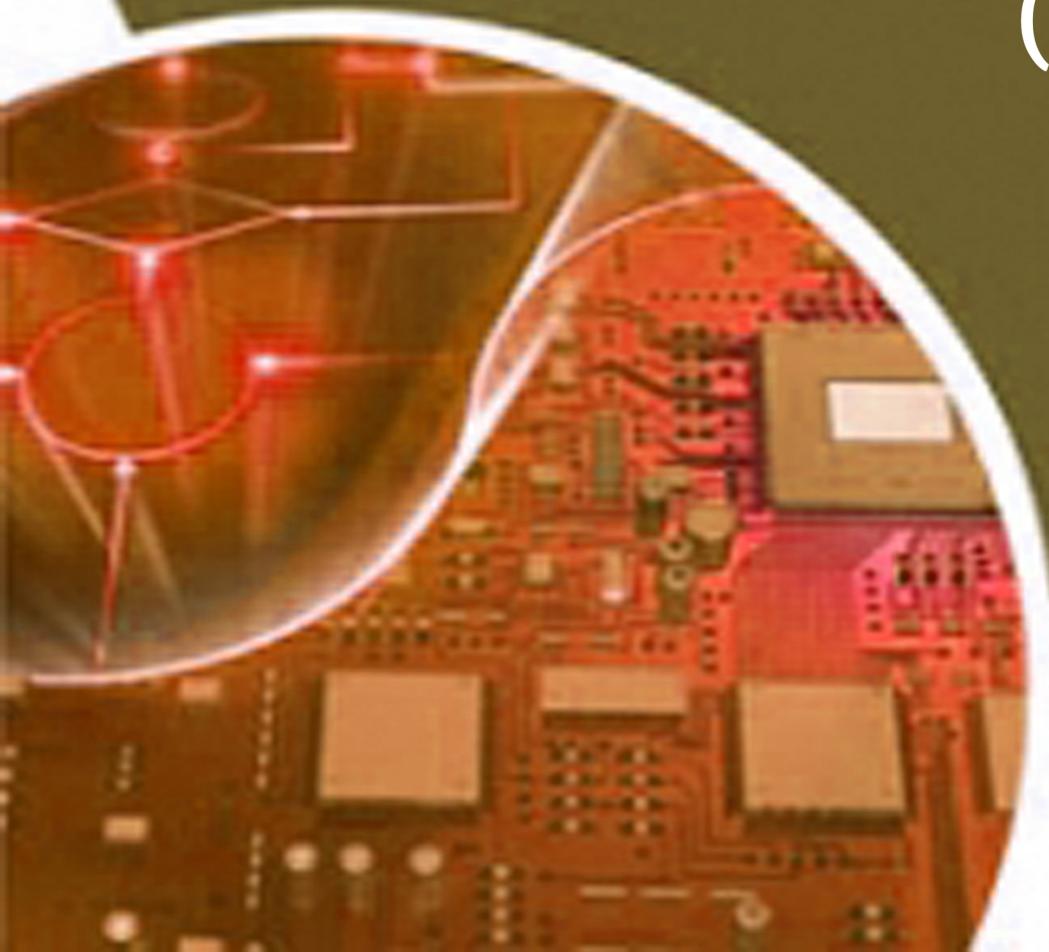


PUNE UNIVERSITY
7th & 8th
Semester
QUESTION PAPERS

Bachelor of Engineering

**Computer Science
(2009-2014)**



Total No. of Questions : 12]

SEAT No. :

P715

[4458]- 781

[Total No. of Pages : 2

B.E. (Computer Engg.)

