAU
Option D:	LATIKBPVVKBV
36.	_____ defines a security service as a service that is provided by a protocol layer of communicating open systems and that ensures adequate security of the systems or of data transfers.
Option A:	X.800
Option B:	X.809
Option C:	X.832
Option D:	X.802
37.	_____ are fundamental to a number of public-key algorithms, including and the digital signature algorithm (DSA).
Option A:	Discrete logarithms
Option B:	Chinese remainder theorem
Option C:	Fermat's theorem
Option D:	Miller and Rabin algorithm
38.	Plain text message is: "meet me after the toga party" with a rail fence of depth 2. Compute cipher text.
Option A:	MEMATRHTGPRYETEFETEOAAT
Option B:	MEMATRHTGPRYETEFETFOAAT
Option C:	MEMATRHTHPRYETEFETEOAAT
Option D:	MEMATRHTGPRYETEFFTEOAOT

39.	In_____ mode, the same plaintext value will always result in the same cipher text value.
Option A:	Cipher Block Chaining
Option B:	Cipher Feedback
Option C:	Electronic code book
Option D:	Output Feedback
40.	DES encrypting the plaintext as block of _____ bits.
Option A:	64
Option B:	56
Option C:	128
Option D:	32
41.	_____ is a symmetric block cipher that is intended to replace DES as the approved standard for a wide range of applications.
Option A:	AES
Option B:	RSA
Option C:	MD5
Option D:	RC5
42.	The number of rounds in RC5 can range from 0 to _
Option A:	127
Option B:	63
Option C:	31
Option D:	255
43.	How many rounds does the AES-192 perform?
Option A:	10
Option B:	14
Option C:	16
Option D:	12

44.	For the Knapsack: {1 6 8 15 24}, Find the cipher text value for the plain text 10011.
Option A:	40
Option B:	15
Option C:	14
Option D:	39
45.	Which of the following is not possible through hash value?
Option A:	Password check
Option B:	Data integrity check
Option C:	Data retrieval
Option D:	Digital signature
46.	Which of the following is not an element/field of the X.509 certificates?
Option A:	Issuer Name
Option B:	Serial Modifier
Option C:	Issue unique identifier
Option D:	Signature
47.	_____ is responsible for distributing keys to pairs of users (hosts, processes, applications) as needed
Option A:	Key distribution center
Option B:	Key analysis center
Option C:	UKey storing center
Option D:	HKey storing center
48.	A digital certificate system is
Option A:	uses third-party CAs to validate a user's identity
Option B:	uses digital signatures to validate a user's identity
Option C:	uses tokens to validate a user's identity

Option D:	are used primarily by individuals for personal correspondence
49.	Hashed message is signed by a sender using
Option A:	His public key
Option B:	His private key
Option C:	Receivers public key
Option D:	Receivers private key
50.	The man-in-the-middle attack can endanger the security of the Diffie-Hellman method if two parties are not
Option A:	Authenticated
Option B:	Joined
Option C:	Submit
Option D:	Separate
51.	_____ operates in the transport mode or the tunnel mode.
Option A:	IPSec
Option B:	SSL
Option C:	PGP
Option D:	BGP
52.	When a hash function is used to provide message authentication, the hash function value is referred to as
Option A:	Message Field
Option B:	Message Digest
Option C:	Message Score
Option D:	Message Leap
53.	What is honey pot attack?
Option A:	dummy device put into the network to attract attackers
Option B:	single line threat

Option C:	Ip spoofing bypass
Option D:	recognition attack
54.	Which of the following tool would NOT be useful in figuring out what spyware or viruses could be installed on a client's computer?
Option A:	Wireshark
Option B:	Malware Bytes
Option C:	HighjackThis
Option D:	HitmanPro
55.	Which of the following does authorization aim to accomplish?
Option A:	Restrict what operations/data the user can access
Option B:	Determine if the user is an attacker
Option C:	Flag the user if he/she misbehaves
Option D:	Determine who the user is
56.	A person who enjoys learning details about computers and how to enhance their capabilities.
Option A:	cracker
Option B:	hacker
Option C:	app controller
Option D:	site controller
57.	Choose from among the following cipher systems, from best to the worst, with respect to ease of decryption using frequency analysis.
Option A:	random polyalphabetic , plaintext , playfair
Option B:	random polyalphabetic, playfair , vignere
Option C:	random polyalphabetic , vignere , playfair , plaintext
Option D:	random polyalphabetic , plaintext , beaufort , playfair
58.	The process of writing the text as rows and read it as columns is known as

Option A:	vernam cipher
Option B:	ceaser cipher
Option C:	transposition columnar cipher
Option D:	homophonic substitution cipher
59.	What is the port number for HTTPS (HTTP Secure)?
Option A:	43
Option B:	443
Option C:	445
Option D:	444
60.	The certificate message is required for any agreed key exchange method, except_____.
Option A:	Ephemeral Diffie-Hellman
Option B:	Anonymous Diffie-Hellman
Option C:	Fixed Diffie-Hellman
Option D:	RSA

Descriptive Questions

In RSA system the public key of a given user e=7 & n=187
     1) What is the private key of this user?
 	
     2) If the intercepted CT=11 and sent to a user whose public key e=7 & n=187. What is the PT?
 	
     3) Elaborate various kinds of attacks on RSA algorithm?

Explain IPSec protocol in detail. Also write applications and advantages of IPSec
Differentiate between i) MD-5 and SHA ii) Firewall and IDS.
How can we achieve web security? Explain with example.
What characteristics are needed in secure hash function? Explain the operation of secure hash algorithm on 512 bit block.
What is the need for message authentication? List various techniques used for message authentication. Explain any one of them .
Use Hill cipher to encrypt the text "short". The key to be used is "hill".

What are different types of viruses and worms? How do they propagate?
Explain different TCP/IP vulnerabilities layerwise.
Explain Working of DES.
What is digital signature. Explain RSA digital signature algorithm.
Compare packet sniffing and packet spoofing. Explain session hijacking attack.
A and B decide to use the Diffie Hellman algorithm to share a key. They choose p=23 and g= 5 as public parameters. Their secret keys are 6 and 15 respectively. Compute the secret key that they share.
Explain working of Kerberos in detail.
What is a digital certificate? How does it help to validate the authenticity of a user? Explain X.509 Certificate Format.
What are Denial of Service Attacks? Explain any three types of DoS attacks in detail.
Compare and Contrast (any two)   i) Block and Stream Ciphers   ii) Substitution cipher and transposition Cipher   iii) MD-5 and SHA-1
List and explain various types of attacks on encrypted message.
What is the purpose of S-boxes in DES? Explain the avalanche effect?
Why is the segmentation and reassembly function in PGP(Pretty Good Privacy) needed?
Give examples of replay attacks. List three general approaches for dealing with replay attacks.
With the help of suitable example compare and contrast monoalphabetic ciphers and polyalphabetic ciphers.
What are the properties of hash functions? What is the role of a hash function in security?
What are the different protocols in SSL? How do the Client and Server establish an SSL connection?
Explain the phases in life cycle of a virus.
Explain SQL Injection attack with examples.
What are the requirements of the cryptographic hash functions? Compare MD5 and SHA-1 hash functions.
Elaborate the steps of key generation using RSA Algorithm.
Explain with examples, Keyed and Keyless transposition Ciphers.
Encrypt the string "This is an easy task" using a playfair cipher with key "monarchy"
Given modulus n= 221 and public key, e= 7, find the values of p, q, phi(n) and d using RSA Algorithm and Encrypt M=5.
Find GCD of (2278,28) using the Euclidean Algorithm.
Explain Steps in MD5 Algorithm along with diagram.

