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TCS-501

B. Tech. (CSE) (Fifth Semester)

End Semester EXAMINATION, 2017

SYSTEM SOFTWARE

Time : Three Hours] [Maximum Marks : 100

Note : (i) This question paper contains two Sections.
(ii) Both Sections are compulsory.

Section—A

1. Fill in the blanks/True-False : (1×5=5 Marks)
 - (a) The maximum memory available on a SIC/XE system is
 - (b) It is very difficult to eliminate forward reference on data items. (True/False)
 - (c) A brings the object program into memory of execution.
 - (d) The data structure involved in macroprocessors are , and
 - (e) Lex patterns match a given input character or string once. (True/False)

2. Attempt any five parts : (3×5=15 Marks)
- Write a program in SIC to compute the following expression :
BETA = ALPHA + INCR-1.
 - Define assembler directive with examples.
 - Write the algorithm for an absolute loader.
 - What do you mean by user-interface criteria ?
 - Define a macro and explain the role of macroprocessor.
 - Write a program in Lex to check whether the given input is digit or not.
 - Write a program in Lex to count the number of words and characters from a given input.

Section—B

3. Attempt any two parts of choice from (a), (b) and (c). (10×2=20 Marks)
- Explain the instruction formats and addressing modes of SIC/XE machine architecture.
 - Generate the complete object code for the following assembly level program. Also indicate the contents of symbol table at the end. Assume standard SIC model and assume the following machine OPCODES in HEX :
LDA → 00 TIX → 2C

LDX → 04 JLT → 38
STA → 0C RSUB → 4C
ADD → 18

SUM	START	2000
FIRST	LDX	ZERO
	LDA	ZERO
LOOP	ADD	TABLE, X
	TIX	COUNT
	JLT	LOOP
	STA	TOTAL
	RSUB	
TABLE	RESW	2000
COUNT	RESW	1
ZERO	WORD	0
TOTAL	RESW	1
	END	FIRST

(c) What is Program Block ? How are multiple program blocks handled by assemblers ?

4. Attempt any two parts of choice from (a), (b) and (c). (10×2=20 Marks)
- Explain the bootstrap loader with the algorithm.

- (b) Explain the various data structures used for a linking loader.

- (c) Explain with a neat diagram the structure of text editor.

5. Attempt any two parts of choice from (a), (b) and (c). (10×2=20 Marks)

- (a) Write the algorithm for one pass macroprocessor and explain.
 - (b) With examples explain how unique labels are generated during macro expansion.
 - (c) Explain the general purpose macroprocessors.

6. Attempt any *two* parts of choice from (a), (b) and (c). $(10 \times 2 = 20$ Marks)

- (a) Explain the structure of Lex program.
 - (b) Write a Yacc program to function as a calculator which performs addition, subtraction, multiplication and division.
 - (c) What is shift/reduce parsing ? Explain with example.

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TCS-502

B. Tech. (CS/IT) (Fifth Semester)

End Semester EXAMINATION, 2017

OPERATING SYSTEM

Time : Three Hours] [Maximum Marks : 100

Note : (i) This question paper contains two Sections.
(ii) Both Sections are compulsory.

Section—A

1. Fill in the blanks/True-False : (1×5=5 Marks)

(a) When a user level thread is blocked, all other threads of its process are blocked.

(True/False)

(b) The kernel uses the Process Control Block to keep track of bookkeeping information about processes, such as the program counter.

(True/False)

(c) A paging scheme does not suffer from external fragmentation. (True/False)

- (d) Scheduler controls the degree of multiprogramming.
- (e) Distributed systems do not share memory.
(True/False)
2. Attempt any *five* parts : (3×5=15 Marks)
- Page size are kept in power of 2. Why ?
 - Explain Belady's anomaly by taking a suitable example.
 - Why thrashing is occurred and how can it be prevented ?
 - What are the problems with SJF scheduling algorithm and how can it be resolved ?
 - Differentiate internal and external fragmentation.
 - Differentiate kernel level and user level threads.
 - Explain race condition through an example.

