B.L.D.E Association"s

VACHANA PITAMAHA DR.P.G.HALAKATTI
COLLEGE OF ENGINEERING AND TECHNOLOGY ,VIJAYPUR

LIBRARY AND INFORMATION CENTER

QUESTION PAPERS

1st,2nd,3rd and 4th SEMESTER

M.TECH COMPUTER SCIENCES

JUNE-JULY 2018

B.L.D.E DR.P.G Halakatti College of Engineering &Techonology, Library Vijaypur

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I sem M.Tech CS

CBCS Scheme

USN ☐☐☐☐☐☐☐☐☐☐

16/17SCS11

First Semester M.Tech. Degree Examination, June/July 2018

Advances in Operating Systems

Time: 3 hrs. Max. Marks: 80

Note: Answer any FIVE full questions, choosing one full question from each module.

Module-1

1 a. Discuss the areas in which the operating system provide the services. **(08 Marks)**

b. Define intrusion detection. Discuss the classification and the logical components of an Intrusion detection systems. **(08 Marks)**

OR

2 a. Define an operating system and its objectives. **(05 Marks)**

b. List the key differences between batch processing and time sharing use multiprogramming. **(03 Marks)**

c. With a neat sketch, explain the simplified process control block. **(08 Marks)**

Module-2

3 a. Define shared memory multiprocessor. Explain the key design issues of multiprocessor operating system. **(08 Marks)**

b. Write the UNIX memory management formats of the following and explain their parameters:

i) Disk block descriptor
ii) Page frame data table entry **(08 Marks)**

OR

4 a. Define a thread and multithreading. Explain the four thread operations associated with a change in thread state. **(08 Marks)**

b. Discuss the characteristics of virtual memory paging. **(08 Marks)**

Module-3

5 a. Describe the various design issues involved in scheduling on a multiprocessor. **(08 Marks)**

b. Compare LINUX scheduling and Windows scheduling. **(08 Marks)**

OR

6 a. Discuss the classification of a multiprocessor system. **(04 Marks)**

b. List the advantages of load sharing. **(04 Marks)**

c. Explain the characteristics of real-time operating system. **(08 Marks)**

Module-4

7 a. Define the term embedded system. Explain the unique characteristics and design requirements for embedded operating system. **(08 Marks)**

b. Define a computer virus. List its parts. Briefly explain the different phases of a typical virus goes through during its life cycle. **(08 Marks)**

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
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OR

8 a. With a neat sketch, explain the organization of an embedded system. **(08 Marks)**

b. Define the term 'computer security'. Explain any two types of threat consequences and its attacks. **(08 Marks)**

Module-5

9 a. What is the function of a process manager? With a neat sketch, summarize the execution of a program at various levels of obstruction. **(08 Marks)**

b. With a neat sketch, illustrate how the NT executive object manager implements another object model on top of the NT Kernel object manager. **(08 Marks)**

OR

10 a. List the steps performed during the creation of a new process by the fork( ) system call. **(08 Marks)**

b. Describe the windows NT operating system architecture with a neat figure. **(08 Marks)**

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CBCS Scheme

USN

16/17SCS/SCE12

First Semester M.Tech. Degree Examination, June/July 2018

Cloud Computing

Time: 3 hrs. Max. Marks: 80

Note: ***Answer FIVE full questions, choosing ONE full question from each module.***

Module-1

1 a. Explain with neat diagram services offered by AWS are accessible from AWS management console. **(08 Marks)**

b. How Software–as–a–Service (SaaS) with Google perspective and MicroSoft windows Azure. **(08 Marks)**

OR

2 a. What are the steps to follow to run an application in cloud infrastructure? **(04 Marks)**

b. Explain the energy use and ecological impact of large scale data centers. **(06 Marks)**

c. What are the objectives of service-and compliance–level agreements? **(06 Marks)**

Module-2

3 a. Enumerate the challenges for existing cloud applications and new application opportunities. **(08 Marks)**

b. With neat diagram, explain a parallel between work flows and programs. **(08 Marks)**

OR

4 a. Explain with neat diagram the Map Reduce philosophy. **(08 Marks)**

b. What is the contribution of cloud computing for biology research and social computing? **(08 Marks)**

Module-3

5 a. What are the 4 physical object simulates the interface for virtualization. **(04 Marks)**

b. Explain the layering and interfaces between layers in a computer system. **(06 Marks)**

c. What is the role of virtual machines and virtual machine monitors in cloud resource virtualization? **(06 Marks)**

OR

6 a. Distinguish between full virtualization and para virtualization. **(08 Marks)**

b. Explain the optimization of network virtualization in Xen 2.0. **(08 Marks)**

Module-4

7 a. What are the five classes grouped for cloud resource management policies. **(04 Marks)**

b. With neat diagram explain stability of a two-level resource allocation architecture. **(06 Marks)**

c. Explain the co-ordination of specialized autonomic performance managers. **(06 Marks)**

OR

8 a. What are three scheduling algorithms for computing clouds? Explain fair queuing algorithm. **(08 Marks)**

b. Explain the parameters used for scheduling subject to dead-lines. **(08 Marks)**

