[Total No. of Questions: *12*] **[Total No. of Printed Pages: 2]**

UNIVERSITY OF PUNE

[4364]-319

B. E. (*Information Technology*) Examination - 2013

DISTRIBUTED SYSTEMS (2003 Course)

[Time: *3* Hours] **[Max. Marks: 100]**

Instructions: *Answer any three questions from each section.*

1 ***Answer Q1 or Q2, Q3 or Q4, Q5 or Q6 from Section I and Q7 or Q8, Q9 or Q10, Q11 or Q12 from Section II***

2 *Answers to the* ***two sections*** *should be written in* ***separate answer-books****.*

3 *Neat diagrams must be drawn wherever necessary.*

4 *Figures to the right indicate full marks.*

5 *Assume suitable data, if necessary.*

SECTION –I

Q.1	A	List and explain advantages and disadvantages of distributed system over centralized system.	8
	B	What are the various challenges for designing distributed systems?	8
		OR	
Q.2	A	Explain with neat diagram architectural models of distributed systems.	8
	B	Distinguish between the client-server and peer to peer models of distributed systems	8
Q. 3	A	Describe working of Remote Procedure Call in Client sever communication with suitable diagram	8
	B	What is group communication? Explain different types of group communication.	8
		OR	
Q. 4	A	What is RMI? Explain types of RMI invocation semantics.	8
	B	Write short note on (any two): i) Stubs. ii) Marshalling and demarshalling. iii) Binding of an object.	8

Q. 5	A	Draw and explain auto-mounting for NFS?	10
	B	What is file sharing? Explain different types of file sharing semantics.	8
		OR	
Q. 6	A	Draw and explain NFS architecture and give detail functions of layers	10
	B	Compare NFS and CODA file system	8

SECTION II

Q. 7	A	Enumerate the various issues in clock synchronization.	8
	B	What is mutual Exclusion? Explain any two types of mutual exclusion algorithm.	8
		OR	
Q. 8	A	List and explain uses of election algorithm? What is Bully algorithm?	8
	B	Explain Ring Algorithm with suitable example.	8
Q. 9	A	What is message ordering? Explain FIFO order and casually ordered multicast.	8
	B	What is fault tolerance? Explain different types of failures.	8
		OR	
Q. 10	A	What is recovery? What is backward and forward recovery?	8
	B	What is 2-phase commit? What is 3-phase commit?	8
Q. 11	A	Draw and explain COBRA architecture.	10
	B	Explain: OBV, CCM, GIOP, DDS	8
		OR	
Q. 12	A	Explain cluster computing system with working, types of clusters and how it can be used as an alternative to traditional super computers	10
	B	Write short note on Grid Computing	8

[Total No. of Questions: *12*] **[Total No. of Printed Pages:** *3*]

UNIVERSITY OF PUNE

[4364]-304

B. E. (*Computer Engineering & IT*) Examination - 2013

Embedded Systems (2003 Course)

[Time: *3* **Hours]** **[Max. Marks: 100]**

Instructions:

1 *Answers to the* ***two sections*** *should be written in* ***separate answer-books***.
2 *In section I attempt* ***Q1 or Q2, Q3 or Q4, Q5 or Q6***
In section I attempt ***Q7 or Q8, Q9 or Q10, Q11 or Q12***
3 *Neat diagrams must be drawn wherever necessary.*
4 *Figures to the right indicate full marks.*
5 *Assume suitable data, if necessary.*

SECTION -I

Q.1	A	What are the characteristics of embedded systems which make them different from other computing systems?	08
	B	What are features of ARM7 core? Explain interrupt structure of ARM7 core.	08
		OR	
Q.2	A	With the help of neat diagram, describe different components of embedded systems.	08
	B	What are embedded processors and Applications Specific Processors?	08
Q. 3	A	It is required to design a mobile phone system. For this application select the appropriate processor based on: i. Instruction cycle time ii. Bus width iii. MIPS iv. On-chip RAM/ROM/EEPROM/Flash memory v. On-chip cache vi. Number of interrupts	08
	B	Which different factors decided the power dissipation in an embedded system? What are the different ways to reduce the power consumption?	08
		OR	
Q. 4	A	What is the role of Watchdog timer in an Embedded system?	06
	B	List the different types of memories for embedded systems.	05
	C	Explain the process of converting a C program into a file for ROM	05

image.

Q. 5	A	What is the role of ADC and DAC in embedded systems? Name two applications for each converter.	06
	B	Describe different fields used in a CAN data frame.	06
	C	Describe any one IPC mechanism in details.	06
		OR	
Q. 6	A	Describe I^2C protocol and the applications where it is preferred.	06
	B	How does host recognize the devices insertion in USB protocol?	06
	C	Explain the following terms: i. Context ii. Interrupt Latency iii. Deadline	06

SECTION II

Q. 7	A	How C++ is useful in embedded system programming? Also mention its disadvantages.	08
	B	What is In-Emulator? Give details.	06
	C	Name different situations in which arrays are needed in embedded system programming.	02
		OR	
Q. 8	A	When do you use lists and tree (in C language) for embedded system programming?	08
	B	When do you use Java as programming language for embedded system? What are the disadvantages of Java?	08
Q. 9	A	Compare the following scheduling models of RTOS, based on worst case latency: i. Cooperative Round Robin ii. Cooperative ordered list iii. Cooperative Time slicing (rate monotonic)	06
	B	Define interrupt latency time. What is interrupt latency time for cooperative scheduling model of RTOS?	06
	C	Write a note on mobile OS.	06
		OR	
Q. 10	A	With the help of neat diagram, explain cyclic scheduling with time slicing for RTOS.	08
	B	List different registering and de-registering related functions of Linux for device drivers.	06
	C	Differentiate between RTOS and embedded OS.	04