Section—B

3. Attempt any *two* parts of choice from (a), (b) and (c). (10×2=20 Marks)
- Explain the concept of demand paging. How do you handle the page fault in demand paging ? Also show the impact of page fault on the system performance by taking a suitable example.

- (b) Consider three processes, all arriving at time zero, with total execution time of 10, 20 and 30 units, respectively. Each process spends the first 20% of execution time doing I/O, the next 70% of time doing computation, and the last 10% of time doing I/O again. The operating system uses a shortest remaining compute time first scheduling algorithm and schedules a new process either when the running process gets blocked on I/O or when the running process finishes its compute burst. Assume that all I/O operations can be overlapped as much as possible. For what percentage of time does the CPU remain idle ?
- (c) Compare the main memory organization schemes of contiguous-memory allocation, pure segmentation and pure paging with respect to the following issues :
- external fragmentation
 - internal fragmentation
 - ability to share code across processes
4. Attempt any *two* parts of choice from (a), (b) and (c). (10×2=20 Marks)
- Explain the Critical Section Problem (CSP) by taking a suitable example. Also give a suitable solution of CSP for n-processes and satisfy CSP solution requirements.

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- (b) On a disk with 1000 cylinders (0 to 999) find the number of tracks must move by disk arm to satisfy all the requests in the disk queue. Assume the last request service was at track 345 and the head is moving toward track 0. The queue contains requests for the following tracks :
- 123, 874, 692, 475, 105 and 376.

Perform the computation for SSTF and SCAN scheduling algorithm.

- (c) Consider the following segment table :

Segment	Base	Length
0	219	600
1	2300	14
2	90	100
3	1327	580
4	1952	96

What are the physical address for the following logical addresses ?

- (i) 0, 430
- (ii) 1, 12
- (iii) 2, 500
- (iv) 3, 400
- (v) 4, 110

5. Attempt any two parts of choice from (a), (b) and (c). $(10 \times 2 = 20 \text{ Marks})$

- (a) Explain the different uses of Semaphore by taking suitable examples. Also give solution to Producer/Consumer problem.

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- (b) Consider the following page reference string :

1,2,3,4,2,1,5,6,2,1,2,3,7,6,3,2,1,2,3,6

How many page faults would occur for replacement by LRU and Optimal page replacement algorithms for four frames ? All frames are initially empty and first unique page reference causes a page fault.

- (c) Considering a system with five processes P_0 through P_4 and three resources types A, B, C. Suppose at time t_0 following snapshot of the system has been taken :

Process	Allocation			Max.			Available		
	A	B	C	A	B	C	A	B	C
P_0	0	1	0	7	5	3	3	3	2
P_1	2	0	0	3	2	2			
P_2	3	0	2	9	0	2			
P_3	2	1	1	2	2	2			
P_4	0	0	2	4	3	3			

Answers the following questions

- (i) Find the total resources in the system.
- (ii) Is the system in safe state ? If yes, then find safe sequences.
- (iii) If a request from process P_1 arrives for (1, 0, 2), can the request be granted immediately ?

6. Attempt any two parts of choice from (a), (b) and (c). $(10 \times 2 = 20 \text{ Marks})$

(a) What are necessary conditions to hold a deadlock in a system ? Give some deadlock prevention mechanisms.

(b) On a system using paging and segmentation, the virtual address space consist of upto 16 segments where each segment can be upto 2^{16} bytes long. The hardware pages each segment into 512 bytes pages. How many bits in the virtual address specify the following ?

- (i) Segment number
- (ii) Page number
- (iii) Offset within page
- (iv) Entire virtual address space

(c) Explain the different file allocation schemes with their advantages and disadvantages.

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B. Tech. (CS/IT) (Fifth Semester)

End Semester EXAMINATION, 2017

DATABASE MANAGEMENT SYSTEMS

Time : Three Hours] [Maximum Marks : 100

Note : (i) This question paper contains two Sections.
(ii) Both Sections are compulsory.

Section—A

1. Write True-False : (1×5=5 Marks)
 - (a) The relational database model was created by E. F. Codd.
 - (b) The candidate key is that you choose to identify each row uniquely is called an alternate key.
 - (c) The database schema is written in DDL.
 - (d) RAW data type can store unstructured data.
 - (e) Triggers is preferred method for enforcing data integrity.

