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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

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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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**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.

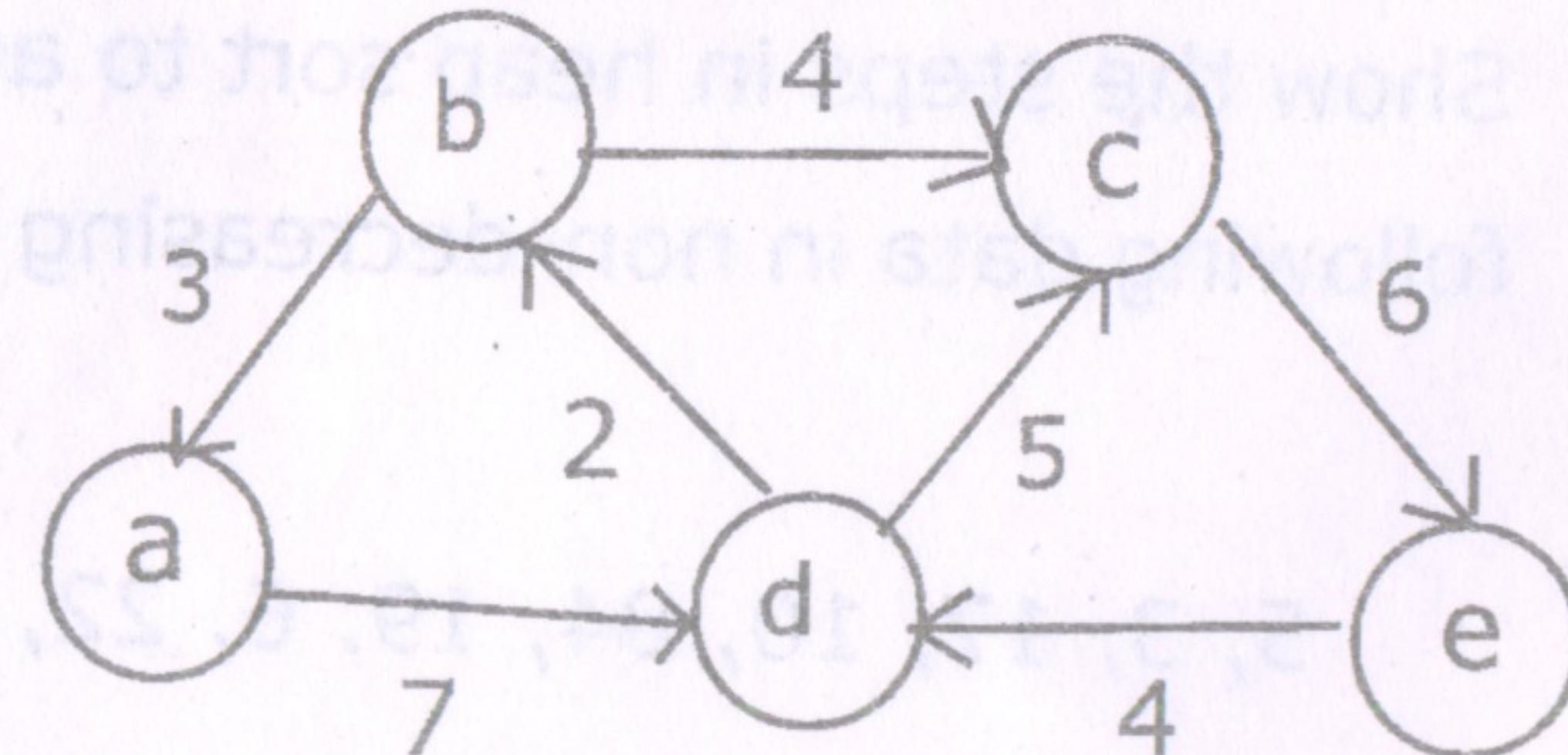
1. (a) Prove that :  $n^3 + 10^6 \cdot n^2 = \Theta(n^3)$  10  
(b) Let  $f(n)$  and  $g(n)$  be asymptotically non-negative function. Using the basic definition of  $\theta$  notation prove that  $\max(f(n), g(n)) = \theta(f(n) + g(n))$  10
2. (a) Show the steps in heap sort to arrange following data in non-decreasing order:

10

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

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- (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  $P_{4 \times 10}$   $Q_{10 \times 3}$   $R_{3 \times 12}$   $S_{12 \times 20}$   
 $T_{20 \times 7}$ . 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
- |          |          |          |          |          |
|----------|----------|----------|----------|----------|
| 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        |
- (b) Write short notes on Branch and Bound. 10

8. (a) Explain Floyd Warshall algorithm with 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.