Q. 11	A	Discuss different features of MicroC/OS-II. Which type of RTOS is it?	06
	B	Discuss an Adaptive Cruise control system for automobiles. Discuss the different tasks and their function in details.	10
		OR	
Q. 12	A	Discuss different application where Vx Works is used. Also list its features.	06
	B	Given: An application for sending application layer byte streams on a TCP/IP network. Discuss different tasks and their functions along with their synchronization.	10

UNIVERSITY OF PUNE

[4364]-312

B.E.(IT) Examination - 2013

ADVANCE DATABASE MANAGEMENT

(2003 Course)

Total No. Of Questions: 12 **[Total No. Of Printed Pages: 5]**

[Time: 3 Hours] **[Max. Marks: 100]**

Instructions:

(1) Answers to the two sections should be written in separate books.
(2) Neat diagrams must be drawn wherever necessary.
(3) Assume suitable data, if necessary.
(4) Section-1: Q1 or Q2,Q3 or Q4,Q5 or Q6
(5) Section-2:Q7 or Q8,Q9 or Q10,Q11or Q12

SECTION-1

Q. 1. A) Explain different costs of parallel evaluation of operations. (5)

B) For each of three partitioning techniques, namely round-robin, hash partitioning, and range partitioning, give an example of a query for which that partitioning technique would provide the fastest response. (6)

C) Explain speed-up and scale-up with suitable example. (6)

OR

Q. 2.A) Describe a good way to parallelize each of the following (9)

a) The difference operation

b) Aggregation by the count distinct operation

c) Aggregation by the avg operation

d) Left Outer Join, if the join condition involves only equality

e) Full outer join if the join condition involves comparisons other than equality

f) Left outer join if the join condition involves comparisons other than equality

B) Describe advantage and disadvantage of pipelined parallelism (4)

C) Write a short note on Parallel Query Optimization. (4)

Q. 3. A) State different types of failures in distributed systems and explain failure handling in distributed database using 2Phase Commit protocol (7)

B) Explain site reintegration availability approach in distributed databases (5)

C) Write a short note on majority based protocol (5)

OR

Q. 4. A) Explain the use of reduction techniques to generate and optimized query in distributed databases using deferent types of fragmentation with suitable examples. Draw relational algebra trees. (7)

B) Describe deadlock in distributed databases (5)

C) Explain Optimistic methods for Distributed Concurrency Control (5)

Q. 5. A) Compare and contrast the two-tier and three-tier architecture for Web-DBMS. Describe design issues for a web-DBMS based E-learning application which includes text, audio and video data. (12)

B) Write a short note on (4)

i. XQuery

ii. XML Schemas

OR

Q. 6. A) Design the various issues for efficient evaluation of XML Queries (8)

B) Write a short note on (8)

1. Web services
2. XML APL

SECTION-2

Q.7. A) Design a fact constellation schemas for retail sales application. (9)

B) Explain Warehouse manager in Data Warehouse (4)

C) Write a short notes on ETL (4)

OR

Q. 8. A) Explain different indexing techniques in Data Warehouse (9)

B) Compare OLTO vs OLAP (4)

C) Discuss what is meant by the following terms when describing the Characteristics of the data in a data warehouse (4)

1. Subject Oriented

2. Integrated
3. Time-variant
4. Non-volatile

Q. 9. A) Define with suitable example (12)

i. Entropy
ii. Information Info(T)
iii. Information for Partition ON X Info(X,T)
iv. Gain
v. Gain Ratio
vi. GINI Index

B) Describe different clustering techniques with suitable example (5)

OR

Q. 10. A) Write a short Note on (12)

i. Outlier Analysis
ii. Association Rules

B) Consider following training data set (5)

Age	Income	Student	Credit_rating	Buys_Computer
<=30	High	no	fair	No
<=30	High	no	excellent	No
31…40	High	no	fair	Yes
>40	Medium	no	fair	Yes
>40	Low	yes	fair	Yes
>40	Low	yes	excellent	No
31…40	Low	yes	excellent	Yes
<=30	Medium	no	fair	No

<=30	Low	yes	fair	Yes
>40	Medium	yes	fair	Yes
<=30	Medium	yes	excellent	Yes
31…40	Medium	no	excellent	Yes
31…40	High	yes	fair	Yes
>40	Medium	no	excellent	No

Write Naïve Bayesian Classifier algorithm. Consider Buys_Computer as a Class Attribute with values yes and no classes. Find the class label for Data sample X=(age<=30, Income = medium, Student = yes Credit_rating =fair) using Naïve Bayesian classifier.

Q. 11.A) Define Information Retrieval System. Describe advantage of Information Retrieval. (6)

B) Write short notes on (10)

i. Signature Files

ii. Ranking Document Similarity

OR

Q. 12. A) Explain any two techniques that support the evaluation of Boolean and Ranked queries. (6)

B) Write a short note on TF/IDF (5)

C) Describe web crawler in information retrieval system (5)

[Total No. of Questions: *12*] **[Total No. of Printed Pages:** *3*]

UNIVERSITY OF PUNE

[4364]-318

B. E. (*I.T.*) Examination - 2013

System Operators and Maintenance (2003 Course)

[Time: *3* **Hours]** **[Max. Marks: 100]**

Instructions:

1 *Answer any three questions from each section*

2 *Answers to the* ***two sections*** *should be written in* ***separate answer-books****.*

3 *Neat diagrams must be drawn wherever necessary.*

4 *Figures to the right indicate full marks.*

5 *Use of logarithmic tables, slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.*

6 *Assume suitable data, if necessary.*

SECTION –I

Q.1 A List the key function of following support process. 9

i) Customer care and billing process.

ii) Order processing and provisioning process.