2. Attempt any *five* parts : (3×5=15 Marks)
 (Define/ Short Numerical/ Short Programming/ Draw)
- (a) What is Lock Granularity ?
 - (b) Differentiate between left outer join and right outer join.
 - (c) Discuss the role of database administrator.
 - (d) What is top-*n* analysis ?
 - (e) How to print first three rows of table ?
 - (f) What is database environment ?
 - (g) Differentiate between third normal form and BCNF.

Section—B

3. Attempt any *two* parts of choice from (a), (b) and (c). (10×2=20 Marks)
- (a) Explain multi-valued dependency and fourth normal form with suitable example.
 - (b) Explain the importance for functional dependency in DBMS. Consider the schema R = (A, B, C, D, E, F) and functional dependency AB → C, BC → AD, D → E, CF → B. Find the closure of AB.
 - (c) Consider the schema R = (A, B, C, D, E) and set of functional dependencies :

$$BC \rightarrow ADE$$

$$D \rightarrow B$$

Find the number of candidate keys.

4. Attempt any *two* parts of choice from (a), (b) and (c). (10×2=20 Marks)
- (a) What are the components of data dictionary ? Discuss active and passive dictionaries.
 - (b) Draw an E-R diagram for a small marketing company database, assuming your own data requirements.
 - (c) Consider the following relation and write the SQL query :
 Employee (emp_id, emp_name, salary, DOB, Hire_date, dep_id, manager_id)
 Department (dep_id, dep_name, loc_id, manager_id)
 - (i) Find emp_id, DOB, Dep_name of all employees in dep_id 90.
 - (ii) Find the Cartesian product of two tables using cross join.
 - (iii) Find emp_name and their manager name of all employees.
 - (iv) Find manager name of all the departments.
5. Attempt any *two* parts of choice from (a), (b) and (c). (10×2=20 Marks)
- (a) Explain the Codd rules, and how does it relate to RDBMS.
 - (b) Let R = (W, X, Y, Z) be a relational schema with the following dependencies :
 $X \rightarrow W$, $WZ \rightarrow XY$, $Y \rightarrow WXZ$,
 find the canonical cover.
 Find the key for R.

- (c) Explain AVG, COUNT, STDDEV, MAX, MIN group functions with suitable example in SQL.
6. Attempt any two parts of choice from (a), (b) and (c). ($10 \times 2 = 20$ Marks)
- Write differences between 2PL and strictly 2PL protocols with example.
 - Gives the following relations :
CUSTOMER (Customer_name, Customer_street, Customer_city)
LOAN (loan_no, Branch_name, amount)
DEPOSITOR (customer_name, account_no)
BORROWER (customer_name, loan_no)
- Write down the relational algebra query for the following :
- Retrieve all tuples of the relation customer who lives in the city 'pnb'.
 - Retrieve those customer names who have either a loan or account in the bank.
 - Find the names of all the customers-who have loan at the 'pnbgeu' branch.
 - Retrieve those customer names who have loan amount ₹ 12,000 in the bank.
- (c) What is Transaction ? List and discuss ACID properties of a Transaction.

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B. Tech. (CS/IT) (Fifth Semester) End Semester EXAMINATION, 2017

DESIGN AND ANALYSIS OF ALGORITHMS

Time : Three Hours] [Maximum Marks : 100

- Note : (i) This question paper contains two Sections.
(ii) Both Sections are compulsory.

Section—A

1. Fill in the blanks/True-False : $(1 \times 5 = 5 \text{ Marks})$
 - (a) The minimum number of comparisons required to find the minimum and the maximum of 800 numbers is
 - (b) Suppose P, Q, R, S, T are sorted sequences having lengths 20, 24, 30, 35, 50 respectively. They are to be merged into a single sequence by merging together two sequences at a time. The number of comparisons that will be needed in the worst case by the optimal algorithm for doing this is

