

DEPARTMENT OF TECHNOLOGY PROMOTION AND COORDINATION  
UNIVERSITY OF COMPUTER STUDIES  
THIRD YEAR ( B.C.Sc. & B.C.Tech. )  
FIRST SEMESTER EXAMINATION

MARCH, 2016

ENGLISH

ZONE IV

Answer All Questions.

Time Allowed: 3 Hours

**L Read the passages and answer the following questions. ( 20 Marks )**

1. Internet security experts have long known that simple passwords do not fully defend online bank accounts from determined fraud artists. Now a study suggests that a popular secondary security measure provides little additional protection.

2. The study, produced jointly by researchers at Harvard and the Massachusetts Institute of Technology, looked at a technology called site-authentication images. In the system, currently used by financial institutions like Bank of America, ING Direct and Vanguard, online banking customers are asked to select an image, like a dog or chess piece, that they will see every time they log in to their account.

3. The idea is that if customers do not see their image, they could be at a fraudulent Web site, dummed up to look like their bank's, and should not enter their passwords.

4. The Harvard and M.I.T. researchers tested that hypothesis. In October, they brought 67 Bank of America customers in the Boston area into a controlled environment and asked them to conduct routine online banking activities, like looking up account balances. But the researchers had secretly withdrawn the images.

5. Of 60 participants who got that far into the study and whose results could be verified, 58 entered passwords anyway. Only two chose not to log on, citing security concerns.

6. "The premise is that site-authentication images increase security because customers will not enter their passwords if they do not see the correct image," said Stuart Schechter, a computer scientist at the M.I.T. Lincoln Laboratory. "From the study we learned that the premise is right less than 10 percent of the time."

7. He added: "If a bank were to ask me if they should deploy it, I would say no, wait for something better," he said.

8. The system has some high-power supporters in the financial services world, many trying to comply with new online banking regulations. In 2005, the Federal Financial Institutions Examination Council, an interagency body of federal banking regulators, determined that passwords alone did not effectively thwart intruders like identity thieves.

9. It issued new guidelines, asking financial Web sites to find better ways for banks and customers to identify each other online. January 2007 was set as the compliance date, though the council has yet to begin enforcing the mandate.

10. Banks immediately knew what they did not want to do: ask customers to download new security software, or carry around hardware devices that feed them PIN codes they can use to authenticate their identities. Both solutions would add an extra layer of security but, the banks believed, detract from the convenience of online banking.

11. The image system, introduced in 2004 by a Silicon Valley firm called PassMark Security, offered banks a pain-free addition to their security arsenals. Bank of America was among the first to adopt it, in June 2005, under the brand name SiteKey, asking its 21 million Web site users to select an image from thousands of possible choices and to choose a unique phrase they would see every time they logged in.

12. SiteKey "gives our customers a fairly easy way of authenticating the Bank of America Web site," said Sanjay Gupta, an e-commerce executive at the bank. "It was very well received."

13. The Harvard and M.I.T. researchers, however, found that most online banking customers did not notice when the SiteKey images were absent. When respondents logged in during the study, they saw a site maintenance message on the screen where their image and phrases should have been pictured. The error message also had a conspicuous spelling mistake, further suggesting something fishy.

14. Mr. Gupta of Bank of America said he was not troubled by the results of the survey, and stressed that SiteKey had made the bank's Web site more secure. He also said that the system was only a single part of a larger security blanket. "It's not like we're betting the bank on SiteKey," he said.

15. Most financial institutions, like Bank of America, have other ways to tell if a customer is legitimate. The banks often drop a small software program, called a cookie, onto a user's PC to associate the computer with the customer. If the customer logs in from another machine, he may be asked personal questions, like his mother's maiden name.

16. Rachna Dhamija, the Harvard researcher who conducted the study, points out that swindlers can use their dummy Web sites to ask customers those personal questions. She said that the study demonstrated that site-authentication images are fundamentally flawed and, worse, might actually detract from security by giving users a false sense of confidence.

