Code : 1G143

R-11/R-13

II B.Tech. II Semester Supplementary Examinations Nov/Dec 2016
Design and Analysis of Algorithms
(Common to CSE & IT)

Max. Marks: 70   **Time: 03 Hours**

Answer *any* **five** questions
All Questions carry equal marks (14 Marks each)
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1. a) Explain performance analysis of an algorithm.   7M

   b) Explain with an example how the performance of Collapsing Find is better
      than Simple Find.   7M

2. a) Compute average time complexity of Quick Sort on a data set of size n.   8M

   b) Explain Strassen's matrix multiplication.   6M

3. a) Write an algorithm for Single Source Shortest Path problem.   8M

   b) Solve the following instance using Knapsack Problem
         m=12, n=5, P=(10,15,6,8,4), W=(4,6,3,4,2).   6M

4. a) Determine OBST for the following instance (a1,a2,a3,a4)=(cout, float, if, while)
         p(i)= (1/20, 1/5, 1/10, 1/20)   q(i)=(1/5, 1/10, 1/5, 1/20, 1/20)   10M

   b) State the differences between Greedy Method and Dynamic Programming.   4M

5. a) Draw the state space tree for m-coloring when n=3 and m=3.   5M

   b) Let W={5,7,10,12,15,18,20} and m=35. Find all possible subsets of W that
      sum to m. Draw the portion of the state space tree that is generated.   9M

6. a) Write an algorithm to find Bi-Connected components and also analyze its
      time complexity.   8M

   b) Explain Depth First Search technique with an example.   6M

7. a) Draw the portion of state space tree using LCBB for the following TSP.

$$\begin{bmatrix} \infty & 5 & 2 & 3 \\ 4 & \infty & 1 & 5 \\ 4 & 2 & \infty & 3 \\ 7 & 6 & 8 & \infty \end{bmatrix}$$

                                                                                          10M

   b) Explain the general method of Branch and Bound.   4M

8. a) State and Explain Cook's Theorem.   7M

   b) Write a non-deterministic algorithm for Knapsack problem.   7M

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Code : 1G142

R-11/R-13

II B.Tech. II Semester Supplementary Examinations Nov/Dec 2016
Database Management Systems
(Common to CSE & IT)

Max. Marks: 70   **Time: 03 Hours**

Answer *any* **five** questions
All Questions carry equal marks (14 Marks each)
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1. a) Explain DBMS Structure. Discuss about Transaction Management in Database   7M

   b) Write in brief the various data models.   7M

2. What is an ER diagram and discuss several choices to be made when generating an ER diagram   14M

3. a) Explain in detail Querying Relational Data   7M

   b) Explain about Transactions and Constraints   7M

4. Give one example of SQL Query for the following keywords
   a) ROLLBACK   b) CONTINUE   c) EXISTS   d) ANY
   e) GROUP BY … HAVING   f) LIKE   14M

5. a) Discuss about Functional Dependencies   7M

   b) Explain Decomposition into 3NF   7M

6. a) Explain serializability with example   7M

   b) Explain the desirable properties of Transactions   7M

7. a) Explain how to implement lock and unlock requests   7M

   b) Explain ARIES recovery algorithm   7M

8. a) Explain compression of file organization   7M

   b) Explain indexed sequential access methods   7M

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II B.Tech. II Semester Supplementary Examinations Nov/Dec 2016
Mathematics – III
(Common to EEE & ECE)

Max. Marks: 70   Time: 3 Hours

Answer *any* **five** questions
All Questions carry equal Marks (**14 Marks** each)
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1. a) Evaluate $\int_0^{\pi/2} \sqrt{\tan \theta}\, d\theta$.   7M

   b) Prove that $\beta(m, 1/2) = 2^{2m-1}\beta(m, m)$.   7M

2. a) Prove that the function f(z) defined by

   $$f(z) = \frac{x^3(1+i) - y^3(1-i)}{x^2 + y^2} \ (z \neq 0), \ f(0) = 0$$

   is continous and the Cauchy's Riemann equations are satisfied at the
   at the origin,   yet $f'(0)$ does not exist   7M

   b) Find the analytic function, whose real part is $\sin 2x \big/ (\cosh 2y - \cos 2x)$ 7M