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- (c) Let G be a graph with n vertices and m edges. The tightest upper bound on the running time on Depth First Search of G is
- (d) The asymptotic notation for defining the average time complexity is reflexive.
(True/False)
- (e) The number of nodes a null tree can have is zero.
(True/False)
2. Attempt any five parts : $(3 \times 5 = 15 \text{ Marks})$
(Define/ Short Numerical/ Short Programming/ Draw)
- (a) Explain subset sum problem with the help of an example.
- (b) Explain N queens problem for $N = 4$.
- (c) Write pseudo code for Floyd's algorithm and explain terminologies used.
- (d) Write pseudo code for recursive binary search and mathematically prove its complexity.
- (e) Write the pseudo code of quick sort and mathematically derive its complexity in worst case.
- (f) Explain with examples classes of P, NP, NP hard and NP complete.
- (g) Explain asymptotic analysis. Why is masters method used ? Comment.

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Section—B

3. Attempt any two parts of choice from (a), (b) and (c). $(10 \times 2 = 20 \text{ Marks})$

- (a) Explain all the algorithm design techniques in detail with the help of examples of each. Why is worst case analysis of algorithms most important than average case analysis ?
- (b) Suggest how can you force the quick sort algorithm to run in $O(n \log n)$ time in the worst case. Solve the following recurrence :

$$T(n) = \sqrt{n} T(\sqrt{n}) + 400n$$

- (c) Find the optimal solution for the 0/1 Knapsack Problem where the total capacity of the Knapsack is $W = 7$. Show each steps clearly :

$$i = \langle 1, 2, 3, 4, 5, 6, 7, 8 \rangle$$

$$w = \langle 1, 2, 3, 3, 4, 5, 3, 6 \rangle$$

$$b = \langle 3, 18, 6, 20, 10, 14, 12, 16 \rangle$$

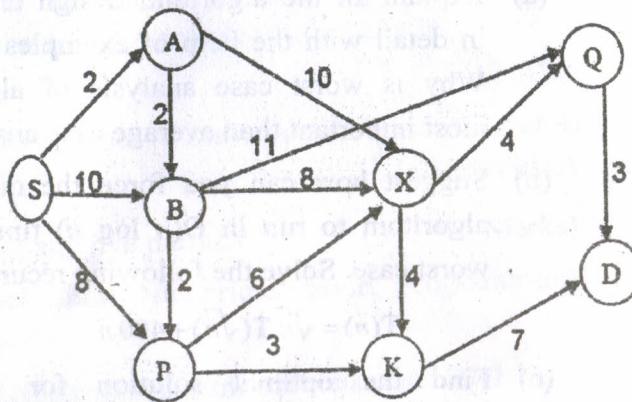
4. Attempt any two parts of choice from (a), (b) and (c). $(10 \times 2 = 20 \text{ Marks})$

- (a) What is the difference between Prim's Kruskal's Algorithm ? What do you mean by Dynamic Programming ? What are overlapping sub problems ? How is dynamic programming different from greedy algorithms ? Comment.

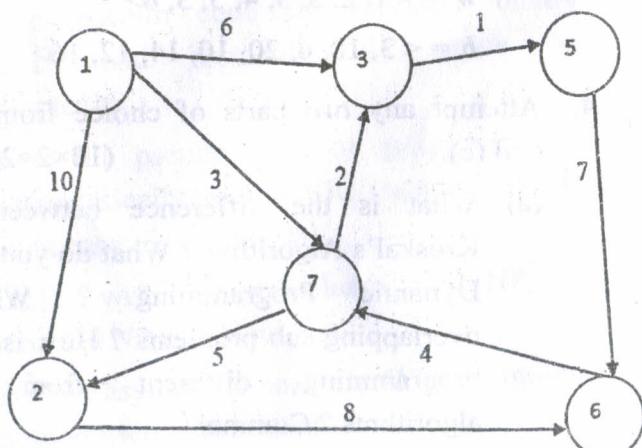
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- (b) Solve the following with the help of single source shortest path algorithm and show all steps clearly. Assume node S is the starting node.