What are the attacks on Digital Signature? Explain each of them.

A and B wish to use RSA to communicate securely. A chooses public key (e, n) as (7, 247) and B chooses public key (e, n) as (5, 221)
    i.   Calculate A's Private key.
    ii.   ii. Calculate B's Private Key.
    iii.   iii. What will be the cipher text sent by A to B, if A wishes to send M=5 to B

What is meant by DOS Attack? What are different ways mount DOS attacks?
How does ESP header guarantee confidentiality and integrity of packet payload?

Explain structure of DES wrt:
    i.   Fiestel structure and its significance
    ii.   Significance of extra swap between left and right half blocks
    iii.   Expansion
    iv.   Significance of S-box
    v.   DES function

What is the need of SSL? Explain handshake mode of protocol.
Encrypt the given message using Autokey Cipher, Key=7 and the Message is: "The house is being sold tonight".
Explain man in the middle attack on Diffie Hellman. Explain how to overcome the same.
Use the playfair cipher with the keyword: "HEALTH" to encipher the message "Life is full of Surprises"
What are different types of firewall? How firewall is different than IDS?
Explain Kerberos authentication process in detail.
Why are digital certificates and signatures required? What is role of digital signature in digital certificates? Explain any one digital signature algorithm.
What are the different components of Intrusion Detection System? Compare signature based IDS to anomaly based IDS.
Explain Diffie Hellman key exchange algorithm. What types of attacks   are possible on it explain with example.

Explain briefly the following attacks with example
    (I) Session hijacking (II) Salami Attack
    (III) SQL injection (IV) Buffer overflow

What is Denial of Service attack? What are the different ways in which an attacker can mount a DOS attack on a system?
Elaborate the steps of key generation using RSA algorithm. In RSA system the public key (E, N) of user A is defined as (7,187). Calculate Φ(N) and private key 'D'. What is the cipher text for M=10 using the public key.
What is OSI model? List few security services and Mechanisms for each layer.
Explain DES, detailing the Fiestel structure and S-block design.
Explain in detail block cipher mode of operation.

What is the need for message authentication? List various techniques used for message authentication. Explain anyone.
What is a digital certificate? How does it help to validate the authenticity of a user? Explain the X.509 certificate format.
With a block diagram, describe SHA-1 and SHA-2
A chooses public key as (7,33) and B chooses public key as (13,221). Calculate their private keys. A wishes to send message m=5 to B. Show the message signing and verification using RSA digital signature.
Explain different types of firewalls and mention the layer in which they operate.
With a block diagram give a brief Overview of SSL protocol.
What is Pretty Good Privacy (PGP)? Explain the concept of "Webb of Trust"
What are the different types of viruses and worms? How do they propagate?
Describe various botnet architectures.
What are the ways of detecting rootkits
Describe the various categories of authentication methods with examples.
Explain the working of DES Algorithm
Explain the working of AES Algorithm
Explain RSA Algorithm with an example
Explain the working of Kerberos.
Define authentication and non-repudiation and show with examples how each one can be achieved.
List and explain various types of attacks on encrypted message.
Why digital signature and digital certificates are required?
Explain with example keyed and keyless transposition cipher
Explain key rings in POP?
What are properties of hash function? Explain role of hash function in security
Using Chinese remainder theorem solve the following: x=2 (mod 3), x=3 (mod 5), x=2(mod 7), Find x?
How is firewall different from IDS?
Why is a digital signature and certificate required?
Encrypt "The Key is hidden under the door" using Playfair cipher with keyword "domestic"
Discuss any one transposition cipher with example. List their merits and demerits.
Write advantages and disadvantages of Symmetric Key Encryption.
Compare cryptography with steganography.

What is the purpose of S-boxes in DES? Explain the avalanche effect?
Explain with examples the CBC and ECB modes of block ciphers.
Compare AES and DES. Which one is bit oriented? Which one is byte oriented?
Explain the operation of secure hash algorithm on 512-bit block.
Compare MD5 and SHA Hash functions.
Explain working of Kerberos.
Explain any digital signature algorithm in detail.
What is Authentication header (AH)? How does it protect against replay attacks?
Write in brief about -IP spoofing.
Write in brief about IPSec protocols for security.
What is firewall? What are the firewall design principles?
List various Software Vulnerabilities. How Vulnerabilities are exploited to launch an attack?
Write short note on Buffer Overflow.

MCQ Questions

Computer Engineering

Subject Name: Mobile Computing   **Semester: VI**

Multiple Choice Questions

	Choose the correct option for following questions. All the Questions carry equal marks
1.	1) Which of the following usually stores all user-related data that is also relevant to GSM mobile systems?
Option A:	VLR
Option B:	HMR
Option C:	CMR
Option D:	SIM
2.	Which of these is required for the transmission of digital information by translating it into analogue signals via a particular frequency?
Option A:	BSPK
Option B:	QPSK
Option C:	Modulation
Option D:	Demodulation
3.	Two or more antennas can also be combined to improve reception by counteracting the negative effects of multi-path propagation. These antennas, also called
Option A:	Multi-element antenna arrays
Option B:	Smart antennas
Option C:	Sectorized antenna
Option D:	Isotropic radiator
4.	In which one of the following, the slow and fast hopping is used?
Option A:	GSM
Option B:	GPRS
Option C:	FHSS
Option D:	None of the above
5.	Which of the following does not come under subsystem of GSM architecture?
Option A:	BSS
Option B:	NSS
Option C:	OSS
Option D:	Channel

6.	Changing VLRs with uninterrupted availability of all services is called as
Option A:	VLR switching
Option B:	Roaming
Option C:	Hard handoff
Option D:	Soft handoff
7.	What is the interface between SGSN and HLR in a GPRS network structure?
Option A:	Gs
Option B:	Gn
Option C:	Gb
Option D:	Gr
8.	UMTS is also known as _____
Option A:	IS-95
Option B:	GPRS
Option C:	CdmaOne
Option D:	W-CDMA
9.	It is defined as the process of transferring a call (or data transfer) in progress from one channel to another channel.
Option A:	Handover
Option B:	Handoff
Option C:	Roaming
Option D:	Both A and B
10.	The security algorithms used in GSM are _____ .
Option A:	A3
Option B:	A5
Option C:	A8
Option D:	All of the above
11.	_____ is the mechanism of taking a packet consisting of packet header and data and putting it into the data part of a new packet.
Option A:	Decapsulation
Option B:	Encapsulation
Option C:	IP-in-IP
Option D:	Packet extension
12.	Foreign agents and home agents advertise their presence periodically using special message is called as
Option A:	Tunneling message
Option B:	Registration request
Option C:	Agent advertisement message
Option D:	Binding request
13.	In TCP/IP, ——————————— is a congestion control algorithm that makes it possible to quickly recover lost data packets.
Option A:	Fast retransmit and fast recovery
Option B:	Fast retransmit

Option C:	Fast recovery
Option D:	None of the above
14.	In the Indirect TCP the Foreign Agent (FA) becomes or acts as a —— and relays data in both directions
Option A:	Router
Option B:	Node
Option C:	Proxy
Option D:	Access Point
15.	A mobile phone uses _____ type of duplex communication
Option A:	Full
Option B:	Half
Option C:	Both A And B
Option D:	None of the above
16.	What does LTE stand for
Option A:	Level telecom advanced
Option B:	Long terminal advanced
Option C:	Long term evolution
Option D:	Long time evolution
17.	What are the advantages of a 4G LTE network over 3G network?
Option A:	More Spectral Efficiency
Option B:	Low power consumption
Option C:	Scalability and flexibility with other networks
Option D:	All of the above
18.	What is the full form of WLAN?
Option A:	Wide Local Area Network
Option B:	Wireless Local Area Network
Option C:	Wireless Land Access Network
Option D:	Wireless Local Area Node
19.	Which of the following specifies a set of media access control (MAC) and physical layer specifications for implementing WLANs?
Option A:	IEEE 802.16
Option B:	IEEE 802.3
Option C:	IEEE 802.11
Option D:	IEEE 802.15
20.	Which of the following is the 802.11 High Rate Standard?
Option A:	IEEE 802.15
Option B:	IEEE 802.15.4
Option C:	IEEE 802.11g
Option D:	IEEE 802.11b
21.	What is an Access point?

