Code: 9A05403

II B. Tech II Semester (R09) Regular & Supplementary Examinations, April/May 2012

DESIGN & ANALYSIS OF ALGORITHMS

(Common to CSS, IT & CSE)

Time: 3 hours Max Marks: 70

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

1 (a) Define an algorithm. What are the different criteria that satisfy the algorithm?
(b) Explain the different areas of research where the algorithms can be applied.

2 (a) Present an algorithm for union with weighting rule.
(b) What is collapsing rule? Explain with example.

3 (a) Give a control abstraction for divide and conquer.
(b) Write the Iterative algorithm for searching an element by using binary search.

4 (a) Find an optimal solution to the knapsack instance n = 7, m = 15, P[1 : 7] = 10,5,15,7,6,18,3) and W [1: 7] = (2,3,5,7,1,4,1)
(b) Write an algorithm for Knapsack problem by using greedy technique.

5 (a) Device an algorithm m to find the optimal order of multiplying n matrices using dynamic programming technique.
(b) Explain the time efficiency of an algorithm OBST is cubic.

6 (a) Write an algorithm to estimate the efficiency of backtracking.
(b) Explain the 4-queen problem using backtracking.

7 (a) What do you mean by bounding? Explain how these bounds are useful in branch and bound method.
(b) Explain FIFO branch and bound.

8 Given an integer m x n matrix A and an integer m-vector b, the 0-1 integer programming problem asks whether there is an integer n-vector x with elements in the set {0,1} such that $Ax \leq b$. Prove that 0-1 integer programming is Np-complete.

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Code: 9A05403

2

II B. Tech II Semester (R09) Regular & Supplementary Examinations, April/May 2012

DESIGN & ANALYSIS OF ALGORITHMS

(Common to CSS, IT & CSE)

Time: 3 hours Max Marks: 70

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

1 (a) What are the different techniques to represent an algorithm? Explain.
(b) Give an algorithm to solve the towers of Hanoi problem.

2 (a) Write a pseudo code for UNION algorithm with weighted rule.
(b) Present an algorithm for FIND using collapsing rule.

3 (a) Search for an element -2 from the below set by using binary search:
A = {-15, -6, 0, 7, 9, 23, 54, 82, 101, 112}.
(b) Draw the binary decision tree for the above.

4 (a) Give brief description about the single source shortest path by using greedy technique.
(b) Write a high – level description for job sequencing algorithm.

5 (a) Using divide and conquer approach coupled with the set generation approach. Show how to obtain an O ($2^{n/2}$) algorithm for O/1 knapsack problem.
(b) Develop an algorithm that uses the approach to solve the O/1 knapsack problem.

6 Generalize Hamiltonian so that it processes a graph whose edge have costs associated with then and finds a Hamiltonian cycle with minimum cost. You can assume that all edge costs are positive.

7 (a) Write an algorithm of LC branch and bound to find minimum cost answer node algorithm.
(b) Explain the solution to the traveling sales person problem by using LC branch and bound.

8 Show that partition α the minimum finish time non-preemptive three processor flow shop schedule use only one job. That has three non-zero tasks. All other jobs have only one non-zero task.

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Code: 9A05403 3

II B. Tech II Semester (R09) Regular & Supplementary Examinations, April/May 2012

DESIGN & ANALYSIS OF ALGORITHMS

(Common to CSS, IT & CSE)

Time: 3 hours Max Marks: 70

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

1 (a) Present an algorithm that searches an unsorted array a [1...n] for the element x. If x occurs, return the position in the array else return zero.
(b) If S is a set of n elements, the power of set S is the set of all possible subsets of S. Write a recursive algorithm to compute power set (S).

2 Explain in detail the set representation with suitable example.

3 (a) Explain the sorting of elements by using merge sort technique.
(b) Present an Iterative algorithm for binary search.

4 (a) Prove that the greedy method produces an optimal solution to the job sequencing problem.
(b) Present greedy algorithm for sequencing unit time jobs with deadlines and profits.

5 (a) Find the solution for the knapsack problem. When n=3, $(W_1, W_2, W_3) = (18, 15, 10,)$. (P1, P2, P3) = (25, 24, 15) and m=20.
(b) Explain the general concept of dynamic programming.

6 How many solutions are there to the eight queens problem? How many distinct solutions are there if we do not distinguish solutions that can be transformed into one another by rotations and reflections?

7 (a) Compare FIFO branch and bound and LC branch and bound.
(b) Explain the method of reduction to solve TSP problem using branch and bound.

8 (a) Mention the classes of complexity in algorithms.
(b) Give out the relation between NP-hard and NP-complete problems.