- (c) Solve the following with the help of all pairs shortest path algorithm, for the given graph show the updated optimal paths and mention all steps clearly :



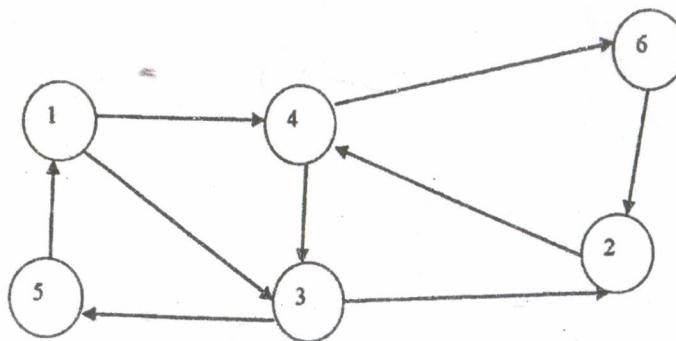
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5. Attempt any two parts of choice from (a), (b) and (c). (10×2=20 Marks)

(a) Explain the differences between DFS and BFS with appropriate pseudo codes. Solve topological sorting problem using DFS algorithm with an example.

(b) Write a transitive closure of a graph. Write a pseudo code that computes transitive closure of a graph. Solve the following problem showing each step clearly using Warshall's algorithm :

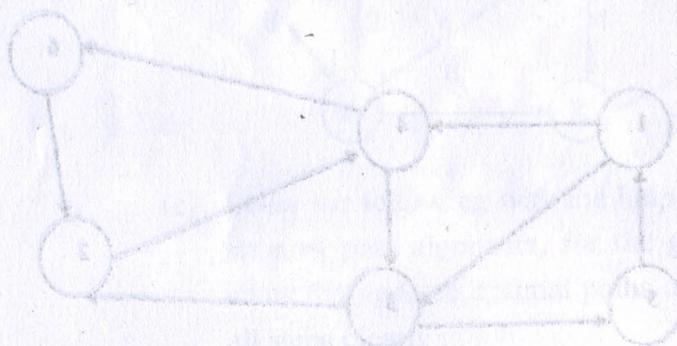


- (c) What is Stable Algorithm ? Explain. Is count sort stable ? Write the pseudo code for count sort. Apply count sort to sort the following elements A = <6, 2, 3, 5, 2, 4, 3, 6, 5, 1>.

6. Attempt any two parts of choice from (a), (b) and (c). (10×2=20 Marks)

- (a) Define principle of optimality. What are non-deterministic algorithms ? Explain by giving examples.

- (d) (a) write code to check whether a given string is a palindrome or not
 (b) Write an algorithm to find median and mode from a list of ' n ' elements. The Dijkstra's algorithm does not work for negative weight path. Why?
 (c) What are branch and bound algorithms? Explain travelling salespersons problem using branch and bound approach in detail.



traversing of selected T-matching, selected of radius 2 (a)

traversing of chosen path with all 1/W * sides from

selected end node of time taken (upper value)

$\{1, 2, 3, 4, 5, 6, 7, 8, 9\}$ = A sequence

(e) (a) write code to check whether a given string is a

palindrome or not
 (b) Write an algorithm to calculate median

from the given list of numbers to calculate median

giving you example & conditions of calculation

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Introduction to Machine Learning

TCS-507

B. Tech. (CSE) (Fifth Semester)

End Semester

EXAMINATION, 2017

BIGDATA ANALYTICS

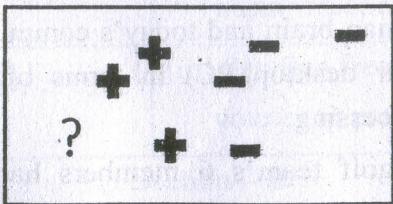
Time : Three Hours] [Maximum Marks : 100

Note : (i) This question paper contains two Sections.
(ii) Both Sections are compulsory.

Section—A

1. Fill in the blanks/True-False : (1×5=5 Marks)

(a) Given the following labelled data set :



The minimal value of k for which the query point "?" will be negative is

(4, 5, 6, 7)

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- (b) "A single perceptron can compute the XOR function." (True/False)
- (c) K-Nearest Neighbour is a (supervised/unsupervised) problem.
- (d) "The back propagation learning algorithm is based on the gradient-descent method." (True/False)
- (e) "No clustering scheme can achieve all three of richness, scale invariance, consistency." (True/False)

2. Attempt any five parts : (3×5=15 Marks)

(Define/ Short Numerical/ Short Programming/ Draw)

(a) Explain in simple language the following with respect to Markov Decision Process :

Model : $T(S, a, S') \sim P(S' | S, a)$

(b) Describe the main differences between the human brain and today's computers (such as your desktop PC) in terms of information processing.

