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(21214) Roll No. .....

B.Tech. V Sem.

TU-87(N)

B.Tech. Examination, Dec - 2014

EC, CS, EI

Engineering & Managerial Economics

BT-501(N)

Time : Three Hours] *[Maximum Marks : 100*

Note: Attempt **all** questions. **All** questions carry equal marks.

1. Define economics. Differentiate between macro and micro economics. 20

OR

Explain the role of science, engineering and technology in economic development of a nation.

P.T.O.

2. What are the various types of demand? Discuss the factors that influence the demand for a commodity. 20

OR

What is the difference between movement along the demand curve and shift in demand.

3. Discuss various methods used for demand forecasting of a new product. 20

OR

What do you mean by supply? Discuss the factors effecting it and law of supply.

4. What are the functions of money? Discuss the evils of money. 20

OR

Discuss the causes behind inflation and the remedies needed to control it.

5. Attempt any **two** parts : $2 \times 10 = 20$

(a) Evolution of management thought

(b) Advantages and disadvantages of bureaucratic organization

(c) Jauhari window framework

(d) Concept of transactional analysis

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(21214) Roll No. .....

B.Tech. V Sem.

TU-95(N)

B.Tech. Examination, Dec. 2014

CS, IT

Operating Systems

BT-509 (N)

Time : Three Hours] *[Maximum Marks : 100*

Note : (i) Attempt any **five** questions.

(ii) **All** questions carry equal marks.

1. (a) Enumerate the basic functions of operating system in brief. 10

(b) Write short notes on following : 10

(1) Time sharing system.

(2) Real - time system.

2. Explain the microkernel approach to operating system design. Also enumerate its advantages and disadvantages. 20

P.T.O.

3. List five services provided by an operating system. Explain how each of them provides convenience to the users. Explain in which case it would be impossible for user level program to provide there services. 20

4. What is the purpose of system calls or application program interface (API). Enumerate five system calls used in process management or file management. 20

5. Define the following terms : 20

   (a) Dispatcher

   (b) Dispatch Latency

   (c) Scheduling

   (d) Swapping

   (e) Context switching.

6. Differentiate between user thread and kernel thread. What is thread cancellation? Explain its type. 20

7. Explain various thread models with their relative advantages and disadvantages. 20

8. Define a critical section problem and its solution by using semaphore. Use this approach to solve producer/ consumer problem. 20

9. (a) Explain with respect to IPC. 10

   (i) Synchronous and asynchronous communication.

   (ii) Need of buffering and its implementation.

   (b) Explain the terms : shell, kernel, thread, process. 10

10. What are the necessary condition to hold a deadlock in a system? Explain the Resource allocation graph algorithm to deal with the deadlock problem. What are the limitations of this approach. 20

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B.Tech. V Sem.

TU-96(N)

B.Tech. Examination, Dec. 2014

C.S., I.T. Branch

Design and Analysis of Algorithm

BT-510(N)

Time : Three Hours] *[Maximum Marks : 100*

Note: Attempt any **five** questions. **Each** questions carry equal marks.

1. (a) Prove that : $n^3 + 10^6 . n^2 = \Theta(n^3)$ 10

   (b) Let f(n) and g(n) be asymptotically non negative function. Using the basic definition of θ notation prove that max $(f(n),g(n) = \theta(f(n)+g(n))$ 10

2. (a) Show the steps in heap sort to arrange following data in non-decreasing order: 10

   5, 3, 17, 10, 84, 19, 6, 22, 9

P.T.O.

(b) Describe the average case and worst complexity of quick sort. 10

3. (a) Show that A red-black tree with n internal nodes has height at most 2 lg(n+1). 10

(b) Define red-black tree. Draw the RB tree of the following sequence: 10

5, 10, 15, 25, 20, 30

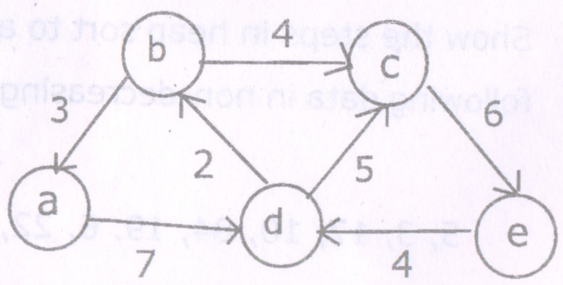
4. (a) What is Fibonacci heap? Illustrate the union process of two Fibonacci-heaps. 10

(b) Create a Fibonacci heap for the following list: 10

20, 10, 5, 30, 35, 55, 25, 45, 36, 32

5. (a) Write the Dijkstra's algorithm and its complexity. 10

(b) Solve the following instance of the single source shortest path problem with vertex a as source node. 10



6. (a) Compute the optimal sequence for the multiplication operation for the following matrices P_{4x10} Q_{10x3} R_{3x12} S_{12x20} T_{20x7}. 10