B What is Telecommunication Management Network? Explain with neat diagram the architecture of TMN. 9

OR

Q.2 A Explain the benefits when advanced support systems are deployed by the Telecom service provider. 9

B With a suitable diagram explain principle business process and their key 9

functions.

Q. 3	A	Explain i) Permanent virtual circuits. ii) Switched virtual circuits. iii) Semi Permanent virtual circuits.	8
	B	Explain in detail policy based networking.	8

OR

Q. 4	A	Explain multiprotocol label switching with a operational example.	8
	B	What is the need of directory services? Explain various attributes of lightweight directory access protocols.	8
Q. 5	A	Explain in detail the role of 557 in fraud management and accounting.	8
	B	What is proactive management in problem handling process?	8

OR

Q. 6	A	Write a note-Identification of fraud for the telecom company.	8
	B	What is the significance of observation of customer behavior?	8

SECTION II

Q. 7	A	What principle processes are included in security management? What basic threats are considered in security management?	8
	B	Explain the significance of frame relay services as one of the alternatives of fast packet switching.	8

OR

Q. 8	A	Discuss the site design considerations for a service provider's vibrant website.	8
	B	Draw a neat diagram of architecture of a generic mediation system.	8
Q. 9	A	Explain with diagram a generic architecture for micro payments.	8
	B	What are the typical service level management processes? Explain.	8

OR

Q. 10	A	What is management framework? Explain with diagram Architecture of management framework.	8
	B	Give the overview of management operations support services. Draw neat diagram.	8
Q. 11	A	Write a job profile of typical network operations manages.	9
	B	List the importance of documentation and management tools in customer care and billing process. Comment on the same using B2B or B2C application.	9

OR

Q. 12	A	Compare and contrast building teams and keeping teams.	9
	B	Discuss the significance of periodic security audit for a telecommunication service provider.	9

UNIVERSITY OF PUNE

[4364]-315

B. E. (I T)

Mobile Computing (Elective-I)

(2003 Pattern)

Total No. of Questions : 12 **[Total No. of Printed Pages :2]**

[Time : 3 Hours] **[Max. Marks : 100]**

Instructions :

*(1) Answers to the **two sections** should be written in **separate answer-books**.*

(2) Neat diagram must be drawn wherever necessary.

(3) Assume suitable data, if necessary.

SECTION-I

Q1.

a) Explain the functional difference in various generation of mobile networks [8]

b) Explain the three tier architecture for mobile computing environment with the appropriate diagram [8]

OR

Q2.

a) Explain the concept of Core, Edge and Access network in mobile communication system [8]

b) How many types of information a context manager maintains? [8]

Q3. Write short notes on [8]

a) GSM architecture.

b) GSM security

c) Java card

OR

Q4. Write short notes on [18]

a) Mobile IP

b) IPv6

c) Bluetooth protocol stack

Q5.

a) Explain WAP protocol in detail [8]
b) Explain how GSM system can be upgraded to GPRS [8]

OR

Q6.

a) Explain CDMA and GSM [8]
b) Explain the spread spectrum technologies [8]

SECTION-II

Q7.

a) Explain the internal component of PDA [8]
b) Explain SS#7 protocol stack [8]

OR

Q8.

a) Explain the 802.11 architecture [8]
b) Explain the design issues for applications targeted for handheld devices [8]

Q9.

a) Explain Palm OS architecture [8]
b) Explain the various layers in Symbian OS [8]

OR

Q10.

a) What is CDC and CDLC in J2ME? [8]
b) Explain the 3 prong approach used in Java [8]

Q11.

a) Compare SIP and H.323 [9]
b) Explain various attacks on static and dynamics assets [9]

OR

Q12. Write short notes on: [18]

a) Real Time Protocols.
b) Various attacks on static assets
c) Components of Information Security

UNIVERSITY OF PUNE

[4364]-293
B. E. (Computer) (Common to Information Technology)
Examination - 2013
OBJECT ORIENTED MODELING & DESIGN
(2003 Pattern)

[Time : 3 Hours] **[Max. Marks : 100]**
Total No. of Questions : 12 **[Total No. of Printed Pages :5]**

Instructions :

*(1) Answers to the **two sections** should be written in **separate answer-books**.*
(2) Black figures to the right indicate full marks.
(3) Attempt Section I :Q1or Q2, Q3 or Q4, Q5 or Q6 and Section II: Q7 or Q8, Q9 or Q10, Q11 or Q12
(4) In the questions based on Design you are encouraged to make further suitable assumptions depending upon scope of the system.

SECTION I

Q1) a) Write a short note on Model Drive Architecture. [6]

b) What is CORBA? What are CORBA Skeletons? How does CORBA help in developing Distributed systems? [6]

c) "UML Programming is language independent" Justify. [6]

OR

Q2) a) Illustrate new UML 2.0 feature: [6]
1) I/p & o/p PINS 2)Tagged values 3) Manifest

b) Why we need OCL? How does one model a constraint on class attributes in OCL? [6]

c) What are the salient features of RUP? How is it different from waterfall model? [6]

Q3) a) Why is state diagram the most important diagram in embedded applications? [6]

b) Consider a system like "Employee Information System". A user selects "Accept information" to fill up the detail information, " View information" to his/her detail information by giving id number, "Leave" to check his/her balance leave count and apply for various leaves like Casual, Medical, Earn [10]

leave etc. "Salary Details" to view his/her salary for the given month or calculate salary by giving present Basic-Pay and "In-Out Details" to check whether he/she has any late marks during the months. Draw use case diagram for his considering other relevant details and using fill UNL notation for use case diagram.