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Code: 9A05403

4

II B. Tech II Semester (R09) Regular & Supplementary Examinations, April/May 2012

DESIGN & ANALYSIS OF ALGORITHMS

(Common to CSS, IT & CSE)

Time: 3 hours Max Marks: 70

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

1 (a) Write an algorithm for transpose of a matrix by using step count method.
(b) What are the advantages and disadvantages of randomized algorithms?

2 (a) Explain the different set operations with suitable examples.
(b) Give brief description about the array representation of sets.

3 Explain in detail about the Stressen's matrix multiplication.

4 (a) Define minimum cost spanning trees. Explain them with suitable example.
(b) Present faster algorithm for job sequencing.

5 Solve the all- pair's shortest path problem for the digraph with the weight n-matrix.

$$\begin{bmatrix} 0 & 2 & \alpha & 1 & 8 \\ 6 & 0 & 3 & 2 & \alpha \\ \alpha & \alpha & 0 & 4 & \alpha \\ \alpha & \alpha & 2 & 0 & 3 \\ 3 & \alpha & \alpha & \alpha & 0 \end{bmatrix}$$

6 (a) Derive the bounding functions of sum of subsets problem and write the algorithm for the same.
(b) Define the following terms: live node, E-node, dead node.

7 Write and explain an algorithm for a LIFO branch and bound algorithm to find the minimum cost answer node.

8 (a) Explain about non deterministic algorithm.
(b) Discuss NP-hard and NP-complete problems.

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Code: 9A15403

1

II B. Tech II Semester (R09) Regular & Supplementary Examinations, April/May 2012

PRINCIPLES OF PROGRAMMING LANGUAGES

(Information Technology)

Time: 3 hours Max Marks: 70

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

1 Explain in detail, the reasons for studying the programming language concepts.

2 (a) Explain the concept of token of a language with an example.
(b) Distinguish between static and dynamic semantics.

3 What is life time of a variable? Explain 4 categories of variables according to their lifetimes.

4 What are design issues for arithmetic expressions? Clearly explain how precedence and associativity are used to specify operator evaluation order.

5 (a) Explain stack implementation of common parameter passing methods.
(b) Explain why parameter passing is more flexible than direct access to non local variable.

6 Explain abstract data types in C # with examples.

7 (a) Explain the applications of logic programming.
(b) Explain how backtracking work in prolog.

8 (a) Explain with suitable examples, the python procedural abstraction.
(b) Discuss in detail about the data abstraction using python.

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Code: 9A15403

2

II B. Tech II Semester (R09) Regular & Supplementary Examinations, April/May 2012

PRINCIPLES OF PROGRAMMING LANGUAGES

(Information Technology)

Time: 3 hours Max Marks: 70

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

1 Explain in detail about language evaluation criteria.

2 (a) Explain three extensions which are common to most EBNFs.
(b) Write BNF and equivalent EBNF grammar for a given expression grammar.

3 Explain in detail about static type binding and dynamic type binding in various languages. What are the disadvantages of dynamic type binding?

4 (a) Explain different forms of statement level sequence control.
(b) Explain different conditional statements in C based languages.

5 (a) Explain parameter passing method of some major languages.
(b) Explain the concepts of overloaded subprograms.

6 (a) What is a C++ name space and what is its purpose?
(b) Explain how information hiding is provided in an Ada package.
(c) What is a java package and what is its purpose?

7 Explain in detail the basic elements of prolog.

8 (a) Discuss in detail about the python procedure with dynamic typing.
(b) Write a python procedure to print the date in ISO format using tuples.

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Code: 9A15403

3

II B. Tech II Semester (R09) Regular & Supplementary Examinations, April/May 2012

PRINCIPLES OF PROGRAMMING LANGUAGES

(Information Technology)

Time: 3 hours Max Marks: 70

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

1 What is a compiler explain? Explain in detail about compilation process.

2 Clearly explain how axiomatic semantics are used to describe the meaning of programs.

3 What is a variable? Explain in detailed different characteristics of a variable.

4 (a) What is the role of parentheses with relate to precedence of operators?
(b) Explain conditional expression of C language.

5 (a) Discuss how parameter- passing techniques are implemented.
(b) Explain how multi-dimensional arrays are passed as parameters.

6 Explain in detail abstract data types in java with examples.

7 (a) What are different classes of exceptions in java?
(b) Explain with suitable example finally clause in java.

8 (a) Give brief description about python tuples, lists and dictionaries.
(b) Explain with examples, the python iterative commands.

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Code: 9A15403

4

II B. Tech II Semester (R09) Regular & Supplementary Examinations, April/May 2012

PRINCIPLES OF PROGRAMMING LANGUAGES

(Information Technology)

Time: 3 hours Max Marks: 70

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

1 (a) What are the factors that influence programming language design?
(b) What is exceptional handling? Explain with example.

