

II B.Tech II Semester(R09) Regular Examinations, April/May 2011
ENVIRONMENTAL SCIENCE

(Common to Civil Engineering, Mechanical Engineering, Information Technology, Computer Science & Engineering, Aeronautical Engineering, Biotechnology)

Time: 3 hours

Max Marks: 70

Answer any FIVE questions
All questions carry equal marks

1. Discuss about present environmental issues on global concern.
2. (a) Define renewable and non renewable resources.
(b) Discuss about the energy resources.
3. (a) Discuss about the characteristic features, structure and functions of the ecosystem.
(b) Discuss about desert eco system and forest ecosystem.
4. (a) Discuss about endemic and endangered species in India with example.
(b) Write note on value of biodiversity.
5. Discuss causes, effects and control measures of water pollution.
6. Discuss about the:
(a) Resettlement and rehabilitation of people.
(b) Urban problems related to energy.
7. Discuss about the:
(a) Population growth.
(b) Women and child welfare.
8. Write the report on the local polluted site you have visited.

II B.Tech II Semester(R09) Regular Examinations, April/May 2011
ENVIRONMENTAL SCIENCE

(Common to Civil Engineering, Mechanical Engineering, Information Technology, Computer Science & Engineering, Aeronautical Engineering, Biotechnology)

Time: 3 hours

Max Marks: 70

Answer any FIVE questions
All questions carry equal marks

1. Discuss about government's initiative for environmental management.
2. Discuss uses and over utilization of mineral resources.
3. (a) Discuss about food chains and food webs with examples.
(b) Discuss about ecological pyramids.
4. Discuss about genetic biodiversity, species and ecosystem diversity.
5. Discuss in detail about the thermal pollution and its problems.
6. Discuss about the air and water prevention and control of protection act.
7. Note on:
(a) Role of information Technology in Environment and human health.
(b) Family welfare programs.
8. Write the field report on the grass land ecosystem.

II B.Tech II Semester(R09) Regular Examinations, April/May 2011
ENVIRONMENTAL SCIENCE

(Common to Civil Engineering, Mechanical Engineering, Information Technology, Computer Science & Engineering, Aeronautical Engineering, Biotechnology)

Time: 3 hours

Max Marks: 70

Answer any FIVE questions
All questions carry equal marks

1. Discuss about environmental crisis and sustainable development.
2. Discuss in detail about uses and over exploitation of forest resources.
3. (a) Discuss about the Energy flow in the ecosystem.
(b) Discuss about ecological succession.
4. Discuss in-situ and ex-situ conservation of biodiversity.
5. Write short note on noise and soil pollution.
6. Write note on:
 - (a) Water shed management.
 - (b) Rain water harvesting.
7. (a) Discuss about the Environment and human health.
(b) Define Environment.
8. Discuss your observation on local agricultural polluted site you have visited.

II B.Tech II Semester(R09) Regular Examinations, April/May 2011
ENVIRONMENTAL SCIENCE

(Common to Civil Engineering, Mechanical Engineering, Information Technology, Computer Science & Engineering, Aeronautical Engineering, Biotechnology)

Time: 3 hours

Max Marks: 70

Answer any FIVE questions
All questions carry equal marks

1. Write a detailed note on the role of any four organizations in the field of environment and their contribution to better management.
2. Discuss in detail about the:
 - (a) World food problems.
 - (b) Changes caused by agriculture and over grazing.
3. (a) Discuss about the Grassland ecosystem and aquatic ecosystem.
 - (b) Define the ecosystem.
4. Discuss the following:
 - (a) Habitat loss
 - (b) Poaching of wild life
 - (c) Hot spots of Biodiversity
5. Discuss causes, effects and control measures of Air pollution.
6. Write short note on:
 - (a) Climate changes
 - (b) Global warming
 - (c) Acid rain
7. (a) Explain HIV/AIDS.
 - (b) Write note on human rights and value education.
8. Write the documentation on environmental assets in your visit.

II B.Tech II Semester(R09) Regular Examinations, April/May 2011**DESIGN & ANALYSIS OF ALGORITHMS**

(Common to Computer Science & Systems Engineering, Information Technology, Computer Science & Engineering)

