Comp

TE Sem - VI R-19 Mobile Computing

University of Mumbai
Examinations Summer 2022
(Revised Set May 2022)

QP code - 93653

Time: 2 Hr 30 Mins Max. Marks: 80

Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	VoLTE Stands for
Option A:	Voice over Long Term Evolution
Option B:	Voice Over Local Telecommunication Equipment
Option C:	Video Over Long Term Evolution
Option D:	Volume Over Long Term Evolution
2.	UTRAN stands for
Option A:	Universal Transmission Radio Networks
Option B:	Universal Terrestrial Radio Access Network
Option C:	Unified Transmission Area Network
Option D:	Universal Time Radio Access Network
3.	Which of the following Stores the User Related Data That is also relevant to GSM Mobile Systems?
Option A:	VLR
Option B:	HMR
Option C:	GMR
Option D:	SIM
4.	Generic Routing Encapsulation allows the encapsulation of packet of One protocol suite into payload portion of a packet of another Protocol suite is nothing but
Option A:	GRE
Option B:	IP Tunneling
Option C:	Protocol Synchronization
Option D:	Minimal Encapsulation
5.	Two or more antennas can also be combined to Improove the reception by counteracting the negative effects of multi path propagation, these antennas are also termed as
Option A:	multi element antenna Array
Option B:	Smart Antenna
Option C:	Sectored antenna
Option D:	Isotropic Radiator
6.	What is an Access Point
Option A:	An entity that provides access to LLC layer
Option B:	An entity that provides access to MAC layer
Option C:	An entity that provides access to the Destination System
Option D:	An entity that provides access to Basic Service Set

7.	A Mobile Phone Uses _____Type of Communication
Option A:	Full Duplex
Option B:	Half Duplex
Option C:	Both A and B
Option D:	None of the Above
8.	There is a need for certain _____to avoid the frequency Overlapping in FDM.
Option A:	Guard Space
Option B:	Frequency Range
Option C:	Carrier
Option D:	Attenuator
9.	Which of the following is the disadvantage of having smaller cells in Cellular System
Option A:	Less Transmission Power
Option B:	Only Local Interface
Option C:	Need of Handover
Option D:	Frequency Re-use
10.	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:	Slow Start

Q2,	**Solve any Two** **10 marks each**
a)	Explain Bluetooth Protocol Stack in detail. Explain the terms PICONET and Scatter net in terms of Bluetooth.
b)	Explain Various Hand over mechanisms in Details.
c)	Write a Short Note on UTRAN and UMTS Network

Q3	**Solve any Two** **10 marks each**
a)	Explain IP Packet Delivery, What do you mean by Agent Discovery and Agent Advertisement in terms of Mobile N/w
b)	Explain GSM Architecture in Detail.
c)	Explain signal Propagation in detail with various effects such as shadowing, Reflection, Refraction, scatter, multipath propagation

Q4	**Solve any Two** **10 marks each**
a)	Write a brief description on Various Generations of Telecommunication, Describe various applications of mobile devices for Vehicles, Emergency situation, Business, Entertainment.
b)	Write a Short Note on a) HAWAII b) HMIPv6
c)	What are the various Wireless LAN Threats and How we can secure the wireless Networks

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TE Sem - VI R-19 Computer

QP code - 93409

CSS

University of Mumbai

Examinations Summer 2022

Time: 2 hour 30 minutes

Max. Marks: 80

Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	The principle of ..... ensures that the sender of a message cannot later deny sending of the message
Option A:	Authentication
Option B:	Non repudiation
Option C:	Access control
Option D:	Integrity
2.	Rail Fence Technique is an example of
Option A:	Substitution
Option B:	Transposition
Option C:	product cipher
Option D:	Caesar cipher
3.	The number of symmetric keys needed for one to one communication between 8 people is
Option A:	256
Option B:	32
Option C:	28
Option D:	8
4.	For the Knapsack: {1 6 8 15 24}, find the plain text code if the ciphertext is 39
Option A:	10010
Option B:	11101
Option C:	10101
Option D:	00111
5.	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
6.	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
7.	Which is not a component of Public key infrastructure (PKI)?
Option A:	Client
Option B:	CRL
Option C:	CA
Option D:	KDC