Module-5

9 a. Explain the top security concerns for cloud users. **(08 Marks)**

b. What is security of virtualization? Explain the security risks posed by shared images. **(08 Marks)**

OR

10 a. How to connect clients to cloud instances through firewalls. Illustrate the instance menu allows the user to select from existing AMI's. **(08 Marks)**

b. What are the motivation behind the cloud based simulation of a distributed trust algorithm. **(08 Marks)**

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CBCS Scheme

USN

16/17SCS/SIT13

First Semester M.Tech. Degree Examination, June/July 2018

Advances in Data Base Management System

Time: 3 hrs. Max. Marks: 80

Note: ***Answer any FIVE full questions, choosing one full question from each module.***

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
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Module-1

1 a. Discuss the Entity Integrity and referential integrity constraints. Why each one considered important. **(06 Marks)**

b. Explain the violation of the integrity constraint in each of the three types of update operations. **(10 Marks)**

OR

2 a. Define the following terms with respect to object oriented Data base Terminology :
i) Method ii) Signature iii) Message iv) Collection v) Extent. **(10 Marks)**

b. Explain specifying object persistent via naming and reachability. **(06 Marks)**

Module-2

3 a. What are the functions of the Object definition Language and Object manipulation Language in the ODMG standard? **(06 Marks)**

b. Explain the mapping an EER schema to an ODB schema. **(10 Marks)**

OR

4 a. Discuss the general principle behind the C++ binding of the ODMG standard. **(06 Marks)**

b. i) Explain the concept of complex object.
ii) What is object and literal? What is the difference between them? **(06 Marks)**

c. Explain the Nested relational model. **(04 Marks)**

Module-3

5 a. Describe the three main architectures for parallel DBMS. **(08 Marks)**

b. Explain fragmentation and replication of relation in distributed DBMS. **(08 Marks)**

OR

6 a. Discuss the concept of parallelizing individual operations. **(10 Marks)**

b. Explain synchronous and asynchronous replication. Also explain the terms capture and apply with respect to asynchronous replication. **(06 Marks)**

Module-4

7 a. Explain OLAP operations in the multidimensional Data model. **(10 Marks)**

b. Explain Top N queries and online aggregation. **(06 Marks)**

OR

8 a. Explain the role of Data mining in the KDD process. **(06 Marks)**

b. What is Apriori property? Describe an algorithm for finding frequent item sets. **(10 Marks)**

Module-5

9 a. Explain the components of ECA model. **(05 Marks)**

b. What are the difference between Valid time and transaction time and bitemporal relations? **(06 Marks)**

c. Explain Infrastructural based mobile flat form, with a neat diagram. **(05 Marks)**

OR

10 a. List and explain the data management issues. **(08 Marks)**

b. Explain the types of multimedia data's available and multimedia applications. **(08 Marks)**

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CBCS Scheme

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16/17SCS/SCN/SCE/SSE/SFC/SIT/LNI14

First Semester M.Tech. Degree Examination, June/July 2018
Probability Statistics and Queuing Theory

Time: 3 hrs. Max. Marks: 80

Note: *Answer FIVE full questions, choosing ONE full question from each module.*

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Module-1

1 a. The probability density function of a variant x is

x	0	1	2	3	4	5	6
p(x)	k	3k	5k	7k	9k	11k	13k

i) Find $p(x < 4)$, $p(x \geq 5)$, $p(3 < x \leq 6)$

ii) What will be the minimum value of k so that $p(x \leq 2) > 3$. **(08 Marks)**

b. I can hit A target 3 times in 5 shorts, B 2 times in 5 shorts, C 3 times in 4 shorts. They fire a valley what is the probability that : i) Two shots hit ii) Atleast two shorts hit. **(08 Marks)**

OR

2 a. A variable x has the probability distribution

x	−3	6	9
P(X = x)	$\frac{1}{6}$	$\frac{1}{2}$	$\frac{1}{3}$

Find E(X) and $E(X^2)$ hence evaluate $E(2X + 1)^2$. **(06 Marks)**

b. x is a continuous random variable with probability density function given by,

$$\begin{aligned} f(x) &= kx (0 \leq x < 2) \\ &= 2k (2 \leq x < 4) \\ &= -kx + 6k (4 \leq x < 6) \end{aligned}$$

Find k and mean value of x. **(06 Marks)**

c. State axioms of probability and Baye's theorem. **(04 Marks)**

Module-2

3 a. Derive mean and variance of normal distribution. **(06 Marks)**

b. If the probability of a bad reaction from a certain injection is 0.001 determine the chance that out of 2000 individuals more than two will get a bad reaction. **(06 Marks)**

c. x is a normal variate with mean 30 and standard deviation 5. Find the probabilities that : i) $26 \leq x \leq 40$ ii) $x \geq 45$. **(04 Marks)**

