

II B.Tech. II Semester Regular Examinations May 2015

Environmental Science
(Common to Civil, ME & CSE)**Max. Marks: 70****Time: 03 Hours**

Answer any five questions

All Questions carry equal marks (14 Marks each)

1. a) Define environment. Discuss the various segments of environment. 9M
b) Write briefly about the importance of Environmental studies. 5M
2. a) Discuss the role played by the non-conventional energy resources towards the protection of the environment. 7M
b) Explain dams and their effects on forests and tribal people. 7M
3. a) Discuss the changes caused by agriculture and overgrazing. 7M
b) Discuss the role of an individual in conservation of natural resources. 7M
4. Define pollution. Describe the sources, adverse effects and control measures of noise pollution. 14M
5. Write a brief note on
 - a) Food Chains 4M
 - b) Food webs 4M
 - c) Energy flow through an ecosystem 6M
6. a) Explain about threats to biodiversity. 8M
b) List the main biogeographic zones in India. 6M
7. Discuss briefly the provisions of the following Acts.
 - a) The water (Prevention and control of pollution) Act, 1974 5M
 - b) The Air (Prevention and control of pollution) Act, 1981 5M
 - c) The Forest conservation Act, of 1980. 4M
8. a) What is the role of information technology (IT) in environment and human health? 7M
b) Explain in detail about Women and Child welfare programme. 7M

Code :1G144

II B.Tech. II Semester Regular Examinations May 2015

Formal Languages and Automata Theory

(Computer Science & Engineering)

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

Answer any five questions

All Questions carry equal marks (14 Marks each)

1. a) Obtain a DFA to accept strings of a 's and b 's having even number of a 's and even number of b 's. 7M
- b) Distinguish DFA and NFA. 7M
2. a) Explain the procedure of minimization of FSM with example. 7M
- b) Distinguish between Moore and Mealy Finite state Machines with example. 7M
3. a) Obtain a NFA for the regular expression $(a + b)^* aa(a + b)^*$ 7M
- b) Construct a regular grammar for the given regular expression $(a + b)^* aa(aa + b)$ 7M
4. a) Construct FA recognizing the following grammar
 $A_0 \rightarrow aA_1$
 $A_1 \rightarrow bA_1 | bA_0 | a$ 7M
- b) Give the CFG for the language $W W^R | W \in (a, b)^+$ 7M
5. a) Describe pumping lemma? What are its applications? 4M
- b) Convert the given CFG to GNF (Griback normal form) where
 $V = \{S, A\}$ $T = \{0, 1\}$ and P is $P = \{S \rightarrow AA | 0, A \rightarrow SS | 1\}$ 10M
6. a) Obtain PDA to accept the language $L = \{a^n b^n | n \geq 1\}$ by final state. 8M
- b) Differentiate PDA by empty stack and final state by giving their definitions. 6M
7. a) Define Turing Machine. Design Turing machine that accept the language
 $L = \{a^n b^{n+1} | n > 0\}$ 10M
- b) Explain the properties of recursively enumerable languages. 4M
8. a) Show or explain that PCP is decidable for words over a one symbol alphabet. 7M
- b) Prove that the Halting Problem of TM is Undecidable. 7M

II B.Tech. II Semester Regular Examinations May 2015

Object Oriented Programming through JAVA*(Common to CSE & IT)***Max. Marks: 70****Time: 03 Hours**Answer *any five* questions

All Questions carry equal marks (14 Marks each)

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| 1. a) | Compare structured programming and object oriented programming | 5M |
| b) | Explain the OOP concepts in detail | 9M |
| 2. a) | Discuss constructor overloading with an example | 8M |
| b) | Illustrate the usage of this keyword | 6M |
| 3. | Explain in detail the process of creating, defining, importing and accessing a package with suitable examples | 14M |
| 4. a) | Enumerate the differences between checked and unchecked exceptions in Java? Explain. | 6M |
| b) | Describe inter-thread communication with a suitable example. | 8M |
| 5. a) | Write a Java program to illustrate TextEvent | 7M |
| b) | Write a Java program to draw a circle inside a rectangle | 7M |
| 6. a) | Explain applet life cycle methods with an example | 6M |
| b) | Discuss border and grid layout managers. | 8M |
| 7. a) | Illustrate the usage of swing buttons. | 7M |
| b) | Write an applet program to display student name and branch using JTable | 7M |
| 8. a) | What are two important TCP socket classes? Explain them. | 6M |
| b) | Define Inet address? Write a Java program that demonstrates the concept of InetAddress. | 8M |

Code : 1G141

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II B.Tech. II Semester Regular Examinations May 2015