8.	The attack in which the attacker aims at exhausting the targeted server's resources.
Option A:	Phishing attack
Option B:	DoS attack
Option C:	Website scripting attack
Option D:	SQL injection attack
9.	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
10.	Which of the following is considered as the unsolicited commercial email?
Option A:	Virus
Option B:	Malware
Option C:	Spam
Option D:	Adware

Q2	
A	**Solve any Two** **5 marks each**
i.	Explain the relationship between Security Services and Mechanisms in detail.
ii.	Explain ECB and CBC modes of block cipher.
iii.	Define non-repudiation and authentication. Show with example how it can be achieved.
B	**Solve any One** **10 marks each**
i.	Elaborate the steps of key generation using the 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.
ii.	Discuss DES with reference to following points 1. Block size and key size 2.Need of expansion permutation 3.Role of S-box 4.Weak keys and semi weak keys 5. Possible attacks on DES

Q3	
A	**Solve any Two** **5 marks each**
i.	What are properties of hash function? Explain role of hash function in security.
ii.	Explain working of TGS in Kerberos.
iii.	List and explain various types of attacks on encrypted message.
B	**Solve any One** **10 marks each**
i.	Why are digital certificates and signatures required?What is the role of digital signature in digital certificates? Explain any one digital signature algorithm.
ii.	What is the need for message authentication? List various techniques used for message authentication. Explain any one of them.

Q4.	

A	**Solve any Two** **5 marks each**
i.	Explain handshake protocol in SSL.
ii.	Explain buffer overflow attack.
iii.	List various Software Vulnerabilities. How vulnerabilities are exploited to launch an attack.
B	**Solve any One** **10 marks each**
i.	How does PGP achieve confidentiality and authentication in emails?
ii.	How is security achieved in Transport and Tunnel modes of IPSEC? Explain the role of AH and ESP.

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QP code – 94000

University of Mumbai

Examinations Commencing from May 2022

Program: Computer Engineering

Curriculum Scheme: Rev2019

Examination: TE Semester VI

Course Code: CSDLO6011and Course Name: Internet of Things

Time: 2.30 hour Max. Marks: 80

Q1 (20 Marks)	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	Identify which is not TRUE about IoT
Option A:	An IoT network is a collection of interconnected devices.
Option B:	IoT stands for Interconnection of Things.
Option C:	IoT technology uses sensors and actuators.
Option D:	IoT technology uses cloud storage to store data.
2.	The layers in IoT Reference Model by IoTWF occurs in the sequence -
Option A:	Physical devices- Data Accumulation- Application- Edge Computing
Option B:	Physical Devices- Data Accumulation- Edge Computing- Application
Option C:	Physical Devices- Edge Computing-Data Accumulation- Application
Option D:	Application - Physical Devices- Edge Computing-Data Accumulation
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.	The following protocol is used to link all devices in IoT-
Option A:	UDP
Option B:	HTTP
Option C:	TCP/IP
Option D:	COAP
5.	MQTT stands for
Option A:	Message Queue Telemetry Transport
Option B:	Message Query Telemetry Transport
Option C:	Meta Query Telemetry Transport
Option D:	Multiple Query Telemetry Transport
6.	Following is NOT an IoT Board-
Option A:	Arduino Uno
Option B:	Beagle Bone Black
Option C:	Particle Photon
Option D:	Microsoft Azure
7.	Which of the following Access network sublayer works in least range
Option A:	HAN
Option B:	FAN
Option C:	PAN
Option D:	LAN

8.	REST API is used in IoT applications for-
Option A:	Developing web applications
Option B:	Managing network devices
Option C:	Programming IoT boards
Option D:	Protocol management
9.	When SCADA is deployed in LLN which technology is used
Option A:	TCP
Option B:	UDP
Option C:	MAP-T
Option D:	RTU
10.	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

Q2 (20 Marks)	**Solve any FOUR Questions 5 marks each**
A	Define sensors in IoT? Give Classification of sensors and explain any 4 types of sensors.
B	Explain in brief- The IoT World Forum (IoTWF) Standardized Architecture.
C	Compare and contrast: Wired and Wireless Sensor Networks. Explain the different network topologies for WSN.
D	Write short note on- Micro Electro-Mechanical Systems (MEMS)
E	Discuss in brief- Gateways and Backhaul Sublayer in Core IoT Functional Stack.
F	Explain Characteristics and Trends in Smart object.
Q3 (20 Marks)	**Solve any FOUR Questions 5 marks each**
A	Compare and contrast: Application Layer protocols.
B	Elaborate the working model of smart city.
C	Explain features of ESP32.
D	Write Short Note on- JSON-LD
E	Compare different IoT Boards in terms of connectivity.
F	Explain IoT Application Transport Methods in brief.
Q4 (20 Marks)	**Solve any FOUR Questions 5 marks each**
A	Write Short Note on- SCADA.
B	Explain following Access Technologies with application area of each- 1. Zigbee 2. BLE 3. RFID 4. Cellular (3G/4G/5G) 5. LPWANs
C	What is IoT? What is its impact? How it is different from Digitization.
D	Compare and contrast :Arduino and Raspberry Pi
E	Explain an IoT Software platform - REST.
F	Discuss Clustered architecture of Wireless Sensor Networks.