(c) A golf team's 6 members had the scores below in their most recent tournament :

70, 72, 74, 76, 80, 114

Between mean and median which is the better measure of centre ? Why ?

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- (d) Draw the full multiplayer neural network structure that can implement XOR function.
- (e) A and B are Boolean random variables. Given : $P(A = \text{True}) = 0.3$, $P(A = \text{False}) = 0.7$, $P(B = \text{True} | A = \text{True}) = 0.4$, $P(B = \text{False} | A = \text{True}) = 0.6$, $P(B = \text{True} | A = \text{False}) = 0.6$, $P(B = \text{False} | A = \text{False}) = 0.4$. Calculate $P(A = \text{True} | B = \text{False})$ by Bayes' rule.
- (f) Differentiate between Regression and Classification.
- (g) Match the following correctly. Also give explanation. Assume Precision at the lower end of the scale and Recall at the higher end :

F_β scores	Prediction Models
(A) $F_{0.5}$	(i) Detecting malfunctioning parts on a spaceship
(B) F_1	(ii) Sending phone notifications about videos a user may like
(C) F_2	(iii) Sending free samples by courier to potential clients

Section—B

3. Attempt any two parts of choice from (a), (b) and (c). (10×2=20 Marks)

(a) Discuss the K-nearest neighbours algorithm.

- (b) We have the following training data for student height/weight vs. gender :

Student	1	2	3	4	5	6
Height	70	65	66	60	58	62
Weight	175	170	168	150	155	160
Gender	0	0	0	1	1	1

Gender = 0 is male and Gender = 1 is female.

Now we have a test case : ($h = 64, w = 161$).

Use the kNN classifier with the following properties :

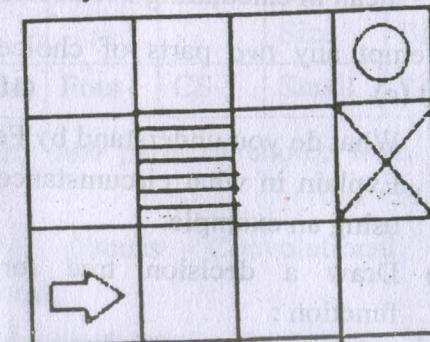
$k = 3$, distance = Manhattan, weight = uniform. Find the 3 nearest neighbours to the test case.

- (c) Describe how the basic Back-Propagation Learning Algorithm for Multi-layer Perceptron (MLP) networks is related to gradient descent learning.

4. Attempt any two parts of choice from (a), (b) and (c). (10×2=20 Marks)

- (a) Differentiate between overfitting and underfitting.
- (b) You are given the following maze where your goal is to reach from the state with an arrow to the state with a circle. You should never enter the state with X sign. The state with striped sign is bounded by a wall hence

you cannot enter it. The following actions can be taken : UP, DOWN, LEFT, RIGHT. You remain in the same state if an action cannot take you to a different state :



Find the shortest sequence for your goal. Now assume that each action is executed as intended with a probability of 0.8, moves at a right angle than the intended direction with a probability of 0.2. Calculate the reliability of the sequence found.

- (c) You have built a classifier to identify Foxes, Jackals and Wolves from image. 5000 images were validated in the classifier giving the following results :

	FOX	JACKAL	WOLF
FOX	1200	400	190
JACKAL	400	500	450
WOLF	210	350	1300

For the class wolves draw the confusion matrix. Then calculate the Precision, Recall and F-1 score. Explain very briefly why do we use Harmonic mean instead of Arithmetic mean in calculating F-1 score.

5. Attempt any two parts of choice from (a), (b) and (c). (10×2=20 Marks)

(a) What do you understand by Feature Scaling ? Explain in what circumstances it is required using an example.