OR

4 a. Derive mean and variance of the binomial distribution. **(06 Marks)**

b. A die is cost until 6 appears. What is the probability that it must be cost more than 5 times? **(06 Marks)**

c. In 256 sets of 12 tosses of a coin in how many cases one can expect 8 heads and 4 tails. **(04 Marks)**

Module-3

5 a. Define random process and give its classification. **(04 Marks)**

b. Suppose a Markov chain with three states has the probability transition matrix :

$$p = \begin{bmatrix} 0 & 1 & 0 \\ 0.5 & 0 & 0.5 \\ 1 & 0 & 0 \end{bmatrix}$$. Determine whether or not this Markov chain is irreducible. **(04 Marks)**

c. Derive the mean and variance of a Poisson process. **(08 Marks)**

OR

6 a. The transition probability matrix of a Markov chain have 3 states 1, 2, 3 is,

$$p = \begin{bmatrix} 0.1 & 0.5 & 0.4 \\ 0.6 & 0.2 & 0.2 \\ 0.3 & 0.4 & 0.3 \end{bmatrix}$$

The initial distribution is $p^{(0)} = [0.7 \;\; 0.2 \;\; 0.1]$. Find the probability of $p[X_2 = 3]$. Find the probability of $p[X_3 = 2, X_2 = 3, X_1 = 3, X_0 = 2]$. **(04 Marks)**

b. Prove that the difference of two independent Poisson process is not Poisson. **(06 Marks)**

c. Define Ergodicity and explain Ergodic process. **(06 Marks)**

Module-4

7 a. A coin was tossed 400 times and the head turned up 216 times test the hypothesis that coin is unbiased at 5% level of significance. **(06 Marks)**

b. Two samples of sizes 9 and 8 give the sum of squares of deviation from their respective means equal to 160 inches^2 and 91 inches^2 respectively can these be regarded as drawn from the same normal population? $[F_{0.05} = 3.73]$. **(04 Marks)**

c. Write a short note on : i) Errors in testing ii) Chi-square distribution. **(06 Marks)**

OR

8 a. In a city A 20% of random sample of 900 school boys had a certain slight physical defect. In another city B 18.5% of a random sample of 1600 school boys had the same defect. Is the difference between the proportions significant? **(06 Marks)**

b. Explain the procedure to test significance and goodness fit. **(04 Marks)**

c. Five dice were thrown 96 times and the number of times 4, 5 or 6 were thrown were,

No. of dice showing 4, 5 or 6	5	4	3	2	1	0
Frequency	8	18	35	24	10	1

Find the probability of getting this result by chance. **(06 Marks)**

Module-5

9 a. A Television repairman finds that the time spent on his jobs has an exponential distribution with mean 30 mins. If he repairs the sets in the order in which they come in and if the arrivals of sets are approximately Poisson with an average rate of 10 per 8 hours day which is the repairs than idle time each day? Find the expected number of units in the system and in the queue. **(06 Marks)**

b. State and explain little law. **(06 Marks)**

c. Explain the types of stochastic processes. **(04 Marks)**

OR

10 a. Calls in a telephone system arrive randomly at an exchange at the rate of 140 per hour. If there is a large number of lines available to handle calls, that lasts an average of 3 mins, what is the average number of lines in use? Estimate the 90th percentile of number of lines in use. **(04 Marks)**

b. Explain the following :
   i) M/M/i queuing system
   ii) M/M/S queuing system. **(08 Marks)**

c. Briefly explain the birth-death process. **(04 Marks)**

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OR

6 a. The transition probability matrix of a Markov chain have 3 states 1, 2, 3 is,

$$p = \begin{bmatrix} 0.1 & 0.5 & 0.4 \\ 0.6 & 0.2 & 0.2 \\ 0.3 & 0.4 & 0.3 \end{bmatrix}$$

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10 a. Calls in a telephone system arrive randomly at an exchange at the rate of 140 per hour. If there is a large number of lines available to handle calls, that lasts an average of 3 mins, what is the average number of lines in use? Estimate the 90th percentile of number of lines in use. **(04 Marks)**

b. Explain the following :
   i) M/M/i queuing system
   ii) M/M/S queuing system. **(08 Marks)**

c. Briefly explain the birth-death process. **(04 Marks)**

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CBCS Scheme

USN

16/17SCS151

First Semester M.Tech. Degree Examination, June/July 2018
Advances in Digital Image Processing

Time: 3 hrs. Max. Marks: 80

Note: ***Answer FIVE full questions, choosing ONE full question from each module.***

Module-1

1 a. What is digital image processing? Explain sampling and quantization with diagrams. **(06 Marks)**

b. Explain with a neat diagram the fundamental steps in a digital image processing. **(10 Marks)**

OR

2 a. Explain different ways of representing digital image. **(04 Marks)**

b. With a diagram, explain the components of an image processing system. **(08 Marks)**

c. Explain different distance measures. **(04 Marks)**

Module-2

3 a. Why image enhancement is required? Compare different types of image enhancement techniques. **(04 Marks)**

b. Explain smoothing frequency domain filters. **(04 Marks)**

c. With a diagram, explain basic gray level transformation function. **(08 Marks)**