2 Clearly explain how operational semantics are used to describing the meaning of programs.

3 (a) Explain type inference of ML language.
(b) Explain dynamic type binding.

4 Explain in detail about the implementation of arithmetic, relational and Boolean expressions in a programming language.

5 (a) Explain pass-by-value and pass-by-result parameter passing techniques.
(b) Explain design issues for functions.

6 Explain in detail abstract data types in C++ with examples.

7 (a) Explain the list structures of prolog.
(b) What are the forms of horn clauses?
(c) What are the general forms of a proposition in casual form?

8 (a) Explain in detail about the characteristics of scripting languages.
(b) Discuss in detail about the python primitive types.

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Code: 9ABS402/9ABS303

II B.Tech II Semester (R09) Regular & Supplementary April/May 2012 Examinations
ENVIRONMENTAL SCIENCE
(Common to Civil Engineering,Mechanical Engineering,Information Technology,Computer Science & Engineering, Aeronautical Engineering and Bio Technology)

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

Answer any FIVE Questions
All Questions carry equal marks

*****

1. (a) Define environmental studies. Give the scope and importance of studying environmental science.
   (b) Discuss the need for public awareness on environmental hazards.

2. (a) Define energy. Discuss the different types of energy.
   (b) What is sustainable agriculture? Write short notes on integrated crop management.

3. (a) Write about concept of an ecosystem.
   (b) What is a grassland ecosystem? Write about the different types of grasslands in India.

4. (a) Give the biogeographic classification of India.
   (b) Write about in-situ and ex-situ conservation of biodiversity.

5. (a) Discuss the effects of air pollution on the following
      I. Human beings
      II. Plants
   (b) Give concepts that help individuals contribute towards a better quality of our environment and human life.

6 (a) Give the classification of wastelands. Write about the need for wasteland development.
   (b) Write notes on global warming and its effects on temperature and rainfall.

7. (a) Discuss how environmental issues are closely linked to human rights.
   (b) What is the nature of population growth? Discuss its variation among nations.

8. (a) Prepare a proforma for fieldwork on documenting environmental assets of river ecosystem.
   (b) Write the general guidelines for study of common plants, insects and birds.

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Code: 9ABS402/9ABS303

2

II B.Tech II Semester (R09) Regular & Supplementary April/May 2012 Examinations
ENVIRONMENTAL SCIENCE
(Common to Civil Engineering,Mechanical Engineering,Information Technology,Computer Science & Engineering, Aeronautical Engineering and Bio Technology)

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

Answer any FIVE Questions
All Questions carry equal marks

*****

1. (a) Define environmental studies. Give the scope and importance of studying environmental science.
   (b) Discuss the need for public awareness on environmental hazards.

Write about the following earth's resources:

2. (a) Atmosphere
   (b) Biosphere

3. (a) Write about concept of an ecosystem.
   (b) What is a desert ecosystem? Write about the structure and functions of the desert ecosystem.

4. (a) What is a biodiversity hot spot? Explain giving examples.
   (b) Discuss the different threats to biodiversity.

5. (a) What is marine pollution? Give the different pathways of marine pollution.
   (b) Discuss disaster management. What are different phases and professional activities associated to disaster management?

6. (a) Discuss the different functions of watershed management
   (b) What is climate change? What are the causes for climate change?

7. (a) Discuss how environmental issues are closely linked to human rights.
   (b) What is value education? Discuss its importance in the present day context.

8. (a) Prepare a proforma for fieldwork on documenting environmental assets of forest ecosystem.
   (b) Write the general guidelines for study of common plants, insects and birds.

*****

Code: 9ABS402/9ABS303

3

II B.Tech II Semester (R09) Regular & Supplementary April/May 2012 Examinations

ENVIRONMENTAL SCIENCE

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

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

Answer any FIVE Questions

All Questions carry equal marks

*****

1. (a) Discuss the multidisciplinary nature of environmental studies.
   (b) Discuss the need for public awareness on environmental hazards.

2. (a) List the available energy sources for the world today and 40 years from now in order of decreasing importance in accordance to your perception.
   (b) Discuss the environmental consequences of mining industry.

3. (a) Define an ecosystem. Discuss about energy flow in ecosystems.
   (b) Cite three examples of large diversified ecosystems and note the factors threatening their existence.

4. (a) Define biodiversity. Discuss the human benefits of biodiversity.
   (b) What is a biodiversity hot spot? Explain with examples.