17. RSA Security, the company that bought PassMark last year, "has a lot of great data on how SiteKey instills trust and confidence and good feelings in their customers," Ms. Dhamija said. "Ultimately that might be why they adopted it. Sometimes the appearance of security is more important than security itself."

### Questions 1-5

Do the following statements agree with the information given in the passage? Write

**TRUE** if the statement agrees with the writer

**FALSE** if the statement does not agree with the writer

**NOT GIVEN** if there is no information about this in the passage

- 1 According to internet security experts, secondary security measures provide little additional protection against fraud.
- 2 In the Harvard and MIT study, two subjects didn't log on without seeing the correct pictures.
- 3 According to Schechter, more than 90% of online banking customers studied logged on without seeing the right pictures.
- 4 The image system is the only security measure that the banks mentioned in the passage have currently.
- 5 Bank of America is the first bank that adopted the image system.

### Questions 6-10

Answer the following questions or complete the following sentences by choosing **NO MORE THAN THREE WORDS** for each answer.

- 6 What is ING Direct and Vanguard?
- 7 What might online banking customers be cheated to give at a fraudulent Web site?
- 8 What may stop online banking customers from using new verification methods?
- 9 The key to online banking security is to verify the \_\_\_\_\_ of customers.

- 10 Where is PassMark Security located?

11 Fill in the spaces with the words below. (10 Marks)

As a result                    the                    of                    or                    as  
According to                    that                    and                    its                    it

A new study conducted for the World Bank by Murdoch University's Institute for Science and Technology Policy (ISTP) has demonstrated 1..... public transport is more efficient than cars. The study compared the proportion 2..... wealth poured into transport by thirty-seven cities around the world. This included both the public and private costs of building, maintaining 3..... using a transport system.

The study found that 4..... Western Australian city of Perth is a good example of a city with minimal public transport. 5....., 17% of 6..... wealth went into transport costs. Some European and Asian cities, on the other hand, spent as little as 5%. Professor Peter Newman, ISTP Director, pointed out that these more efficient cities were able to put the difference into attracting industry and jobs 7..... creating a better place to live.

8..... Professor Newman, the larger Australian city of Melbourne is a rather unusual city in this sort of comparison. He describes 9..... as two cities: 'A European city surrounded by a car-dependent one'. Melbourne's large tram network has made car use in the inner city much lower, but the outer suburbs have the same car-based structure 10..... most other Australian cities.

**III. (A) Each sentence contains a mistake. Find and write the correct form using *Present simple and present continuous tense*. ( 10 Marks )**

1. Hello Stacey. I write to you to say thanks for your letter
2. That's the best programme on TV and I watching it every night.
3. We're going to that cinema because it shows a science-fiction film.
4. The weather here is lovely and we stay in a hotel with a big swimming pool.
5. In my country people don't wearing clothes like those at weddings
6. I leave this note to let you know which cinema we are going to
7. Every day at school I'm wearing jeans and a black or orange shirt.
8. The owners look for someone to work in the shop during the summer.
9. He comes from London and is speaking English very well.
10. Dear Richard, I send you this email to thank you for your present.

**III. (B) Fill in the gaps in this conversation with the correct form of used to and a verb in the list. ( 7 Marks )**

*be      not go      have      not have      live      know      travel      walk*

Mina: There's Dahlia in her dad's sports car. Where do they get their money from?

Sara: Don't you know? Her family won the lottery.

Mina: Wow!

Sara: I knew her before that, though. Her family 1 used to live in our road. She 2..... to school like all the other children in those days.

Mina: 3..... ( you ) them very well?

Sara: Oh, yes. They 4 ..... friendly people. And her father grew all the vegetables because they 5 ..... much money.

Mina: They go on holidays a lot now. 6..... (they) abroad then?

Sara: No, they 7 ..... away at all.

Mina: They're very lucky now.

Sara: Mmm, but they 8..... more friends.