OR

Q4) a) Draw activity diagram (for software process) to depict user may do with HELP of Hypothetical Software in a PAINBRUSH kind of picture editor system to create a sketch for a dream house from scratch right up to the final print on color plotter. Assume that the whole process is done over multiple settings over one or more days. Make suitable assumptions about the scope of your system, software features. [8]

b) Explain the change in Activity Diagram from UML 1.4 to UML 2.0. [8]

Q5) a) Draw CRC card for any two classes of a Railway Reservation System. [4]

b) Show how Composite Structure can best represent Refrigerator & its internal parts [6]

c) Draw object diagram for Library System with two classes Account and Member, further the Member may be of type student or Staff. Assume suitable attributes for the classes for the classes & values for objects. [6]

OR

Q6) a) Explain in detail different type of advance relationship & class required for class diagram with suitable example. Make some assumptions. [8]

b) Compare access, import, and export stereotype of package diagram. [4]

c) What is the purpose, need & use of Structural Modeling. [4]

SECTION II

Q7) a) Consider a Use Case "Adding an Employee to a Project". The HR Manager interacts with the Use case to choose the employee from the list of existing employees. The employee is informed about his addition to a project and also his record is updated whenever added to a project. Make relevant and suitable assumptions where ever necessary. Draw the Communication diagram by identifying the classes, actors needed and making best use of UML Notations. [8]

b) Draw a state machine diagram for coffee vending machine which prepares the coffee by adding material of coffee. Assume suitable data. [6]

c) In context of sequence diagram explain the terms: [4]

OR

Q8) a) Draw neat fragment on state machine diagram to represent the following & [6]

Explain the concept:

i) Concurrent sub state & Sequential sub state

ii) Composite sub state.

b) Consider a use case in library management system namely "Issue Book from library" the Member, book, issue details will have to be updated appropriately. Please identify correct Objects and messages and Draw sequence diagram for this scenario. [8]

c) Compare Interaction Diagram and Interaction Overview Diagram. [4]

Q9) a) An academic institution has developed a campus wide network and has implemented Automated System. The student section, library, account section, store, office, department are all connected. All the modules are centrally served through a common server in form of wed application.
Identify software component required. Make assumption about their environment and depict all these in a deployment diagram. [8]

b) Explain the common uses of component diagram. [8]

OR

Q10) a) Consider a College Registration System, the system allows students to apply for admission. Support the short listing process & enrollment to courses & collecting fees to admission. From above system identify the component, the interface it supports and give a UML representation of the same details of services the component/interface offers. Make suitable assumption about the system. [8]

b) Explain purpose and application of Deployment Diagram to make Three Tier Architecture. [8]

Q11) a) Write short note on Interaction diagram. [8]

b) Give notations for following in Sequence diagram and also explain its need by giving suitable example: [8]

i) Destroy an object ii) Recursive call iii) Return Values iv) Alt

OR

Q12) a) Explain with example forward and reverse engineering of class diagram. [8]

b) Compare Asynchronous and Synchronous messages. [8]

[Total No. of Questions: 12] **[Total No. of Printed Pages: 2]**

UNIVERSITY OF PUNE

[4364]-303

B. E. (Computer Engg./IT Engg.) Examination - 2013

Software Architecture (2003 Course)

[Time: 3 Hours] **[Max. Marks: 100]**

Instructions:

1 *Figures to the right indicate full marks.*

2 *Answers to the **two sections** should be written in **separate answer-books**.*

3 *From Section I answer Q1 or Q2, Q3 or Q4, Q5 or Q6*

4 *From Section II answer Q7 or Q8, Q9 or Q10, Q11 or Q12*

5 *Make suitable assumptions wherever appropriate and relevant*

SECTION –I

Q.1	A	Write short notes on software architecture	6
	B	What is role of software architect and what skills do him/she needs	6
	C	Write briefly on following (i) CODE view (ii) Module structures	6
		OR	
Q.2	A	Where does "software architecture", fit in the classical waterfall model for Software engineering	6
	B	Write short note on CLIENT SERVER architecture	6
	C	Compare and contrast the analogy of software architecture with civil engineering architecture (building, bridges).	6
Q. 3	A	List out some common user friendly features seen in MS WORD	6
	B	What do you understand by quality aspects Modifiability, performance	6
	C	What do you understand by functional requirements	4
		OR	
Q. 4	A	Explain and illustrate the following concepts (in context of quality attribute/tactics) with examples, in brief (a) User friendliness (b) Reliability tactics: redundancy of servers (c) LOGIN as a security tactics (d) Recovery from failures	16
Q. 5	A	Write how UML can be used for Design patterns	4
	B	Give use/application for following patterns i) COMPOSITE ii) Observer ii) ADAPTOR	12

OR

Q. 6	A	DEFINE design pattern	4
	B	Write short notes on ANY ONE DESIGN pattern	6
	C	Write short notes on proxy pattern	6

SECTION II

Q. 7	A	Why J2EE	4
	B	What is difference between using sockets, RPC?	4
	C	Compare and contrast EJB and java	4
	D	What are client and server side sockets	4

OR

Q. 8	A	What are entity beans.	4
	B	Draw a neat J2EE diagram showing various technologies in J2EE	6
	C	Explain what you understand by XML and why XML so popular	6
Q. 9	A	Explain following Web Client side concepts through simple examples a) HTML b) Browser capabilities c) Browser types d) Java applets, with an example code/application	16