5. (a) Discuss the effects of presence of the following contaminants in water
      I. pathogens
      II. organic matter
      III. Inorganic nutrients
      IV. Toxic and hazardous substances.
   (b) Describe an integrated urban and industrial waste management strategy.

6. (a) What is an acid rain? What are the effects of acid rain on aquatic and terrestrial ecosystems?
   (b) Define sustainable development. How can one ensure sustainable development?

7. (a) Write about family welfare programs taken up by our country in response to phenomenal population growth.
   (b) What are values? Discuss the role of value education in the context of environment.

8. (a) Prepare a proforma for fieldwork to study the cause and effects of pollution at a local polluted site.
   (b) Write the general guidelines on aspects that can be observed and documented during ecosystem field studies.

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Code: 9ABS402/9ABS303 **4**

II B.Tech II Semester (R09) Regular & Supplementary April/May 2012 Examinations
ENVIRONMENTAL SCIENCE
(Common to Civil Engineering,Mechanical Engineering,Information Technology,Computer Science & Engineering, Aeronautical Engineering and Bio Technology)

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

Answer any FIVE Questions
All Questions carry equal marks

*****

1. (a) Define environmental studies. Give the scope and importance of studying environmental science.
   (b) Discuss the need for public awareness on environmental hazards.

2. What is sustainable lifestyle? Discuss the equitable use of resources for sustainable lifestyle.

3. (a) Write about concept of an ecosystem.
   (b) What is an aquatic ecosystem? Write about the structure and functions of the desert ecosystem.

4. (a) Write short notes on conservation of biodiversity.
   (b) What are the human benefits of biodiversity.

5. (a) Discuss the effects of soil pollution on the following
      I. Health
      II. Ecosystem
   (b) Give concepts that help individuals contribute towards a better quality of our environment and human life.

6. (a) Give the classification of wastelands. Write about the need for wasteland development.
   (b) Write notes on consumerism and its effect on society and environment.

7. (a) Discuss how environmental issues are closely linked to human rights.
   (b) What is population explosion? Discuss its effect on environment and human health.

8. (a) Prepare a proforma for fieldwork on documenting environmental assets of grassland ecosystem.
   (b) Write the general guidelines for study of common plants, insects and birds.

*****

Code: 9ABS401/9ABS304

II B. Tech II Semester (R09) Regular & Supplementary Examinations, April/May 2012

PROBABILITY & STATISTICS

(Common to CE, ME, CSS & IT)

Time: 3 hours Max Marks: 70

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

1 Prove the following identities:

(i) $P(A^1)=1-P(A)$

(ii) For any two events A and B

(a) $P(A^1 \bigcap B)=P(B)-P(A\cap B)$

(b) $P(A\cap B^1) = P(A) - P(A\cap B)$

(iii) If $B \subset A$, then $P(A\cap B^1)=P(A)-P(B)$.

2 If X is a continuous random variable and Y = ax + b prove that E (1/y) = Ae (x) + b and V(y) = a^2 V(x).

3 (a) When the mean of marks was 50% and S.D 5% then 60% of the students failed in an examination? Determine the grace marks to be awarded in order to show that 70% of the students passed. Assume that the marks are normally distributed.

(b) The marks X obtained in mathematics by 1000 students in normally distributed with mean 78% and s.d 11% determine:
(a) How many students got marks above 90%?
(b) What was the highest mark obtained by the lowest 10% of students?
(c) Semi inters quartile range.
(d) Within what limits did the middle 90% of students lie.

4 If the mean of breaking strength of copper wire is 575 Ibs, with a standard deviation of 8.3 Ibs. How large a sample must be used in order that there will be one chance in 100 that the mean breaking strength of the sample is less than 572 Ibs?

5 To estimate the average time it takes to assemble a certain computer component, the industrial engineer at an electronic firm timed 40 technicians in the performance of the task, getting a mean of 12.73 min. and a S.D. of 2.06 min.
(i) What can we say with 99% confidence about the maximum error if $\bar{x}$ = 12.73 is used as a point estimate of the actual average time required to do the job?
(ii) Use the given data to construct 99% confidence interval.
(iii) With what confidence we can assert that the sample mean does not differ from the true mean by more than 30 sec.

Contd. in Page 2

6 (a) A coin was tossed 400 times and returned heads 216 times. Test the hypothesis that the coin is unbiased. Use a 0.05 level of significance.

(b) Producers of 'gutkha', claims that the nicotine content in his 'gutkha' on the average is 1.83 mg. Can this claim accepted if a random sample of 8 'gutkha' of this type have the nicotine contents of 2.0, 1.7, 2.1, 1.9, 2.2, 2.1, 2.0, 1.6 mg? Use a 0.05 level of significance.