INFORMATION SECURITY

(Elective - IV) (410451) (Semester - II)(2008 Course)

Time : 3 Hours]

[Max. Marks : 100

Instructions to the candidates:

- 1) *Answer three questions from Section-I and three questions from Section-II.*
- 2) *Figures to the right indicate full marks.*
- 3) *Assume suitable data, if necessary.*

SECTION - I

- Q1)** a) What are threats? Explain the different categories of threat. [6]
b) Explain the four important functions of the information security performs in an organization. [12]

OR

- Q2)** a) Explain replay, modification of messages and denial of service attacks. [6]
b) Explain in detail the Legal, Ethical and Professional issues during the security investigation. [12]

- Q3)** a) Write Characteristics of IDEA. Explain Encryption process of IDEA.[8]
b) Explain with diagram steps involved in Automatic Key Distribution for Connection-Oriented Protocols. [8]

OR

- Q4)** a) Explain Control Vector Encryption and Decryption with diagram. [8]
b) Describe Euclidean algorithm with the help of importance and pseudo code of algorithm. [8]

- Q5)** a) Briefly explain Diffie-Hellman key exchange. [8]
b) In a public-key system using RSA, you intercept the ciphertext $C = 10$ sent to a user whose public key is $e = 5$, $n = 35$. What is the plaintext M ? [8]

OR

P.T.O.

- Q6)** a) Users A and B use the Diffie-Hellman key exchange technique with a common prime $q = 71$ and a primitive root $a = 7$. [8]
- i) If user A has private key $X_A = 5$, what is A's public key Y_A ?
- ii) If user B has private key $X_B = 12$, what is B's public key Y_B ?
- iii) What is the shared secret key?
- b) Explain Elliptic Curve Cryptography in details. [8]

SECTION - II

- Q7)** a) What are the technical deficiencies in the Kerberos version 4 protocol. Explain how, Kerberos version 5 address these deficiencies. [8]
- b) Explain Digital Signature Algorithm. [8]

OR

- Q8)** a) Explain with the help of diagram X.509 certificate format. [8]
- b) Explain PKIX model Management Functions in details. [8]

- Q9)** a) What is Intrusion Detection System(IDS)? Explain different reasons for using IDS and different terminologies associated with IDS. [8]
- b) What are IPSec Services for IP layer? Explain SA parameters of IPSec. [8]

OR

- Q10)** a) What are the factors to be considered in selecting a right firewall? [4]
- b) How firewalls are configured and managed? [4]
- c) Draw SSL Protocol Stack and explain same. [8]

- Q11)** a) With help of diagram explain SET Participants. [8]
- b) Describes the functions of S/MIME. Also describes the functions of Cryptographic Algorithms Used in S/MIME. [10]

OR

- Q12)** a) Write short notes on : [12]
- i) PEM.
- ii) PGP.
- b) Describe Electronic commerce security issues from the perspective of customers and e-businesses. [6]

↑↑↑↑

Total No. of Questions : 12]

SEAT No. :

P1471

[Total No. of Pages : 2

[4164] - 714

B.E. (Computer Engineering)

CLOUD COMPUTING

(2008 Pattern) (Sem.-II) (Elective-IV)

Time :3 Hours]

[Max. Marks :100

Instructions to candidates :-

- 1) *Answer THREE questions from each section.*
- 2) *Answers to the TWO sections should be written in SEPARATE answer books.*
- 3) *Figures to the right indicate full marks.*
- 4) *Assume suitable data, if necessary.*

SECTION - I

- Q1)** a) Define Cloud computing, Enlist and explain essential characteristics of cloud computing. [8]
- b) Explain the services provided by the Amazon infrastructure cloud from a user perspective. [8]
- c) What is self service provisioning? [2]

OR

- Q2)** a) What is cloud computing? Enlist and explain three service models, and four deployment models of cloud computing. [8]
- b) Explain a user view of Google App Engine with suitable block schematic. [8]
- c) Explain in brief, how cloud helps reducing capital expenditure? [2]

- Q3)** a) What is the difference between process virtual machines, host VMMs and native VMMs ? [8]
- b) Enlist and explain some of the common pitfalls that come with virtualization. [8]

OR

- Q4)** a) What is the fundamental differences between the virtual machine as perceived by a traditional operating system processes and a system VM? [8]
- b) Compare the SOAP and REST paradigms in the context of programmatic communication between applications deployed on different cloud providers, or between cloud applications and those deployed in -house. [8]

P.T.O.

