डा बी आर अम्बेडकर राष्ट्रीय प्रौद्योगिकी संस्थान,
जालन्धर

Dr B R AMBEDKAR NATIONAL INSTITUTE OF TECHNOLOGY, JALANDHAR

DEPARTMENT OF MATHEMATICS

B. TECH. FIFTH SEMESTER

MINOR-I (11.09.18)

MAX-206, NUMERICAL METHODS

Time Allowed: 1 Hr **MM-20**

This Question Paper Consists of 5 Questions and 1 Printed Page.

Note: Attempt all Questions. All Questions Carry Equal Marks.

1. Define order of convergence. Prove that the Regula-Falsi method is linear order convergent.
2. Using Lin-Bairstow's method, obtain the quadratic factor of the equation $x^4 - 3x^3 - 4x^2 - 2x + 8 = 0$ with $p_0 = 1.5, q_0 = 1.5$ (perform one iteration correct to three decimals).
3. Find the fifth root of 3 correct to five decimals using Newton-Raphson method.
4. Solve the following system of equation by Gauss-Seidal method:

   $10x + y + z = 12;\ 2x + 10y + z = 13;\ 2x + 2y + 10z = 14$

   correct to three decimals.
5. Apply Crout's method to solve the equations:

   $3x + 2y + 7z = 4;\ 2x + 3y + z = 5;\ 3x + 4y + z = 7.$

DR B R AMBEDKAR NATIONAL INSTITUTE OF TECHNOLOGY
JALANDHAR
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
B. TECH CSE, FIFTH SEMESTER
CLASS TEST - I (Sept 12, 2018)
CSX-331 Advanced Programming Concepts in Java

Duration: 1 Hr **MM: 20**

This Question Paper Consists of 7 Questions and 2 Pages
Note: Attempt all Questions. Be brief and to the point in writing answers

1. Give the error/output of the following programming statements:

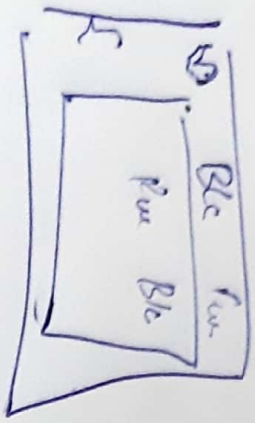
a)
```
public static void main(String[] args){
        byte x = 12;
        byte y = 13;
        byte result = x + y;
        System.out.println(result);
}
```

b)
```
public static void main(String[] args){
        final int a = 1, b = 5;for (int i = 0; a < b; i++) {
            System.out.print("Hello ");
            a++;
        }
        System.out.print("Hi");
}
```

c)
```
class Helper{
        private int data;
        private Helper() {
          data = 5;
        }
}
public class Test {
        public static void main(String[] args)
        {
          Helper help = new Helper();
          System.out.println(help.data);
        }
}
```

d)
```
class Test {
        public final int a;
}
class Example {
        public static void main(String args[]){
        Test obj = new Test();
        System.out.println(obj.a);
        }
}
```

e)
```
public static void main(String args[]){
        String str1 = new String("Hello World");
        String str2 = new String("Hello World");
        if (str1 == str2)
            System.out.println("Hello England");
        else
            System.out.println("Hello India");
}
```



f)
```
class Base {
        public void foo() {}
}
class Derived extends Base {
        private void foo() {}
}
public class Main {
        public static void main(String args[]) {
            Derived d = new Derived();
        }
}
```

(0.5*6 =3)

2. a. How is Git different from GitHub? Explain briefly. (3)
   b. What is the use of *classpath* in Java? (1)

3. Why is Java known as a robust programming language? Describe briefly. (2)

4. How does Java 8 avoid/handle diamond inheritance problem? Explain with examples. (3)

5. What is limitation form of inheritance? List at least four examples for the same. (3)

6. Compare the following with the help of appropriate examples: (2)
   a. default method and abstract method
   b. universal object and immutable object

7. How do Java and C++ differ in supporting call by value and call by reference? Describe with examples. (3)

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DEPARTMENT OF COMPUTER SCIENCE ENGINEERING
B.Tech 5th SEMESTER
Minor I Examination (AY 2017-18 Semester 1)
CSX-301 Computer Networks

Duration: 1 Hr. **Max. Marks: 20**

Notes: Attempt all the Questions.