7 (a) Write about (M/M/1): (∞/FIFO) queuing system.

(b) Derive the formula for the probability distribution density function of the waiting time distribution.

8 (a) A manufacturer claims that only 4% of his products are defective. A random sample of 500 was taken among which 100 were defective. Test the hypothesis at 0.05 levels.

(b) An oceanographer wants to check whether the depth of the ocean in a certain region if 57.4 fathoms, as had previously been recorded. What can he conclude at the 0.05 level of significance, if reading taken at 40 random locations in the given region yielded a mean of 59.1 fathoms with a S.D. 5.2 fathoms?

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Code: 9ABS401/9ABS304

2

II B. Tech II Semester (R09) Regular & Supplementary Examinations, April/May 2012

PROBABILITY & STATISTICS

(Common to CE, ME, CSS & IT)

Time: 3 hours Max Marks: 70

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

1 In a bolt factory machines A, B, C manufacture 20%, 30%, 50% of the total of their output and 6%, 3% and 2% are defective. A bolt is drawn at random and found to be defective. What is the probability that is manufactured by machines A, B and C?

2 A continuous random variable x has the distribution function:
F(x) = 0 if $x \leq 1$
= $k(x-1)^4 \; if \; -1 < x \leq 3$
= 1 if x>3
Find k and the probability density function of x.

3 (a) A box contains 9 cards numbered 1 to 9. If four cards are drawn with replacement. What is the probability that none is 1?

(b) An insurance agent accepts policies of 5 men all of identical age and good in health. The probability that a man of this age will be alive 30 years is 2/3. Find the probability that in 30 years: (i) All five men. (ii) At least one man. (iii) Almost three will be alive.

4 The following are the times between six calls for an ambulance in a city and the patient's arrival at the hospital: 27, 15, 20, 32, 18 and 26 minutes. Use these figures to judge the reasonableness of the ambulance services claim that it takes on the average 20 minutes between the call for an ambulance and patient's arrival at the hospital.

5 (a) A random sample of 100 teachers in a large metropolitan area revealed a mean weekly salary of Rs. 487 with S.D. Rs. 48. With what degree of confidence can we assert that the average weekly salary of all teachers in all area is between 472 to 502.

(b) A population ransom variable has mean 100 and S.D.16. What are the mean and S.D. of the sample mean for the random sample of size 4 drawn with replacement?

6 (a) In a city 'A' 20% of a random sample of 900 school boys had a certain slight physical defect. In another city 'B' 18.5% of a random sample of 1600 school boys had the same defect. Is the difference between the proportions significant at 0.05 level of significance?

(b) The mean yield of wheat from a district A was 210 pounds with S.D. of 10 pounds per acre from a sample of 100 plots. In another district the mean yield was 220 pounds with S.D. of 12 pounds from a sample of 150 plots. Assuming that the S.D. of yield in the entire state was 11 pounds, test whether there is any significant difference between the mean yields of crops in the two districts.

Contd. in Page 2

7 (a) Find the maximum difference that we can expect with probability 0.95 between the means of samples of sizes 10 and 12 from a normal population if their S.D. is found to be 2 and 3 respectively.

(b) A mechanist is making engine parts with axle diameters of 0.007 inch. A random sample of 10 parts shows a mean diameter of 0.742 inch with a S.D. of 0.040 inch. Compute the statistic you would use to test whether the work is meeting the specification at 0.05 level of significance.

8 Derive the following:

(i) $E(n) = L_s = \frac{\rho}{1-\rho}$,

(ii) Average queue length $L_q = \frac{\lambda^2}{\mu(\mu-\lambda)}$,

(iii) $E(m/m > 0) = \frac{\mu}{\mu-\lambda}$,

(iv) $V(n) = \frac{\lambda\mu}{(\mu-\lambda)^2}$.

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II B. Tech II Semester (R09) Regular & Supplementary Examinations, April/May 2012

PROBABILITY & STATISTICS

(Common to CE, ME, CSS & IT)

Time: 3 hours Max Marks: 70

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

1 Consider a single server queuing system with Poisson input and exponential service time. Suppose the mean arrival rate is 3 calling units per hrs. with the expected service time as 0.25 hrs. and the maximum permissible number of calling units in the system is two. Obtain the steady state probability of the number of calling units in the system and then calculate the expected number in the system?

2 (a) A sample poll of 300 voters from district A and 200 voters from district B showed that 56% and 48% respectively, were in favour of a given candidate. At a 0.05 level of significance, test the hypothesis that the there is a difference in the districts.

(b) Two independent samples of 8 and 7 items respectively had the following values of the variables

Sample I	9	11	13	11	16	10	12	14
Sample II	11	13	11	14	10	8	10	-

Do the estimates of the population variance differ significantly.

