DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY,
LONERE – RAIGAD -402 103
Semester Examination – December - 2019

Branch: M.Tech Computer Engineering **Sem.:- I**
Subject:- Computer Algorithms (MTCE1101) **Marks: 60**
Date:- 10/12/2019 **Time:- 3 Hrs.**

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Instructions to the Students

1. Each question carries 10 marks.
2. Attempt all question are compulsory.
3. Illustrate your answers with neat sketches, diagram etc., wherever necessary.
4. If some part or parameter is noticed to be missing, you may appropriately assume it and should mention it clearly

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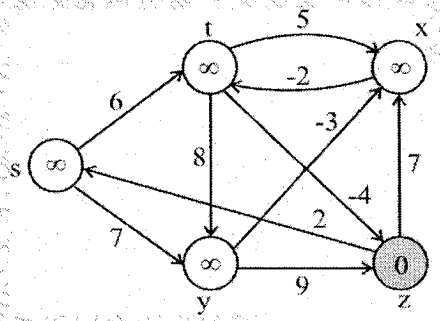
(Marks)

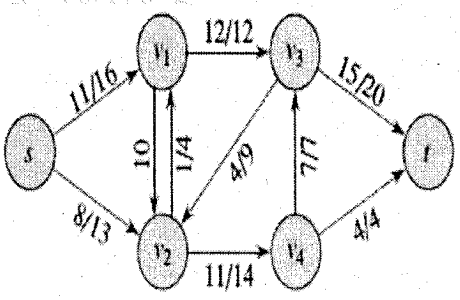
Q.1. a) Create the Fibonacci heap for following data items . **(5)**
{20,16,4,8,19,15,14,12,6,30 }. Delete node with key = 8 from this Fibonacci heap.

b) Write the algorithm of Left Rotation and explain with the help of an example. **(5)**

Q.2. a) Find the shortest path using Bellman Ford algorithm for following graph. **(5)**



b) Apply Ford Fulkerson algorithm on following flow network. **(5)**



Q.3. a) What is convex hull ? Explain increamental approach, divide and conquer approach and prune and search method to determine convex hull. (5)

b) Explain Graham Scan algorithm with suitable example. (5)

Q.4. a) Working modulo q=13 how many spurious hits does the Rabin Karp matcher encounters in the text T= 23590231415267399921 when looking for the pattern P = 31415 ? (5)

b) Write and explain Knuth Morris Pratt matching algorithm. What is the time complexity of algorithm? (05)

Q.5. a) Show the results of multiplying following matrices using Strassen's matrix multiplication algorithm. (05)

$$\begin{Bmatrix} 1 & 2 \\ 3 & 4 \end{Bmatrix} \quad \begin{Bmatrix} 5 & 6 \\ 7 & 8 \end{Bmatrix}$$

b) Explain forward substitution .Using forward substitution solve the following.(5)

$$\begin{Bmatrix} 1 & 2 & 0 \\ 3 & 4 & 4 \\ 5 & 6 & 3 \end{Bmatrix} x = \begin{Bmatrix} 3 \\ 7 \\ 8 \end{Bmatrix}$$

Q.6. a) Explain Extended Euclid's algorithm for GCD computation . Apply Extended Euclid's algorithm on inputs 99 and 78. (5)

b) Explain co-efficient and point value representation of polynomials. Explain how divide and conquer strategy is used by Fast Fourier Transform (FFT)method. (5)

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DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY,
LONERE – RAIGAD -402 103
Winter Semester Examination – Dec. - 2019

Branch:Computer Science & Engineering M.Tech. **Sem.:- II**
Subject:- Data Science (MTCE1201) **Marks: 60**
Date:-11/12/2019 **Time:- 3 Hr.**

Instructions to the Students
1. Each question carries 12 marks.
2. Attempt **any five** questions of the following.
3. Illustrate your answers with neat sketches, diagram etc., wherever necessary.
4. If some part or parameter is noticed to be missing, you may appropriately assume it and should mention it clearly