OR

Q. 10	A	Consider an online shopping website like application, show what concerns/functionality of the online shop, will you distribute to presentation, business, data layers in 3 tier architecture. Make suitable assumptions about the features/scope of online shop.	4
	B	What is XML, give an example of XML datafile.	4
	C	What are JSPs, illustrate	4
	D	Compare Servlets and JSP	4
Q. 11	A	Write short Notes on ANY THREE a) Components and interfaces b) Web services c) .Net and Advantages of .Net d) ASP e) COM/DCOM	18

OR

Q. 12	A	Explain in context of COM/.NET the following briefly a) Active X control b) .NET c) c# d) .NET Remoting e) Components f) DLLs	18

UNIVERSITY OF PUNE
[4364]-311
B. E.(IT)Examination - 2013
INFORMATION SYSTEMS SECURITY
(2008 Pattern)

[Total No. of Questions:11] **[Total No. of Printed Pages :1]**
[Time : 3 Hours] **[Max. Marks : 100]**

Instructions

*(1) Answer **Q1 or Q2, Q3 or Q4, Q5 or Q6** from section I and **Q7 or Q8, Q9,Q10 or Q11** 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) Neat diagrams must be drawn wherever necessary.
(5) Use of logarithmic tables, slide rule, Mollier charts, electronics pocket calculator is allowed.
(6) Assume suitable data, if necessary.

SECTION-I

Q1 a) Design a network level and Application level security for business a [18]

Application between two offices of the same company.

OR

Q2 a) Illustrate RSA Algorithm [9]

b) Explain AES steps [9]

Q3 a) State different modes of operation. Compare these modes. [8]

b) How to solve the problem of Non-repudiation. Illustrate that availability of[8]

information assets may be hampered because of reliability or security threat.

OR

Q4 a) Explain the Bell-Lapadula Model. [8]

b) Explain Biba integrity model [8]

Q5 a) Why security is process? [8]

b) Explain Diffiee-hellman protocol of key exchange [8]

OR

Q6 a) List and state the security design principles [8]

b) Describe authentication protocol [8]

SECTION-II

Q7 a) Explain Key Management systems [9]

b) Explain Identity Management [9]

OR

Q8 a) Illustrate SSL protocol interaction sequence diagram between client And server. [9]

b) Explain different IDS methods with one example each. [9]

Q9 Write short notes on (any 3) [16]

a) Cyber crimes b) Importance of Public key systems

c) IT law effectiveness d) Penetration Testing

e) Security Audit

Q10 Explain the security aspect in a web server and web client applications [16]

OR

Q11 Explain Security policy with examples [16]

UNIVERSITY OF PUNE

[4364-313]

B.E.(I.T.) Examination 2013

Software Testing Quality Assurance

(2003 pattern)

Time-Three hours **Maximum Marks-100**
[Total No. of Question=11] **[Total no. of printed pages= 2]**
Instructions:

(1)Answer question number 1 or 2,3 or 4,5 or 6 from Section-I
(2) Answer question number 7 or 8,9 or 10,11 from Section-II.
(3)Answer to the TWO sections should be written in separate answer books
(4)Neat diagrams must be drawn whenever necessary.
(5)Figures to the right indicate full marks.
(6)Assume suitable data whenever necessary.

SECTION-I

Q.1 (a)Define any four of the following terms. (8)
(i)Failure (ii)Faults (iii)Test Bed (iv)Defects (v)Errors
(vi)Software Quality.
(b)Explain in short any four methods of System Level Testing. (8)

OR

Q.2 (a)What are different levels of testing?Which software components are most suitable for unit testing and why? (8)
(b)Differentiate between white box testing & black box testing. (8)

Q.3 (a)Explain Equivalence Class partitioning and boundary value analysis with an example. (8)
(b)Write a short note on test adequacy criteria and control graphs. (8)

OR

Q.4 (a)Draw and explain Software defect life cycle. (8)
(b)Explain test case database,defect repository and configuration management repository in context of test infrastructure management. (8)

Q.5 (a)List and explain different types of measurement scales an example. (8)
(b)Explain with examples following in-process quality metrics. (10)
(i)Defect arrival pattern during machine testing.
(ii)Defect removal effectiveness

OR

Q.6 (a)Explain the importance of the metric- *percentage delinquent fixes* in context with software maintenance. Also calculate percent delinquent fixes (pdf) if number of fixes delivered in a specified time are 40 and the number of fixes that exceeded the response time criteria by severity level are 80. (10)

(b)Explain GQM technique in detail.Draw a GQM tree for the quality goal of achieving better software usability. (8)

SECTION-II

Q.7 (a)What is meant by software quality control?Explain the method of measuring software reliability as a software quality attribute? (8)

(b)Enumerate Ishikawa's seven basic quality tools.Explain any two in detail.(8)

OR

Q.8 (a)Write a short note on any two. (8)

(i)SQA activities
(ii)Software reviews
(iii)Software inspection and Audits

(b)Write a short note on any two quality attributes. (8)

(i)Portability
(ii)Maintainability
(iii)Interoperability

Q.9 (a)Explain any four in detail. (16)

(i)Requirements Management(RM)
(ii)Software Project Tracking and Oversight(SPTO)
(iii)Software Configuration Management(SCM)
(iv)Organization Process Definition(OPD)
(v)Defect Prevention(DP)
(vi)Software Product Engineering(SPE)

OR

Q.10 (a)How does the ISO 9000:9001 standard ensure in producing a good quality software? (8)

(b)Write a short note on 6 sigma standard.(8)

Q.11 Write short notes on any three. (18)

(i)Importance of code review in software security testing.
(ii)Functional testing of Web-site.
(iii)Client-Server Testing techniques.
(iv)Class testing.