(b) Draw a decision tree for the Boolean function :

$$(A \wedge B) \vee C$$

(c) Consider the following set of training examples to train a robot janitor to predict whether or not an office contains a recycling bin :

Status	Floor	Dept	Office Size	Recycling Bin
Faculty	Four	CS	Medium	Yes
Research Student	Four	IT	Large	Yes
Staff	Five	CS	Medium	No
Research Student	Three	IT	Small	Yes
Staff	Four	CS	Medium	No

Show how a naïve Bayesian classifier would classify the following instance :

Status	Floor	Dept	Office Size	Recycling Bin
Student	Four	CS	Small	??

6. Attempt any two parts of choice from (a), (b) and (c). (10×2=20 Marks)

(a) Briefly discuss Convolutional Neural Networks.

(b) Consider the following Boolean function :

A	B	$\sim A \vee B$
1	1	1
1	0	0
0	1	1
0	1	1

(i) Can this function be represented by a perceptron ? Explain your answer.

(ii) If answer is Yes to the part above construct a perceptron that represents the function. Otherwise construct a multiplayer neural network that represents it.

(c) Discuss the Markov decision process framework.

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B. Tech. (CS/IT) (Fifth Semester) End Semester EXAMINATION, 2017

DATA COMMUNICATIONS AND SYSTEMS

Time : Three Hours] [Maximum Marks : 100

Note : (i) This question paper contains two Sections.
(ii) Both Sections are compulsory.

Section—A

1. Fill in the blanks/True-False : (1×5=5 Marks)
 - (a) A wave has a frequency of 100 Hz. Its period(T) is given by.....
 - (b) layer establishes, maintains and synchronizes the interaction between communicating systems.
 - (c) Error detection uses the concept of, which means adding extra bits for detecting errors at the destination.
 - (d) is the process of transmitting multiple signals over a single communication channel.

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- (e) If there are N routers from source to destination, total end to end delay in sending packet P ($L \rightarrow$ number of bits in the packet $R \rightarrow$ transmission rate) will be $(N*L)/R$.
 (True/False)

2. Attempt any *five* parts : $(3 \times 5 = 15 \text{ Marks})$

(Define/Short Numerical/Short Programming/Draw)

- (a) What is the max. bit rate of a noiseless channel with a bandwidth of 5000 Hz transmitting a signal with two signal levels ?
- (b) What is sampling ? Explain its importance.
- (c) How many addressing schemes are supported by OSI ref. model ? Explain.
- (d) The frequency domain is more compact and useful. Why ?
- (e) What are the *three* criteria necessary for an effective and efficient network ?
- (f) Explain the concept of Delta and Adaptive Delta Modulation.
- (g) Discuss ASK and FSK modulation techniques.

Section—B

3. Attempt any *two* parts of choice from (a), (b) and (c). $(10 \times 2 = 20 \text{ Marks})$

- (a) What is network topology ? Explain the different network topologies with example and compare them.

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- (b) Contrast the OSI model described with the TCP/IP model, using the diagram show the correspondence between the relevant protocol layers in the two model.
- (c) What are the propagation time and transmission time for a 3.5 k-byte message, if the bandwidth of the network is 2 Gbps ? Assume that the distance between the sender and the receiver is 10000 km and speed of light is $2.4 \times 10^8 \text{ m/s}$.

4. Attempt any *two* parts of choice from (a), (b) and (c). $(10 \times 2 = 20 \text{ Marks})$

- (a) Explain the different transmission impairments that affect the data communications. If the signal at the beginning of a cable with -0.2 dB/km has a power of 4 mW, what is the power of the signal at 8 km, if loss in a cable is defined in dB/km ?
- (b) Explain different Analog and Digital Transmission modes with example.
- (c) Discuss Pulse Code Modulation and quantization process in detail.

5. Attempt any *two* parts of choice from (a), (b) and (c). $(10 \times 2 = 20 \text{ Marks})$

(a) (i) A periodic composite signal contains frequencies from 10 to 50 kHz. The peak amplitude is 5 V for the lowest and the highest signals and is 15 V for the 25-kHz signal. Assuming that the amplitudes change gradually from the minimum to the maximum, draw the frequency spectrum.