(Marks)

Q.1. **a)** Explain K-means clustering with example. **(6)**
b) Explain following terms: Support, Confidence and Lift. Illustrate these terms with the help of a suitable example . **(6)**

Q.2. **a)** What is document term frequency matrix? How is it useful in statistical analysis? **(6)**
b) What is text mining? Wirte R language code for: i) to convert lower case to upper case letters ii) Removing Punctuation iii) Removing numbers. **(6)**

Q.3. **a)** What is regression? Which tools are available in R for regression analysis? Explain them. **(6)**
b) What is correlation? What are the three types ? Enlist the tools which are available in R for Correlation. **(6)**

Q.4 **a)** What is bivariate data? Explain function used to group and organize bivariate data. **(6)**
b) Enlist packages used to provide mapping information in R. **(6)**

Q.5. **a)** What is supervised and unsupervised machine learning? Explain these terms with real life examples. Enlist algorithm used in supervised and unsupervised machine learning. **(6)**
b) What is predictive modeling?What are the applications of predictive modeling?What are the different Modelling methods? **(6)**

Q.6. Write a note on any 3 of the following
a) K- nearest neighbor classification **(4)**
b) Bayesian Hierarchical Clustering **(4)**
c) Word Stems **(4)**
d) Anomaly Detection **(4)**

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY,
LONERE – RAIGAD -402 103
Winter Semester Examination – December - 2019

Branch: M. Tech (Computer Engineering) **Sem.:- I**
Subject:- Machine Learning (MTCE1102/MTSE1102) **Marks: 60**
Date:- 12/12/2019 **Time:- 3 Hrs.**

Instructions to the Students

1. Each question carries 12 marks.
2. Attempt **any five** questions of the following.
3. Illustrate your answers with neat sketches, diagram etc., wherever necessary.
4. If some part or parameter is noticed to be missing, you may appropriately assume it and should mention it clearly

Marks

Q.1. **Solve the following**

a) What is machine learning? Define feature, feature vector and feature space. Explain any two applications of machine learning. (06)

b) Explain hypothesis space and inductive bias. (06)

Q.2. **Solve any Two from the following**

a) What is cross validation in machine learning? Differentiate between validation set and test set. Also state limitations of cross validation (06)

b) Explain concept of decision tree learning. Also discuss statistical measures to select attributes for constructing decision tree. (06)

c) Consider the following set of training examples: (06)

Instance	Classification	a1	a2
1	+	T	T
2	+	T	T
3	-	T	F
4	+	F	F
5	-	F	T
6	-	F	T

(i) What is the entropy of this collection of training examples with respect to the target function Classification?

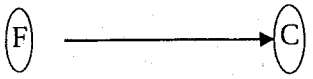
(ii) What is the information gain of a2 relative to these training examples?

Q.3. **Solve any Two from the following**

a) State Bayes' theorem. Explain Bayesian Belief Networks. (06)

b) Explain linear regression, multiple linear regression and locally weighted linear regression. (06)

c) Consider the following Bayesian network: (06)



where F stands for Flu and C stands for Coughing. Find P(C).
$P(F) = 0.1$
$P(C|F) = 0.8$
$P(C|\bar{F}) = 0.3$.

Q.4. **Solve the following**

a) Explain PAC learning model. Also explain concept of VC Dimensions. (06)

b) Describe multilayer neural network. Also explain concept of back propagation in neural network (06)

Q.5. **Solve the following**

a) State requirement of clustering algorithms Also explain K-means clustering algorithm (06)

b) Write Short note on (06)

i) Instance Based Learning
ii) Logistic Regression

Q.6. **Solve the following**

a) Describe elements of reinforcement learning (06)

b) Explain in brief, Support Vector Machine (06)

Paper End

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE – RAIGAD – 402 103

Winter Semester Examination – December – 2019

Branch: M. Tech. (Computer Engineering) Semester: I

Subject (Code) :- Advanced Computer Network (MTCE1103)

Date:- 17/12/2019 Time: 3 Hrs. Marks: 60

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Instructions to the Students

1. Each question carries 12 marks.
2. Attempt any ***FIVE*** questions of the following.
3. Illustrate your answers with neat sketches, diagram etc., wherever necessary.
4. If some part or parameter is noticed to be missing, you may assume appropriately and should mention it clearly before writing answer.