[Total No. of Questions: 6] **[Total No. of Printed Pages: 2]**

UNIVERSITY OF PUNE

[4364]-314

B. E. (*IT*) Examination - 2013

Bioinformatics (2003 Course)

[Time: *3* Hours] **[Max. Marks: 100]**

SECTION –I

Q.1 A Explain the role of 'User Interface' in Information Theory? Explain in detail User Interface Components with associated Hierarchy? Explain why user interface is a major bandwidth-limiting element in delivery of data from application to the user? 18

OR

Q.1 B The probability of a patient having a particular genetic disease is 0.8. Calculate the pretest odds? If the Likelihood ratio is given as 1.35, calculate the post-test odds? Find the probability of the patient suffering from the genetic disease? Explain Bayes Theorem in detail? 18

Q.2 A Explain Microarray Spotting Process Flow? 08

B Explain the Gene Mapping Process in detail? 08

OR

Q. 2 A What is data mining? Mention the various tools used in Data Mining? 08

B What is Clustering? Explain Hierarchical clustering. Explain K-means clustering. 08

Q. 3 A For the given fluorescence data as x1[n] in the table below, calculate mean standard deviation and variance? 08

n	1	2	3	4	5	6	7
X1[n]	2.2	8.6	3.4	3.3	5.7	1.3	4.8

N	1	2	3	4	5	6	7
X2[n]	12.2	18.6	8.4	13.3	52.7	81.3	44.8

B For given x1[n] and x2[n] calculate True Positive, True Negatives, False Positives and False Negatives? 04

C Explain the concept of Sensitivity and Specificity along with the formulae. 02

	D	Explain the concept of Receiver Operating Characteristics?	02
		OR	
Q. 3		Explain any two of the following terms 1. Neural Networks and Liner regression 2. Hidden Markov Models and state machine. 3. Genetic Algorithms and Simulated Annealing 4. Decision Trees and Pattern Association	16
		SECTION II	
Q. 4	A	Draw flow-charts and write pseudo-codes for: 1. Monte Carlo Method 2. Metropolis Algorithm	10
	B	Explain Collaboration-Communication Hierarchy?	08
		OR	
Q. 4	A	For the given two nucleotide sequences calculate the alignment score. Use gap penalty of (-0.5) Per gap. Assuming opening cost extension cost of (-0.5) each calculate the penalty gap, using this also calculate expanded gap, using this also calculate expanded gap penalty. Sequence 1: ATTCGGCATTCAGAGCTAGA Sequence 2: ATTCGACATT----GCTAGTGGTA	12
	B	Given A=[1 3 8 5 2] and B=[9 11 1 0 0 0 0 6 7 3 2], calculate Max Value=f(A_1, B_i), where, i=1, 2,….,11.	06
Q. 5	A	Explain the central Dogma of Molecular Biology.	08
	B	Explain Inductive Logic Programming and Deductive Logic Programming along with the differences between the two?	08
		OR	
Q. 5	A	What is Genetic Engineering? Explain Genetic markers. What are the dangers of genetic engineering?	08
	B	Explain the process of interchange and transformation of pollutant in atmosphere, hydrosphere and lithosphere	08
Q. 6	A	BLAST and FASTA are two widely used tools for sequence alignment. Explain only the differences in their approaches?	08
	B	Discuss the applications of PSI-BLAST program exploring protein family relationships?	08
		OR	
Q. 6		Explain in detail-FASTA algorithm for database search with an example.	16

UNIVERSITY OF PUNE

[4364-316]

B.E.(IT) Examination 2013

GIS and Remote Sensing

(2003 pattern)

Time-Three hours **Maximum Marks-100**

[Total No. of Question=12] **[Total no. of printed pages= 2]**

Instructions:

(1) Answer Q.1 or Q.2,Q.3 or Q.4,Q.5 or Q.6 from Section-I

(2)Answer Q.7 or Q.8,Q.9 or Q.10,Q.11 or Q.12 from Section-II.

(3)Answer to the TWO sections should be written in separate answer books

(4)Neat diagrams must be drawn whenever necessary.

(5)Figures to the right indicate full marks.

(6)Assume suitable data whenever necessary.

SECTION-I

Q.1 (a)Explain the energy interaction with earth's surface material. (8)
(b)Explain radar principle with required formula. What are the factors affecting microwaves. (8)

OR

Q.2 (a)Describe Multispectral imaging sensor systems and thermal Sensing system. (8)
(b)Explain Side looking Airbone Radar System.(SLAR) (8)

Q.3 (a)Explain image registration process in detail. (8)
(b)Which are the basic elements of image interpretation? (8)

OR

Q.4 (a)Which are the spatial filtering techniques?Explain any two. (8)

(b)Which are the correction methods for preprocessing the data? Explain geometric correction methods. (8)

Q.5 (a)Define GIS.What are 4 M's of GIS/Explain the term topology. (8)
(b)Define the advantages and disadvantages of digitizer units and real world units used in map projection. (8)

OR

Q.6 (a)Explain GIS work flow process. (8)
(b)What are maps?What is map scale?Explain spatial referencing system. (8)

SECTION-II

Q.7 (a)What are the type of Vector GIS Models?Explain any two. (8)
(b)Explain the functions of database management systems(DBMS) with respect to GIS. (8)