Option A:	An entity that provides access to the LLC Layer
Option B:	An entity that provides access to the MAC Layer
Option C:	An entity that provides access to the distribution system
Option D:	An entity that provides access to the Basic Service Set
22.	The frequency band of Bluetooth radio is around
Option A:	2.1GHz
Option B:	2.3GHz
Option C:	2.4GHz
Option D:	None of the above
23.	The Single Piconet formed by
Option A:	One Slave and One master
Option B:	One Slave and multiple masters
Option C:	Multiple slaves and one master
Option D:	Multiple slaves and multiple masters
24.	The Scatternet is a combination of
Option A:	Single piconet
Option B:	Double piconet
Option C:	Multiple piconet
Option D:	None of the above
25.	The size of an IP address in IPv6 is
Option A:	4 bytes
Option B:	128 bits
Option C:	8 bytes
Option D:	100 bits
26.	In CIP Architecture the major components are
Option A:	Micro mobility
Option B:	Macro mobility
Option C:	Cellular IP gateway
Option D:	None of the above
27.	In practical IPv6 application, a technology encapsulates IPv6 packets inside IPv4 packets, this technology is called
Option A:	Tunneling
Option B:	Hashing
Option C:	Routing
Option D:	NAT
28.	The header length of an IPv6 datagram is
Option A:	10 bytes
Option B:	25 bytes
Option C:	30 bytes
Option D:	40 bytes
29.	HMIPv6 stands for

Option A:	Host Mobile IPv6
Option B:	High Mobile IPv6
Option C:	Hierarchical Mobile IPv6
Option D:	None of the above
30.	Challenges of mobile computing include
Option A:	Low Security
Option B:	Ad hoc Networking
Option C:	Shared medium
Option D:	All of the above

Descriptive Questions

Differentiate between DSSS and FHSS.
Explain the Various types of antennas along with their radiation patters.
Explain GSM architecture and different interfaces used in it.
What are the modifications are required to an existing GSM network to be upgraded to GPRS, Explain with suitable diagram.
Write a short note on UTRAN and UMTS network.
Explain Hidden and Exposed terminal problem? Discuss solutions to this problems
Explain Tunnelling and Encapsulation and discuss how tunnelling work for Mobile IP using IP-In-IP Encapsulation?
Explain about Hierarchical Mobile IPv6?
Explain the SAE architecture in detailed manner.
Explain LTE protocol stack.
Explain LTE MAC layer.
Explain Protocol Architecture of 802.11?
Explain in detail IEEE 802.11 MAC sub layer?
Explain Bluetooth Architecture in detailed manner?
Draw and explain Bluetooth protocol stack in detail?
Explain about optimization in mobility management?
Comparison of IPv4 and IPv6 Header format?
What is Cellular IP? Explain CIP architecture along with routing and paging procedure in CIP?
Discuss in detail about Macro Mobility?
Explain about HAWAII in detailed manner?
Explain Agent advertisement in Mobile IP?
Explain various ALOHA protocol?
What are the goals of Mobile IP?
Write a short note on different generations of telecommunication
Compare between 1G, 2G, 3G, 4G and 5G generations.

Compare between LTE and LTE advanced.
Explain how Mobile originated call (MOC) work.
Explain the concept of medium access protocol.
Discuss various GSM services.
Explain how Mobile terminated call work in GSM.
Difference between Ad-hoc Network and Infrastructure Network?
Comparison of various IEEE 802.11x Standards?
Explain about Wireless LAN threats?
Short note on 5G.
Describe Micro Mobility.

Sample Questions

Computer Engineering

Subject Name: Artificial Intelligence (CSC604)   **Semester: VI**

Multiple Choice Questions

	Choose the correct option for following questions. All the Questions carry equal marks
1.	What is the goal of Artificial Intelligence?
Option A:	To solve artificial problems
Option B:	To extract scientific causes
Option C:	To explain various sorts of intelligence
Option D:	To solve real-world problems
2.	Which of the following is a component of Artificial Intelligence?
Option A:	Learning
Option B:	Designing
Option C:	Puzzling
Option D:	Training
3.	What is the function of an Artificial Intelligence "Agent"?
Option A:	Mapping of precept sequence to an action
Option B:	Work without the direct interference of the people
Option C:	Mapping of environment sequence to an action
Option D:	Mapping of goal sequence to an action
4.	What is the action of task environment in artificial intelligence?
Option A:	Problem
Option B:	Solution
Option C:	Agent
Option D:	Observation
5.	Which of the following is not the commonly used programming language for Artificial Intelligence?
Option A:	Perl
Option B:	Java
Option C:	PROLOG
Option D:	LISP
6.	Which of the following machine requires input from the humans but can interpret the outputs themselves?
Option A:	Actuators
Option B:	Sensor
Option C:	Agents
Option D:	AI system

7.	Which search comes under Local search ?
Option A:	A* search
Option B:	BFS
Option C:	Hill Climbing Search
Option D:	DFS
8.	Memory space requirement in hill climbing algorithm is _____
Option A:	Less
Option B:	More
Option C:	very high
Option D:	Zero
9.	Which search strategy is also called as blind search?
Option A:	Simple reflex search
Option B:	Uninformed search
Option C:	Informed search
Option D:	Adversarial search
10.	The time and space complexity of BFS is (For time and space complexity problems consider b as branching factor and d as depth of the search tree.)
Option A:	O(bd+1) and O(bd+1)
Option B:	O(b2) and O(d2)
Option C:	O(d2) and O(b2)
Option D:	O(d2) and O(d2)
11.	What are the two main features of Genetic Algorithm?
Option A:	Crossover techniques & Random mutation
Option B:	Fitness function & Crossover techniques
Option C:	Individuals among the population & Random mutation
Option D:	Random mutation & Fitness function
12.	What is state space?
Option A:	The whole problem
Option B:	Your Definition to a problem
Option C:	Problem you design
Option D:	Representing your problem with variable and parameter
13.	_____ are the curves in the search space that leads to sequence of local maxima
Option A:	Plateau
Option B:	Ridges
Option C:	Peak
Option D:	Mount
14.	Which is a best way to go for Game playing problem
Option A:	Linear approach
Option B:	Heuristic approach