OR

4 a. Explain the following :
  i) Contrast stretching
  ii) Gray-level slicing
  iii) Bit-plane slicing
  iv) Ideal lowpass filters. **(12 Marks)**

b. Explain homomorphic filtering approach for image enhancement. **(04 Marks)**

Module-3

5 a. Explain any four noise probability density functions. **(08 Marks)**

b. Discuss different types of mean filters. **(04 Marks)**

c. Write short notes on adaptive filters. **(04 Marks)**

OR

6 a. With a diagram, explain the model of the image degradation/restoration process. **(06 Marks)**

b. What are order-statistics filters? Explain any three order statistics filters. **(07 Marks)**

c. Write a note on minimum mean square error filtering. **(03 Marks)**

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Module-4

7 a. What is the purpose of a color model? Explain any two color models. **(07 Marks)**
b. With a diagram, explain a general compression system model. **(06 Marks)**
c. Write a note on types of compression. **(03 Marks)**

OR

8 a. What is pseudocolor image processing? List out atleast two principal use of pseudocolor. **(03 Marks)**
b. Explain functional diagram for pseudocolor image processing. **(05 Marks)**
c. Write a short notes on :
  i) Image pyramids
  ii) Subband coding
  iii) The Heat transform. **(08 Marks)**

Module-5

9 a. Explain different morphological operations. **(06 Marks)**
b. Explain three basic types of gray-level discontinuities in a digital image. **(10 Marks)**

OR

10 a. What is objective of segmentation? Explain region based segmentation. **(08 Marks)**
b. Write a short notes on :
  i) Edge linking and Boundary detection
  ii) Thresholding. **(08 Marks)**

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II sem M.Tech CS

CBCS SCHEME

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16/17SCS/SCE21

Second Semester M.Tech. Degree Examination, June/July 2018
Managing Big Data

Time: 3 hrs. Max. Marks: 80

Note: Answer any FIVE full questions, choosing one full question from each module.

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Module-1

1 a. Define Big data and explain the importance of Big data in modern world. **(05 Marks)**
b. Define unstructured data and explain the advanced analytics used in data mining and simulation. **(06 Marks)**
c. Define and explain Digital Marketing and Web analytics in detail. **(05 Marks)**

OR

2 a. What is cross-channel lifecycle marketing approach explain with a neat diagram. **(06 Marks)**
b. Explain Near Real time event processing framework for fraud detection with the help of neat diagram. **(06 Marks)**
c. What is crowd sourcing analytics? Explain. **(04 Marks)**

Module-2

3 a. Explain aggregate data model with an example. **(08 Marks)**
b. Explain relationships and graph database in detail. **(08 Marks)**

OR

4 a. What is sharding? Explain in detail. **(06 Marks)**
b. Explain Basic partitioning and combining map reduce techniques. **(10 Marks)**

Module-3

5 a. Explain map and reduce phase with an example. **(06 Marks)**
b. Briefly explain the significance of data flow in distributed file system. **(06 Marks)**
c. What are Hadoop pipes? Explain. **(04 Marks)**

OR

6 a. What is Hadoop distributed file system and Briefly explain its design. Where HDFS is not a good fit today? **(08 Marks)**
b. Explain serialization and its RPC-formats with an example. **(08 Marks)**

Module-4

7 a. What are map reduce work flows and how a problem is decomposed into jobs by using map reduce? Explain with an example. **(08 Marks)**
b. Explain Job run and independent entities for a classic map reduce. **(08 Marks)**

OR

8 a. What is job scheduling? Explain Fair scheduler and capacity scheduler. **(08 Marks)**
b. Explain input format class hierarchy with a neat diagram. **(08 Marks)**

Module-5

9 a. Explain clusters, key spaces and columns with respect to Cassandra data model. (08 Marks)
b. List and explain the design differences between RDBMS and Cassandra. (08 Marks)

OR

10 a. Write a short note on pig in Hadoop. (05 Marks)
b. Write a short note on Hbase data model. (05 Marks)
c. Write a short note Hive data types. (06 Marks)

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CBCS Scheme

USN ☐☐☐☐☐☐☐☐☐☐

16/17SCS22

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Second Semester M.Tech. Degree Examination, June/July 2018
Advances in Computer Networks

Time: 3 hrs. Max. Marks: 80

Note: ***Answer FIVE full questions, choosing ONE full question from each module.***

Module-1

1 a. List and explain the requirements that influence the network design. **(10 Marks)**

b. Suppose a 128 Kbps point to point link is set up between earth and a rover on mars. The distance from earth to mars is approximately 55 Gm and data travels over the link at the speed of light 3×10^8m/sec.

i) Calculate the minimum RTT for the link

ii) A camera on the roller takes pictures of its surroundings and sends to earth. How quickly after a picture is taken can reach on earth? Assume that each image is 5 MB in size. **(06 Marks)**

OR

2 a. With a neat time line diagram, explain the four different scenarios for stop and wait algorithm. **(08 Marks)**

b. Explain 5 layer TCP/IP reference model with a neat diagram. **(08 Marks)**

Module-2

3 a. Describe virtual circuit switching with example. **(08 Marks)**

b. Explain how bridges use spanning tree algorithm to handle loops. Give an example. **(08 Marks)**