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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

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- (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 Inheritance.
- (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:  
 $2.5 \times 4 = 10$
- (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. Examination, Dec. 2014

C.S./I.T. Branch

Graph Theory

BT-513(N)

Time : Two Hours ]

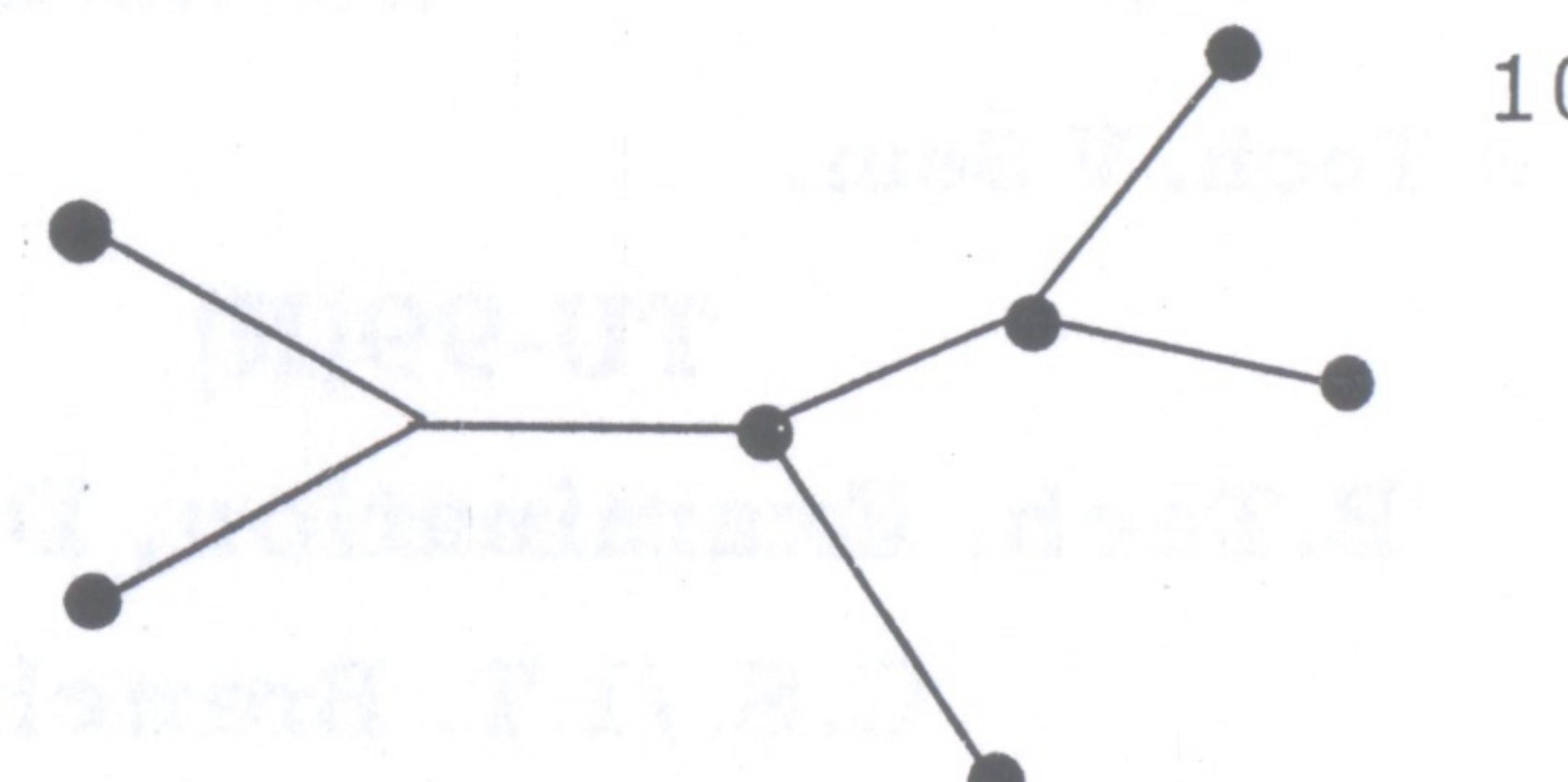
[Maximum Marks : 50

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

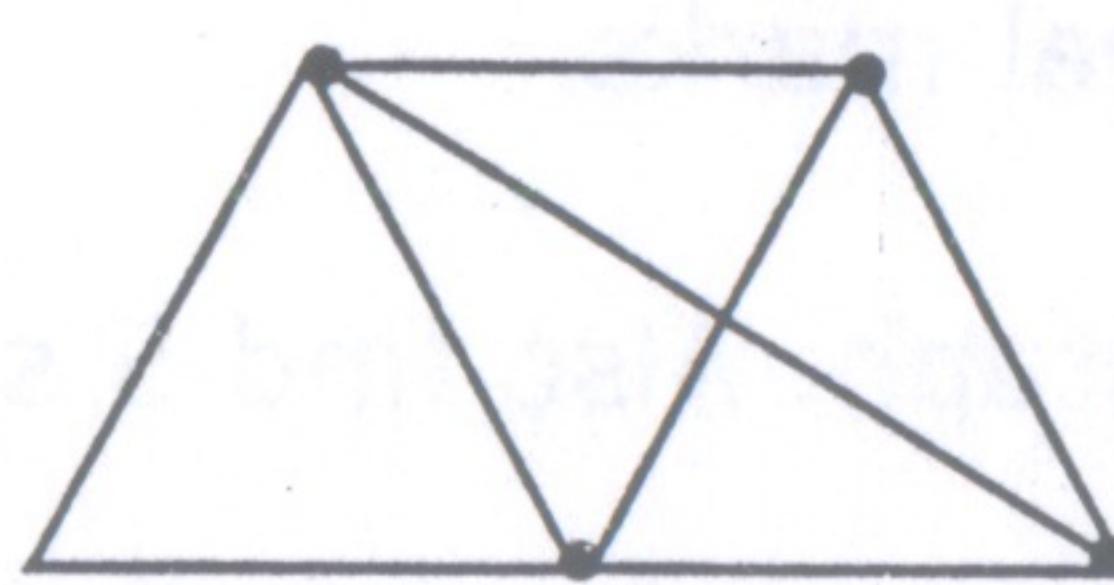
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3. Define radius and diameter of a tree. Also find the radius and diameter for a given tree.