3 (a) During a country wide investigation the incidence of tuberculosis was found to be 1%. In a college of 400 strength 5 reported to be affected whereas in another 1200 strength 10 were affected. (i) Dose this indicate any significant difference. (ii) if the population proportion of the tuberculosis is not known test whether the difference is significant

(b) A study shows that 16 of 200 tractors produced on one assembly line required extensive adjustments before they could be shipped, while the same was true for 14 of 400 tractors produced on another assembly line. At the 0.01 level of significance, does this support the claim that the second production line does superior work?

4 The mean mark in mathematics in common entrance test 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 $\sigma_0^2 = 5.76$.

(i) What probability can we assign to the actual mean being somewhere between 71.8 and 73.4 for the next year's test?

(ii) Construct a 95% Bayesian interval for μ if the test is conducted for a random sample of 100 students from the next incoming class yielding a mean mark of 70 with S.D. of 8.

(iii) What posterior probability should be assigned to the event of part (i)?

Contd. in Page 2

5 (a) For the given three events A,B and C, verify that:
$$P(A \cup B/C) = P(A) \subset P(B/C) - P(A \cap B/C)$$

(b) For three event A,B and C prove that $P(A \cap B^1/C) + P(A \cap B/C) = P(A/C)$

6 The diameter of an elective cable say X is assumed to be a continuous random variable with p.d.f of $f(x) = kx(1-x^2) \, in \, 0 \le x \le 1 = 0$ elsewhere find the value of k and $P(0 \le x \le 1/2)$, $P(x \ge 1/4)$.

7 A die is thrown 8 times. If getting a 2 or 4 is a success. Find the probability of:
(i) 4 success
(ii) $P(x \le 3)$
(iii) $P(x \ge 2)$

8 (a) Find the value of the finite population correction factor for n = 10 and N = 1000.
(b) A sample is collected from the items produced by a factory. The sample size is 81. The standard deviation of the population is 0.3. Find the standard error of the mean of sampling distribution.

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Code: 9ABS401/9ABS304

4

II B. Tech II Semester (R09) Regular & Supplementary Examinations, April/May 2012

PROBABILITY & STATISTICS

(Common to CE, ME, CSS & IT)

Time: 3 hours Max Marks: 70

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

1 (a) One card is drawn from a regular deck of 52 cards. What is the probability of card being either red or a king?

(b) A bag contains 12 balls numbered from 1 to 12. If a ball is taken at random what is the probability of having a ball with a number which is a multiple of either 2 or 3.

2 A continuous random variable x has a probability density function: $f(x)=3x^2, 0 \le x \le 1$. Find a and b such that: (i) $P\{x \le a\}=P\{x > a\} and$ (ii) $P\{x \ge b\}=0.05$

3 It has been claimed that in 60% of all solar heat installations the utility bill is reduced by at least one third. Accordingly what are the probabilities that the utility bill will be reduced by at least one – third in: (i) Form of five installations. (ii) At least four of five installations.

4 Take 30 slips of paper and label 5 each -4 and 4, from each -3 and 3, three each -2 and 2 and each -1, 0 and 1. If each slip of paper has the same probability of being drawn find the probabilities of getting -4, -3, -2, -1, 0, 1, 2, 3, 4 and find the mean and variance of this distribution.

5 (a) A random sample of size 100 has a S.D. of 5. What can you say about the maximum error with 95% confidence?

(b) The mean and S.D. of a population are 11,795 and 14,054 respectively. What can one assert with 95% confidence about the maximum error $\bar{x}$ = 11,795 and n = 50?

(c) Also construct the 95% confidence interval for the true mean for the above given data.

6 (a) In a city 325 men out of 600 men were found to be smokers. Does this information support the conclusion that the majority of men in this city are smokers.

(b) A sample of 400 items is taken from a population whose S.D. is 10. The mean of the sample is 40. Test whether the sample has come from a population with mean 38. Also calculate 95% confidence interval for the population.

7 A random sample of 10 boys had the following I.Q.'s: 70, 120, 110, 101, 88, 83, 95, 98, 107, and 100. (i) Do these data support the assumption of a population mean I.Q of 100? (ii) Find a reasonable range in which most of the mean I.Q. values of the samples of 10 boys lie?

8 A machine repairing shop gets on average 16 machines per day (of eight hours) for repair and the arrival pattern is Poisson. At the moment there is no repair man available in the shop. The shop owner has two applicants A and B for the job of repairman. Both A and B claim the service times are exponentially distributed with mean 20 and 15 min. respectively. They demand salaries Rs. 500 and Rs. 600 per day respectively. The lost time costs Rs. 50/- per hour per machine. Assuming that the claims of the applicants are true, which one should be employed.