(Marks)

Q.1 **Attempt the following questions** (2 x 6)

A) Choose the correct answer from multiple alternatives.

(i) Which of the following protocols used UDP as a transport layer protocol?
a) DNS b) SMTP c) HTTP d) Telnet

(ii) What is the maximum number of IP addresses that can be assigned to hosts? Assume subnet is 255.255.255.229.
a) 4 b) 6 c) 8 d) 16

(iii) What is maximum size of Ethernet frame?
a) 32 bytes b) 64 bytes c) 1518 bytes d) 256 bytes

(iv) What is minimum size of IP header?
a) 60 bytes b) 20 bytes c) 10 bytes d) 30 bytes

(v) Which of the following describe function(s) of router?
a) packet filtering b) switching c) path selection d) all above

(vi) Which protocol is used to find the logical address of a local device from physical address?
a) ARP b) RARP c) ICMP d) IP

B) Calculate the latency (from first bit sent to last bit received) for the following:
(i) 1-Gbps Ethernet with a single store-and-forward switch in the path, and a packet size of 5000 bits. Assume that each link introduces a propagation delay of 10 μs and that the switch begins retransmitting immediately after it has finished receiving the packet.
(ii) Same as (i) but with three switches.

Q. 2 **Attempt the following questions** (2 x 6)

A) What is stop and wait protocol? Prove that **efficiency** of stop and wait protocol is **1/(1+2a)** and throughput is **efficiency x bandwidth**

B) What is TCP? Give differences between TCP and UDP. Also give three names of typical applications in which TCP is used as transport protocol.

Q. 3 **Attempt the following questions** (2 x 6)

A) A TCP connection is in the ESTABLISHED state. The following events occur one after another:

i) A FIN segment is received.

ii) The application sends a "close" message.

What is the state of the connection after each event? What is the action after each event?

B) What is fiber optic communication? Enlist the advantages of fiber optic technology in communication systems?

Q. 4 **Attempt the following questions** (2 x 6)

A) Consider two regions, 900 - 1000 nm and 1350 - 1550 nm in a fiber low-loss spectrum. Calculate the actual bandwidth provided by each region. (Assume velocity of light in fiber is 2.3×10^8 m / s.)

B) What is DHCP? What is necessicity of DHCP server in the network?

Q. 5 **Attempt the following questions** (2 x 6)

A) Discuss in detail, evolution of the WDM network.

B) What do you mean by GMPLS technology? How does MPLS work?

Q. 6 **Attempt the following questions** (2 x 6)

A) What is wavelength conversion? What are the characteristics of ideal wavelength converter should possess?

B) What is SONET? Explain with figure STS – 1 frame format.

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE - RAIGAD -402 103

Winter Semester Examination – December - 2019

Branch: M. Tech (Computer) **Sem.:- I**

Subject with Subject Code:- Cloud Computing (MTCE1104) **Marks: 60**

Date:- 19/12/2019 **Time:- 3 Hr.**

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Instructions to the Students

1. Each question carries 12 marks.
2. Attempt **any five** questions of the following.
3. Illustrate your answers with neat sketches, diagram etc., wherever necessary.
4. If some part or parameter is noticed to be missing, you may appropriately assume it and should mention it clearly

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(Marks)

Q.1. a) Define Cloud computing. Enlist and explain different service models (06)

b) Discuss distributed and cluster computing (06)

Q.2. a) Give an example of Platform as a Service. Explain in detail (06)

b) Explain any two virtual machine scheduling algorithm (06)

Q.3. a)) Explain Kernel Based Virtual Machine (06)

b) What is disaster recovery in cloud computing? Explain benefits of disaster recovery in cloud computing (06)