OR

4 a. Describe different fields of IPV4 header format with a neat diagram. **(10 Marks)**

b. What is the need for DHCP? Explain the working of DHCP. **(06 Marks)**

Module-3

5 a. Explain distance vector routing protocol with an example network. **(10 Marks)**

b. For the network shown in Fig.5(b), show how link state algorithm builds the routing table for node A. **(06 Marks)**

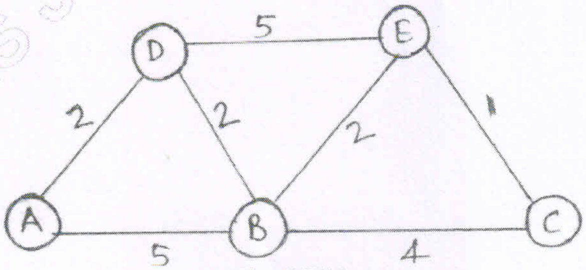

Fig.Q5(b)

OR

6 a. Briefly explain about BGP characteristics. **(10 Marks)**
b. What are the general characteristics of mobile IP technology? **(06 Marks)**

Module-4

7 a. Briefly explain about different "TCP congestion control" mechanisms. **(08 Marks)**
b. Explain the following queuing disciplines : i) FIFO ii) Fair queuing. **(08 Marks)**

OR

8 a. With a neat diagram explain three-way hand shake algorithm used by TCP to establish and terminate connection. **(08 Marks)**
b. Explain UDP segment format. Mention the advantages and disadvantages of using UDP. **(08 Marks)**

Module-5

9 a. What are the different characteristics of HTTP explain in brief. What is the purpose of GET command in HTTP? **(10 Marks)**
b. Explain the mechanism for mapping domain names to addresses. **(06 Marks)**

OR

10 a. Briefly explain about different congestion avoidance mechanisms. **(10 Marks)**
b. What is URL? Explain with example. **(06 Marks)**

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CBCS Scheme

USN

16/17SCS23

Second Semester M.Tech. Degree Examination, June/July 2018

Advanced Algorithms

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing one full question from each module.

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Module-1

1 a. Explain the following asymptotic notations: O, Ω, θ with suitable examples. **(06 Marks)**

b. Using master method, solve the following recurrences:

i) $T(n) = 9T(n/3) + n$ ii) $T(n) = 2T(n/2) + \theta(n)$ iii) $T(n) = 3T(n/4) + n\lg n$

iv) $T(n) = 8T(n/2) + \theta(n^2)$ v) $T(n) = T(2n/3) + 1$ **(10 Marks)**

OR

2 a. Using substitution method, solve the following recurrence relation to give an upper and lower bound: $T(n) = 2T(n/2) + \theta(n)$. **(05 Marks)**

b. Construct a recursion tree for the recurrence, $T(n) = T(n/3) + T(2n/3) + cn$ and indicate the running time. **(05 Marks)**

c. Explain the aggregate analysis technique used in amortized analysis, using multipop stack and binary counter problems. **(06 Marks)**

Module-2

3 a. Write Bellman-Ford algorithm for solving single-source shortest paths problems. Trace it for the following graph.

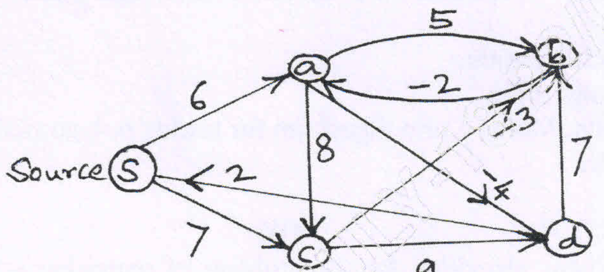

Fig.Q3(a) **(08 Marks)**

b. Briefly explain the following:

i) Flow networks ii) Residual networks

iii) Cuts iv) Augmenting paths **(08 Marks)**

OR

4 a. Write Johnson's algorithm for solving all pair shortest paths problem. Also indicate the running time. **(05 Marks)**

b. Describe how to find maximum bipartite matching for a given graph, considering suitable example. **(05 Marks)**

c. Write and explain recursive – FFT algorithm. **(06 Marks)**

Module-3

5 a. Write modular-linear-equation-solver algorithm and using the same, solve the following: $14x \equiv 30 (\bmod 100)$. **(08 Marks)**

b. Apply the Chinese remainder theorem, to the following equations:
$a \equiv 2 \pmod 5$
$a \equiv 3 \pmod{13}$
Generate all the solutions, in the form of a table. **(08 Marks)**

OR

6 a. With the help of suitable example, describe Pollard's rho heuristic algorithm. **(08 Marks)**

b. Write the procedure for RSA public-key crypto system. Apply it for the following input $p = 3$ and $q = 11$, $e = 7$. Compute 'd' and encrypt $M = 2$. **(08 Marks)**