- Q5)** a) Explain the architecture of cloud file systems (GFS, HDFS). [8]
b) Explain with suitable example, how a relational join could be executed in parallel using MapReduce. [8]

OR

- Q6)** a) Explain how Big tables are stored on a distributed file system such as GFS or HDFS. [8]
b) Explain with suitable example the MapReduce model. [8]

SECTION - II

- Q7)** a) Why Cloud Computing brings new threats? [6]
b) What is secure execution environment and communication in cloud? [6]
c) Explain different threats and vulnerabilities specific to virtual machines. [6]

OR

- Q8)** a) Explain the two fundamental functions, identity management and access control, which are required for secure cloud computing. [7]
b) Explain risks from multi-tenancy, with respect to various cloud environments. [7]
c) What is trusted cloud computing? [4]

- Q9)** a) Explain issues in cloud computing with respect to implementing real time application over cloud platform. [8]
b) Enlist and explain the principal design issues that are to be addressed while designing a QoS-aware distributed (middleware) architecture for cloud. [8]

OR

- Q10)** a) What is quality of service (QoS) monitoring in a cloud computing? [8]
b) Enlist and explain different issues in inter-cloud environments. [8]

- Q11)** a) Explain conceptual representation of the Eucalyptus Cloud. Explain in brief the components within the Eucalyptus system. [8]
b) What is Nimbus? What is the main way to deploy Nimbus Infrastructure? What is the difference between cloudinit.d and the Context Broker? [8]

OR

- Q12)** a) What is Open Nebula Cloud? Explain main components of Open Nebula. [8]
b) Explain Xen Cloud Platform (XCP) with suitable block diagram. [8]



[Total No. of Questions: 12]

[Total No. of Printed Pages: 2]

UNIVERSITY OF PUNE

[4364]-780

B. E. (Computer Engg) Examination - 2013

Cloud Computing (2008 Course)

[Time: 3 Hours]

[Max. Marks: 100]

Instructions:

- 1 *Answer 3 questions from Section I and 3 questions from Section II*
- 2 *Answers to the two sections should be written in separate answer-books.*
- 3 *Black figures to the right indicate full marks.*
- 4 *Assume suitable data, if necessary.*

SECTION - I

- Q.1 A What is demand self service? Explain how it is implemented in cloud computing platforms. 08
- B Compare and contrast utility computing, elastic computing and cloud computing. 08
- C Explain monitoring challenge in cloud computing. 02
- OR**
- Q.2 A Explain the component stack of SaaS , PaaS and IaaS. 08
- B Explain with suitable diagram Amazon and Google Cloud models. 08
- C Explain Network bottlenecks challenge in cloud computing. 02
- Q. 3 A What is multi-tenancy? Explain in brief different ways to achieve multi-tenancy in application software. 08
- B What is service composition? Distinguish mashup and traditional service composition. 08
- OR**
- Q. 4 A What is data access control for enterprise applications? Explain with example, how data access control can be implemented. 08
- B Explain how rich internet applications work. Compare with traditional web applications. 08
- Q. 5 A Explain structure of Google App Engine's Data store and its underlying technologies. 08
- B Explain with suitable example; how a relational join could be executed in parallel using map reduce model. 08

OR

- Q. 6 A Explain architecture of Amazon Dynamo. How vector timestamp mechanism is used in this architecture? 08
- B What is parallel efficiency? Discuss parallel efficiency for Map Reduce model. 08

SECTION II

- Q. 7 A Why Cloud Computing brings new threats? Explain security issue from virtualization, vulnerability in virtualization and risk prevention in VMM. 10
- B Define trusted cloud computing and explain cloud service provider Risks? 08

OR

- Q. 8 A Explain various security threats and vulnerabilities inherent in virtualized systems. Discuss VM-Specific Security Techniques. 10
- B What is identity management? Explain issues in implementing Identity Management. 08