**III. (C) Put the verbs in brackets into the *simple present perfect* , *past* or the *past continuous tense*. ( 13 Marks )**

1. He (watch) TV when the phone rang. Very unwillingly he (turn) down the sound and (go) to answer it.
2. The boys (play) cards when they (hear) their father's step. They immediately (hide) the cards and (take) out their lesson books.
3. Do you know that lady who just (leave) the shop?  
Yes, that is Miss Thrift. Is she a customer of yours ?  
Not exactly. She (be) in here several times but she never (buy) anything.
4. Where you (be)?  
I (be) to the dentist. -  
He (take) out your bad tooth ?

IV.(A) The table below gives information about changes in modes of travel in England between 1985 and 2000.

Summarise the information by selecting and reporting the main features, and make comparison where relevant. ( 7 Marks )

*Average distance in miles travelled per year, by mode of travel*

	1985	2000
Walking	255	237
Bicycle	51	41
Car	3199	4806
Local bus	429	274
Long distance bus	54	124
Train	289	366
Taxi	13	42
Other	450	585
All modes	4740	6,475

IV.(B) Describe someone in your family who you like. ( 7 Marks )  
You should write:

- how this person is related to you
- what this person looks like
- what kind of person he/she is and explain why you like this person.

IV.(C) 1.Which instrument do you like listening to most? (Why?) ( 2 Marks )

2.Do you think children should learn to play a musical instrument at school?[Why/Why not] ( 2 Marks )

3.What do most people do to keep fit in your country? ( 2 Marks )

IV. Write about the following topic: ( 20 Marks )

International entertainers, including sports personalities, often get paid million of dollars in one year.

In your view, with widespread poverty in the world, are these huge earnings justified? Give reasons for your answer and include any relevant from your own knowledge or experience.

**Department of Technology Promotion and Coordination**

**University of Computer Studies**

**Third Year (B.C.Sc./B.C.Tech.)**

**First Semester Examination**

**Computer Organization (CST-301)**

**March, 2016**

**Zone IV**

**Answer all questions**

**Time allowed: 3 hours**

- (a) State whether the following statements are TRUE or FALSE. (5 marks)**
- (i) Level 0 to level 3 from multilevel machine, language designed to be used by systems programmers.
  - (ii) The outputs of the latch are uniquely determined by the current inputs.
  - (iii) User mode is intended to run application program and does not permit certain sensitive instructions to be executed.
  - (iv) Registers visible at the microarchitecture level are always visible at the ISA level.
  - (v) The SP register changes during the execution of the method as operands are pushed onto the stack or popped from it.
- (b) Choose correct or the best alternative in the following: (5 marks)**
- (i) A computer' primitive instructions form a language in which it is possible for people to communicate with the computer. Such a language is called a \_\_\_\_\_  
A. assembly language      B. high-level language  
C. machine language      D. java language
  - (ii) \_\_\_\_\_ is used to hold the current microinstruction, whose bits drive the control signals that operate the data path.  
A. MIR      B. MPC      C. MAR      D. MBR
  - (iii) In the Mic-1, the size of the control store is \_\_\_\_\_.  
A. 512 bit      B. 36 bit      C. 18 Kbit      D. none of these
  - (iv) Most slaves are connected to the bus by a \_\_\_\_\_.  
A. bus driver      B. bus receiver      C. bus transceiver      D. wired-OR
  - (v) An \_\_\_\_\_ has two inputs, *S* for Setting the latch and *R* for Resetting it.  
A. clocked SR latch      B. SR latch      C. clock D latch      D. D flip-flop
- (c) Match each of items in List-1 with the most appropriate one in List-2: (5 marks)**
- List-1**
- (i) A register is used to save the address of the opcode for a branch instruction
  - (ii) A register points to the highest word of the local variable for the active procedure
  - (iii) A register points to the base of the local variable for the active procedure
  - (iv) A register contains the value of the memory location pointed to by SP
  - (v) Determines how the next microinstruction is selected
- List-2**
- A. LV
  - B. TOS
  - C. JAM
  - D. SP
  - E. OPC
  - F. Addr

2. Define ANY FOUR of the following: (8 marks)

- (i) Virtual Machine (iv) Bus skew  
(ii) Microprogram (v) Local variable frame  
(iii) System bus