Time: 3 hours**Max Marks: 70**

Answer any FIVE questions
All questions carry equal marks

1. (a) Differentiate between recursive and non - recursive algorithms. Write a non recursive and recursive algorithm to find the factorial of a given number.
(b) Discuss in detail about the different asymptotic notations with suitable examples.
2. (a) Write a pseudocode to determine bicomponents.
(b) Prove that two biconnected components can have at most one vertex in common and this vertex is an articulation point.
(c) Write simple algorithms for union and find operations.
3. (a) Write an algorithm to sort a set of elements by using sort technique.
(b) Sort the following array of elements by using merge sort technique
(179,285,310,351,652,254,423,861,450,520)
4. (a) Write a faster algorithm for job sequencing problem.
(b) Explain with example, the procedure to find the minimum cost spanning tree by using prim's algorithm.
5. Explain the reliability design in detail. Design a three stage system with device types D_1, D_2 and D_3 . The costs are \$30, \$15 and \$20 respectively. The cost of the system is no more than \$105. The reliability of each device type is 0.9, 0.8 and 0.5 respectively.
6. (a) Write a recursive backtracking algorithm for sum of subsets problem.
(b) Draw the state space tree for mcoloring when $n=3$ and $m=3$.
(c) Write an algorithm to estimate the efficiency of backtracking technique.
7. (a) Write the control abstraction for LC - Search.
(b) Explain in detail about FIFO branch and bound and LC Branch and Bound.
8. Explain the following:
 - (a) decision problem
 - (b) clique
 - (c) non deterministic machine
 - (d) satisfiability

II B.Tech II Semester(R09) Regular Examinations, April/May 2011
DESIGN & ANALYSIS OF ALGORITHMS

(Common to Computer Science & Systems Engineering, Information Technology, Computer Science & Engineering)

Time: 3 hours

Max Marks: 70

Answer any FIVE questions
All questions carry equal marks

1. (a) What is the use of asymptotic notations. Explain different asymptomatic notations with suitable example.
 (b) What is meant by space complexity. Explain, how to measure the space complexity with suitable examples.
2. (a) Explain in detail about the weighted union and collapsing find algorithm with suitable examples.
 (b) Write a short notes on bi connected components.
3. (a) Explain the general method of Divide and Conquer and present a control abstraction for the same
 (b) Write a short notes on stressen's matrix multiplication.
4. (a) Write in detail about the general method of the greedy technique.
 (b) Find the optimal solution for the following knapsack problem with $n=3, m=20, (p_1, p_2, p_3)=(25, 24, 15)$ and $(w_1, w_2, w_3)=(18, 15, 10)$.
5. (a) Give brief description about the All pairs shortest paths problem.
 (b) Write a detailed note on the general method of dynamic programming.
6. (a) Explain the following with examples.
 (i) Explicit Constraints. (ii) Implicit Constraints.
 (iii) Solution Space (iv) Answer States. (v) state space tree.
 (b) Write the general iterative backtracking algorithm.

7. Consider the traveling salesperson instance defined by the cost matrix

α	07	03	12	08
03	α	06	14	09
05	08	α	06	18
09	03	05	α	11
18	14	09	08	α

- (a) Find the reduced cost matrix.
 - (b) Draw the state space tree.
 - (c) Find the minimum cost path.
8. (a) Explain the non deterministic sorting and searching algorithms.
 (b) Discuss in detail the different classes in NP-Hard and NP-Complete.

II B.Tech II Semester(R09) Regular Examinations, April/May 2011
DESIGN & ANALYSIS OF ALGORITHMS

(Common to Computer Science & Systems Engineering, Information Technology, Computer Science & Engineering)

Time: 3 hours

Max Marks: 70

Answer any FIVE questions
All questions carry equal marks

1. (a) What is meant by performance analysis. Explain them with suitable example.
(b) Write an algorithm to find the factorial of a given number using iterative method and also write the step table for the same.
2. (a) Discuss in detail about the different set operations with suitable examples.
(b) What is degenerative tree. union(1,2),union(2,3),union(3,4),union(4,5),.....union(n-1,n) and find(1),find(2),.....find(n). Draw the degenerative tree for the above sequence of operations.
3. (a) Explain with example, the merge sort technique to sort a set of elements.
(b) Prove that the average case time complexity of quick sort is $O(n \log n)$.
4. (a) Prove that $p_1/w_1 \geq p_2/w_2 \geq \dots \geq p_n/w_n$ the greedy knapsack generates an optimal solution to the given instance of the knapsack problem.
(b) Write a greedy algorithm for sequencing unit time jobs with deadlines and profits.
5. (a) Write an algorithm to find the minimum cost binary search tree.
(b) Explain merging and purging rules with suitable examples.
6. (a) Write an algorithm for all solutions to be n-queens problem.
(b) Draw the tree organization of the 4 - queens solution space.
7. (a) Write the control abstraction for LC - search.
(b) Explain in detail about FIFO branch and bound and LC Branch and Bound.
8. Give brief description about the cooks theorem.