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TE Sem - VI (R-19) Computer

QA

QP code - 93900 **University of Mumbai**

Examinations Summer 2022

Time: 2 hour 30 minutes Max. Marks: 80

Q1 (20 Marks)	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	Inspectors for a hospital chain with multiple locations randomly select some of their locations for a cleanliness check of their operating rooms.
Option A:	Cluster sampling
Option B:	Stratified Sampling
Option C:	Quota Sampling
Option D:	Snowball Sampling
2.	In MLR, the square of the multiple correlation coefficient or R^2 is called the
Option A:	Coefficient of determination
Option B:	Variance
Option C:	Covariance
Option D:	Cross-product
3.	The mode of the calls received on 7 consecutive days 11,13,13,17,19,23,25 is
Option A:	11
Option B:	13
Option C:	17
Option D:	23
4.	"More than type Ogive" and "less than type Ogive" for a distribution intersect at
Option A:	Mean
Option B:	Median
Option C:	Mode
Option D:	Origin
5.	In _____method, the upper limit of one class is the lower limit of the next class.
Option A:	Inclusive
Option B:	Exclusive
Option C:	Inter
Option D:	Intra
6.	If the regression coefficients are $b_{yx} = 0.5$ and $b_{xy} = 0.46$, then the value of coefficient of correlation (r) is
Option A:	0.39
Option B:	0.48
Option C:	0.23
Option D:	0.25
7.	In regression analysis, if the independent variable is measured in Kilometers, the dependent variable
Option A:	Must also be in Kilometers
Option B:	Must be in some unit of Distance
Option C:	Cannot be in Kilometers

Option D:	Can be any units
8.	A linear regression (LR) analysis produces the equation Y = 0.4X + 3. This indicates that:
Option A:	When Y = 0.4, X = 3
Option B:	When Y = 0, X = 3
Option C:	When X = 3, Y = 0.4
Option D:	When X = 0, Y = 3
9.	If all the dots of a scatter diagram lie on a straight line falling from left bottom corner to the right upper corner, the correlation is called.....
Option A:	Zero correlation
Option B:	High degree of positive correlation
Option C:	Perfect negative correlation
Option D:	Perfect positive correlation
10.	A point estimator is defined as _____
Option A:	A single value from the sample
Option B:	Average of all sample values
Option C:	Average of all population values
Option D:	A single value that is best estimate of unknown population parameter

Q2 (20 Marks)	**Solve any Two Questions out of Three** **10 marks each**
A	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.
B	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**
C	Explain the following Point Estimation Properties with example i) Consistency *ii)* Unbiasedness

Q3 (20 Marks)	**Solve any Two Questions out of Three** **10 marks each**
A	What is Hypothesis testing? Explain i) Z-Test for single mean ii) Z-Test for Difference of Mean
B	Perform simple linear regression , Determine slope and intercept

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

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

Sr. No.	Cost of produce (Y) (Rs./hectare)	Cost of Seed (X1) (Rs./hectare)	Cost of Labour (X2) (Rs./hectare)
1	190	50	10
2	50	30	10
3	300	150	15
4	100	50	15
5	150	40	20
6	90	40	10
7	300	100	35
8	120	60	14

a) Fit a regression $\hat{y} = a + b_1x_1 + b_2x_2$
b) Find the coefficient of multiple determination (R^2).
c) Also test the significance of regression ***(Given the appropriate Table value, F = 13.27, for a significance level of $\alpha = 0.01$)***

