

II B.Tech. II Semester Supplementary Examinations December, 2014

**Design and Analysis of Algorithms**  
(Common to CSE & IT)

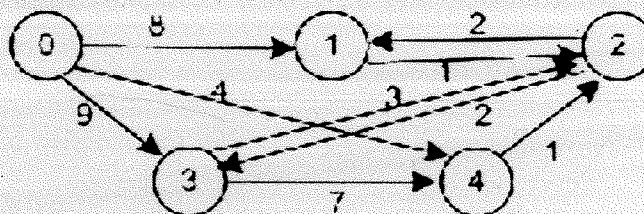
Time: 3 hours

Max Marks: 70

Answer any FIVE of the following  
All questions carry equal marks (14 Marks each)

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1. a) Experimentally compare the performance of SimpleUnion and SimpleFind with WeightedUnion and CollapsingFind. For this, generate a random sequence of union and find operations. 8M
  - b) Derive the Time and Space Complexity of the following programme.  
Algorithm Pow (x, y)  
{  
    S=x  
    For I : 1 to y  
        S = S\*x;  
    Return (S);  
}
- 6M
2. a) Distinguish between Quick sort and merge sort according to their time complexities (derive time complexities). 8M
  - b) State the Strassen's matrix multiplication and derive it's Time complexity? And How much Time reduction we can get over classical matrix multiplication? 6M
  3. a) State the problem of Job sequencing with dead-lines, and its time complexity? 6M
  - b) Find the shortest paths from source 0 to remaining all the nodes using Dijkshra's algorithm in a given graph.



- 8M
4. a) State the recurrence relation for the matrix chain multiplication and what is the time complexity in Big oh (O) notation? 6M
  - b) Solve the following knapsack problem using dynamic programming technique for W=10.

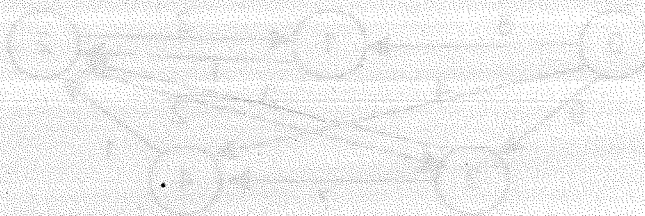
**Item Weight Value**

1	6	\$30
2	3	\$14
3	4	\$16
4	2	\$9

8M

5. a) Write the solution space for 4-Queens problem? 6M  
 b) Solve the following sum of subsets problem using back tracking technique.  
 $S = \{3, 5, 6, 7\}$  and the sum of the subset  $d=15$ . ? 8M
6. a) Define the following terminology i) Articulation point ii) Bi connected components?  
 With an example, explain how the Articulation points are undesirable feature in the graph theory? 7M  
 b) For a sample graph, explain DFS and BFS graph traversal algorithms using suitable data structures? 7M
7. a) Compare and contrast LC Branch and Bound Solution, FIFO Branch and Bound solution for knapsack problem? 6M  
 b) Write the algorithm for 0/1 knapsack problem using branch and bound technique. Trace the algorithm to find optimal solution to the knapsack instance of  $n=4$ ,  $m=15$ , profit  $(p_1, p_2, p_3, p_4) = (10, 10, 12, 18)$ , weights  $(w_1, w_2, w_3, w_4) = (2, 4, 6, 9)$ ? 8M
8. a) What is Boolean Satisfiability problem? Discuss with some suitable example. 6M  
 b) State and prove Cook's theorem? 8M

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**Database Management Systems***(Common to CSE & IT)***Time: 3 hours****Max Marks: 70**

*Answer any FIVE of the following  
All questions carry equal marks (14 Marks each)*

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1. a) Explain various levels of data abstraction and their benefits. 7M  
b) Explain Architecture of database System in detail. 7M
2. a) Draw ER diagram for college environment incorporating all the ER notations with explanation. 7M  
b) Explain weak entity, strong entity, derived attribute and specialization. 7M
3. a) Discuss various integrity constraints with suitable example. 7M  
b) Explain logical data base design. 7M
4. a) Explain group by, having and order by clauses with suitable examples. 7M  
b) Consider the relation **Employee[empno, ename, department, salary]**
  - i) List out the details of all employees working for 'Sales' and 'Production' departments using UNION operation. Order the employees in descending order of their salaries.
  - ii) Using self join, display the details of all employees who are working in the same department of 'Venkateswarlu' 7M
5. a) Explain 2NF and 3NF with example. 7M  
b) Write about Functional dependency and Multi valued dependency. 7M
6. a) Explain the remedial measures to be taken to avoid the anomalies of concurrent execution of transactions. 7M  
b) Write about transaction Serializability. 7M
7. a) Explain Lock based protocol in concurrency control. 7M  
b) Discuss Log based recovery system. 7M
8. a) Explain ISAM with sample data. 7M  
b) Briefly explain various techniques for faster accessing of data 7M