- Q. 9 A Explain various design issues that are to be addressed when designing a QoS- aware middleware architecture for Cloud Computing. 08
- B Explain Quality of Service (QoS) monitoring in cloud computing environment. 08

OR

- Q. 10 A Explain different module of the Quality of Service (QoS) aware Cloud Architecture. 08
- B Enlist and explain the Quality of Service (QoS) issues that are to be addressed while designing a real time application over cloud platform. 08

- Q. 11 A Explain Encalytus cloud Computing infrastructure and its components. 08
- B Enlist and explain different features and functions of Apache Vitual Computing Lab. 08

OR

- Q. 12 A Explain various components of Xen Cloud Platform. 08
- B Explain various components within the Enomal Elastic Computing Platform. 08

[Total No. of Questions: 12]

[Total No. of Printed Pages: 4]

UNIVERSITY OF PUNE

[4364]-779

B. E. (Computer) Examination - 2013

Operation Research (2008 Course)

[Time: 3 Hours]

[Max. Marks: 100]

Instructions:

- 1 Answer any 3 questions from each Section.
- 2 Answers to the two sections should be written in separate answer-books.
- 3 Use of non programmable calculator is allowed.
- 4 Black figures to the right indicate full marks.
- 5 Neat diagrams must be drawn wherever necessary.
- 6 Assume suitable data, if necessary.

SECTION -I

- Q.1 A Formulate the following problem as linear programming problem. 4
A company produces two types of Hats. Each hat of first type requires twice as much labour time as the second type. If all hats are of second type only, the company can produce a total of 500 hats of day. The market limits daily sales of first and second type to 150 and 200 hats. Assume that profits per hat are Rs.8 for first type and Rs.5 for second type.
- B Solve the following LP Problem graphically. 8
Maximize $Z=3x_1 + 5x_2$ subject to restrictions
 $x_1+2x_2 \leq 2000$, $x_1+x_2 \leq 1500$, $x_2 \leq 600$ and $x_1, x_2 \geq 0$
- C Define Slack and surplus variables. 4

OR

- Q.2 A Solve following LP Problem using Simplex Method 8
Maximize $Z=x_1+2x_2 +x_3$ subject to constraints
 $2x_1+x_2-x_3 \leq 2$, $-2x_1 +x_2 -5x_3 \geq -6$, $4x_1 +x_2 + x_3 \leq 6$ and $x_1, x_2, x_3 \geq 0$
- B With respect to LPP, What is testing for optimality? How it is carried out? 6
- C Define feasible and optimal solution. 2

- Q.3 A What is importance of probability distribution functions? Explain any two types of continuous probability distribution functions. 6
- B Find the range of values of 'P' and 'Q' with the entry (2,2) as a saddle point for given matrix representation of a game. 6

	Player B		
Player A	2	4	5
	10	7	Q
	4	P	6

- C Differentiate between decision under risk and decision under certainty. 6

OR

Q. 4 A What is the expectation of the number of failure preceding the first success in an infinite series of independent trials with constant probability of success ‘P’ in each trail? 6

B Consider the following pay-off table. 6

Acts	Events			
	E1	E2	E3	E4
A1	40	200	-200	100
A2	200	0	200	0
A3	0	100	0	150
A4	-50	400	100	0

Probabilities of events are $P(E1)=0.2$, $P(E2)0.15$, $P(E3)=0.4$, $P(E4)=0.25$. Calculate expected pay-off the expected loss of each action.