II B.Tech II Semester(R09) Regular Examinations, April/May 2011
DESIGN & ANALYSIS OF ALGORITHMS

(Common to Computer Science & Systems Engineering, Information Technology, Computer Science & Engineering)

Time: 3 hours

Max Marks: 70

Answer any FIVE questions
All questions carry equal marks

1. (a) Differentiate between recursive and non - recursive algorithms. Write a non recursive and recursive algorithm to find the factorial of a given number.
 (b) Discuss in detail about the different asymptotic notations with suitable examples.
2. (a) Explain the different storage representation techniques of sets with suitable example.
 (b) Give brief description about the bi connect components.
3. (a) Write a iterative quick sort algorithm to sort a set of elements. Explain it with an example.
 (b) Write the control abstraction for Divide and Conquer.
 (c) Write a short notes on Strassen's matrix multiplication.
4. (a) Write a high level description of job sequencing algorithm.
 (b) Give brief description about the general method of a greedy technique.
 (c) Find the optimal solution to the following job sequencing problem with $n=5$,
 $(p_1, p_2, \dots, p_5) = (20, 15, 10, 5, 1)$ and $(d_1, d_2, \dots, d_5) = (2, 2, 1, 3, 3)$.
5. (a) Write an algorithm to find the minimum cost binary search tree.
 (b) What are dominance rule and merging rule. Explain them with suitable example.
6. (a) Draw the solution space organization for the sum of subsets for $n=4$, $(w_1, w_2, w_3, w_4) = (11, 13, 24, 7)$ and $m=31$.
 (b) Explain in detail the sum of subsets problem by using dynamic programming.

7. Consider the traveling salesperson instance defined by the cost matrix

α	20	30	10	11
15	α	16	04	02
03	05	α	02	04
19	06	18	α	03
16	04	07	16	α

- (a) Find the reduced cost matrix.
 - (b) Draw the state space tree.
 - (c) Find the minimum cost path.
8. (a) Explain the non deterministic sorting and searching algorithms.
 (b) Discuss in detail the different classes in NP -Hard and NP - Complete.

II B.Tech II Semester(R09) Regular Examinations, April/May 2011**DATABASE MANAGEMENT SYSTEMS**

(Common to Computer Science & Systems Engineering, Information Technology, Computer Science & Engineering)

Time: 3 hours**Max Marks: 70**

Answer any FIVE questions
All questions carry equal marks

1. (a) What are the basic building blocks of data model.
(b) Explain about the importance of database design.
2. (a) What are the different decisions to be made during the design of an ER diagram.
(b) What do you mean by entity clustering. Illustrate with an example.
3. (a) For foreign key violations, SQL provides several alternatives to deal with violations. Illustrate them with examples.
(b) Explain in detail various integrity constraints over selections.
4. Consider the following sectional schema.
Employee (employee-name,street,city)
Works (employee-name, company-name, salary)
Company (company -name, city)
Managers(employee-name, manager-name)
Give expressions in SQL for the following queries.
 - (a) Find the names of all employees in this database who line in the same city as the company for which they work.
 - (b) Find the names of all employees who live in the same city and on the same street as do their managers.
 - (c) Find the names of all employees in this database who do not work for first bank corporation.
5. What is the need for normalization. Give the process of normalization.
6. (a) Explain about optimistic concurrency control mechanism.
(b) Explain about recovery using validation based protocol.
7. (a) Explain how loss of non volatile storage be death with.
(b) Explain in detail about concurrent transactions.
8. Illustrate with example dynamic hashing.

II B.Tech II Semester(R09) Regular Examinations, April/May 2011**DATABASE MANAGEMENT SYSTEMS**

(Common to Computer Science & Systems Engineering, Information Technology, Computer Science & Engineering)

Time: 3 hours**Max Marks: 70**

Answer any FIVE questions
All questions carry equal marks

1. (a) What do you mean by a data model. Explain how data models have evolved.
(b) Explain with examples various levels of data abstraction.
2. (a) Explain in detail various choices in developing an ER diagram.
(b) What do you mean by aggregation. ? Explain with an example how aggregation can be indicated in an ER diagram.
3. Consider the following relational scheme.
Employee (employee-name, street, city)
Work (employee-name, company-name, salary)
Company (Company-name, city)
Managers (employee-name, manager -name)
Give expressions in SQL for the following queries.
(a) Give all manager in this database, a 10-percent salary raise.
(b) Find all companies located in every city in which small bank corporation is located.
(c) Find the names of all employees who live in the same city as the company for which they work.
4. Explain with examples how key constraints, foreign key, constraints and general constraints can be enforced in SQL.
5. (a) Explain in detail about denormalization.
(b) What do you mean by surrogate key.
6. (a) What do you mean by a transaction ? How can you ensure atomicity and durability?
(b) Explain about conservative time stamp ordering mechanism.
7. (a) Explain about log based recovery system.
(b) Explain in detail about remote backup system.
8. Explain in detail various RAID levels.