Module-4

7 a. Working modulo $q = 13$, demonstrate Robin-Karp string matching algorithm for the text: 2359023141526739921 and the pattern: 31415. **(08 Marks)**

b. Write compute-transition function of string matching automata. Illustrate the same for the pattern: ababaca over the alphabet $\Sigma = \{a, b, c\}$. **(08 Marks)**

OR

8 a. Write compute-prefix function of Knuth-Morris-Pratt string matching algorithm. Apply it on the pattern AAACAAAAAC. Indicate the running time of K-M-P algorithm. **(08 Marks)**

b. Write Boyer-Moore algorithm for string matching problem. Illustrate it on the following input.
Text: BESS_KNEW_ABOUT_BAOBABS
Pattern: BAOBAB **(08 Marks)**

Module-5

9 a. Describe how to randomize the deterministic algorithms considering the following problems:
i) Linear search algorithm
ii) Quick sort algorithm **(08 Marks)**

b. Write and explain, Monte-Carlo algorithm for testing polynomial equality, with the help of a suitable example. **(08 Marks)**

OR

10 a. Describe Las Vegas algorithm for the problem of searching a list with repeated elements. Also list the differences between Monte-Carlo and Las-Vegas algorithms. **(08 Marks)**

b. Explain minimum cut problem in graphs using edge contraction method, considering a suitable example. Also write a Monte-Carlo algorithm for the same. **(08 Marks)**

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CBCS Scheme

USN

16/17SCS24

Second Semester M.Tech. Degree Examination, June/July 2018
Internet of Things

Time: 3 hrs. Max. Marks: 80

Note: ***Answer FIVE full questions, choosing ONE full question from each module.***

Module-1

1 a. Define internet of things. Justify internet of things is "just a concept". **(08 Marks)**

b. Explain the characteristics of an object. Discuss classification of objects with a diagram. **(08 Marks)**

OR

2 a. Explain any four applications of automotives. **(08 Marks)**

b. Discuss the basic elements of an M2M application. **(08 Marks)**

Module-2

3 a. Differentiate between contactless smart card and RIFD tags. **(08 Marks)**

b. Discuss the structural aspects of IOT. **(08 Marks)**

OR

4 a. Illustrate the working of routing protocol for LLN-RPL. **(08 Marks)**

b. List out the main features of COAP. Explain the Request/Response model used by COAP. **(08 Marks)**

Module-3

5 a. Explain the interaction between NFC interrogator and NFC device communicates. **(08 Marks)**

b. Explain IEEE 802.15.4 acknowledgement frame format and data frame format. **(08 Marks)**

OR

6 a. List and explain the advantages of IPv6 over IPv4. **(08 Marks)**

b. Describe QoS capabilities in IPv6. **(08 Marks)**

Module-4

7 a. With a neat diagram, explain deployment design of the weather monitoring IOT system. **(08 Marks)**

b. Illustrate with figures service specification for home automation IOT system for mode and state service. **(08 Marks)**

OR

8 a. Show how the communication occurs between various components of the web socket implementation of the weather monitoring system. **(08 Marks)**

b. Write a program in python for smart parking controller native service. **(08 Marks)**

Module-5

9 a. How do you set up Hadoop cluster? **(08 Marks)**

b. Write a short note on Hadoop yarn. **(08 Marks)**

OR

10 a. Briefly discuss the functions of the key processes of Hadoop. **(08 Marks)**

b. Explain Mapreduce job execution workflow. **(08 Marks)**

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
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CBCS Scheme

USN

16/17SCS253

Second Semester M.Tech. Degree Examination, June/July 2018
Information and Network Security

Time: 3 hrs. Max. Marks: 80

Note: ***Answer any FIVE full questions, choosing ONE full question from each module.***

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

Module-1

1 a. Discuss the simplified model of conventional cryptosystem with neat diagram. **(04 Marks)**

b. Explain the features of play fair cipher. **(04 Marks)**

c. Perform the hill cipher encryption and decryption for the plaintext "PAYMOREMONEY" by using key $K = \begin{bmatrix} 17 & 17 & 5 \\ 21 & 18 & 21 \\ 2 & 2 & 19 \end{bmatrix}$. **(08 Marks)**

OR

2 a. Explain the Feistel cipher encryption and decryption with diagram. **(08 Marks)**

b. Describe the general depiction of DES encryption algorithm with neat diagram. **(08 Marks)**

Module-2

3 a. Discuss the applications and requirements for public key cryptography. **(08 Marks)**

b. Perform the encryption and decryption using RSA algorithm for the following :
i) $p = 3, q = 11, e = 7, M = 5$
ii) $p = 5, q = 11, e = 3, M = 9$. **(08 Marks)**

OR

4 a. What are Abelian groups? Explain the geometric description of addition in Elliptic curves. **(08 Marks)**

b. User A and B use the Diffie-Hellman's key exchange technique with a common prime $q = 71$, and primitive root of $\alpha = 7$. Compute the following :
i) If user A has private key $X_A = 5$, compute Y_A
ii) If user B has private key $X_B = 12$, compute Y_B. **(08 Marks)**