Q4 (20 Marks)	**Solve any Four Questions out of Six** **05 marks each**
A	What is Stratified sampling? Explain the merits and limitations of Stratified sampling.
B	Explain the following methods to check the performance of Regression Model i) MAE ii) MAPE
C	In a trivariate distribution, the simple coefficients of correlation are as follows: If $r_{12} = 0.86$, $r_{13} = 0.65$ and $r_{23} = 0.72$, calculate the coefficient of partial correlation $r_{12.3}$.
D	What is diagrammatic representation of data? Explain its advantages.
E	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)
F	Explain method of maximum likelihood with its advantages and disadvantages

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QP. code - 91398

University of Mumbai

Examinations Summer 2022

Time: 2hour 30 minutes Max. Marks: 80 SPCC

Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	Identify the correct statement with respect to inherited attributes?
Option A:	The attributes can take values from the parents and from the left siblings but not the right sibling
Option B:	The attributes can take values from the parents and from the right siblings but not the left sibling
Option C:	The attribute can take value either from its parent or from its siblings.
Option D:	The attribute can only take value from its siblings.
2.	Which of the following is the graphical representation that shows the basic blocks and their successor relationship?
Option A:	Hamiltonian graph
Option B:	Control graph
Option C:	Flow graph
Option D:	DAG
3.	Rearrange the Compilation Process in the correct order:- a. Linking b. Assembling c. Pre-Processing d. Compiling
Option A:	c→d→b→a
Option B:	c→d→a→b
Option C:	d→c→b→a
Option D:	c→b→d→a
4.	What will be the **FOLLOW(A)** for following grammar? S→AaAb S→BaBb A→ε B→ε
Option A:	Only a
Option B:	a, b
Option C:	Only b
Option D:	Only ε
5.	Which technique is applicable to optimize the given code? t=c*4 for (j=0 ; j< c*4; j++) {..,..}
Option A:	Constant Propagation
Option B:	Copy Propagation
Option C:	Induction Variable Reduction
Option D:	Common Sub-expression Elimination
6.	Consider the code:- **MACRO** &TEST ABC &X, &Y, &Z &TEST A 1, &X A 2, &Y A 3, &Z

	MEND LOOP1 SPCC P1,P2,P3 What will be the value in MDTC and MNTC after processing macro definition?
Option A:	MDTC = 5, MNTC =1
Option B:	MDTC = 6, MNTC =2
Option C:	MDTC = 2, MNTC =6
Option D:	MDTC = 1, MNTC =5
7.	Consider the Assembly code and Identify the type of statement: START 300 **Line -1** ADD AREG,A **Line -2** A DC '4' -- -- END
Option A:	Line -1 is Imperative Statement and Line-2 is Assembler Directive
Option B:	Line -1 is Assembler Directive and Line-2 is Declaration Directive
Option C:	Line -1 is Imperative Statement and Line-2 is Declaration Statement
Option D:	Line -1 is Declaration Directive and Line-2 is Assembler Directive
8.	Which of the following grammar is appropriate for operator precedence grammar?
Option A:	S-> EF
Option B:	S-> E*F | ε
Option C:	S-> E+F
Option D:	S-> +EF
9.	Consider the Assembly code and Identify the type of statement: START 100 **Line-1** MOVER AREG, First **Line-2** ADD AREG, Second **Line-3** MOVEM AREG, Result **Line-4** PRINT Result What will be the intermediate code and Current Location Counter for Line-2?
Option A:	LC = 101, Intermediate code : (IS,02) (RG,01) (S,1)
Option B:	LC = 101, Intermediate code : (IS,01) (RG,01) (S,1)
Option C:	LC = 102, Intermediate code : (IS,01) (RG,01) (S,1)
Option D:	LC = 102, Intermediate code : (IS,02) (RG,01) (S,1)
10.	In terms of relocating the loader, which of the following is used to overcome the problem of linking?
Option A:	Transfer Vector
Option B:	Relocation bits
Option C:	Transfer Array
Option D:	Program length

Q2.	
A	**Solve any Two** **5 marks each**
i.	Write a short note on Peephole Optimization.
ii.	Differentiate between Application and System Software.
iii.	What are the functions of Loader?
B	**Solve any One** **10 marks each**
i.	Explain the different phases of compiler with suitable example?
ii.	What are the different ways of representing Intermediate code? Explain with example

Q3	**Solve any Two Questions out of Three 10 marks each**

A	Consider the following Assembly Program:-
	START 501
	A DS 1
	B DS 1
	C DS 1
	READ A
	READ B
	MOVER AREG, A
	ADD AREG, B
	MOVEM AREG, C
	PRINT C
	END
	
	Generate Pass-1 and Pass-2 and also show the content of Database table involved in it.