II B.Tech II Semester(R09) Regular Examinations, April/May 2011**DATABASE MANAGEMENT SYSTEMS**

(Common to Computer Science & Systems Engineering, Information Technology, Computer Science & Engineering)

Time: 3 hours**Max Marks: 70**

Answer any FIVE questions
All questions carry equal marks

1. (a) Distinguish between file processing system and database management systems.
(b) What do you mean by data abstraction. Explain in detail data at various levels of abstraction.
2. What will generally be the data requirements of banking enterprise. From the data requirements identify entity sets and their attributes, and relationship sets and finally draw an ER diagram.
3. Consider the following schema.
Sailors (sid:integer,sname:string,rating:integer,age:red)
Boats (bid:integer, bname: string , color :string)
Reserver (sid: integer bid integer day date)
Write the following queries in SQL.
 - (a) Find the name of sailors who have received at least two boats.
 - (b) Find the sids of sailors with age over 20 who have not reserved a red boat
 - (c) Find the names of sailors who have reserved all boats.
 - (d) Find the names of sailors who have reserved all boats called Interlave
4. (a) List two reasons why are many choose to define a view.
(b) List to major problem with processing update operations experienced in terms of viewa.
5. Explain in detail various normal forms.
6. Explain in detail various concurrency control mechanism using time streaming.
7. (a) Discuss in detail about buffer management.
(b) Discuss about remote back up systems.
8. (a) Explain about bitmap indices
(b) Explain about static hashing.

II B.Tech II Semester(R09) Regular Examinations, April/May 2011

DATABASE MANAGEMENT SYSTEMS

(Common to Computer Science & Systems Engineering, Information Technology, Computer Science & Engineering)

Time: 3 hours

Max Marks: 70

**Answer any FIVE questions
All questions carry equal marks**

1. (a) What are the major disadvantages of file - processing systems.
(b) What do you mean by a data model? Explain in detail various data models.
2. Construct an ER diagram for a car insurance company. That has a set of customers, each of whom owns one or more cars. Each car has associated with it zero to any number of recorded accidents.
3. (a) Illustrate with examples SQL constructs for creating and modifying relations.
(b) What do you mean by a foreign key constraint. Illustrate with example how key constraints and foreign key constraints can be specified in SQL.
4. (a) What do you mean by a view? Explain how views enable data independence and ensure security.
(b) List two major problems with processing update operations expressed in terms of views.
5. (a) How can we improve the database design using normalization.
(b) Explain about denormalization.
6. (a) Explain about basic timestamp order concurrency control mechanism.
(b) What do you mean by serializability? How can you test for serializability.
7. (a) Explain how log based recovery works.
(b) Discuss about buffer management.
8. Illustrate with examples insertion and deletion operations of B+ trees.

II B.Tech II Semester(R09) Regular Examinations, April/May 2011

OBJECT ORIENTED PROGRAMMING

(Common to Computer Science & Systems Engineering, Information Technology, Computer Science & Engineering)

Time: 3 hours

Max Marks: 70

Answer any FIVE questions
All questions carry equal marks

1. (a) What is the need of OOP paradigm?
(b) Write about agents of communities.
2. (a) How java is more secure than other languages?
(b) What is data type? Explain data types in java.
3. (a) What is method overloading? Explain with an example.
(b) Explain the usage of final and super keywords with an example.
4. What is a package? How do create a package? Explain about access protection in packages.
5. (a) What is an exception? Explain about exception handling mechanism in java.
(b) Compare thread based and process based multitasking.
6. What is the task performed by layout manager? Explain different layout managers.
7. (a) What is an applet? Explain applet life cycle.
(b) Write the difference between applet and stand alone applications.
8. (a) What is network programming? How are the different machines in a network addressed? Explain.
(b) What is a part? What are the differences between port & socket? Explain with an example.

II B.Tech II Semester(R09) Regular Examinations, April/May 2011

OBJECT ORIENTED PROGRAMMING

(Common to Computer Science & Systems Engineering, Information Technology, Computer Science & Engineering)

Time: 3 hours

Max Marks: 70

Answer any FIVE questions
All questions carry equal marks

1. (a) Write about concept of responsibility in OOP.
(b) Write about information hiding with respect to message passing.
2. (a) What is an empty statement? Explain its usefulness.
(b) Compare in terms of their functionalities, the following pairs while and do-while.
3. (a) Can you declare abstract class members as final? Why?
(b) Explain the following:
 - i. Abstract methods.
 - ii. Concrete methods.
4. (a) Explain about classes of java.util package.
(b) Write the difference between class and interface.
5. (a) Explain the procedure to create user defined exceptions.
(b) Why finally keyword is necessary in exception handling?
6. (a) What are the functionalities supported by java related to drawing ellipses?
(b) What is event delegation model? Explain it.
7. (a) Explain briefly how to pass parameters to an applet.
(b) Write the differences between applet and standalone applications.
8. Explain about various networking classes & interfaces available in java.