Option C:	Random approach
Option D:	Optimal Approach
15.	Where does the values of alpha-beta search get updated?
Option A:	Along the path of search
Option B:	Initial state itself
Option C:	At the end
Option D:	None of the mentioned
16.	Which function is used to calculate the feasibility of whole game tree?
Option A:	Evaluation function
Option B:	Transposition
Option C:	Alpha-beta pruning
Option D:	All of the mentioned
17.	In propositional logic, propositional symbols are denoted with .
Option A:	capital letters
Option B:	numbers
Option C:	double letters
Option D:	double digits
18.	FOL is a
Option A:	lower level logic
Option B:	foundation level logic
Option C:	post order logic
Option D:	higher level logic
19.	Which are more suitable normal form to be used with definite clause?
Option A:	Positive literal
Option B:	Negative literal
Option C:	Generalized modus ponens
Option D:	Neutral literal
20.	Which is mainly used for automated reasoning?
Option A:	Backward chaining
Option B:	Forward chaining
Option C:	Logic programming
Option D:	Parallel programming
21.	Antecedent to consequent is the flow of
Option A:	Backward Chaining
Option B:	Forward Chaining
Option C:	First Chaining
Option D:	Last Chaining
22.	Which of the mentioned point correctly defines a quantifier in AI?
Option A:	Quantifiers are numbers ranging from 0-9.
Option B:	Quantifiers are the quantity defining terms which are used with the

	predicates.
Option C:	Quantifiers quantize the term between 0 and 1.
Option D:	Quantifiers quantize the term between 10 and 100.
23.	Knowledge and reasoning also play a crucial role in dealing with environment.
Option A:	Completely Observable
Option B:	Partially Observable
Option C:	Neither Completely nor Partially Observable
Option D:	Only Completely and Partially Observable
24.	Which of the following is not the style of inference?
Option A:	Forward Chaining
Option B:	Backward Chaining
Option C:	Resolution Refutation
Option D:	Modus Ponen
25.	What is the form of Fuzzy logic?
Option A:	Two-valued logic
Option B:	Crisp set logic
Option C:	Many-valued logic
Option D:	Binary set logic
26.	Which of the following is an advantage of using an expert system development tool?
Option A:	imposed structure
Option B:	knowledge engineering assistance
Option C:	rapid prototyping
Option D:	all of the mentioned
27.	What is Decision Tree?
Option A:	Flow-Chart
Option B:	Structure in which internal node represents test on an attribute, each branch represents outcome of test and each leaf node represents class label
Option C:	Flow-Chart & Structure in which internal node represents test on an attribute, each branch represents outcome of test and each leaf node represents class label
Option D:	None of the mentioned
28.	Which values are independant in minimax search algorithm?
Option A:	Pruned leaves x and y
Option B:	Every states are dependant
Option C:	Root is independant
Option D:	None of the mentioned
29.	Which of the following includes major tasks of NLP?
Option A:	Automatic Summarization
Option B:	Discourse Analysis

Option C:	Machine Translation
Option D:	All of the mentioned
30.	What is the main challenge/s of NLP?
Option A:	Handling Ambiguity of Sentences
Option B:	Handling Tokenization
Option C:	Handling POS-Tagging
Option D:	All of the mentioned

Descriptive Questions

10 marks each
Explain steps in problem formulation with example.
Draw and Describe the Architecture of Utility based agent. How is it different from Model based agent?
Compare different uninformed search strategies.
Explain DFS algorithm with example.
Define the terms chromosome, fitness function, crossover and mutation as used in Genetic algorithms. Explain how Genetic algorithms work.
Explain BFS algorithm with example.
Explain the steps involved in converting the propositional logic statement into CNF with suitable example.
Consider the search problem below with start state S and goal state E. Thetransaction cost and heuristic values are given. What is the final cost using A* algorithm to reach from the start State to goal state? (Heuristic values S=10, A=5, B=6, Y=8, Z=5, C=4, D=15, E=0
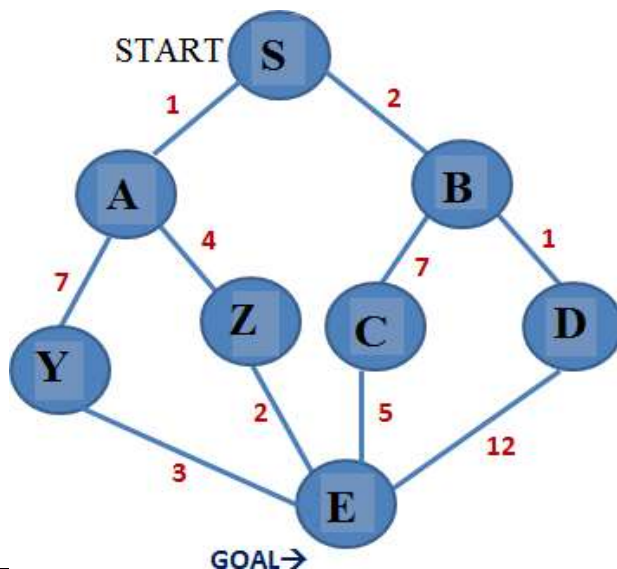
Figure depicts a search space in which the nodes are labelled with names like A,B, C and D. Node S is the start node and G is the goal node
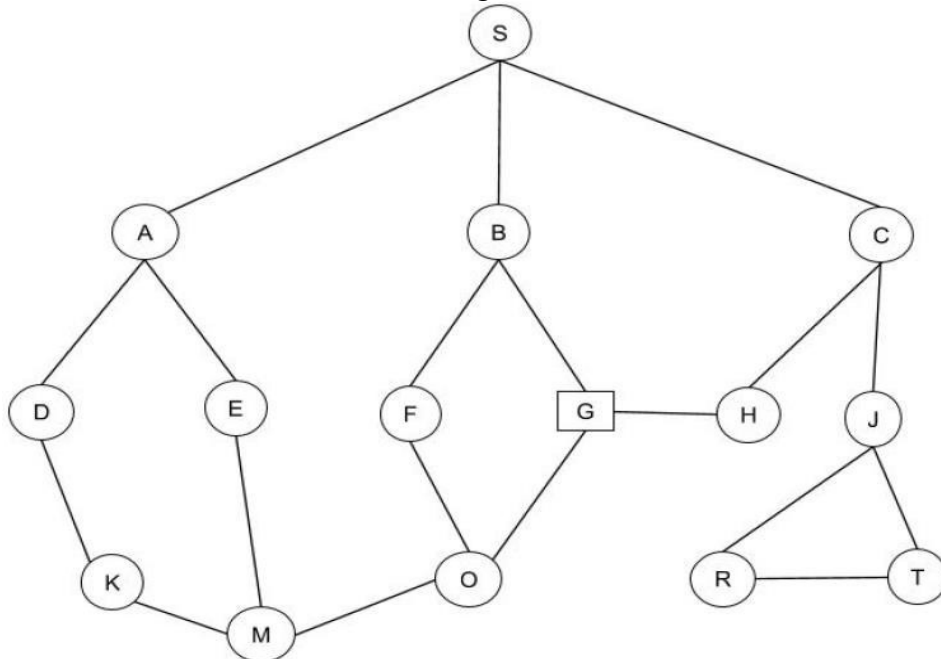
a) List the order in which the Depth First Search algorithm inspect the nodes in Figure whenever there is a contention between morethan one node the algorithm chooses one on left
b) What is the path found by the algorithm in the previous question?
c) List the order in which the Bredth First Search algorithm inspectthe nodes in figure
d) What is the path found by the algorithm in previous question?