C Solve the following game. 6

	B1	B2	B3
A1	1	7	2
A2	0	2	7
A3	5	1	6

Q. 5 A What is queuing system? Explain queuing systems transient state and steady state. 8

B A software tester finds that the time spent on debugging and fixing the error has an exponential distribution with mean 30 min per module. The arrival of modules is Poisson with an average of 10 modules per day of 8 hours. What is expected time per day? How many modules are there on average? 8

OR

Q. 6 A At what average rate must a clerk at a supermarket work in order to ensure a probability of 0.9 that the customer will not have to wait longer than 12 minutes? It is assumed that there is only one counter to which customer arrive in a Poisson fashion at an average rate of 15 per hour. The length of service by the clerk has an exponential distribution. 8

B State and prove the arrival distribution theorem.(Pure birth process). 8

SECTION II

Q. 7 A Find the sequence of jobs that minimizes the total elapsed time to complete the following set of jobs on two machines. 10

Job	1	2	3	4	5	6
Machine A	3	12	5	2	9	11
Machine B	8	10	9	6	3	1

Also calculate the ideal time for both machines.

B Draw the network diagrams for the following set of activities and identify 8

dummy activities.

1. $A < B, C$; $B < D, E$; $C < E$; $E < F$; $D, F < G$; $G < H$;

2. Consider the following table.

Activity	A	B	C	D	E	F	G	H	I
Immediate Predecessor	-	-	-	A	B,C	A	C	D,E,F	D

OR

- Q. 8 A Find the sequence of jobs that minimizes the total elapsed time to complete the four jobs on five machines. 8

Job	Machines				
	M1	M2	M3	M4	M5
A	7	5	2	3	9
B	6	6	4	5	10
C	5	4	5	6	8
D	8	3	3	2	6

- B Consider a project consists of series of tasks labeled A to I with following relationship and constraints. Construct network diagram , Network analysis table and identify critical path. 10

$A < D, E$; $B, D > F$; $C < G$; $B < H$; $F, G < I$

Find also the optimum time of completion of project ,the time of completion of each task is as follows.

Task	A	B	C	D	E	F	G	H	I
Time	23	8	20	16	24	18	19	4	10

- Q. 9 A Find the maximum or minimum of the function 8

$$f(x) = X_1^2 + X_2^2 + X_3^2 - 4X_1 - 8X_2 - 12X_3 + 56$$

- B Discuss Lagrangian multiplier method to provide necessary condition for an optimum when constraints are equations. 8

OR

- Q. 10 A Formulate following description as non-linear programming problem 8

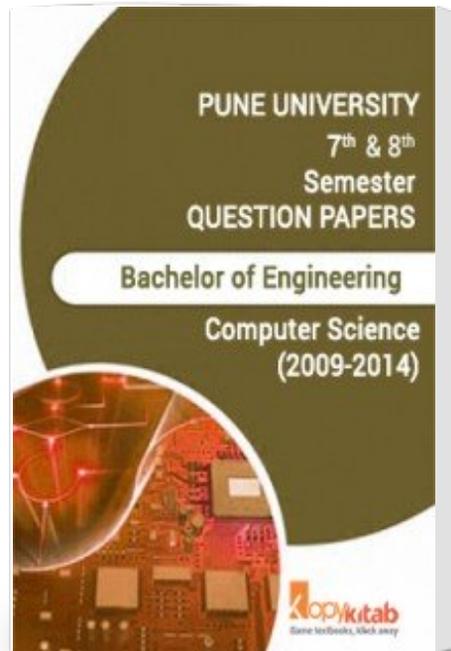
A company manufactures two products A and B. A takes 30 minutes while B 15 minutes for each unit. Maximum machine time available is 35 hours per week. Products A and B requires 2 kg and 3 kg of raw material per unit respectively. Available quantity of raw material is 180 kg per week. Product A and B have unlimited market potential sell for 200 Rs and 500 Rs respectively. Manufacturing cost for A and B are $2x^2$ and $3y^2$ respectively. Find how much of each product should be produced per week? [X is quantity of product A and Y is quantity B]

- B Use separable programming algorithm to convert following specification to non-linear problem. 8

$$\text{Max } z = X_1 + X_2^4, \text{ subject to constraints } 3x_1 + 2X_2^2 \leq 9, X_1, X_2 \geq 0$$

[Note: NLP problem formulation only, do not solve formulated NLP problem]

PUNE UNIVERSITY QUESTION PAPERS 4th Year Computer Engineering (2009- 2014)



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