(b) Define minimum cost spanning tree. Write Kruskal's algorithm to generate a minimum cost spanning tree for any given weighted graph. 10

7. (a) Solve the all-pairs shortest path problem for the diagraph with the weight matrix: 10

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

(b) Write short notes on Branch and Bound. 10

8. (a) Explain Floyd Warshall algorithm wirth example. 10

(b) Write short notes on Backtracking. 10

9. (a) Define FFT. Write an Algorithm for FFT. Also discuss its time complexity. 10

(b) Write short note on "Approximation algorithm". 10

10. (a) What are string matching problems? Consider working module q=11, how many spurious hits does the Rabin-Karp matcher counter in the text T=3141592653589793 when looking for the pattern p=26? 10

(b) Define the classes P, NP and NPC. How are they related to each other? Is every decision problem in NP complete. 10

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(21214) Roll No. .....

B.Tech. V Sem.

TU-97(N)

B.Tech. Examination, Dec. 2014

CS/IT

Object Oriented Techniques

BT-511(N)

Time : Three Hours] *[Maximum Marks : 100*

Note: Attempt any **five** questions from the following:

1. (i) What do you means by polymorphism? Is this concept only applicable to object oriented systems? explain. 10

   (ii) Define object oriented modeling (OOM). Describe various steps involved in object oriented modeling process. 10

2. (i) Discuss in brief the following terms:

   (a) Generosity 5+5=10

   (b) Encapsulation

P.T.O.

(ii) Explain the term UML, also explain the Architecture of UML. 10

3. (i) What do you mean by sequence diagram? Explain various terms and symbols used in a sequence diagram. 10

(ii) What do you understand by Architectural modeling? Explain its various concepts and diagrams with suitable example. 10

4. (i) What do you mean by a Collaboration Diagram? How polymorphism is described using a collaboration diagram? Explain using an Examples. 10

(ii) Write a note on use case diagram and time diagram with suitable diagram and their utility in system design. 10

5. (i) Describe the various features of object oriented languages also compare any two object oriented languages. 10

(ii) Describe the following with example. 5+5=10

(a) Implementation of Inheritence.

(b) Modeling associates as a class.

6. (i) What do you means by optimization of design? Discuss the design optimization with suitable example using diagrams. 10

(ii) How do you map the object oriented concepts using non-object oriented languages? Explain with an Examples. 10

7. (i) Describe the main features of Java. Also discuss the features that makes Java different from C++. 10

(ii) Write a short note on the following with suitable example in Java. 5+5=10

(a) Session beans and entity beans.

(b) Enterprise Java Beans.

8. (i) Why Java is known as a platform independent language? Discuss the advantages and disadvantages of a platform independent languages. Also give various data types in Java. 10

(ii) What do you mean by multithreading? Does it have an impact on the performance of Java? Explain. 10

9. (i) What do you understand by ODBC? Why is it required? How is it Implemented using Java? Explain with an Example. 10

(ii) Discuss the term Applets. How Applets differ from the application. Explain with an example. 10

10. (i) Write short notes on the following: 2.5×4=10

(a) JAR file

(b) Packages

(c) Multithreading

(d) Interface

(ii) Discuss the difference between AWT and swing with suitable example. 10

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B.Tech V Sem.

TU-98(N)

B.Tech Examination, Dec. 2014

Computer Graphics

BT-512(N)

Time : Two Hours] *[Maximum Marks : 50*

Note: Attempt any **five** questions. **All** questions carry equal marks.

1. (a) Explain the term pixels, points & frame buffer

   (b) Write steps required to draw a line from point (x_1, Y_1) to (x_2, Y_2) using Bresenham's line drawing algorithm.

2. Consider a system of raster scan with a resolution of 1024×1024. What is the size of raster (in bytes) needed to store 4 bites per pixel? How much storage is required if 8 bites per pixel are to be stored.

P.T.O.

3. (a) What is the difference between Raster Scan CRT and vector scan CRT.?

   (b) Compare the advantage and disadvantage of CRT and LCD.

4. Write a 2×2 transformation matrix for each of the following scaling transformations:

   (a) The entire picture three times as large

   (b) The entire picture one third as large.

   (c) The direction four times as large, the y direction unchanged.

   (d) The y lengths reduced to two-third their original value, the x length unchanged.

   (e) The x direction reduced to three-forths the original value and Y direction increased by a factor of seven-fifths.

5. What is the difference between geometric and co-ordinate transformation and rotation, translation and scaling in both the cases.

6. What is midpoint subdivision algorithm? Explain.

7. (a) Differentiate window and view port.

   (b) Write short notes on 3D clipping and 3-D scaling.