Q.4. a) Explain concept of vertical scaling, horizontal scaling and auto scaling in cloud computing (06)

b) Explain the terms recovery point objective (RPO), recovery time objective (RTO) and disaster recovery plan (DRP) with respect disaster recovery (06)

Q.5 a) Explain in brief cloud security challenges (06)

b) Describe types of hypervisor. Also explain why it is necessary to secure hypervisor (06)

Q.6. a) Discuss the purpose of Open Cloud Consortium (OCC) and Distributed Management Task Force (DMTF) cloud related working groups. (06)

b) Explain working of any three cloud compliance regulations that are governing cloud compliance (06)

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Winter Semester Examination – Dec. - 2019

Branch: M. Tech. (CE / CSE / CE&IT / CS) CSE **Sem.:- I**

Subject:- Intrusion Detection System (Elective-2) MTCE1105A **Marks: 60**

Date:- 21/12/2019 **Time:- 3 Hr.**

Instructions to the Students

1. Each question carries 12 marks.
2. Attempt any five questions of the following.
3. Illustrate your answers with neat sketches, diagram etc., wherever necessary.
4. If some part or parameter is noticed to be missing, you may appropriately assume it and should mention it clearly.

(Marks)

Q.1. a) Where IDS is placed in OSI model? How it works? (06)
b) Explain types of intruders in detail (06)

Q.2. a) Describe components of Denning model of intrusion detection (06)
b) Describe and compare Host Based and Network Based intrusion detection systems (06)

Q.3. a) Explain Cost Sensitive IDS (06)
b) Explain SVM intrusion detection system (06)

Q.4. a) Explain Anomaly based intrusion detection system (06)
b) What are Honeypots? Give their classification (06)

Q.5. a) Give significance of Sensors with respect to IDS. Describe Network based sensors (06)
b) Explain Multi-Tiered architecture of Intrusion Detection System (06)

Q.6. a) Describe Network Behavior Anomaly Detection (NABD) in detail (06)
b) Differentiate between IDS and IPS (06)

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DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE – RAIGAD -402 103

Winter Semester Examination – Dec. - 2019

Branch: M.Tech. Computer Engineering **Sem.:- I**

Subject:- Artificial Intelligence & Knowledge Reasoning (MTCE1105C)

Date:- 21/12/2019 **Marks: 60** **Time:- 3 Hr.**

Instructions to the Students

1. Each question carries 12 marks.
2. Attempt **any five** questions of the following.
3. Illustrate your answers with neat sketches, diagram etc., wherever necessary.
4. If some part or parameter is noticed to be missing, you may appropriately assume it and should mention it clearly

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(Marks)

Q.1. Solve any two sub questions

a) Explain the Tableau Method. **(06)**

b) Explain The Resolution Refutation Method. **(06)**

c) What is knowledge representation technique? Explain the role of reasoning in AI. **(06)**

Q.2. Solve any two sub questions

a) Explain the Resource Description Framework(RDF). **(06)**

b) Explain the Conceptual Dependency (CD) Theory,. **(06)**

c) Explain the RATE Algorithm. **(06)**

Q.3. Solve any two sub questions

a) Explain The Cut Operator in PROLOG. **(06)**

b) Explain The Resolution Refutation Method for FOL. **(06)**

c) Explain The PROLOG (Programming for Artificial Intelligence) with example. **(06)**

Q.4. Solve all sub questions

a) Explain The Plan Applier Mechanism (PAM). (06)

b) Explain the Script Applier Mechanism (SAM). (06)

Q.5. Solve all sub questions

a) Explain the attributive language with complement (ALC) (06)

b) Differentiate between Inductive and Deductive reasoning. (06)

Q.6. Solve any two sub questions

a) Explain The Kripke Semantics in a Multi Agent Scenario. (06)

b) Explain the Minimal Models. (06)

c) Explain The Auto-epistemic Logic. (06)

Paper End