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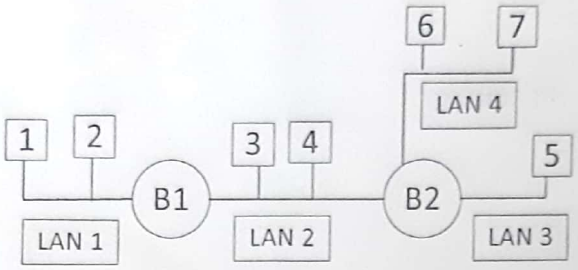
1. a. Consider the network below, which shows four 10 Mbps LANs connected by two bridges, labeled B1 and B2. Assume all users (labeled 1 through 7) are very chatty and equally chatty. [2]



I. What is the effective data rate seen by user 4?
II. What is the effective data rate seen by user 5?
III. What is the effective data rate seen by user 6?
IV. What is the effective data rate seen by user 6 ~~if the two bridges are~~ without using bridges

b. Five protocol layers. 100 byte message. 10 bytes header added at each layer (including 1st and 5th). What is the efficiency? [2]

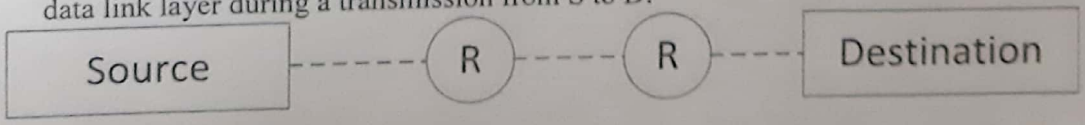
2. a. Suppose an application entity sends an m-byte message to its peer entity. The layers in the TCP/IP model add a total of 58 bytes of overhead (header and trailer). What percentage of the total layer bits corresponds to the application message if m=100 bytes. [3]

b. What are the advantages of dividing an Ethernet LAN with a bridge? [1]

3. a. A network with CSMA/CD protocol in the MAC layer is running at 1 Gbps over a 1 km cable with no repeaters. The signal speed in the cable is 2×10^8 m/sec. The minimum frame size for this network should be [2]

b. Explain CSMA/CD and draw the flow diagram? [2]

4. a. Assume that source S and destination D are connected through two intermediate routers labeled R. Determine how many times each packet has to visit the network layer and the data link layer during a transmission from S to D. [1]



b. Asynchronous Transfer Mode (ATM) is a virtual-circuit (VC) based technology in which data is transmitted in cells. Explain the terms cell and virtual-circuit. Explain how VCs are identified within an ATM network and the constraints that apply when identifiers are allocated. [3]

5. a. In classless addressing, we know the first and the last address in the block. Can we find the prefix length? If the answer is yes, show the process and an example. [2]

b. In a TDM medium access control bus LAN, each station is assigned one time slot per cycle for transmission. Assume that the length of each time slot is the time to transmit 100 bits plus the end-to-end propagation delay. Assume a propagation speed of 2×10^8 m/sec. The length of the LAN is 1 km with a bandwidth of 10 Mbps. The maximum number of stations that can be allowed in the LAN so that the throughput of each station can be 2/3 Mbps is

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DEPARTMENT OF COMPUTER SCIENCE ENGINEERING
B.Tech 5th SEMESTER
Minor II Examination (AY 2018-19 Semester 1)
CSX-301 Computer Networks

Duration: 1 Hr. **Max. Marks: 20**

Notes: Attempt all the Questions.

1.	a)	You have sub-netted your class C network 200.138.1.0 with a subnet mask of 255.255.255.252. Please list the following: number of networks, number of hosts per network, the full range of the first three networks, and the usable address range from those first three networks. Additionally, identify the broadcast addresses for each network.	[4]
	b)	Compare and contrast the IPv4 and IPv6? (Min. 5 points)	[4]
2.	a)	With respect to network management, what is SNMP? What is a SNMP trap receiver?	[2]
	b)	You have the following address: 192.16.5.133/29 How many total bits are being used to identify the network, and how many total bits identify the host?	[2]
3.		Briefly explain about Telnet?	[2]
4.		Discuss at least four differences between TFTP and FTP?	[2]
5.	a)	Assume that Bob uses an e-mail client (mail reader) such as Outlook to send an e-mail to Alice who uses a Web-based e-mail account (such as Hotmail). The IP address of Alice's mail server is initially unknown to Bob's mail server. List all the transport and application layer protocols that are involved from the time when Bob sends the e-mail to the time when Alice reads it. Clearly indicate in which part of the transfer of the e-mail these transport/application layer protocols are used	[2]
	b)	Explain DNS? How can iterated DNS queries improve the overall performance?	[2]

Dr B R AMBEDKAR NATIONAL INSTITUTE OF TECHNOLOGY, JALANDHAR

DEPARTMENT OF COMPUTER SCIENCE ENGINEERING

Minor I (AY 2018-19 Semester 1)

CSX-303 Software Engineering

Duration: 1 Hr. **Max. Marks: 20**

Notes: All questions are compulsory. The paper has total four questions on two printed pages. Despite the correctness of an answer, the quality of the answer is an important evaluation criterion. Overwritten answers will not be entertained.