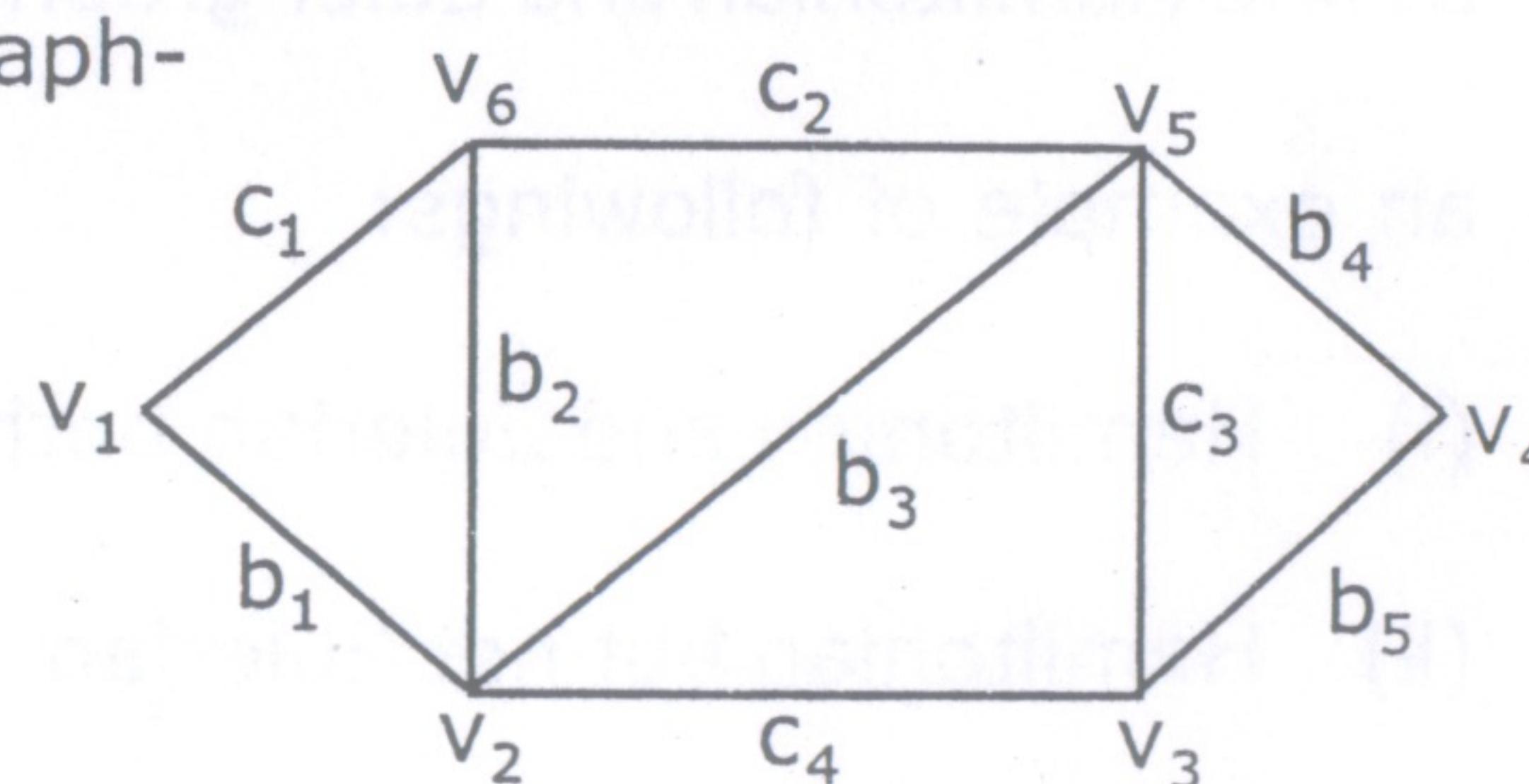
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4. What is a spanning tree? Find all spanning trees for a given graph.