II B.Tech II Semester(R09) Regular Examinations, April/May 2011

OBJECT ORIENTED PROGRAMMING

(Common to Computer Science & Systems Engineering, Information Technology, Computer Science & Engineering)

Time: 3 hours

Max Marks: 70

**Answer any FIVE questions
All questions carry equal marks**

1. (a) Briefly explain about abstract mechanism.
(b) How to cope up with complexity? What are the mechanisms used to do so?
2. (a) Explain briefly about bitwise operators.
(b) Explain the structure of java program with an example.
3. (a) What is multilevel inheritance? Explain with suitable example.
(b) Explain how you can define constants in java. Explain with an example.
4. (a) Write a java program to demonstrate implementing two interfaces by single class.
(b) Discuss java.util package in detail.
5. (a) Write a java program to implement runnable interface to create a thread.
(b) Write short notes on Daemon threads.
6. Explain the following layout managers with a simple program.
(a) Card layout managers.
(b) Grid layout managers.
7. (a) What are mandatory attributes of applet tag? Explain them.
(b) Write a program which draws dashed line and dotted line using applet.
8. (a) What is socket? What are the two important TCP socket classes? Explain.
(b) Explore java.net package.

II B.Tech II Semester(R09) Regular Examinations, April/May 2011

OBJECT ORIENTED PROGRAMMING

(Common to Computer Science & Systems Engineering, Information Technology, Computer Science & Engineering)

Time: 3 hours

Max Marks: 70

**Answer any FIVE questions
All questions carry equal marks**

1. (a) What is the difference between message passing and a procedure call?
(b) Briefly write about OOP principles.
2. (a) Write a program to find the roots of quadratic equation.
(b) What is type casting? What are the rules followed for type casting?
3. Explain the following:
 - (a) Super.
 - (b) Static members of class.
 - (c) Abstract methods Vs Concrete methods.
4. (a) Write a java program to find date and time.
(b) What is the significance of CLASSPATH environment variables in creating losing a package?
5. (a) Differentiate checked and unchecked exception.
(b) What is thread? Explain thread life cycle.
6. (a) Write the difference between AWT components and SWING components.
(b) Write short notes on inner class and adapter class.
7. (a) Write an applet program that display simple message “ ALL THE BEST”.
(b) How do applets differs from application programs?
(c) Write short notes on different types of applets.
8. (a) Discuss briefly about the following:
TCP,UDP & URL
(b) Write a client-server application that takes the password as input and check whether it is correct.
The program should print the appropriate messages.

II B.Tech II Semester(R09) Regular Examinations, April/May 2011
PRINCIPLES OF PROGRAMMING LANGUAGES
(Information technology)

Time: 3 hours

Max Marks: 70

Answer any FIVE questions
All questions carry equal marks

1. Discuss briefly languages evaluation criteria and the characteristics that affect them.
2. (a) Discuss the general problem of describing syntax.
(b) Consider the grammar $E \rightarrow E + E$
 $E \rightarrow E * E$
 $E \rightarrow i$
Using the expression $5+6*7$, prove that the grammar is ambiguous.
3. (a) Explain the advantages and disadvantages of dynamic scoping.
(b) What is a heterogeneous array? Discuss the design issues for arrays.
4. (a) Describe coercion in expressions.
(b) Explain dijkstra's guarded commands with example.
5. (a) Explain the general characteristics of subprograms.
(b) What is a coroutine? How do they provide interleaved execution?
6. (a) What are the language design requirements for a language that supports abstract data types?
(b) How is cooperation synchronization provided for Ada tasks? Explain.
7. (a) Discuss the fundamentals of functional programming language
(b) Explain procedural abstraction in Python.
8. Explain exception handling in Java.

II B.Tech II Semester(R09) Regular Examinations, April/May 2011
PRINCIPLES OF PROGRAMMING LANGUAGES
 (Information technology)

Time: 3 hours

Max Marks: 70

Answer any FIVE questions
All questions carry equal marks

1. Explain various programming domains. Give your arguments for and against having a single language for all programming domains.
2. (a) Describe the basic concept of denotational semantics.
 (b) Show a parse tree and leftmost derivation for the statement $A = (A + B) * C$ of the following grammar.