1. [1M*2=2M] Answer the following questions:
   (a) What do you mean by component testing? How it differs from the system testing. Explicitly highlight the difference. Vague answer will be awarded zero mark.
   (b) Consider a NITJ accounting system that replaces an existing system, suggest the most appropriate generic software process model that might you use for the development of the software.

2. [2M*4=8M] Answer the following questions:
   (a) Extreme programming represents requirements in the form of user stories, with each story written on a card. Discuss two advantages and two disadvantages of this approach to requirements specification.
   (b) With the help of a suitable diagram, explain the essential distinctions between plan-driven and agile approaches to system specification.
   (c) What do you mean by pair-programming? How does it support the principle of refactoring to improve software structure?
   (d) How do the factors such as system type, lifetime, scale, regulation related to the system being developed influence the choice of plan-driven or agile based development? Explain in detail.

3. [1M*2=2M] Differentiate the following terms. Vague justification will be awarded with Zero marks:
   (a) Scope and Feasibility
   (b) Change Anticipation and Change Tolerance

4. [2M*4=8M] Answer the following questions:
   (a) With the help of a suitable diagram, write short note on the spiral model.
   (b) Identify and explain four major differences between the exploratory style and modern software development practices.
   (c) Identify and explain the four factors contributing to the present software crisis.
   (d) Explain the essential stages/phases through which a software product undergoes during its lifetime.

--End--

डॉ. बी. आर. अम्बेडकर राष्ट्रीय प्रौद्योगिकी संस्थान, जालन्धर

Dr B R AMBEDKAR NATIONAL INSTITUTE OF TECHNOLOGY, JALANDHAR

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

B.Tech FIFTH SEMESTER (CSE& ECE)

Class Test- I (11.09.18)

CSX-305 OPERATING SYSTEMS

Time Allowed: 1 hr MM-20

This Question Paper Consists of 7 Questions and 1 Page

Note: Attempt all Questions. Be brief and to the points in writing answers.

Q.1 A computer has a cache, main memory, and a disk used for virtual memory. If a referenced word is in the cache , 15 ns are required to access to it. If it is in the main memory but not in cache, 45 ns are needed to load it into the cache (including the time to check cache), and then the reference is started again. If the word is not in the main memory , 10 ms are required to fetch the word from disk, followed by 45 ns to copy it in cache, and then reference is started again. The cache hit ratio is 0.8 and the main-memory hit ratio is 0.7. What is the average time in ns required to access a referenced word in this system ? (2)

Q.2 Suppose a computer has A I/O devices and B processors. Further suppose that main memory is only large enough to hold C processes at any given time. You can assume that A<B<C, if needed.

a. What is the maximum number of processes that can be in each of the Ready, Running, Blocked, Ready-suspend, and Block-suspend state at one time.
b. What is the minimum number of processes again in each of the above states as in part a. (2)

Q.3

a. What is an address space switch? What is a context switch? How are they different from each other?
b. Why do application developers use API calls in the library instead of making system calls directly? (3)

Q.4

a. Suppose you have a multithreaded application process. One of those threads executes a fork to create a new process? Does the new process is an exact replica of the parent process and have the same number of threads?
b. In a single CPU system at most one process is at the running state. In such systems, why can we not use a single common kernel stack for all processes? Why do different processes have their own kernel stacks?
c. What is an exception? In what way is it similar to an interrupt? In what way are they different from each other? (4)

Q.5 Suppose five CPU-bound processes P1, P2, P3, P4, and P5 arrive in a computer system in the said order at time points 0, 5, 15, 20, and 25, respectively. Their execution requirements are 12, 10, 15, 14, and 16 time units, respectively. Draw the Gantt chart and compute the turnaround time for each process and their average turnaround time for FCFS, SJF, and SRTN scheduling disciplines. You may assume negligible context switching overhead. (6)

Q.6 Suppose the syntax "P || Q" means processes P and Q are concurrent processes. Assume that only read and write operations on shared variables are atomic. We have the following three processes (A, B, and C) that share a single integer variable x, as follows. The variable is initialized to 0. When "A || B || C", what are the possible values for x after A, B, and C have terminated?

```
int x = 0;
A            B            C
x = 2 x;     x = 2 x;     x = 1;
x = 2 x;     x = 3 x;     x = x + 1;
```

(3)