3. Describe the differences between ANY THREE of the following: (12 marks)

- (i) Differences between translation and interpretation  
(ii) Differences between master bus and slave bus.  
(iii) Differences between immediate addressing and direct addressing  
(iv) Differences between MAR and PC

4. Briefly explain two types of bus arbitration mechanisms. (7 marks)

5. (a) (i) Draw the circuit diagram for the new 1 bit ALU to compute any one of the four functions -namely A AND B, A OR B, A XOR B, or A add B depending on whether the function select input lines. (7 marks)

(ii) How to organize the 8Mbits memory chip using  $1024K \times 8$  bits to construct  $n \times n$  matrices method? (3 marks)

(iii) Consider the timing diagram of a synchronous bus. We will use the 40 MHz clock. It takes 1 nsec for a signal to change. Reading a word from memory takes 46.5 nsec from the time address appears until it must produce the data. The address output delay is 11 nsec. How much the data setup time? (3 marks)

(b) (i) Construct an 8-bit storage register from single-bit flip flops. How many signals (including power and ground) would be required the 8-bit register to have? (4 marks)

(ii) Draw the logic diagram for  $4 \times 2$  memory organization. Why does memory block require fewer signals unlike register? (9 marks)

6. (a) Write the detail of MIR for the following microcode to implement the IJVM instructions. (8 marks)

Label	Operations
Main1	PC = PC + 1; goto (MBR)
istore 1	H=LV
istore 2	MAR = MBRU + H
istore 3	MDR = TOS; wr
iflt 1	MAR = SP = SP - 1; rd
iflt 2	OPC = TOS
iflt3	TOS = MDR

(b)(i) Convert the following Java code to IJVM instruction: (5 marks)

```
r2=r1;  
r3=r2-r1;  
while (r3<>0)  
{ r2=r2+r1;  
r3=r3-1;  
}
```

(ii) Describe the three techniques for reducing the execution path length. (3 marks)

(a) Compare 0-, 1-, 2-, and 3-address machines by writing programs to compute

$$X = (A + B / D) / (Y * Z)$$

for each of the four machines. The instructions available for use are as follows: (8 marks)

0 Address	1-Address	2-Address	3-Address
PUSH M	LOAD M	MOV (X = Y)	MOV (X = Y)
POP M	STORE M	ADD (X = X+Y)	ADD (X = Y+Z)
ADD	ADD M	SUB(X = X-Y)	SUB (X = Y-Z)
SUB	SUB M	MUL (X = X*Y)	MUL (X = Y*Z)
MUL	MUL M	DIV (X = X/Y)	DIV (X = Y/Z)
DIV	DIV M		

(b)(i) Given the memory values below and a one-address machine with an accumulator, what values do the following instructions load into the accumulator? (3 marks)

word 30 contains 50

word 40 contains 60

word 50 contains 70

word 60 contains 80

- a. LOAD IMMEDIATE 30
- b. LOAD DIRECT 30
- c. LOAD INDIRECT 30
- d. LOAD IMMEDIATE 40
- e. LOAD DIRECT 40
- f. LOAD INDIRECT 40

(ii) Which of the following pairs of reverse Polish notation formulas are mathematically equivalent? (3 marks)

- a. AB + C + and ABC++
- b. AB + C - and ABC+-
- c. AB - C - and ABC--

(iii) Convert the following reverse Polish notation formulas to infix. (2 marks)

- a. AB/CD/+
- b. AB - C + D \*

**Department of Technology Promotion and Coordination**  
**University of Computer Studies**  
**B.C.Sc. /B.C.Tech.(Third Year)**  
**First Semester Examination**  
**Mathematics of Computing III (CST-302)**  
**March, 2016**  
**Zone IV**

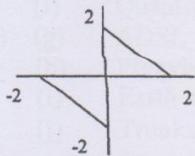
Answer All Questions.