Module-3

5 a. Discuss the techniques involved in distribution of public keys. **(08 Marks)**

b. Give the format of X·509 certificate with neat diagram. **(08 Marks)**

OR

6 a. Differentiate between Kerberos version 4 and 5. **(04 Marks)**

b. Explain decentralized key control. **(04 Marks)**

c. With the aid of diagram describe the key distribution scenario. **(08 Marks)**

Module-4

7 a. Give the general IEEE802 MPDU format. **(04 Marks)**

b. Explain the IEEE 802.11 network components and architectural model. **(04 Marks)**

c. Describe the IEEE 802.11i phases of operations briefly. **(08 Marks)**

OR

8 a. Explain SSL architecture and SSL record protocol. **(08 Marks)**
b. Describe the SSH protocol stack with neat diagrams. **(08 Marks)**

Module-5

9 a. Explain any two PGP cryptographic functions. **(08 Marks)**
b. Describe the IP security applications and benefits with the help of IP security scenario. **(08 Marks)**

OR

10 a. What are the services of PGP? Explain. **(04 Marks)**
b. Explain the various fields of MIME content types. **(04 Marks)**
c. Describe the encapsulation security payload (ESP) IP security format with neat diagrams. **(08 Marks)**

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IV sem M.Tech CS

USN

14SCS41

Fourth Semester M.Tech. Degree Examination, June/July 2018

Machine Learning Techniques

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions.***

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

1 a. What is Machine Learning? Write the issues in machine learning. **(04 Marks)**

b. List four components in machine learning and illustrate the design of checkers learning problem with a neat sketch. **(06 Marks)**

c. Write candidate – Elimination learning algorithm and explain with an example. What are its limitations? **(10 Marks)**

2 a. What is Decision tree? Write the characteristics which are best suited for a problem of decision tree learning? **(04 Marks)**

b. Explain Gradient Descent Algorithm for training a linear unit. **(06 Marks)**

c. Calculate the information gain for all the attributes using Decision tree algorithm for the below problem. **(10 Marks)**

Day	Outlook	Temperature	Humidity	Wind	Play Tennis
D_1	Sunny	Hot	High	Weak	No
D_2	Sunny	Hot	High	Strong	No
D_3	Overcast	Hot	High	Weak	Yes
D_4	Rain	Mild	High	Weak	Yes
D_5	Rain	Cool	Normal	Weak	Yes
D_6	Rain	Cool	Normal	Strong	No
D_7	Overcast	Cool	Normal	Strong	Yes
D_8	Sunny	Mild	High	Weak	No
D_9	Sunny	Cool	Normal	Weak	Yes
D_{10}	Rain	Mild	Normal	Weak	Yes
D_{11}	Sunny	Mild	Normal	Strong	Yes
D_{12}	Overcast	Mild	High	Strong	Yes
D_{13}	Overcast	Hot	Normal	Weak	Yes
D_{14}	Rain	Mild	High	Strong	No

3 a. Define perceptron and explain the representation of perceptron. **(04 Marks)**

b. Explain the back propagation Algorithm with extensions. **(08 Marks)**

c. Represent the program discovered by the genetic programming as a tree. Illustrate the operation of genetic programming cross over operation by applying it using two copies of your tree as the two parents. **(08 Marks)**

4 a. Give the rules for i) The optimal Bayesian hypothesis ii) The maximum likelihood hypothesis. When are these the same. **(04 Marks)**

b. Discuss a prototypical Genetic Algorithm is detail. **(06 Marks)**

c. Describe the Naïve Bayesian method of classification. What assumption does this method make about the attributes and the classification? Give an example where this assumption is not justified. **(10 Marks)**

5 a. Explain mistake Bound model of learning for Halving Algorithm. **(04 Marks)**
b. Define EM Algorithm and derive K-means Algorithm. **(10 Marks)**
c. Explain shattering a set of instances and the vapnik-chervoncnkis Dimension. **(06 Marks)**

6 a. Describe K-NEAREST NEIGHBOR learning algorithm for discrete valued function. Write one major issue of this algorithm and the approaches to overcome this issue. **(08 Marks)**
b. Explain Radial Basis Functions and write the approaches for choosing an appropriate number of hiden units. **(04 Marks)**
c. What is the need for LEARN – ONE – RULE and explain LEARN – ONE – RULE Algorithm. **(08 Marks)**

7 a. Define the following terms :
- i) Literal
- ii) Clause
- iii) Horn clause
- iv) Substitution.