B	Explain various Code Optimization techniques in detail.
C	Test whether the given grammar is in LL(1) or not. Construct LL(1) Parsing Table. S→AB/gDa A→ab/e B→dC C→gC/g D→fD/g Where a,b,e,d,f,g are the terminals and S,A,B,C,D are the Non-Terminals

Q4	
A	**Solve any Two** **5 marks each**
i.	Draw a neat flowchart of pass-1 of two pass assembler design
ii.	What is relocation and linking concept in Loaders
iii.	Compare Pattern, Lexeme and token with example
B	**Solve any One** **10 marks each**
i.	Draw a neat flowchart of two pass macro processor. Explain with the help of example
ii.	Explain the design of direct linking loader.

TE Sem -VI (Comp) R-19 A.I.

University of Mumbai

Examinations Summer 2022

Time: 2hour 30 minutes Max. Marks: 80 QP: 93660

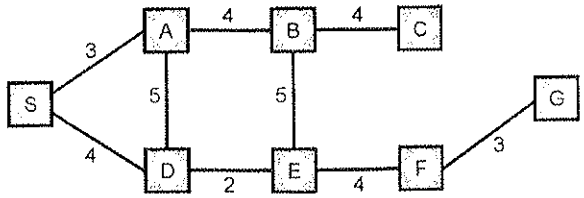
Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	The computer program that simulates the thought process of humans is known as:
Option A:	Expert reason
Option B:	Personal information
Option C:	Expert system
Option D:	Human logic
2.	_____ is the heuristic function of greedy best-first search and _____ is heuristic function of A* Algorithmic search.
Option A:	F(n)!= h(n) and f(n) = h(n) + g(n)
Option B:	F(n)= h(n) and f(n) = h(n) + g(n)
Option C:	F(n)> h(n) and f(n) = h(n) g(n)
Option D:	F(n)<h(n) and f(n) = h(n) + g(n)
3.	The search strategy that uses a problem specific knowledge is known as
Option A:	Heuristic Search
Option B:	Informed Search
Option C:	Best-first Search
Option D:	All of the above Search
4.	In which agent does the problem generator is present?
Option A:	Learning agent
Option B:	Simple-reflex agent
Option C:	Goal based agent
Option D:	Utility based agent

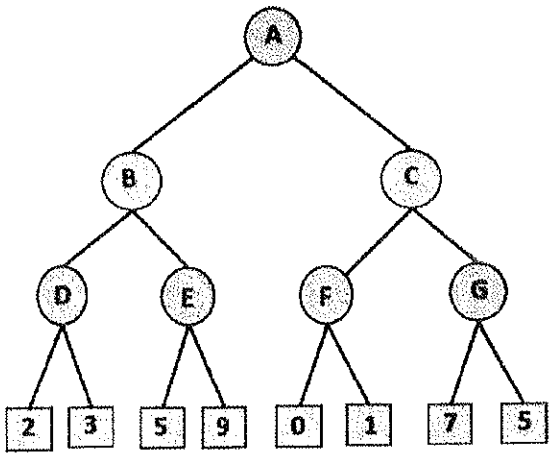
5.	_____ is the field that investigates the mechanics of human intelligence.
Option A:	Sociology
Option B:	Nurology
Option C:	Cognitive science
Option D:	Psychology
6.	What is present in empty plan?
Option A:	Start
Option B:	Finish
Option C:	Modest
Option D:	Both Start and Finish
7.	Which is the most straightforward approach for planning?
Option A:	Best first search
Option B:	Hill climbing search
Option C:	Depth first search
Option D:	State space search
8.	What are you predicating by the logic ∀x :∃y : loyal_to(x,y)?
Option A:	Everyone to loyal to all
Option B:	Everyone is loyal to someone
Option C:	Everyone is not loyal to someone
Option D:	Everyone is loyal
9.	Which of the following is not a stage of knowledge engineering?
Option A:	Assemble the relevant knowledge
Option B:	Encode general knowledge about the domain.
Option C:	Identify the task.
Option D:	Fixing a problem.
10.	The father of AI is
Option A:	Alan Turing

QP: 93660

Option B:	John McCarthy
Option C:	Russel Stuart
Option D:	Andrew Ng

Q2. **(20 Marks)**	**Solve any Four out of Six 5 marks each**
A	Explain WUMPUS world environment giving its PEAS description. Explain how percept sequence is generated.
B	Write a short note on conditional probability and its role in AI.
C	What are the limitations of Hill Climbing Search and how that can be overcome?
D	Explain the concept of Supervised Learning.
E	Convert the following statements into predicate logic 1. All kings are persons. 2. Every city in Maharashtra has temple. 3. An Apple a day keeps doctor away. 4. Anything anyone eats and is not killed by is food. 5. Square of 3 is 9.
F	Explain the steps involved in Natural Language Processing.