Time allowed: 3 hours

**1.** (a) Find the Fourier series of the given function  $f(x)$ , which is assumed to have the period  $2\pi$ . Show

the details of your work.  $f(x) = \begin{cases} x & \text{if } -\pi < x < 0 \\ \pi - x & \text{if } 0 < x < \pi \end{cases}$  (10-marks)

(b) Is the function from the following figure even or odd or neither even nor odd? Why? Find its Fourier series by showing the details of your work. (10-marks)



**2.** (a) (i) Show that the integral represents the indicated function.

$$\int_0^\infty \frac{\sin \pi \omega \sin x \omega}{1-\omega^2} d\omega = \begin{cases} \frac{\pi}{2} \sin x & \text{if } 0 \leq x \leq \pi \\ 0 & \text{if } x > \pi \end{cases} \quad (5\text{-marks})$$

(ii) Find  $\hat{f}_s(\omega)$  for  $f(x) = x$  if  $0 < x < a$ ,  $f(x) = 0$  if  $x > a$ . (5-marks)

(b) Find the graph all roots in the complex plane  $\sqrt[3]{1+i}$ . (10-marks)

(a) Show that  $u = e^{\pi x} \cos \pi y$  is harmonic and find a harmonic conjugate function  $v$  of  $u$  and also find  $f(z)$ . (10-marks)

(b) Show that (i)  $\cos z = \cos x \cosh y - i \sin x \sinh y$  (ii)  $|\cos z|^2 = \cos^2 x + \sinh^2 y$  (10-marks)

(a) Find the mean, standard deviation, medium and interquartile range for the data, the roll-call of 20 students. (7-marks)

74.9	74.7	75.1	75.2	75.9	75.1	74.9	75.1	74.9	75.1
75.1	74.9	74.8	75.1	74.7	75.2	74.8	75.1	75.2	74.9

(b) What gives the greater probability of hitting at least once: (i) hitting with probability  $1/2$  and firing 1 shot, (ii) hitting with probability  $1/4$  and firing 2 shots, (iii) hitting with probability  $1/8$  and firing 4 shots? (13-marks)

(i) In how many different ways can 6 people be seated at a round table?

(ii) Let  $X$  be the thickness of washers. Assumed that  $X$  has the density  $f(x) = kx$  if  $0.9 < x < 1.1$  and 0 otherwise. Find  $k$ . What is the probability that a washer will have thickness between 0.95mm and 1.05mm? (10-marks)

(b) If on the average 2 cars enter a certain parking lot per minute, what is the probability that during any given minute 4 or more cars will enter the lot? (10-marks)

Department of Technology Promotion and Coordination  
University of Computer Studies  
Third Year (B.C.Sc/ B.C.Tech)  
First Semester Examination  
Data and Computer Communications I (CST-303)  
March, 2016  
Zone IV

**Answer All Questions.**

**Time Allowed: 3 hours**

- |      |                                                                                                                                                                                |            |
|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| 1    | Define the following.                                                                                                                                                          | (20-marks) |
|      | (a) Multipoint (f) Quantizing Error                                                                                                                                            |            |
|      | (b) Signal-to-noise ratio (SNR) (g) ADSL                                                                                                                                       |            |
|      | (c) Direct Link (h) Piggybacking                                                                                                                                               |            |
|      | (d) Damaged Frame (i) Earth station                                                                                                                                            |            |
|      | (e) Transponder (j) Trunks                                                                                                                                                     |            |
| 2    | Answer <b>ANY FOUR</b> of the following.                                                                                                                                       | (20-marks) |
|      | (a) List of Transmission Impairments and explain Attenuation and Attenuation Distortion.                                                                                       |            |
|      | (b) Key four factors affect channel capacity                                                                                                                                   |            |
|      | (c) Discuss about characteristics distinguishes optical fiber from twisted pair or coaxial cable.                                                                              |            |
|      | (d) What is direct broadcast satellite (DBS)?                                                                                                                                  |            |
|      | (e) Describe VSAT Configuration with diagram.                                                                                                                                  |            |
|      | (f) The effect of nonlinear coding.                                                                                                                                            |            |
|      | (h) Delta Modulation (DM)                                                                                                                                                      |            |
| 3(a) | Explain about two commonly techniques for controlling the timing of bit stream between transmitter and receiver (asynchronous and synchronous transmission) with frame format. | (8-marks)  |
| 3(b) | The effect of ARQ is to turn an unreliable data link into a reliable one. Describe three versions of ARQ and explain any two with diagram.                                     | (12-marks) |
| 4(a) | Why is a statistical time division multiplexer more efficient than a Synchronous time division multiplexer?                                                                    | (10-marks) |
| 4(b) | Define spread spectrum and its goal. Define DSSS and explain how it achieves bandwidth Spreading.                                                                              | (10-marks) |
| 5(a) | Describe the comparison of circuit switching and packet switching with diagrams. What are the advantages of packet switching compared to circuit switching?                    | (10-marks) |
| 5(b) | What are the advantages and disadvantages of Adaptive Routing? Describe several drawbacks associated with the use of Adaptive Routing compared to Fixed Routing.               | (10-marks) |