OR

Q.8 (a)Explain compact raster data models. (8)
(b)List different database models by which GIS is built.Explain any two. (8)

Q.9 (a)Which are the common errors in GIS Database?Explain the process of data cleaning. (8)
(b)What are different types of accuracies used in GIS. (8)

OR

Q.10 (a)Explain the detecting and correcting methods for the data in the database of GIS. (8)
(b)Which are the sources of errors in GIS?Explain point data error models and Line and area error models. (8)

Q.11 (a)What is overlay analysis?Describe the process of digital terrain modeling . (8)
(b)List and explain application areas of remote sensing and GIS. (8)

OR

Q.12 (a)Which are the main tasks of DTM system?Explain Triangulated irregular network model. (8)
(b)Explain the land use/Land cover system in India. (8)

UNIVERSITY OF PUNE

[4364-317]

B.E.(I.T) Examination 2013

Oragnisational Behaviour & management Concepts

(2003 pattern)

Time-Three hours **Maximum Marks-100**

[Total No. of Question=10] **[Total no. of printed pages= 2]**

Instructions:

(1)Q .5and Q.10 are compulsory.Solve any two from remaining, in each section.

(2)Answer to the TWO sections should be written in separate answer books

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SECTION-I

Q.1 "Formal groups can be informal but informal groups cannot be formal"Do you agree?.Justify. (16)

Q.2 Define organisational Behaviour .Explain autocratic model of organisational Behaviour in detail. (16)

Q.3 Evaluate McGregor's theory x and theory y with relevant examples. (16)

Q.4 What do you mean by morale?Explain the various indicators of morale. (16)

Q.5 Write short notes on (Any Three)

(a)Hergerg's two factor theory of motivation.

(b)Perception

(c)Levels of Conflict

(d)Organizational climate

(e)Disciplines of OB.

SECTION-II

Q.6 What is leadership?Discuss its nature & significance. Explain how it differs from managership. (16)

Q.7 Define change. Why there is resistance to change by individuals and groups?(16)

Q.8 Explain the term conflict. Discuss the difference between traditional and modern views on conflict. (16)

Q.9 What is stress management?Explain what is meant by "Stress has to be managed". (16)

Q.10 Write a short notes on.(Any Three). (18)

(a)Re-engineering

(b)Resistance to change

(c)Organisational Effectiveness

(d)Characteristics of a leader

(e)Constructive conflict.

[Total No. of Questions: *12*] **[Total No. of Printed Pages: *1*]**

UNIVERSITY OF PUNE

[4364]-320

B. E. (*IT*) Examination - 2013

Information Retrieval (2003 Course)

[Time: *3* Hours] **[Max. Marks: 100]**

SECTION –I

Q.1	Differentiate between data retrieval and information retrieval. Explain term-frequency and inverse document frequency.	16
	OR	
Q.2	Explain single link algorithm and probabilistic listing.	16
Q. 3	Explain Boolean, vector and fuzzy set mode.	18
	OR	
Q. 4	Explain suffix trees, suffix arrays and cluster based retrieval	18
Q. 5	Explain different evaluation measures for IR system.	16
	OR	
Q. 6	From HCI point of view, what considerations must be given while designing a search engine?	16

SECTION II

Q. 7	Discuss online IR system and cataloguing MARC record.	18
	OR	
Q. 8	Write a note on digital libraries and their architectural issues.	18
Q. 9	Explain one-dimensional time series and automatic feature extraction.	16
	OR	
Q. 10	Write a short note on: MULTOS and GEMINI algorithm.	16
Q. 11	Explain meta searchers and query processing.	16
	OR	
Q. 12	Explain MIMD architecture and distributed architecture of a search engine.	16

[Total No. of Questions: 12] **[Total No. of Printed Pages: 2]**

UNIVERSITY OF PUNE
[4364]-321
B.E. (Information Technology) Examination-2013
ARTIFICAL INTELLIGENCE (Course 2003)

[Time: 3 Hours] **[Max. Marks: 100]**

Instructions:

1 Answers to the two sections should be written in separate answer-books.
2 Neat diagrams must be drawn wherever necessary.
3 Black figures to the right indicate full marks.
4 Assume suitable data, if necessary.

SECTION-I

Q.1 a) Define artificial intelligence systems. Explain with examples how does conventional computing differs from intelligent computing. [8]

b) Describe the essence of a constraint satisfaction problem. What are some of the major applications of constraint satisfaction search? [8]

OR

Q.2 a) Describe the purpose of an OPEN and CLOSED list in Best-First search algorithm. Explain with suitable example. [8]

b) What is heuristics? A*search uses a combined heuristic to select the best path to follow through the state space toward the goal. [8]

Q.3 a) What is predicate logic? Describe the advantages of predicate logic over propositional logic. [8]

b) What is resolution? Explain resolution is predicate logic with suitable example. [8]

OR

Q.4 a) Briefly explain Truth maintenance system. Explain with suitable example how TMS allows truth values to be changed during reasoning. [8]

b) What are the semantic networks and how do they perform inheritance? [8]

Q.5 a) Differentiate the three levels of analysis viz syntax, semantics and pragmatics in Natural language processing using examples. [9]

b) What is parsing? Explain top down and bottom-up parsing. [9]