(ii) What is Bit rate, Bit length and Bit duration ? What is the relevance of Bit rate in data communications ?

(b) What is the advantage of twisting in twisted pair cable ? What are the important applications of coaxial cable ?

(c) What is scrambling ? What will be the result of scrambling the sequence 11100000000000 using one of the following scrambling techniques ? Assume that the last non-zero signal level has been positive :

(i) B8ZS

(ii) HDB3 (the no. of non-zero pulses is odd after the last substitution).

6. Attempt any *two* parts of choice from (a), (b) and (c). $(10 \times 2 = 20 \text{ Marks})$

(a) Draw a 3-stage switch. There are 18 inputs and 20 outputs. Stage 1 has 3 switches, stage 2 has 2 switches and stage 3 has 4 switches. How many cross-points are needed ? Compare it with system using just 1 cross bar switch.

(b) What is Multiplexing ? Explain Frequency Division Multiplexing and Time Division Multiplexing.

(c) What is the purpose of Hamming Code ? How the redundant bits are computed for a data unit of m-bits ? Explain the process for Hamming code for error detection with example.

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B. Tech. (IT) (Fifth Semester)

End Semester EXAMINATION, 2017

SOFTWARE ENGINEERING

Time : Three Hours] [Maximum Marks : 100

Note : (i) This question paper contains two Sections.
(ii) Both Sections are compulsory.

Section—A

1. Fill in the blanks/True-False : (1×5=5 Marks)
 - (a) Software is a set of that when executed provide desired function and performance.
 - (b) The definition phase of software engineering includes tasks such as system engineering, software project planning and
 - (c) is also known as functional testing.
 - (d) CASE stands for
 - (e) In waterfall model, output of one phase is input to next phase. (True/False)

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2. Attempt any five parts : (3×5=15 Marks)
(Define/ Short Numerical/ Short Programming/ Draw)
- (a) Decision Tree
 - (b) Flow Chart
 - (c) ISO
 - (d) Prototype
 - (e) Coupling
 - (f) Module
 - (g) Cohesion

Section—B

3. Attempt any two parts of choice from (a), (b) and (c). (10×2=20 Marks)
- (a) Explain in detail about the decision table. Create a decision table by taking suitable example.
 - (b) What are the problems associated with software engineering ? Also elaborate in detail about modularization.
 - (c) Explain the term Software Crisis. Write in detail about the history of software crisis.

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4. Attempt any two parts of choice from (a), (b) and (c). (10×2=20 Marks)
- (a) What do you understand by the term 'Incremental' model ? Explain various phases of this model with suitable diagram.
 - (b) What do you mean by SRS ? What are its characteristics and organization ? Outline IEEE template for SRS.
 - (c) Write in detail about questionnaire and interview process of requirement gathering with their pros and cons.
5. Attempt any two parts of choice from (a), (b) and (c). (10×2=20 Marks)
- (a) What do you understand by Re-Engineering and Reverse Engineering ? Explain.
 - (b) Elaborate the term risk analysis. Explain the various categories of risk and their containment procedure.
 - (c) Explain the SEI/CMM model with all its phases in detail.
6. Attempt any two parts of choice from (a), (b) and (c). (10×2=20 Marks)
- (a) Elaborate the term 'software testing'. Differentiate between Equivalence Class Partitioning (ECP) and Boundary Value Analysis (BVA) in detail.

(d) (a) and write to [4] TIT-507

(b) What is the process of debugging ? Explain various debugging methods.

(c) Write short notes on the following :

(i) White box testing (ii)

(ii) RAD model

(iii) Umbrella Activities

(e) (a) and write to [4] TIT-507

(b) What is the process of debugging ?

(c) What is the process of testing ?

(d) What is the process of debugging ?

(e) What is the process of testing ?

(f) What is the process of debugging ?

(g) What is the process of testing ?

(h) What is the process of debugging ?

(i) What is the process of testing ?

(j) What is the process of debugging ?

(k) What is the process of testing ?

(l) What is the process of debugging ?

(m) What is the process of testing ?

(n) What is the process of debugging ?

(o) What is the process of testing ?

(p) What is the process of debugging ?

(q) What is the process of testing ?