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Code : 1G441

II B.Tech. II Semester Supplementary Examinations December 2014

**Operating Systems**  
(Information Technology)

Max. Marks: 70

Time: 03 Hours

Answer any five questions

All Questions carry equal marks (14 Marks each)

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1. a) Write about System calls? 7M  
 b) Discuss the following  
     i) Parallel Systems 7M  
     ii) Real Time Systems 7M
2. a) What is a Process and also explain the process state diagram? 7M  
 b) Explain the Priority Scheduling algorithm and calculate average waiting time & average Turnaround time using the given data

Process	Burst Time (ms)	Priority
P1	10	3
P2	1	1
P3	2	3
P4	1	4
P5	5	2

3. a) Explain the Critical section problem in detail? 6M  
 b) What is monitor and explain any inter process synchronization problem using monitors? 8M
4. a) What is deadlock? Explain the necessary conditions for deadlock? 7M  
 b) Explain about resource allocation graph with deadlock and without deadlock? 7M
5. a) Explain the Optimal page replacement algorithm with an example? 7M  
 b) Distinguish between paging and segmentation? 7M
6. a) Explain the File Accessing methods? 7M  
 b) Explain the Directory structure and also explain the operations on file directories? 7M
7. What is disk scheduling? Explain the various disk scheduling algorithms with an example? 14M
8. a) Explain about User Authentication in detail? 7M  
 b) Write the following  
     i) Types of viruses  
     ii) Antivirus approaches 7M

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B. Sabhan

Code : 1GA41

R-11

II B.Tech. II Semester Supplementary Examinations December 2014

**Managerial Economics and Financial Analysis**  
(Information Technology)

Max. Marks: 70

Time: 03 Hours

Answer any five questions

All Questions carry equal marks (14 Marks each)

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1. "Managerial economics is a multi-dimensional discipline". Explain.
2. What is demand forecasting and explain the criteria for a good forecasting method.
3. The sales and profit for a company during two years were as follows:

Years	Sales (Rs.)	Profit (Rs.)
2012	1,00,000	10,000
2013	1,50,000	20,000

  - (i) Find out the breakeven point.
  - (ii) What amount of sales will generate a profit of Rs. 40,000?
4. What are the types of monopoly? Under what conditions monopoly is justified?
5. Explain the role of public sector for the development of Indian Industrial economy.
6. Explain the relative merits and demerits of NPV and IRR as techniques of investment evaluation. Which do you prefer and why?
7. The following is the Trial Balance of Aishwarya as on 31<sup>st</sup> December 2013:

	Dr Rs.		Cr Rs.
Stock 1.1.2013	3,000	Sales	52,000
Purchases	37,000	Purchases returns	900
Carriage	300	Creditors	11,000
Sales returns	500	Capital	9,000
Salaries	4,000	Bills Payable	5,000
Wages	1,000		
Rent	1,800		
Discount	1,000		
Repairs	300		
Misc. expenses	1,000		
Cash in hand	3,000		
Furniture and Fixtures	6,000		
Debtors	12,000		
Drawings	7,000		
Total	77,900	Total	77,900

The closing stock as on December 31, 2013 was Rs. 8,000/-. You are required to prepare Trading, Profit and loss account for the year ending December 31, 2013 and Balance Sheet as on that date.

8. The following are the ratios of Aishwarya Ltd.

Current ratio	= 2.6
Liquid ratio	= 1.4
Net Working Capital	Rs. 1,10,000

You are required to calculate:

- (i) current assets
- (ii) current liabilities,
- (iii) liquid assets, and
- (iv) stock.

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Code : 1G145

II B.Tech. II Semester Supplementary Examinations December, 2014

**Object Oriented Programming through JAVA**  
(Common to CSE & IT)

Time: 3 hours

Max Marks: 70

*Answer any FIVE of the following*  
*All questions carry equal marks (14 Marks each)*