$$\begin{aligned} \langle assign \rangle &\rightarrow \langle id \rangle = \langle expr \rangle & \langle id \rangle &\rightarrow A/B/C \\ \langle expr \rangle &\rightarrow \langle expr \rangle + \langle term \rangle / \langle term \rangle & \langle factor \rangle &\rightarrow (\langle expr \rangle) / \langle id \rangle \\ \langle term \rangle &\rightarrow \langle term \rangle * \langle factor \rangle / \langle factor \rangle \end{aligned}$$
3. (a) Discuss the advantages of name type compatibility and structure type compatibility.
 (b) Explain in detail implementation of pointer and reference types.
4. (a) Discuss the problem of operand evaluation order and side effects and provide solutions for this problem.
 (b) Explain user-located loop control mechanisms.
5. (a) What the three semantic models of parameter passing.
 (b) What is a parameter profile? What is a subprogram protocol?
6. (a) Compare the class entity access controls of C++ and Java.
 (b) What advantages do monitors have semaphores? Explain.
7. Explain list processing in LISP using schema function. Give illustrations.
8. What is an exception? Discuss about exception propagation and exception handling.

II B.Tech II Semester(R09) Regular Examinations, April/May 2011
PRINCIPLES OF PROGRAMMING LANGUAGES
(Information technology)

Time: 3 hours

Max Marks: 70

Answer any FIVE questions
All questions carry equal marks

1. (a) List the potential benefits of studying concepts of programming language.
(b) What are the important factors that influence the basic design of programming language? Explain.
2. Discuss briefly formal language generation mechanisms used to describe the syntax of programming languages.
3. (a) Define coercion, type checking and strong typing.
(b) Discuss the design issues for pointers types.
4. (a) Explain about mixed mode assignment.
(b) "Every counting loop can be built with a logical loop, but the reverse is not true" Substantiate this statement.
5. Explain variety of models that guide the implementation of the three basic parameter transmission modes.
6. (a) Explain why naming encapsulation are important for developing large programs.
(b) What is the purpose of a task-ready queue?
(c) Define race condition.
7. Discuss how schema function are used to solve the problems in simple list-processing.
8. (a) Describe the basic elements of prolog.
(b) Give a note on exception handles in Ada.

II B.Tech II Semester(R09) Regular Examinations, April/May 2011
PRINCIPLES OF PROGRAMMING LANGUAGES
(Information technology)

Time: 3 hours

Max Marks: 70

Answer any FIVE questions
All questions carry equal marks

1. (a) Discuss various types of implementation systems of programming languages.
(b) Write short notes on programming environments.
2. (a) In what way do operational semantics and denotational semantics differ? Explain.
(b) Explain the additional features of extended BNF.
3. (a) Compare and contrast static binding with dynamic binding.
(b) Explain various user-defined ordinal issues for arithmetic expressions.
4. Discuss the primary design issues for arithmetic expressions.
5. What is a generic subprogram? Explain the support provided by programming languages for generic sub programs.
6. (a) What dangers are avoided in java by having implicit garbage collection, relative in C++?
(b) Discuss the primary reason for all java objects have a common ancestor.
(c) What is a binary semaphore? What is a counting semaphore?
7. (a) Explain type inferencing in ML.
(b) Discuss the key concepts of scripting languages.
8. Give an overview of logic programming and its applications.

II B.Tech II Semester(R09) Regular Examinations, April/May 2011

PROBABILITY & STATISTICS

(Common to Civil Engineering, Mechanical Engineering, Computer Science & Systems Engineering, Information Technology)

Time: 3 hours

Max Marks: 70

Answer any FIVE questions
All questions carry equal marks

1. (a) Define conditional event and conditional probability
(b) Prove that if E_1, E_2, E_3 are mutually independent events of a sample space S , then E_1, E_2 and E_3 are also independent events.
(c) Suppose 5 men out of 100 and 25 women out of 10,000 are color blind. A color blind person is chosen at random. What is the probability of the person being a male. Assume male and female to be in equal number?
2. (a) A sample of 4 items is selected at random from a box containing 12 items of which 5 are defective. Find the expected number E of defective items.
(b) The probability density $f(x)$ of a continuous random variable is given by $f(x) = ce^{-|x|}$, $-\infty < x < \infty$. Find C , mean, variance and probability between 0 and 4.
3. (a) Find the maximum n such that the probability of getting no head in tossing a fair coin n times is greater than 0.1?
(b) Show that poisson distribution can be derived as a limiting case of the binomial distribution.
4. (a) A normal population has a mean of 0.1 and standard deviation of 2.1. Find the probability that mean of a sample of size 900 will be negative.
(b) The mean voltage of a battery is 15 and S.D is 0.2. Find the probability that four such batteries connected in series will have a combined voltage of 60.8 or more volts.
5. (a) In a study of an automobile insurance a random sample of 80 body repair cost had a mean of RS 472.36 and the S.D of 62.35. If \bar{x} is used as a point estimate to the true average repair costs with what confidence we can assert that the maximum error doesn't exceed Rs 10?
(b) A random sample of size 81 was taken whose variance is 20.25 and mean is 32, construct 98% confidence interval.
6. (a) A manufacturer claims that only 4 % of his products are defective. A random sample of 500 were taken among which 100 were defective. Test the hypothesis at 0.05 level.
(b) A sample of 64 students has a mean weight of 70Kgs. Can this be regarded as a sample from a population with mean weight 56 Kgs and S.D 25 Kgs.
7. The life time of electric bulbs for a random sample of 10 from a large consignment gave the following data:

Item	1	2	3	4	5	6	7	8	9	10
Life in 1000 hrs	1.2	4.6	3.9	4.1	5.2	3.8	3.9	4.3	4.4	5.6

8. (a) What are the assumptions of single channel queue?
(b) A bank plans to open a single server drive in banking facility at a certain center. It is estimated that 20 customers will arrive each hour on average. If on average it requires 2 min to process a customer's transaction, determine.
 - i. The proportion of time that the system will be idle.
 - ii. On the average how long a customer will have to wait before reaching the server.
 - iii. The fraction of customers who will have to wait.

II B.Tech II Semester(R09) Regular Examinations, April/May 2011

PROBABILITY & STATISTICS

(Common to Civil Engineering, Mechanical Engineering, Computer Science & Systems Engineering, Information Technology)

Time: 3 hours

Max Marks: 70

Answer any FIVE questions
All questions carry equal marks

- A problem in statistics is given to 3-students A,B,C whose chance of solving it are $1/2$, $3/4$ and $1/4$ respectively. What is the probability that the problem is solved?
 - State and prove Baye's theorem.
- Two Dice are thrown. Let X assign to each point (a,b) in S . The maximum of its numbers i.e $X(a,b)=\max(a,b)$. Find the probability distribution. X is a random variable with $X(s)=\{1,2,3,4,5,6\}$. Also find the mean and variance of the distribution.
 - Find the mean and variance of the uniform probability distribution given by $f(x)=1/n$ for $x=1,2,3,\dots,n$.
- The mean of Binomial distribution is 3 and the variance is $9/4$. Find
(i) the value of n (ii) $p(x \geq 7)$ (iii) $p(1 \leq x < 6)$.
 - If X is a poisson variate such that $P(x=0)=p(x=1)$, find $P(x=0)$ and using recurrence formula find the probability at $x=1,2,3,4$ and 5.
- 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.
 - A random sample of size 100 is taken from an infinite population having the mean $\mu=76$ and the variance $\sigma^2=256$, what is probability that \bar{x} will be between 75 and 78.
- What is the size of the smallest sample required to estimate an unknown proportion to within a maximum error of 0.06 with atleast 95% confidence.
 - A sample of 11 rats from a central population had an average blood viscosity of 3.92 with S.D of 0.61. Estimate the 95 % confidence limits for the mean blood viscosity of the population.
- A die is thrown 9000 times and of these 3220 yielded a 3 or 4. Is this consistent with the hypothesis that the die was unbiased?
 - The mean of two large samples of size 1000 and 2000 members are 67.5 inches and 68.0 inches respectively. Can the samples be regards as drawn from the same population of S.D 2.5 inches?
- 4 coins were tossed 160 times and the following results were obtained.

No.of heads	0	1	2	3	4
Observed frequencies	17	52	54	21	6

Under the assumption that coins are balanced, find the expected frequencies of 0,1,2,3 or 4 heads and test the goodness of fit ($\alpha=0.05$).

- At the election commission office, for the vote's identity card. A photographer takes passport size photo at an average rate of 24 photos per hour. The photographer must wait until the voter blinks or scouds, so the time to take a photo is exponentially distributed. Customers arrive at poisson distributed average rate of 20 voters per hour. Find
 - What is the utilization of photographer?
 - How much time, the voter has to spent at the election commission office on an average.

II B.Tech II Semester(R09) Regular Examinations, April/May 2011

PROBABILITY & STATISTICS

(Common to Civil Engineering, Mechanical Engineering, Computer Science & Systems Engineering, Information Technology)