List the order in which DFID algorithm inspect the nodes in figure

| What are steps involved in natural language processing (NLP) of an English sentence? Explain with an example sentence. |
| Examine Architecture of Expert Systems with its applications |
| Describe backward chaining with example. |
| Design planning agent to solve block world problem. Assume suitable initial state and final state for the problem. |
| Discuss partial order planning giving suitable example. |
| Explain decision tree learning with an example. What are decision rules? How to use it for classifying new sample. |

5 marks each
Define Intelligent Agent. What are the characteristics of Intelligent Agent?
What is an agent? Explain basic building blocks of learning agent?
Describe different types of environments application to AI System.
Formulate 8-puzzle problem
Explain detail architecture of goal based agent.
Explain heuristic function with example.
Explain various method of knowledge representation techniques.
Differentiate between forward and backward chaining.
Write short note on Hill Climbing algorithms.
Draw game tree of tic-tac-toe problem

What is Min-Max search?
Write short note on admissibility of A*.
Give PEAS properties of WUMPUS world.
Write first order logic statements for the following i)If a perfect square is divisible by a prime p then it is also divisible bysquare of p. ii) Every perfect square is divisible by some prime iii) Alice does not like Chemistry and History iv) If it is Saturday and warm, then Sam is in the park Anything anyone eats and is not killed is a food
Convert the following propositional logic statement into CNF "If it ishumid then it will rain, since it is humid it will rain"
Define Belief Network. Explain conditional Independence relation in Belief Network with example.
Short note on predicate logic.
What is planning in AI?
Define partial order planner.
Describe unsupervised learning with example.
Write short note on natural language processing

Sample Questions

Computer Engineering

Subject Name: Internet of Things   **Semester: VI**

Multiple Choice Questions

	Choose the correct option for following questions. All the Questions carry equal marks
1.	The layer number seven of IoTWF standard is
Option A:	Application
Option B:	Data Accumulation
Option C:	**Collaboration and Processes**
Option D:	Edge computing
2.	In which layer of IoTWF standard is sensors deployed
Option A:	Application
Option B:	**Physical devices**
Option C:	Connectivity
Option D:	Data abstraction
3.	The standardized architecture of M2M IoT does not achieve
Option A:	Decompose IoT problem to smaller part
Option B:	Identify different technologies at each layer and how they relate to one another
Option C:	Have a process of defining interfaces that leads to interoperability
Option D:	**Define a tiered security model that does not enforce the transition points between levels**
4.	Which of the following is not new requirements of IoT Data Management and Compute Stack
Option A:	Minimizing latency
Option B:	Increasing local efficiency
Option C:	**Reducing the amount of data transmission**
Option D:	Conserving network bandwidth
5.	Which of the following an example of position sensor
Option A:	Force gauge
Option B:	Barometer
Option C:	Anemometer
Option D:	**Potentiometer**
6.	Galvanometer works on which principle
Option A:	**Ampere's Law**
Option B:	Faraday's Law of Induction
Option C:	Photoconductive Effect

Option D:	Hall Effect
7.	Which of the following is a mechanical actuator
Option A:	**Screw Jack**
Option B:	Step motor
Option C:	Pneumatic cylinder
Option D:	Electrostatic motor
8.	MEMS stands for
Option A:	Mini Electro Mechanical System
Option B:	**Micro Electro Mechanical System**
Option C:	Mini Electro Machine System
Option D:	Micro Electro Machine System
9.	Which of the following is disadvantage of Zigbee
Option A:	Does not require knowledge to operate zigbee
Option B:	**It is not as secure as wifi based secured system**
Option C:	Replacement cost is low
Option D:	It can be used in outdoor wireless communication
10.	Which of the following Access network sublayer works in least range
Option A:	HAN
Option B:	FAN
Option C:	**PAN**
Option D:	LAN
11.	Which of the following is not part of Layer 2 communication network layer
Option A:	Access Network Sublayer
Option B:	Gateways and Backhaul Sublayer
Option C:	IoT Network Management Sublayer
Option D:	**Application and analytics layer**
12.	SCADA network mainly focuses on which domain
Option A:	Agriculture
Option B:	Healthcare
Option C:	Utility
Option D:	Transportation
13.	CoAP message has fixed size header field of
Option A:	3 bytes
Option B:	2 bytes
Option C:	**4 bytes**
Option D:	5 bytes
14.	MQTT protocol works on which method of communication
Option A:	Get Post
Option B:	Send Receive
Option C:	**Publish Subscribe**

Option D:	Transmit Acknowledeg
15.	Which of the following is not component is not mandatory in Intrusion detection system
Option A:	Proximity sensor
Option B:	Buzzer or alert message
Option C:	**Gyroscope**
Option D:	IR sensor
16.	Which of the following is an IoT hardware
Option A:	**Beaglebone**
Option B:	Temboo
Option C:	Kaa
Option D:	Thingspeak
17.	Which of the following is not supported by Raspberry Pi 3
Option A:	GPIO
Option B:	PWM
Option C:	**Analog Pins**
Option D:	Wifi
18.	Arduino Uno has which of the following
Option A:	40 GPIO pins,
Option B:	four USB 2.0 ports,
Option C:	one micro-SD card slot
Option D:	**Analog pins**
19.	Which of the following is not a category of sensors
Option A:	Active or Passive
Option B:	Contact or no contact
Option C:	Absolute or relative
Option D:	**Short and Long range**
20.	When SCADA is deployed in LLN which technology is used
Option A:	TCP
Option B:	UDP
Option C:	**MAP-T**
Option D:	RTU

21.	What is the full form of SCADA
Option A:	Supervisory Control and Document Acquisition
Option B:	**Supervisory Control and Data Acquisition**
Option C:	Supervisory Column and Data Assessment
Option D:	Supervisory Column and Data Assessment

22.	MQTT is _____ oriented
Option A:	Data
Option B:	**Message**
Option C:	Network
Option D:	Device
23.	Which type of sensor is used to measure the distance between the vehicle and other objects in its environment
Option A:	Tactile sensor
Option B:	**Ultrasonic sensor**
Option C:	Motion sensor
Option D:	Pressure sensor
24.	DHT22 sensor is used to sense
Option A:	Obstacles
Option B:	**Humidity**
Option C:	Position
Option D:	Resistance
25.	What is ESP8266
Option A:	**WIFI module**
Option B:	Sensor
Option C:	Board
Option D:	USB cable
26.	Which sensor is LM35
Option A:	Pressure sensor
Option B:	Humidity sensor
Option C:	**Temperature sensor**
Option D:	Touch sensor
27.	Barometer is which type of sensor_____
Option A:	**Pressure sensor**
Option B:	Temperature sensor
Option C:	Touch sensor
Option D:	Humidity sensor
28.	Which devices measures gases or liquid
Option A:	Proximity sensor
Option B:	**Pressure sensor**
Option C:	Temperature sensor
Option D:	Touch sensor
29.	_____ sensor is used for tracking rotation or twist
Option A:	**Gyroscope**
Option B:	Temperature
Option C:	Pressure

Option D:	Proximity
30.	What is the microcontroller used in Arduino UNO
Option A:	**ATmega328P**
Option B:	ATmega327P
Option C:	ATmega329P
Option D:	ATmega326P

Descriptive Questions

10 marks each
Justify the need of OT and IT convergence and elaborate the challenges associated with it.
Describe the hierarchy of Cloud computing, Edge computing and Fog Computing
Explain IoTWF standardised architecture with diagram
Explain concept and working of RFID System
Describe Smart Object and its characteristics
Describe MEMS and its application
Discuss the framework of Zigbee and its application
Elaborate the working of Layer 1 of Core IoT Functional Stack
Elaborate Tunneling Legacy SCADA over IP Networks with three scenarios
Describe the SCADA Transport over LLNs with MAP-T
Elaborate the working model of smart weather monitoring system
Elaborate the working model of smart agriculture system
Compare Arduino Uno and Raspberry Pi 3 model in terms of connectivity and communication standards
Identify the IoT board / platform in terms development environment and communication standards for smart irrigations system and discuss the security concerns related to it.
Identify the most appropriate IoT board / platform in terms development environment and communication standards for smart home and discuss the security concerns related to it.
Identify the most appropriate IoT board / platform in terms of computing smart irrigations system and discuss the security concerns related to it.

5 marks each
Elaborate the driving force behind development of new architecture for IoT
Compare M2M and IoT frameworks
Discuss any one IoT Software platform and its working wrt an application
Define sensor and list types of sensors
Give different ways to categorized the sensors with one example for each
List differences between bluetooth and BLE
Explain working of Backhaul Sublayer in communication network layer

Explain the working principle and characteristics of actuators
Describe the types of topologies used in sensor network
Distinguish between Bluetooth and BLE
Distinguish between Analytics and Control Applications of layer 3 IoT Functional stack
Discuss the need of IoT Data Broker and its working
Analyze the deployment requirements for smart irrigation system
Analyze the deployment requirement for smart parking system.