OR

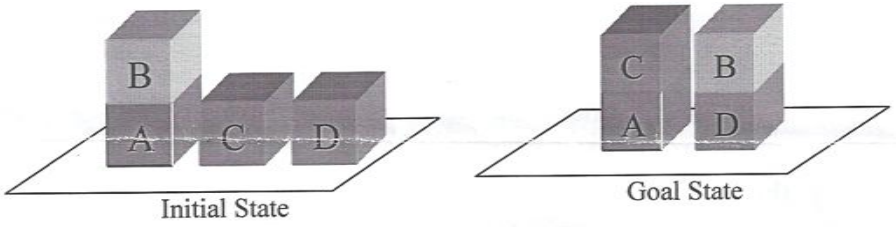
Q.6 a) Explain the major modules of a natural language interpretation system and explain their functions. [9]

b) Explain Waltz algorithm for line labeling with suitable example. [9]

SECTION-II

Q. 7 a) What are the components of a planning system? Explain briefly how these components can be implemented. [9]

b) Consider the following block world problem. Represent the start state and goal state using STRIPS type of operators. Using goal stack planning process, what will be the initial goal stack? What operators will be used to achieve the first goal? Specify its preconditions. [9]



OR

Q. 8 a) What is planning? How block world problem helps us to study planning. Give suitable examples. [9]

b) Explaining the basic principle of goal stack planning. Explain with suitable example. [9]

Q. 9 a) What is learning? Explain Failure-driven learning in details with suitable example. [8]

b) What is Inductive learning? Also explain Winston's learning program. [8]

OR

Q.10 a) What is supervised Learning and unsupervised Learning? Explain the benefits of Neural Networks. [8]

b) Explain Artificial Neural Networks (ANN). Also explain how ANN mimics the human brain working. [8]

Q.11 a) Explain architecture of expert system and discuss how expert system technique helps in building an efficient system. [8]

b) Give a short note on expert system: MYCIN [8]

OR

Q.12 a) Identity and describe two good application areas for expert system within a Indian judiciary system. [8]

b) Draw and explain process of knowledge acquisition. Also write the role of knowledge engineer. [8]

[Total No. of Questions: 12] **[Total No. of Printed Pages: 2]**

UNIVERSITY OF PUNE
[4364]- 322
B. E. (I.T) Examination - 2013
Real Time Systems (Elective-II) (2003 Course)

[Time: 3 Hours] **[Max. Marks: 100]**

Instructions:

1. ***Answer Q1 or Q2, Q3 or Q4, Q5 or Q6 from Section I and Q7 or Q8, Q9 or Q10, Q11 or Q12 from Section II***
2. *Answers to the **two sections** should be written in **separate answer-books**.*
3. *Figures to the right indicate full marks.*
4. *Neat diagrams must be drawn wherever necessary.*
5. *Assume suitable data, if necessary.*

SECTION -I

Q.1 A Explain the properties of good performance measure. 8

B Explain two-stage pipelining in detail for real time systems. 8

OR

Q.2 A What are Cost function and hard deadlines? Explain with example. 8

B Derive performability of a controller for automatic aircraft landing system. 8

Q. 3 A Derive necessary and sufficient condition for rate monotonic (RM) scheduling algorithm. 10

B Suppose we have M=4 classes. Then the following table lists the utilization bounds corresponding to each class. 8

Enrollment in local colleges, 2005

Class	Bound
C1	(0.41, 1)
C2	(0.26, 0.41)
C3	(0.19, 0.26)
C4	(0.00, 0.19)

Consider the following periodic task set.

	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11
e_i	5	7	3	1	10	16	1	3	9	17	21
p_i	10	21	22	24	30	40	50	55	70	90	95

Is it possible to schedule these all task to 4 processors? Calculate u_i and map to their respective classes and schedule on processor. (u-CPU Utilization)

OR

Q. 4 A What is Myopic Offline Scheduling (MOS) algorithm? Explain the drawbacks and its solution. 10

	B	Consider the following periodic task set of five tasks. Denoted by α_i the worst-case runtime of the alternative version of Ti and, by 1_i the run time limit of the corresponding primary version.	8

	T1	T2	T3	T4	T5
l_i	10	10	15	10	5
α_i	3	2	1	7	4
p_i	20	20	20	40	40

Schedule task using Primary and alternative task scheduling algorithm.

Q. 5	A	Why Ada is better language for real time system than the general-purpose programming language. Explain its feature with example.	8
	B	Why Two phase approach is use to improve predictability in real time databases, Give reasons.	8
		OR	
Q. 6	A	Which database is used for real time systems, explain why.	8
	B	Explain AEVD algorithm with example.	8

SECTION II

Q. 7	A	Explain following network topologies (Any two): i) Fault Tolerance ii) Packet switching iii) Circuit switching.	8
	B	What is window Protocol? Does it provide the deadline guarantee? Justify the answer.	8
		OR	
Q. 8	A	Derive the condition for, when channel switches state from busy to idle in Virtual Time Sensed Multiple Access (VTCSMA) with flow chart.	8
	B	State, in timed token protocol why 2xTTRT must be followed, prove it?	8
Q. 9	A	Describe the following functionality of a real time operating system: i) Time services ii) EDF Scheduling.	8
	B	Two level scheduler in Open system architecture.	8
		OR	
Q. 10	A	Explain following Real Time OS (Any two): i) LynxOS ii) pSOSystem iii) QNX/Nutrino.	8
	B	What is Deferred Procedure Call? How it can cause the problem?	8
Q. 11	A	Explain Malicious or Byzantine failures for fault tolerance with example.	8
	B	Write Short note on i) Failure handling. ii) Parity coding.	10
		OR	
Q. 12	A	Write short notes on i) Fault types. ii) Fault and error containment zones (FCZ and ECZ respectively).	8
	B	Explain following software error models: i) Jelinski-Moranda model ii) Goel-Okumoto model iii) Littlewood model iv) Littlewood-Verall model.	10