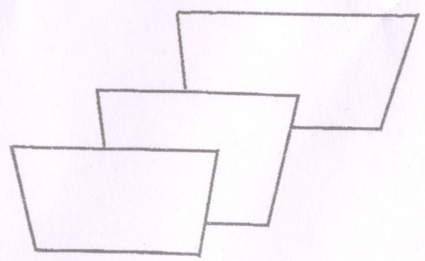
8. Explain the following

   (a) z buffer method

   (b) Hidden Line method

9. Define and compare Beizer curve & B-Spline curve with example.

10. Apply any hidden line/surface removal algorithm to the following objects. What would be the final object generated?



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(21214) Roll No. .....

B.Tech. V Sem.

TU-99(N)

B.Tech. Examination, Dec. 2014

C.S./I.T. Branch

Graph Theory

BT-513(N)

Time : Two Hours] *[Maximum Marks : 50*

Note: Attempt any **five** questions. **All** questions carry equal marks.

1. Define subgraph. Also find 5 subgraphs of a complete graph with four vertices. 10

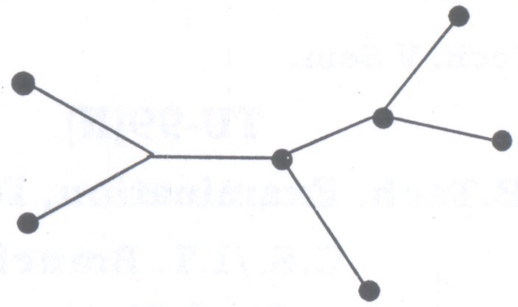
2. Define Hamiltonian and Euler graph. Also give an example of followings: 10

   (i) Hamiltonian and Eulerian both

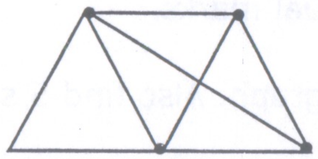
   (ii) Hamiltonian but not Eulerian

P.T.O.

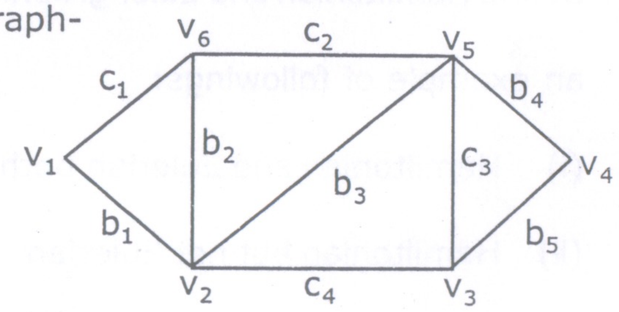
3. Define radius and diameter of a tree. Also find the radius and diameter for a given tree. 10



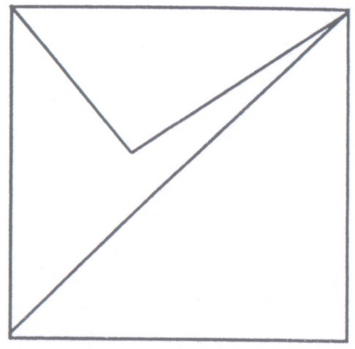
4. What is a spanning tree? Find all spanning trees for a given graph. 10



5. What is cut-set? Find all cut-set for a given graph- 10



6. What is a combinatorial dual? Also draw a combinatorial dual for a given graph- 10



7. What is a planer graph? Prove that a complete graph Km is a planer if $m \leq 4$ 10

8. Discuss various matrix representation of graph with suitable example. 10

9. Define chromatic number. Draw a regular graph with 15 vertices and 15 edges. Also find its chromatic number. 10

10. Define basis vector of a graph. Find the number of distinct basis possible in a cut-set subspace. 10

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(21214) Roll No. .....

B.Tech. V Sem.

TU-100(N)

B.Tech. Examination, Dec. 2014

C.S./I.T.

Internet Security and Cyber Laws

BT-514(N)

Time : Two Hours] *[Maximum Marks : 50*

Note: Attempt any **five** questions. **All** questions carry equal Marks.

1. Explain the Security issues in mobile computing environment? Discus Push Attack 10

2. Explain the historical role of information system. In what way do you think the industrial revolution impacted information system. 10

3. What do you understand by Laptop security? Discuss various techniques used for laptop security. 10

P.T.O.

4. Describe various key security issues in the E-commerce transaction. 10

5. What is biometric? How can a biometric be used for access control? Discuss the criteria for selection of biometric. 10

6. What is Intrusion Detection system? Describe the approaches used for Intrusion Detection in a system? 10

7. What do you mean by VPN? Discuss Various types of VPN and their uses. 10

8. What do you understand by Fire wall? explain. Also, write different types of Fire wall? 10

9. Write notes on following :- 10

   (a) Copyright law.

   (b) Legal issues in data mining security.

10. Discuss the Software life cycle ethical issues in detail. 10