Sample Questions

Computer Engineering

Subject Name: Digital Signal and Image Processing　　　　　　**Semester: VI**

Multiple Choice Questions

	Choose the correct option for following questions. All the Questions carry equal marks
1.	If x(n) is a discrete-time signal, then the value of x(n) at non integer value of 'n' is:
Option A:	Zero
Option B:	Positive
Option C:	Negative
Option D:	Not defined
Answer	Not defined
2.	The function given by the equation x(n)=1, for n=0; and x(n) =0, for n ≠ 0 is
Option A:	Step function
Option B:	Ramp function
Option C:	Triangular function
Option D:	Impulse function
Answer	Impulse function
3.	Which of the following should be done in order to convert a continuous-time signal to a discrete-time signal?
Option A:	Sampling
Option B:	Differentiating
Option C:	Integrating
Option D:	None of the mentioned
Answer	Sampling
4.	What is output signal when a signal x(t)=cos (2*pi*40*t) is sampled with a sampling frequency of 20Hz?
Option A:	cos(pi*n)
Option B:	cos(2*pi*n)
Option C:	cos(4*pi*n)
Option D:	cos(8*pi*n)
Answer	cos(4*pi*n)
5.	Which of the following is true regarding the number of computations requires to compute an N-point DFT?
Option A:	N2 complex multiplications and N(N-1) complex additions
Option B:	N2 complex additions and N(N-1) complex multiplications
Option C:	N2 complex multiplications and N(N+1) complex additions
Option D:	N2 complex additions and N(N+1) complex multiplications
Answer	N2 complex multiplications and N(N-1) complex additions
6.	What is the DFT of the four point sequence x(n)={0,1,2,3}?
Option A:	{6,-2+2j-2,-2-2j}
Option B:	{6,-2-2j,2,-2+2j}
Option C:	{6,-2+2j,-2,-2-2j}
Option D:	{6,-2-2j,-2,-2+2j}

Answer	{6,-2+2j,-2,-2-2j}
7.	What is the order of the four operations that are needed to be done on h(k) in order to convolute x(k) and h(k)? Step-1:Folding Step-2:Multiplication with x(k) Step-3:Shifting Step-4:Summation
Option A:	1-2-3-4
Option B:	1-2-4-3
Option C:	2-1-3-4
Option D:	1-3-2-4
Answer	1-3-2-4
8.	An LTI system is said to be causal if and only if?
Option A:	Impulse response is non-zero for positive values of n
Option B:	Impulse response is zero for positive values of n
Option C:	Impulse response is nonzero for negative values of n
Option D:	Impulse response is zero for negative values of n
Answer	Impulse response is zero for negative values of n
9.	If x(n)=(0,0,1,1,1,1,1,0) then x(3n+1) is?
Option A:	(0,1,0,0,0,0,0,0)
Option B:	(0,0,1,1,1,1,0,0)
Option C:	(1,1,0,0,0,0,0,0)
Option D:	None of the mentioned
Answer	(0,1,0,0,0,0,0,0)
10.	Which function has a provision of determining the similarity between the signal and its delayed version?
Option A:	Auto-correlation Function
Option B:	Cross-correlation Function
Option C:	Convolution Function
Option D:	DFT function
Answer	Auto-correlation Function
11.	Which property is exhibited by the auto-correlation function of a complex valued signal?
Option A:	Commutative property
Option B:	Distributive property
Option C:	Conjugate property
Option D:	Associative property
Answer	Conjugate property
12.	In 4-neighbours of a pixel p, how far are each of the neighbours located from p?
Option A:	one pixel apart
Option B:	four pixels apart
Option C:	alternating pixels
Option D:	none of the Mentioned
Answer	one pixel apart
13.	What is the technique for a gray-level transformation function called, if the transformation would be to produce an image of higher contrast than the original by darkening the levels below some gray-level m and brightening the levels above m in the original image.
Option A:	Contouring
Option B:	Contrast stretching

Option C:	Mask processing
Option D:	Point processing
Answer	Contrast stretching
14.	What does the bilinear Interpolation do for gray-level assignment?
Option A:	Assign gray level to the new pixel using its right neighbor
Option B:	Assign gray level to the new pixel using its left neighbor
Option C:	Assign gray level to the new pixel using its four nearest neighbors
Option D:	Assign gray level to the new pixel using its eight nearest neighbours
Answer	Assign gray level to the new pixel using its four nearest neighbors
12	For pixels p(x, y), q(s, t), the Euclidean distance between p and q is defined as:
Option A:	$D(p, q) = [(x - s)^2 + (y - t)^2]^{1/2}$
Option B:	$D(p, q) = \|x - s\| + \|y - t\|$
Option C:	$D(p, q) = \max (\|x - s\| + \|y - t\|)$
Option D:	None of the mentioned
Answer	$D(p, q) = [(x - s)^2 + (y - t)^2]^{1/2}$
16.	Highlighting the contribution made to total image by specific bits instead of highlighting intensity-level changes is called as:
Option A:	Bit-plane slicing
Option B:	Intensity Highlighting
Option C:	Byte-Slicing
Option D:	None of the Mentioned
Answer	Bit-plane slicing
17.	Which of the following in an image can be removed by using smoothing filter?
Option A:	Sharp transitions of brightness levels
Option B:	Sharp transitions of gray levels
Option C:	Smooth transitions of gray levels
Option D:	Smooth transitions of brightness levels
Answer	Sharp transitions of gray levels
18.	What is the full form of JPEG?
Option A:	Joint Photographs Expansion Group
Option B:	Joint Photographic Expansion Group
Option C:	Joint Photographic Experts Group
Option D:	Joint Photographic Expanded Group
Answer	Joint Photographic Experts Group
19.	Which of the following is the first fundamental step in image processing?
Option A:	Filtration
Option B:	Image Restoration
Option C:	Image Enhancement
Option D:	Image Acquisition
Answer	Image Acquisition
20.	What is the name of the tool that helps in zooming, shrinking, rotating, etc.?
Option A:	Filters
Option B:	Interpolation
Option C:	Sampling
Option D:	None of the above
Answer	Interpolation
21.	Intensity levels in 8-bit image are:_____.
Option A:	0—255
Option B:	0—1024

Option C:	0—128
Option D:	0--64
Answer	0—255
22.	The number of grey values are integer powers of:_____.
Option A:	3
Option B:	4
Option C:	8
Option D:	2
Answer	2
23.	The Overlap Save and Overlap Add methods are used to compute DFT of __.
Option A:	Short date sequence
Option B:	Moderate data sequence
Option C:	Big sample value sequence
Option D:	Long date sequence.
Answer	Long data sequence.
24.	D.I.T. is_____.
Option A:	Dissemination In Task.
Option B:	Degradation In Time.
Option C:	Dissemination In Time.
Option D:	Disadvantage in Time.
Answer	Dissemination In Time.
25.	In FFT, how many complex multiplications are required to compute X(k)?
Option A:	N(N+1)
Option B:	N(N-1)/2
Option C:	N2/2
Option D:	N(N+1)/2
Answer	N(N+1)/2
26.	If x(n) and X(k) are an N-point DFT pair, then X(k+N)=?
Option A:	X(-k)
Option B:	-X(k)
Option C:	-X(-k)
Option D:	X(k)
Answer	X(k)
27.	What is the name of process used to correct the power-law response phenomena?
Option A:	Beta correction
Option B:	Alpha correction
Option C:	Gamma correction
Option D:	Pie correction
Answer	Gamma correction
28.	Which of the following make an image difficult to enhance?
Option A:	Narrow range of intensity levels
Option B:	High noise
Option C:	Dynamic range of intensity levels
Option D:	All of the mentioned above
Answer	All of the mentioned above
29.	The circular convolution of two sequences in time domain is equivalent to_____.
Option A:	Square of multiplication of DFTs of two sequences
Option B:	Difference of DFTs of two sequences
Option C:	Summation of DFTs of two sequences

Option D:	Multiplication of DFTs of two sequences
Answer	Multiplication of DFTs of two sequences
30.	To convert a continuous sensed data into Digital form, which of the following is required?
Option A:	Sampling
Option B:	Quantization
Option C:	Both Sampling and Quantization
Option D:	Neither Sampling nor Quantization
Answer	Both Sampling and Quantization

Descriptive Questions

A particular digital image with eight quantization level has the following histogram perform histogram equalization. Give new equalized histogram.