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Code: 9A05401

1

II B. Tech II Semester (R09) Regular & Supplementary Examinations, April/May 2012

DATABASE MANAGEMENT SYSTEMS

(Common to CSS, IT & CSE)

Time: 3 hours Max Marks: 70

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

1	(a)	What are the problems of file system? Explain.
	(b)	Explain the object-oriented model with example.
2	(a)	Explain 1:1 recursive relationship with example.
	(b)	What are the characteristics of a primary key? Explain.
3		Discuss about the following with examples: (a) Any four relational set operators. (b) Data redundancy.
4	(a)	What is the purpose of a trigger? Explain with example.
	(b)	Explain about arithmetic and logical operators in SQL.
5	(a)	Explain the need for normalization.
	(b)	Explain about functional dependency.
6	(a)	Explain how the concurrency can be controlled using optimistic method.
	(b)	How to ensure serializibility in concurrency control using 2 phase locking and lock types?
7	(a)	What is log based recovery, explain?
	(b)	Explain clearly about restart recovery and recovery algorithm.
8	(a)	What is B-Tree?
	(b)	What are the advantages, disadvantages and applications of B-Tree?

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Code: 9A05401

2

II B. Tech II Semester (R09) Regular & Supplementary Examinations, April/May 2012

DATABASE MANAGEMENT SYSTEMS

(Common to CSS, IT & CSE)

Time: 3 hours Max Marks: 70

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

1 (a) What are the functions of DBMS? Explain.
(b) Explain the development of data models.

2 (a) What are the differences between composite and simple attributes? Explain with examples.
(b) Distinguish between primary key and foreign key with example.

3 (a) Explain how all joins are performed on a table with examples.
(b) Define key. What are the various keys that are used in relational database? Explain them with the context of library system.

4 (a) What is data definition language? What are the commands that are performed in this language?
(b) Explain about WHERE and ANY and ALL sub queries with example.

5 (a) What is partial dependency? With which Normal form is it associated.
(b) What is 3NF? How it is achieved and what are its advantages over 2NF?

6 (a) Explain about inconsistent retrieval and uncommitted data in concurrency control?
(b) Explain about transaction recovery in database recovery management?

7 (a) Explain about buffer management in details.
(b) What is fuzzy check pointing and transaction roll back, explain?

8 Explain the following terms:
(a) Hard disk controller.
(b) Tertiary storage.
(c) Accessibility.
(d) Addressability.

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Code: 9A05401

3

II B. Tech II Semester (R09) Regular & Supplementary Examinations, April/May 2012

DATABASE MANAGEMENT SYSTEMS

(Common to CSS, IT & CSE)

Time: 3 hours Max Marks: 70

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

1 (a) What is business rule and what is its purpose in data modeling?
(b) How end user interaction with database is managed in DBMS?

2 (a) What are the challenges in data base design? Explain.
(b) Define the terms entity super types and sub types with examples.

3 (a) Explain the entity integrity and referential integrity are important in DS.
(b) Consider two tables customer, agent and perform all the relational set operations on those tables.

4 (a) How to restore the table contents and how to delete the table rows? Explain each with example and syntax.
(b) What is an attribute list sub query and correlated sub query? Explain

5 (a) Show that if a relation schema is in BCNF, then it is in 3NF, but if a relation schema is in 3NF then it is not necessary in BCNF. Explain with an example.
(b) What are the anomalies in BCNF?

6 (a) How the concurrency can be controlled using optimistic method? Explain.
(b) Explain about database recovery management.

7 Explain about the following:
(a) Immediate database recovery.
(b) Deferred database recovery.
(c) Check point.

8 Describe the structure of B-Tree and B+ Trees.

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Code: 9A05401

4

II B. Tech II Semester (R09) Regular & Supplementary Examinations, April/May 2012

DATABASE MANAGEMENT SYSTEMS

(Common to CSS, IT & CSE)

Time: 3 hours Max Marks: 70

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

1	(a)	What is data anomaly? Discuss about various types of anomalies.
	(b)	Describe the basic features of the relational data model.
2	(a)	Explain the terms connectivity and cardinality with examples.
	(b)	What is weak entity? How to identify a weak entity in an ERD?
3		What are the rules that are used to define a relational data base system?
4	(a)	What is an index? What are the operations that are performed on an index?
	(b)	Write about the conversion functions in advanced SQL.
5		Explain 1 NF and 2 NF with suitable example.
6	(a)	Explain about transaction properties in transaction management.
	(b)	Briefly explain about lost updates and inconsistent retrieval in concurrency control.
7	(a)	Explain the concepts of ARIES and its features?
	(b)	What is log based recovery, explain?
8		List the advantages and disadvantages of B-Trees.