Time: 3 hours

Max Marks: 70

Answer any FIVE questions
All questions carry equal marks

- State the axioms of probability. If A and B are independent events show that (A^c, B^c) , (A, B^c) and (A^c, B) are also independent.
 - A, B, C are aiming to shoot a balloon. A will succeed 4 times out of 5 attempts. The chance of B to shoot the balloon is 3 out of 4 and that of C is 2 out of 3. If the three aim the balloon simultaneously, then find the probability that at least two of them hit the balloon.
- If X and Y are discrete random variables and K is a constant then prove that
 - $E(X+K) = E(X) + K$
 - $E(X+Y) = E(X) + E(Y)$.
 - For the continuous probability function $F(x) = Kx^2e^{-x}$, $x \geq 0$ find
 - K
 - Mean
 - Variance.
- Out of 800 families with 5 children each, how many would you expect to have
 - 3 boys
 - either 2 or 3 boys.
 - Find the mean and standard deviation of a normal distribution in which 7 % of items are under 35 and 89 % are under 63.
- A normal population has a mean of 0.1 and standard deviation of 2.1. Find the probability that mean of a sample of size 900 will be negative.
 - Calculate the probability that \bar{x} will be between 75 and 78 if a random sample of size 100 is taken from an infinite population having mean $\mu = 76$ and variance $\sigma^2 = 256$.
- Determine 99 % confidence interval for the mean of contents of soft drink bottles if contents of 7 such soft drink bottles are 10.0, 9.8, 10.2, 9.6 ml.
 - Calculate μ_1, σ_1 for the posterior distribution if the random sample size is 80, $\bar{x} = 18.85$, $S = 5.55$ using S for S.D of population σ
- A manufacturer claimed that atleast 95 % of the equipment which he supplied to a factory conformed to specifications. An examination of a sample of 200 pieces of equipment revealed that 18 were faulty. Test his claim at 5 % loss.
 - Explain the procedure generally followed in testing of hypothesis.
- A group of 5 patients treated with medicine A weight 42, 39, 48, 60 and 41 Kgs. Second group of 7 patients from the same hospital treated with medicine B weight 38, 42, 56, 64, 68, 69 and 62 Kgs. Do you agree with the claim that medicine B increases the weight significantly?
 - A die is thrown 264 times with following results. Show that the die is biased.

No. of appeared on the die	1	2	3	4	5	6
Frequency	40	32	28	58	54	52

- A fast food restaurant has one drive in window. It is estimated that cars arrive according to a poisson distribution at the rate of 2 every 5 times and that there is enough space to accommodate a line of 10 cars. Other arriving cars can wait outside this space, if necessary, It takes 15 minutes on the average to fill an order, but the service time actually varies according to an exponential distribution. Determine the following.
 - The probability that the facility is idle.
 - The expected number of customers waiting to be served.

II B.Tech II Semester(R09) Regular Examinations, April/May 2011

PROBABILITY & STATISTICS

(Common to Civil Engineering, Mechanical Engineering, Computer Science & Systems Engineering, Information Technology)

Time: 3 hours

Max Marks: 70

Answer any FIVE questions
All questions carry equal marks

- Define a finite even probable space.
 - A coin is tossed n times. What is the probability that the tail will present itself an odd number of times?
 - If A_1, A_2, \dots, A_n are n events then prove that

$$p\left(\bigcap_{i=1}^n A_i\right) \geq \sum_{i=1}^n p(A_i) - (n-1).$$
- A sample of 4 items is selected at random from a box containing 15 items of which 5 are defective. Find the expected number E of defective items.
 - If x is a continuous random variable and $y = ax + b$, prove that $E(Y) = aE(x) + b$ and $V(Y) = a^2 V(x)$ where V stands for variance and a, b are constants.
- Derive the mean, variance, mode of the binomial distribution. Also obtain the relation

$$p(r+1) = \frac{(n-r)p}{(r+1)q} \cdot p(r).$$
- Determine the expected number of random samples having their means
 - Between 22.39 and 22.41
 - Greater than 22.42,
 - Less than 22.37,
 - Less than 22.38 or more than 22.41 if $N=1500$, $n=36$, No of samples $N_s=300$ $\sigma=0.48$, $\mu=22.4$.
- Construct a 99% confidence interval for the true mean weight loss if 16 persons on diet control after one month had a mean weight loss of 3.42 kgs with s.d. of 0.68 kgs.
 - The mean mark in mathematics in common entrance that will vary from year to year. If this variation of the mean mark is expressed subjectively by a normal distribution with mean $\mu_0=72$ and variance $\sigma^2=5.76$. What probability can we assign to the actual mean mark being some where between 71.8 and 73.4 for the next year's test.
- Experience had shown that 20% of a manufactured product is of the top quality. In one day's production of 400 articles only 50 are of top quality. Test the hypothesis at 0.05 level.
 - A sample of 64 students have a mean weight of 70kgs. Can this be regarded as a sample from a population with mean weight 56 kgs and standard deviation 25 kgs.
- On the basis of information given below about the treatment of 200 patients suffering from a disease, state whether the new treatment is comparatively superior to the conventional treatment.

	Favorable	Not favorable	Total
New	60	30	90
Conventional	40	70	110
- Explain the poisson process in the queuing theory.
 - Give an explanation on exponential distribution in queuing theory.