3. a) If cosh(u+iv)=x+iy then prove that

   $$\frac{x^2}{\cosh^2 u} + \frac{y^2}{\sinh^2 u} = 1 \ and \ \frac{x^2}{\cos^2 v} - \frac{y^2}{\sin^2 v} = 1.$$ 7M

   b) Find all the roots of the equation tanhz+2=0.   7M

4. a) State and prove Cauchy's integral formula.   7M

   b) Evaluate $\int_c \frac{\sin^2 z}{(z - \pi/6)^3} dz$ where c is the circle |z|=1.   7M

5. a) Find the Taylor's expansion of $f(z) = \frac{1}{(z+1)^2}$ about the point z=-i.   7M

   b) Expand $f(z) = \frac{1}{(z-1)(z-2)}$ in the regions (i) $|z| < 1$,(ii) $1 < |z| < 2$.   7M

6. a) Using Residue theorem, evaluate $\int_c \tan z\, dz$ where c is the circle $|z| = 2$. 7M

   b) By Integrating around a unit circle, evaluate $\int_0^{2\pi} \frac{\cos 3\theta}{5 - 4\cos \theta} d\theta$.   7M

7. a) State and prove Rouche's theorem.   7M

   b) Prove that the polynomial $z^5 + z^3 + 2z + 3$ has just one zero in the first
   quadrant of the complex plane.   7M

8. a) Find the image of the infinite strip $0 < y < \frac{1}{2}$ under the transformation

   $w = \frac{1}{z}$.   7M

   b) Find the Bilinear transformation which maps the points (,i,0) in the z-
   plane into (-1,-i,1) in the w-plane.   7M
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II B.Tech. II Semester Supplementary Examinations Nov/Dec 2016

Object Oriented Programming through JAVA

(Common to CSE & IT)

Max. Marks: 70   **Time: 03 Hours**

Answer *any* **five** questions

All Questions carry equal marks (14 Marks each)

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1. a) Explain use of command line arguments in java

   b) Write a program to implement constructor overloading.

2. a) Explain briefly about access modifiers and their usage.

   b) Explain polymorphism with an example.

3. a) Explain about abstract classes and abstract methods.

   b) List the differnces between classes and interfaces.

4. a) Explain life cycle of a thread

   b) Explain about try-catch functionality in Exception handling

5. a) Write about Event classes and Event Listeners.

   b) Explain graphics class methods in java.

6. a) Describe the different stages in the life cyle of an applet.

   b) Write a program to find the factorial of a given number using Applets.

7. a) Write about limitations of AWT.

   b) Write a java program to implement TabbedPanes and Scroll bars.

8. a) Discuss about java.net package.

   b) Write about network addresses and ports.

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II B.Tech. II Semester Supplementary Examinations Nov/Dec 2016
Operating Systems
(Information Technology)

Max. Marks: 70   **Time: 03 Hours**

Answer *any **five*** questions
All Questions carry equal marks (14 Marks each)
****

1	a)	Define Operating Systems and explain about Time Sharing System	7M
	b)	Explain in detail about Distributed Systems	7M
2	a)	Define Scheduling and Explain the process of Scheduling	7M
	b)	Explain with an example about FIFO and SJF scheduling algorithms	7M
3	a)	Explain the Dining Philosophers problem using semaphores.	7M
	b)	Explain the producer and consumer problem	
4	a)	Explain about deadlock prevention	7M
	b)	Write in brief about deadlock detection and recovery	7M
5	a)	Write the differences between paging and segmentation	7M
	b)	What is page replacement and explain about FIFO and LRU page replacement algorithms	7M
6	a)	Explain about various File Access Methods	7M
	b)	Write in brief about free-space management	7M
7	a)	Explain about various Disk Scheduling algorithms	7M
	b)	How Stable storage is implemented	7M
8	a)	Explain about Access matrix	7M
	b)	Explain about various security problems	7M

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