Computer Organization
(Computer Science & Engineering)

Max. Marks: 70

Time: 03 Hours

Answer any five questions

All Questions carry equal marks (14 Marks each)

1. a) Write about floating point representation with examples. 7M
b) Explain about 4-bit shift register. 7M
2. a) Explain about shift and rotate instructions with examples. 7M
b) Discuss about program control transfer instructions with examples. 7M
3. a) Describe micro programmed control unit with block diagram. 8M
b) How address sequencing is performed in hardwired control unit. 6M
4. a) Draw the flow chart for floating point addition and subtraction. 7M
b) Multiply 17 X19 using booth's multiplication algorithm. 7M
5. Define cache memory and compare different mapping techniques 14M
6. a) Explain DMA controller in a computer system. 10M
b) What is IOP? Give its advantages. 4M
7. a) Describe briefly about arithmetic pipeline. 8M
b) Write short notes on array processors. 6M
8. a) Draw and explain centralized shared memory architecture. 7M
b) What is interprocessor arbitration? Explain serial bus arbitration. 7M

II B.Tech. II Semester Regular Examinations May 2015

Design and Analysis of Algorithms

(Common to CSE & IT)

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

Answer any five questions

All Questions carry equal marks (14 Marks each)

1. a) Write an algorithm for finding minimum element of an array, find best and worst case time complexities with appropriate order notations. 7M
- b) Solve the following recurrence relations.
 - i) $T(n) = 2T(n/2) + n \log n, T(1) = 1$
 - ii) $T(n) = 2T(n/3) + T(2n/3) + Cn$ 7M
2. a) Illustrate the merge sort algorithm with a numeric example. 7M
- b) Discuss Strassen's matrix multiplication as well as classical $O(n^2)$ one. Also make a comparison between these two methods. 7M
3. a) Write the control abstraction for greedy method and also list the advantages and disadvantages of greedy method. 7M
- b) Find an optimal solution to the knapsack problem with $n=7, m=15, (p_1, p_2, \dots, p_7) = (10, 8, 15, 7, 6, 18, 3)$ and $(w_1, w_2, \dots, w_7) = (7, 3, 5, 1, 4, 2, 6)$. 7M
4. a) With an example, explain construction of optimal binary search tree. 7M
- b) Explain the solution for travelling salesman problem using dynamic programming. 7M
5. a) Write and explain control abstraction for backtracking. 4M
- b) Describe how Eight Queen's problem can be solved using back tracking and also write an algorithm to implement the same. 10M
6. a) Write an algorithm for depth first search of a graph and explain with an example. 10M
- b) Give a note on bi-connected components. 4M
7. Explain the solution for knapsack problem using branch and bound techniques. 14M
8. a) How to prove a problem is NP complete? Explain with example. 7M
- b) Write short notes on NP hard problems. 7M

II B.Tech. II Semester Regular Examinations May 2015

Database Management Systems*(Common to CSE & IT)***Max. Marks: 70****Time: 03 Hours**Answer *any five* questions

All Questions carry equal marks (14 Marks each)

1. a) Define DBMS. List the database system applications 7M
 b) Explain the three tier architecture of DBMS 7M

2. Construct ER diagram for your college admission systems, consider all categories of admissions. List the entities, identify attributes, categorize the attributes, and identify relationships. Incorporate class hierarchies. Discuss assumptions made for this diagram. 14M

3. a) What is meant by logical database design? Explain with examples. 9M
 b) Can view be used as a security mechanism in DBMS? Discuss. 5M

4. Consider the following database schema to write queries in SQL.
 Sailors(sid, sname, age, rating)
 Boats(bid, bname, bcolor) 3M
 Reserves(sid, bid, day) 3M
 - (i) Find the sailors who have reserved at least two boats 3M
 - (ii) Find the names of the sailors who have reserved all red boats 4M
 - (iii) Find the youngest sailor for each rating level 4M
 - (iv) Find the total number of boats available with the organization 4M

5. a) Discuss the problems caused by redundancy. 8M
 b) Explain the role of functional dependencies in normalization. 6M

6. a) What is transaction? What are the goals for concurrent execution of transactions? 7M
 b) How to test the serializability of a schedule? Give illustrations. 7M

7. a) Explain lock based concurrency control, discuss two phase locking protocol with suitable schedules. 9M
 b) What is log? Give examples for log record. What is meant by log tail? 5M

8. a) Explain the following terms with respect to disk organization:
 Tracks, cylinder, sector, rotational delay, seek time. 6M
 b) Describe bulk loading process and insertion operation on B+tree. 8M