Q3. **(20 Marks)**	**Solve any Two Questions out of Three 10 marks each**
A	Consider the following facts: 1. Steve only likes easy courses. 2. Science courses are hard. 3. All the courses in the basket_weaving department are easy. 4. BK301 is a basket_weaving course. Find by resolution that "What course would steve like?"
B	List down all agent types. Explain each with block diagram.
C	Apply A* algorithm on the following graph. Heuristic values are h(S) = 15, h(A) = 14, h(D) = 12, h(B) = 10, h(E) = 10, h(C) = 8 , h(F) = 10 , h(G) = 0. S is the start node and G is the goal node. 

i.	What is planning? List types of planning and describe in detail Partial order planning.
ii.	Apply the alpha beta pruning on following example by considering the root node a max. 

Comp

TE Sem - VI R-19 Computer

DSIP

QP code - 93864

University of Mumbai
Examinations Summer 2022

Time: 2 hour 30 minutes

Max. Marks: 80

	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
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
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
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)
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
6.	Robert, Sobel , Prewitt masks are used for
Option A:	line detection
Option B:	point detection
Option C:	Low pass filtering
Option D:	Median filters
7.	For N=8 Complex multiplications required using FFT are
Option A:	32
Option B:	12
Option C:	2
Option D:	96

8.	Image negative can be obtained by
Option A:	f2(x,y) = L-1 – f1(x,y)
Option B:	f2(x,y) = L+1 – f1(x,y)
Option C:	f2(x,y) = L – f1(x,y)
Option D:	f2(x,y) = (L/2)– f1(x,y)
9.	Piecewise linear transformation Is used to
Option A:	adjust lighting effects of the scene during image acquisition
Option B:	improve contrast of the image
Option C:	increase resolution of the image
Option D:	rotate the image
10.	Median filtering is a
Option A:	Nonlinear filter
Option B:	Laplacian filter
Option C:	Mean filter
Option D:	Linear filter

Q2 (20 Marks Each)	Solve any Four out of Six 5 marks each
A	For the given image perform low pass filtering without considering the boundary pixels (no padding). Apply 3*3 mask. 0 5 5 3 2 3 2 5 6 4 3 6 5 3 4 7
B	Write the masks for line detection.
C	Define and explain any two properties of DFT
D	Define with examples types of 3 systems in DSP
E	Justify that two images can have same histograms.
F	Which filter is suitable for salt and pepper noise? Explain with an example

Q3 (20 Marks Each)	Solve any Two Questions out of Three 10 marks each
A	Compute DFT for given causal 8-point sequence using DIT-FFT flow graph for x(n) ={ 2, 1, 2, 1, 1, 2, 1, 2 }
B	Apply the following operations for the 3 bit 4X4 size image: 1. Negation 2. Thresholding with T=4 3. Intensity level slicing with background r1=2 and r2=5 4. Bit level slicing for MSB and LSB planes 1 2 3 0 2 4 6 7 5 2 4 3 3 2 6 1
C	Write short notes on a) Overlap add and save method of convolution **Or** b) 4, 8 and m adjacency in image processing

<table>
<tr><td>Q4
(20 Marks Each)</td><td>Solve any Two Questions out of Three 10 marks each</td></tr>
<tr><td>A</td><td>Find linear convolution of x(n)={1,2,2,1,1} and h(n)={3,2,1}</td></tr>
<tr><td>B</td><td>Explain with steps whether x(n)=u(n) is a power signal or energy signal</td></tr>
<tr><td>C</td><td>Apply Histogram Equalization on given histogram
<table>
<tr><td>Grey Level</td><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td></tr>
<tr><td>Number of pixels</td><td>790</td><td>1023</td><td>850</td><td>656</td><td>329</td><td>245</td><td>122</td><td>81</td></tr>
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