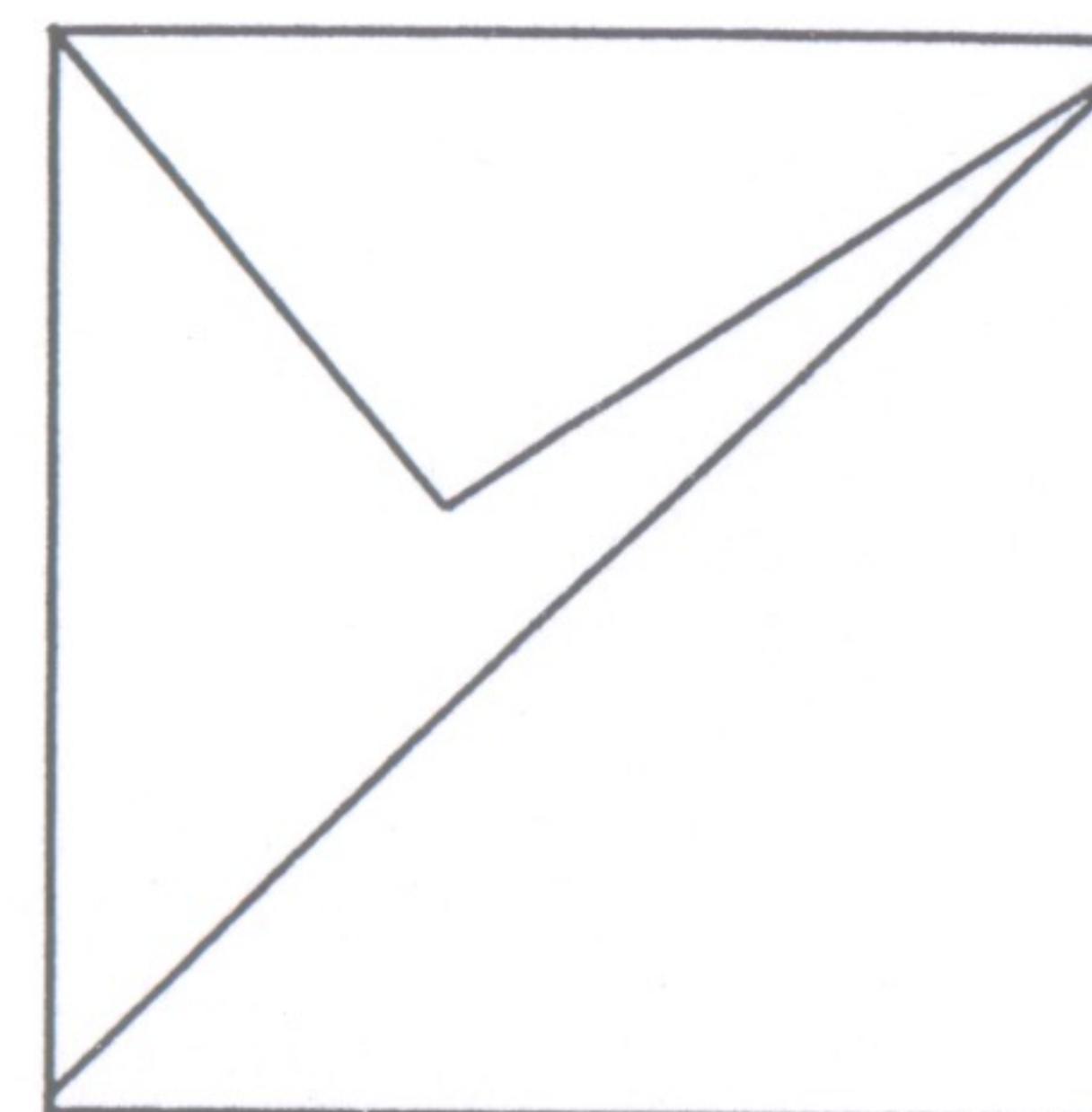
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5. What is cut-set? Find all cut-set for a given graph-



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≤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.

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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? Discuss 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

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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 :-
  - (a) Copyright law.
  - (b) Legal issues in data mining security.10
10. Discuss the Software life cycle ethical issues in detail. 10

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B.Tech. V Sem.

TU-101(N)

B.Tech. Examination, Dec. 2014

I.T.

E - Commerce

BT-515(N)

Time : Three Hours / Maximum Marks : 100

Note: (1) Attempt any **five** questions.

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

1. (a) Define e-commerce. What are different types of e-commerce model? Discuss with examples.  $10 \times 2 = 20$
- (b) Discuss the advantages and disadvantages of e-commerce.
2. (a) Define m-commerce. What are the relative advantages of m-commerce over

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- e-commerce? Also discuss the applications of m-commerce.  $10 \times 2 = 20$
- (b) Name and explain different type of ISDN Channels.
3. (a) Discuss the various methods that can be implemented for network security.  $10 \times 2 = 20$
- (b) Explain the following security threats for e-commerce:
- (i) Secrecy threats
  - (ii) Integrity threats
  - (iii) Necessity threats
  - (iv) Server threats
4. (a) What do you mean by cryptography, encryption and decryption? Discuss any two encryption techniques.  $10 \times 2 = 20$
- (b) What is a digital signature? What are the requirements that a digital signature must satisfy? Explain.
5. (a) What do you understand by digital token based electronic payment system? What are smart cards? Describe the working of smart card readers.  $10 \times 2 = 20$
- (b) Discuss the credit card based electronic payment system. Describe the risk involved in electronic payment system?
6. (a) Write a note on firewalls and its limitations.  $10 \times 2 = 20$
- (b) Describe in brief, the concept of WAP technology.
7. (a) What is virtual private Network? How it maintains the confidentiality of resources from the existing physical Network to a selected group of nodes within the same Network?  $10$

- (b) Write a short note on magnetic strip card. 10
8. Write short note on any **two**:  $10 \times 2 = 20$
- (i) EDI application in business
  - (ii) Network security
  - (iii) Frame relay
  - (iv) Online banking

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