Gray Levels	0	1	2	3	4	5	6	7
No. of Pixels belongs to gray level	200	170	130	60	60	80	140	160

Perform the histogram stretching so that the new image have dynamic range [0 -7].

Gray Levels	0	1	2	3	4	5	6	7
No. of Pixels belongs to gray level	100	90	85	70	0	0	0	0

Explain the procedure of Zooming an image using replication and interpolation with suitable example.

Find the convolution of the following sequencesi)
x(n)=u(n), h(n)=u(n-3)
ii) x(n)={1,2,-1,1}, h(n)={1,0,1,1}

For a periodic signal v(t) = 30sin(2*pi*100t) + 10cos(2*pi*300t) + 6 sin(2*pi*500t), find the fundamental frequency in rad/s and Nyquist sampling rate. Obtain the discrete signal x(n).

Determine the response of the relaxed system characterized by the impulse response
$h[n]= 0.5^n u(n)$ and input $x[n]=2^n u(n)$.

If x(n) = {1,2,3,4} and h(n) = {1,2,3,2}
   a) Find Circular Convolution using DFT and IDFT?
   b) Find Linear Convolution using Circular Convolution using DFT and IDFT?

Find the output y(n) of a filter whose impulse response is h(n) = {1, 1, 1} and input signal
   x(n) = {3, -1, 0, 1, 3, 2, 0, 1, 2, 1} using overlap save method?

Obtain the convolution for two D.T. sequences x(n) = u(n) and $y(n)=(0.5)^n u(n)$.

Two discrete time systems are connected in cascade $h_1(n) = (0.5)^n u(n)$ and $h_2(n) =(0.25)^n$ u(n). Determine unit sample response of cascade.

The Impulse response of DT- LTI system h(n) = n $(1/2)^n$ u(n). Determine whether the system is stable and casual?

A system has unit impulse response h(n) = $(1/3)^{n+1}$ u(n+1).Find the response for unit step input?

Find the output y(n) of a filter whose impulse response is h(n) = {1, 1, 1} and input signal x(n) = {3, -1, 0, 1, 3, 2, 0, 1, 2, 1} using overlap save method?

Perform bit plane slicing and obtain all bit planes of following image

7	3	5	4
6	2	4	3
5	7	6	0
6	7	4	3

Show that a high pass filter can be obtained as High Pass = Original – Low Pass

What is zero padding? What are its uses?

List and explain any four properties of DFT.

How many multiplications and additions are required to compute N point DFT using Radix-2 FFT?

Explain the procedure of neighborhood processing technique?

Distinguish between linear convolution and circular convolution of two sequences.

Let x(n) = cos(n.π/2) u(n). Find D.F.T. of x(n).

Compare the high pass and low pass filtering in spatial domain.

What are different applicators of DSP?

Distinguish between Discrete Signal and Analog signals.

What are different signals used for analysis of discrete time signals?

Obtain the autocorrelation of sequence x(n) = a^n u(n) , 0 < a < 1

Find the signal energy of $(1/2)^n$ u(n)?

Obtain the digital negative of the 8 bpp image

23	206	244	72	130
163	79	47	69	122
201	247	100	80	39
48	77	111	211	121

What effect would set to zero the higher-order bit planes have on the histogram of an image in general?

The impulse response of a LTI system is h(n)={1,2,1,1}. What is the response of the signal to the input x(n)={1,2,3,4}?

Sample Questions

Computer Engineering

Subject Name: Quantitative Analysis   **Semester: VI**

Multiple Choice Questions

1.	Q:Multiple linear regression (MLR) is a _____ type of statistical analysis. Options a) Univariate b) Bivariate c) Multivariate d) Trivariate
2.	Q:A linear regression (LR) analysis produces the equation Y = 0.4X + 3. This indicates that: Options When Y = 0.4, X = 3 When Y = 0, X = 3 When X = 3, Y = 0.4 When X = 0, Y = 3
3.	Q:A LR analysis produces the equation Y = -3.2X + 7. This indicates that: Options a) A 1 unit increase in X results in a 3.2 unit decrease in Y. b) A 1 unit decrease in X results in a 3.2 unit decrease in Y. c) A 1 unit increase in X results in a 3.2 unit increase in Y. d) An X value of 0 would would increase Y by 7
4.	When writing regression formulae, which of the following refers to the predicted value on the dependent variable (DV)? a)Y b)Y (hat) c)X d)X (hat)

5.	In MLR, the square of the multiple correlation coefficient or R2 is called the a)Coefficient of determination b)Variance c) Covariance d)Cross-product
6.	Which of the following is true about the adjusted R2? It is usually larger than the R^2 It is only used when there is just one predictor It is usually smaller than the R^2 It is used to determine whether residuals are normally distributed

7.	Least square method calculates the best-fitting line for the observed data by minimizing the sum of the squares of the _____ deviations.
	
	   a) Vertical
	
	   b) Horizontal
	
	   c) Both of these
	
	   d) None of these

8.	A residual is defined as a) The difference between the actual Y values and the mean of Y. b) The difference between the actual Y values and the predicted Y values. c) The predicted value of Y for the average X value. d) The square root of the slope.
9.	The correct relationship between SST, SSR, and SSE is given by; a) SSR = SST + SSE b) SST = SSR + SSE c) SSE = SSR – SST d) d) all of the above

10.	Below you are given a summary of the output from a simple linear regression analysis from a sample of size 15, SSR=100, SST = 152. The coefficient of determination is; a) 0.5200 b) 0.6579 c) 0.8111 d) 1.52
11.	Significance for the coefficients (b) is determined by a)an F-test. b)an R^2 test. c)a correlation coefficient. d)a t-test.
12.	Q:A researcher polls people as they walk by on the street. Options a) Systematic Random Sample b) Convenience Sampling c) Judgmental Sampling d) Quota Sampling
13.	Q:Inspectors for a hospital chain with multiple locations randomly select some of their locations for a cleanliness check of their operating rooms. Options a) Cluster sampling b) Stratified Sampling c) Quota Sampling d) Snowball Sampling
14.	Q: The runs scored by a batsman in 5 ODIs are 31,97,112, 63, and 12. The standard deviation is Options 1: 24.79

	2: 23.79 3: 25.79 4: 26.79
15.	Q: Find the mode of the call received on 7 consecutive day 11,13,13,17,19,23,25 Options 1: 11 2: 13 3: 17 4: 23
16.	Q: Find the median of the call received on 7 consecutive days 11,13, 17, 13, 23,25,19 Options 1: 13 2: 23 3: 25 4: 17
17.	Q: If the probability of hitting an object is 0.8, find the variance Options 1: 0.18 2: 0.16 3: 0.14 4: 0.12
18.	Q: E(X) = λ is used for which distribution? Options 1: Binomial distribution 2: Poisson's distribution 3: Bernoulli's distribution 4: Laplace distribution
19.	Q: The classification of data on geographical basis is also called as Options 1: reflected classification 2: populated classification 3: sampling classification 4: spatial classification