(04 Marks)
b. Explain propositional Resolution operator and propositional Inverse Resolution operator in inverting Resolution. **(06 Marks)**
c. Explain the algorithm for regressing a set of literal through a single Horn clause with an example. **(10 Marks)**

8 a. Differentiate between FOIL and FOCL. **(04 Marks)**
b. Illustrate Q-learning Algorithm with an example. **(08 Marks)**
c. State and prove the convergence of Q learning for deterministic Markov decision process. **(08 Marks)**

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CBCS Scheme

USN

16SCS41

Fourth Semester M.Tech. Degree Examination, June/July2018

Machine Learning Techniques

Time: 3 hrs. Max. Marks: 80

Note: *Answer any FIVE full questions, choosing ONE full question from each module.*

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
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Module-1

1 a. What is machine learning? Explain steps to design a learning system in details with example and diagram. **(08 Marks)**

b. Describe the find -S algorithm. explain its working by taking the enjoy sport concept and training instances given below :

Example	Sky	Air Temp	Humidity	Wind	Water	Forecast	Enjoy sport
1	Sunny	Warm	Normal	Strong	Warm	Same	Yes
2	Sunny	Warm	High	Strong	Warm	Same	Yes
3	Rainy	Cold	High	Strong	Warm	Change	No
4	Sunny	Warm	High	Strong	Cool	Change	Yes

(08 Marks)

OR

2 a. Describe candidate–elimination learning algorithm with example. **(08 Marks)**

b. Illustrate the operation of ID3 for the following training examples given in the table I. Here the target attribute is PlayTennis. Draw the complete decision tree.

Day	Outlook	Temperature	Humidity	Wind	Play Tennis
D1	Sunny	Hot	High	Weak	No
D_2	Sunny	Hot	High	Strong	No
D_3	Overcast	Hot	High	Weak	Yes
D_4	Rain	Mild	High	Weak	Yes
D_5	Rain	Cool	Normal	Weak	Yes
D_6	Rain	Cool	Normal	Strong	No
D_7	Overcast	Cool	Normal	Strong	Yes
D_8	Sunny	Mild	High	Weak	No
D_9	Sunny	Cool	Normal	Weak	Yes
D_{10}	Rain	Mild	Normal	Strong	Yes
D_{11}	Sunny	Mild	Normal	Strong	Yes
D_{12}	Overcast	Mild	High	Strong	Yes
D_{13}	Overcast	Hot	Normal	Weak	Yes
D_{14}	Rain	Mild	High	Strong	No

(08 Marks)

Module-2

3 a. Explain in detail perceptron based ANN system its representation and training rule. **(08 Marks)**

b. Explain Back propagation algorithm in detail. **(08 Marks)**

OR

4 a. Describe in detail a prototypical genetic algorithm. **(08 Marks)**

b. Explain genetic programming with example. **(08 Marks)**

Module-3

5 a. What is the relationship between Bayes theorem and problem of concept learning? Explain in detail. **(08 Marks)**

b. Explain likelihood hypothesis for predicting probabilities. **(08 Marks)**

OR

6 a. Explain Naïve Bayes classifier by applying it to a concept-learning problem. Use table I and novel instance <Outlook = sunny, Temp = cool, Humidity = high, Wind = strong>. **(08 Marks)**

b. Explain the EM algorithm in detail. **(08 Marks)**

Module-4

7 a. Explain k-nearest neighbor learning algorithm with example. **(08 Marks)**

b. Describe the method of learning using locally weighted linear regression. **(08 Marks)**

OR

8 a. Explain learning sets of First-order rules in detail with example. **(08 Marks)**

b. Explain how inverting resolution constructs hypotheses by inverting a deductive inference rule. **(08 Marks)**

Module-5

9 a. Compare inductive learning and analytical learning. **(08 Marks)**

b. Explain the explanation-based learning algorithm PROLOG-EBG. **(08 Marks)**

OR

10 a. Explain the Q functions and Q learning algorithm. **(08 Marks)**

b. Explain Q learning for non deterministic Markov Decision Process (MDP). **(08 Marks)**

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USN ☐☐☐☐☐☐☐☐☐☐

14SCS422

Fourth Semester M.Tech. Degree Examination, June/July 2018

Business Intelligence and Its Applications

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions.***

1 a. Define Business Intelligence and explain the decision support initiatives. **(10 Marks)**
b. What are Business Intelligence development approaches? **(10 Marks)**

2 a. Define and describe in detail the traditional development approach used in BI. **(10 Marks)**
b. Explain three project parallel development tracks. **(10 Marks)**

3 a. What is Risk Analysis? What are key points to consider while risk analysis? **(10 Marks)**
b. What is Controlled Chaos? Write a short note on middle ware platform. **(10 Marks)**

4 a. With a neat diagram, explain project planning activities. **(10 Marks)**
b. What are the items that need to be considered for interviewing process and list 5 interviewing tips? **(10 Marks)**

5 a. Discuss in brief the three categories of data quality requirements. **(10 Marks)**
b. Write a note on project charter **(10 Marks)**

6 a. Classify and interpret the 3 types of BI database back up techniques. **(10 Marks)**
b. Explain Physical Database design guidelines. **(10 Marks)**

7 a. What are Dash boards? Why enterprises need them and illustrate different types of dash boards. **(10 Marks)**
b. Explain the Application Release concept. **(10 Marks)**

8 a. What is Cloud Computing and why BI should be on cloud? **(10 Marks)**
b. Describe in detail how to manage and store unstructured data. **(10 Marks)**

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