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Code: 9A05402

II B. Tech II Semester (R09) Regular & Supplementary Examinations, April/May 2012

OBJECT ORIENTED PROGRAMMING

(Common to CSS, IT & CSE)

Time: 3 hours Max Marks: 70

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

1 (a) Briefly write the OOP principles.
(b) What is an object oriented programming? How is it different from procedure oriented programming?

2 (a) Explain java buzz words.
(b) How java is suitable for Internet?

3 (a) Write a java program to demonstrate static polymorphism.
(b) What is inheritance? Write its advantages.

4 Write a program to create a package PKg1 which includes an interface ABC with two methods Read ( ) and Area ( ) and a constant PI. Create another package PKg2, which include two class circle and rectangle implements ABC interface to compute area of circle and area of rectangle. And also explain the compilation and execution of above program.

5 (a) How are synchronized methods implemented?
(b) What is inter thread communication? What methods are employed?

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 differences between applet and stand alone applications.

8 Define the following,
(a) Socket.
(b) Proxy server.
(c) Internet address.
(d) Domain name service.

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Code: 9A05402

2

II B. Tech II Semester (R09) Regular & Supplementary Examinations, April/May 2012

OBJECT ORIENTED PROGRAMMING

(Common to CSS, IT & CSE)

Time: 3 hours Max Marks: 70

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

1	(a)	Write about the concept of “Responsibility” in object oriented programming?
	(b)	What are the messages and methods? Write about information hiding with respect message passing.
2	(a)	List the differences between C++ and Java.
	(b)	Explain briefly about bitwise operators.
3	(a)	What are the costs of using inheritances foe software development?
	(b)	What are the differences between private, static and final variables?
4	(a)	What is a package? How do we design a package?
	(b)	How do we add a class or interface to a package?
5		What is the necessity of exception handling? Explain exception handling taking “Divide – by Zero” as an example.
6	(a)	What is dialog? Explain with an example.
	(b)	Explain about graphics class.
7	(a)	What are the limitations of AWT?
	(b)	Discuss model view architecture.
8	(a)	Define URL. What is the format of URL?
	(b)	What is the use of URL connection class?

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Code: 9A05402

3

II B. Tech II Semester (R09) Regular & Supplementary Examinations, April/May 2012

OBJECT ORIENTED PROGRAMMING

(Common to CSS, IT & CSE)

Time: 3 hours Max Marks: 70

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

1 (a) Describe with a flow chart how various tools are used in the applet development.
(b) "Java is platform independent language". Why?
(c) What is a class? How do classes help us to organize our programs?

2 (a) What is an operator? Write about unary operators in java?
(b) Explain the structure of java program with an example?

3 Create a base class with an abstract print ( ) method that is overridden in a derived class. The overridden version of the method prints the value of an int variable defined in the derived class. At the point of definition of this variable, give it a nonzero value. In the base-class constructor, call this method. In main ( ), create an object of the derived type, and then call its print ( ) method. Explain the results.

4 What is a package? How do create a package? Explain about access protection in packages.

5 Describe the life cycle of a thread with a neat sketch.

6 (a) Describe grid and card layout managers.
(b) Create a simple java program to draw filled ellipse and circle.

7 (a) Explain briefly how to pass parameters to an applet.
(b) What is swing? Discuss its features.

8 Write about the following:
(a) Inet address.
(b) URL.
(c) URL connection.

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II B. Tech II Semester (R09) Regular & Supplementary Examinations, April/May 2012

OBJECT ORIENTED PROGRAMMING

(Common to CSS, IT & CSE)

Time: 3 hours Max Marks: 70

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

1		Explain different programming approaches. Write their advantages and disadvantages.
2	(a)	Write a java program to find roots of quadratic equation.
	(b)	What is type casting? What are the rules followed for type casting?
3	(a)	What is inheritance? Explain different types of inheritances.
	(b)	Explain benefits and limitations of inheritances.
4	(a)	Explain about implicit and explicit import statements.
	(b)	How to extend one interface by another interface? Explain with an example.
5	(a)	What is a thread group class? Explain any three methods of this class.
	(b)	How can we set the priorities for a thread?
6	(a)	Write a java program to create a file menu.
	(b)	Write short notes on color and font classes.
7	(a)	Explain the process of creating applets.
	(b)	What is an applet? What are the differences between local and remote applets?
8		Write short notes on the following: (a) TCP / IP programming. (b) Client/Server model implementation. (c) Getting information from internet.

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