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1. a) What is a constructor? Explain about constructor overloading? 7M  
b) Write a program to convert the given temperature in Fahrenheit to Celsius using the following conversion formula  $C = (F - 32)/1.8$  And display the values in a tabular form 7M
2. a) What are the differences between private, static and final variables? 7M  
b) What is inheritance? Explain different types of inheritances? 7M
3. a) Write the similarities between class and interfaces? 7M  
b) Explain about classes of java.util package? 7M
4. a) What is Synchronization? Why is thread Synchronization important for Muthithreaded programs 7M  
b) What is the use of "Throw" "Throws" & "Finally"? Explain with examples for each. 7M
5. a) What is Event delegation model? Explain it? What are the benefits of it? 7M  
b) Design a simple calculator using AWT? 7M
6. a) Explain the following methods of an applet: init(),start(), stop(),paint() 7M  
b) Describe Flow and Border Layout managers 7M
7. a) Explain, in detail, the swing controls: TabbedPanes and ScrollPanes with suitable Java code examples 7M  
b) What are the limitations of AWT? 7M
8. a) Discuss in brief about socket class with an example. 7M  
b) Discuss about java.net package 7M

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Code : 1GC42

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET  
(AUTONOMOUS)

II B.Tech. II Semester Supplementary Examinations December, 2014

**Probability & Statistics**  
(Common to Civil, ME & IT)

Time: 3 hours

Max Marks: 70

*Answer any FIVE of the following*  
*All questions carry equal marks (14 Marks each)*

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1. a) Calculate the mean and standard deviation for the following.

$x$	6	7	8	9	10	11	12
$f$	3	6	9	13	8	5	4

- b) Obtain the rank correlation coefficient for the following data

$X$ :	68	64	75	50	64	80	75	40	55	64
$Y$ :	62	58	68	45	81	60	68	48	50	70

2. a) From a city population, the probability of selecting
- 
- (I) a male (or) a smoker is
- $7/10$
- , (II) a male smoker is
- $2/5$
- and
- 
- (III) a male, if smoker is already selected is
- $2/3$
- .

Find the probability of selecting

(i). A non-smoker (ii). a male and (iii). a smoker, if a male is first selected.

- b) From a vessel containing 3 white & 5 black balls, 4 balls are transferred into an empty vessel. From this vessel a ball is drawn and is found to be white. What is the probability that out of four balls transferred 3 are white and 1 is black?

3. a) A random variable
- $X$
- has the following probability distribution.

$X$ :	0	1	2	3	4	5	6	7	8
$P(X)$ :	5	$3k$	$5k$	$7k$	$9k$	$11k$	$13k$	$15k$	$17k$

Find (i)  $k$  (ii)  $P(X \geq 3)$ (iii) What if the smallest value of  $x$  for which  $P(X \leq x) > 0.5$ .

- b) A random variable
- $X$
- is distributed at random between the values 0 and 1, so that its probability density function is
- $f(x) = kx^2(1-x^3)$
- , where
- $k$
- is a constant.

Find (i)  $k$  (ii) mean (iii) standard deviation.

4. a) In a binomial distribution consisting of 5 independent trials, probabilities are 1 and 2 success are 0.4096 and 0.2048 respectively. Find the parameter
- $p$
- of the distribution.
- 
- b) A manufacturer, who produces medicine bottles, finds that 0.1% of the bottles are defective. The bottles are packed in boxes containing 500 bottles. A drug manufacturer buys 100 boxes from the producer of bottles, using poisson distribution, find how many boxes will contain (i) no defective (ii) atleast two defectives.

5. a) The mean of certain normal population is equal to the standard error of the mean of the samples of 64 from that distribution. Find the probability that the mean of the sample size 36 will be negative.
- b) What is the effect on standard error, if a sample is taken from an infinite population of sample size is increased from 400 to 900.
6. a) A random sample of 100 teachers in a large metropolitan area revealed a mean weekly salary of Rs. 487/- with a S.D of Rs. 48/-. With what degree of confidence can we assert that the average weekly salary of all teachers in the metropolitan area is between Rs. 472 to Rs.502
- b) To estimate the average amount of time, visitors take to move from one building to another in an office complex, the mean of a random sample of size 'n' is used. Given  $\sigma = 1.40$  minutes, determine how large should be the sample size if it is ascertained with 99% confidence that the error  $E$  is atmost 0.25.
7. a) A sample of 400 male students is found to have a mean height of 171.38cm can it be reasonably regarded as a sample from a large population with mean height of 171.17cm and S.D 3.30cm
- b) Two random samples drawn from normal populations are:  
 I : 20 16 26 27 23 22 18 24 25 19 - -  
 II : 27 33 42 35 32 34 38 28 41 43 39 37
- Test whether the two populations have the same variance.
8. Four methods are under development for making discs of a super conduction material. Fifty discs are made by each method and they are checked for super conductivity when cooled with liquid.

	Method I	Mehod II	Mehod III	Mehod IV
Super conductors	31	42	22	25
Failures	19	8	28	25

Test the significant difference between the proportions of conductors at 0.05 level.

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