20.	Q: The summary and presentation of data in tabular form with several non-overlapping classes is referred as Options 1: nominal distribution 2: ordinal distribution 3: chronological distribution 4: frequency distribution
21.	Q: The largest value is 60 and smallest value is 40 and the number of classes desired is 5 then the class interval is Options 1: 20 2: 4 3: 25 4: 15
22.	Q: The diagram used to represent group and ungrouped data is classified as Options 1: breadth diagram 2: width diagram 3: bar diagram 4: length diagram
23.	Q: Histogram, pie charts and frequency polygon are all types of Options 1: one dimensional diagram 2: two dimensional diagram 3: cumulative diagram 4: dispersion diagram
24.	Q: Which of the following is not a type of univariate frequency distribution Options 1: Individual observation 2: Discrete frequency distribution 3: Continuous frequency distribution 4: Random frequency distribution
25.	Q: The method of classification of data in terms of class intervals in which both the lower limit and the upper limit of any class (class interval) are included in that class (class interval) is known as _____ method of classification

Options
1: exclusive
2: inclusive
3: equal
4: unequal

26. Q: What is the arithmetic mean of 2, 8, 10, 6, 14?

Options
1: 5
2: 6
3: 7
4: 8

27. Q: From the following frequency distribution, find the median class:

Cost of living index	No. of weeks
1400-1550	8
1550-1700	15
1700-1850	21
1850-2000	8

Options
1: 1400–1550
2: 1550–1700
3: 1700–1850
4: 1850–2000

28. Q: We need _____ dimension(s) to table or plot a univariate (1-variable) frequency distribution

Options
1: one
2: two
3: three
4: four

29. Q: Quota sampling is similar to _____ sampling.

Options
1: purposive
2: convenience
3: stratified
4: cluster

30. Q: The number of possible samples of size 2 out of 5 population size in simple random sampling with replacement (SRSWR) is equal to

Options

	1: 10 2: 15 3: 20 4: 25
31.	Q: Which of the following method of sampling is not a part of 'restricted random sampling'? Options 1: Lottery method 2: Stratified method 3: Systematic method 4: Cluster method
32.	Q: Consider simple random sampling without replacement (SRSWOR) from a population of size N. The number of samples of size n is Options 1: $^{N}P_n$ 2: $^{N}C_n$ 3: N^n 4: N
33.	Q: Population census conducted by the government of India after every 10 years is an example of _____ data. Options 1: Primary data 2: Secondary data 3: Structured data 4: Unstructured data
34.	Q: If b_{yx} = 0.5 and b_{xy} = 0.46, then the value of coefficient of correlation (r) is Options 1: 0.39 2: 0.48 3: 0.23 4: 0.25
35.	Q: From the given table, the MAE value is <table><tr><th>Week</th><th>Demand</th><th>Forecast</th><th>Error</th><th>|Error|</th><th>Error^2</th></tr><tr><td>1</td><td>100</td><td>0</td><td>-100</td><td>100</td><td>10 000</td></tr><tr><td>2</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>3</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>Total</td><td>100</td><td>0</td><td>-100</td><td>100</td><td>10 000</td></tr></table>

	Options 1: 100 2: 333.33 3: 133.33 4: 33.33

Descriptive Questions

In a simple study about coffee habits in two towns A and B the following information is given

Town A: Females were 40%, total coffee drinkers were 45% and female non coffee drinkers were 20%.

Town B: males were 55%, male non coffee drinkers were 30% and female coffee drinkers were 15%

Present the data into a table format

What is diagrammatic representation of data explain advantages of it.

The data with regard to the output of gram and cost of seed and labour per hectare at ten farmers' fields, are as given below

Sr No	Cost of produce (Y) (RS/ha)	Cost of Seed (X1) (RS/ha)	Cost of Labour (Y) (RS/ha)
1	1127	235	128
2	840	236	82
3	735	238	205
4	570	241	71
5	462	238	110
6	614	233	130
7	916	235	200
8	460	190	170
9	1540	235	180
10	1065	243	165

i) Fit the regression equation $Y^{\wedge}=b_0+b_1X_1+b_2X_2$

ii) Estimate the cost of produce per hectare given that $X_1=230$ and $X_2=125$

iii) Test the significance of partial regression coefficients

iv) Find the partial correlation coefficient $r_{YX_2X_1}$

What do you mean by a questionnaire? What is the difference between a questionnaire and a schedule? State the essential points to be remembered in drafting a questionnaire.

What are the different methods of collection of data? Why are personal interviews usually preferred to questionnaire? Under what conditions may a questionnaire prove as satisfactory as a personal interview?

Perform simple linear regression

X	1	2	3	3	4	5
Y	8	4	5	2	2	0

Determine slope and intercept

Exercise on find correlation of the following data

x	9	8	7	6	5	4	3	2	1
y	15	16	14	13	11	12	10	8	9

Relationship of R^2 and Adjusted R^2 with additional of one independent variable

Using t-test check significance of independent variable.

What is the effect of R2 and Adjusted R2 for addition of new variable in multiple linear regression.

Obtain Partial correlation coefficients for following data

Example 2: From the following data, obtain $r_{12.3}$, $r_{13.2}$ and $r_{23.1}$.

X_1	20	15	25	26	28	40	38
X_2	12	13	16	15	23	15	28
X_3	13	15	12	16	14	18	14

1. Explain in details primary and secondary data.

How will you decide about the relative importance of various independent variables?

What is non-probability sampling and explain types of non-probability samplings.

From 10 observations on Price (x) and Supply (y) of a commodity, the following summary of figures were obtained.

$$\sum x = 130, \sum y = 220, \sum x^2 = 2288, \sum xy = 3467$$

Compute the line of regression of y on x and interpret the result. Estimate the supply when price is 16 units.

Let $X_1, X_2, \ldots X_n$ be a random . sample show that the sample mean

$$\hat{\theta} = \bar{X} = \frac{X_1 + X_2 + \cdots X_n}{n}$$

is an unbiased estimator of $\theta = E X_i$

Obtain Partial correlation coefficients for following data

Example 2: From the following data, obtain $r_{12.3}$, $r_{13.2}$ and $r_{23.1}$.

X_1	20	15	25	26	28	40	38
X_2	12	13	16	15	23	15	28
X_3	13	15	12	16	14	18	14

Frequency Distribution, Types of Univariate Frequency Distribution, Cumulative Frequency Distribution, Bivariate/Two-way classification of data, Cumulative frequency curve or ogive (i.e., more than ogive and less than ogive)

Methods to Check the Performance of Regression Models: MAE, MSE, R^2, MAPE (Moving Averages)
Sums on Point Estimate of the Population mean, Population Std Deviation, and Std. Error of the Estimate mean

Hypothesis Testing:
   a) Z test for Single Mean
   b) Z test for Difference of Mean

Explain 1.Test of significance 2.Level of significance 3.Simple hypothesis 4.Composite Hypothesis
The manufacturer of a certain make of electric bulbs claims that his bulbs have a mean life of 25 months with standard deviation of 5 months. A random sample of 6 such bulbs gave the following values Life of bulb in months 24,26,30,20,20,18 Is the manufacturer's claim valid at 1% level of significance?(Given that the table values of the appropriate test statistics at said level are 4.032,3.707 and 3.499 for 5, 6 and 7 degree of freedom respectively)
Explain in details MP and UMP-Test
Define MAPE, MAE, RMSE with formula and example