\*\*\*\*\* End \*\*\*\*\*

Department of Technology Promotion and Coordination  
University of Computer Studies

Third Year (B.C.Sc)  
CS-304 (Software Engineering)  
First Semester Examination

March, 2016  
Zone IV

Answer all questions.

Time allowed: 3 hours

(20 marks)

Choose the correct answer from the following:

- 1. The repository model is suited to applications where data is generated by one sub-system and used by another.
  - (a) True
  - (b) False
- 2. The developers have to make decisions on the overall organizational model of a system early in the architectural design process.
  - (a) True
  - (b) False
- 3. Peer-to-peer architectures are centralized architectures where there are distinguished clients and servers.
  - (a) True
  - (b) False
- 4. Client-server systems are distributed systems where the system is modeled as a set of services provided by servers to client process.
  - (a) True
  - (b) False
- 5. Acceptance testing is the process where the system is tested using test data to check that meet the customer's real needs.
  - (a) True
  - (b) False
- 6. In pair programming, developers work in pairs, checking each other's work and providing the support to always do a good job.
  - (a) True
  - (b) False
- 7. Reuse-based software engineering is an approach to development that tried to minimize the reuse of existing software.
  - (a) True
  - (b) False
- 8. Aspect-oriented software development address one of the major problem in software design.
  - (a) True
  - (b) False
- 9. A software component is a unit of composition with contractually specified interfaces and explicit context dependencies only.
  - (a) True
  - (b) False

10. Component validation involves developing a set of test cases for the component and developing a test harness to run the component test.
- True
  - False
11. Different architecture models such as structural model, .....and a decomposition model may be developed the architectural design process.
- internal model
  - control model
  - distribution model
12. Call on the service offered by servers. These are normally sub-systems in their own right.
- A set of clients
  - A network
  - A set of services
13. This protocol defines how the interface of web services can be represented.
- SOAP
  - WSDL
  - UDDI
14. Peer-to-peer architectures are ..... where there are no distinguished clients and servers. Computations can be distributed over many systems in different organization.
- Client-server architecture
  - Decentralized architecture
  - Software architecture
15. Continual change tends to corrupt the structure of any software system.
- Validation problems
  - Maintenance problems
  - Management problems
16. It is used to create form for data input and display.
- Report generator
  - Interface generator
  - Parser generator
17. Software components that implements a single function, such as a mathematical function or an object class, may be reused is called.....
- application system reuse
  - component reuse
  - object and function reuse
18. This approach is embodied in system such as lex and yacc for C and JavaCC, compiler of Java.
- Code generator
  - Parser generator
  - Report generator
19. A ..... specifies what services must be provided by other components on the system.
- provides interface
  - requires interface
  - specifies interface
20. There are two stages in the ..... where you have to identify components for possible reuse in the system.
- Software process
  - CBSE process
  - Evolution process

**III. Define the following: (15 marks)**

1. Client-server model
2. Repository model
3. Middleware
4. Peer-to-peer architecture
5. Objective of throw-away prototyping
6. Agile method
7. Design patterns
8. Program generator
9. CBSE
10. Component model

**III. Write short notes on Any Three from the following: (15 marks)**

- (i). List the five levels of service in the CASE reference model.
- (ii). Two generic types of distributed system architecture.
- (iii). What are two main advantages to adopting an incremental approach to software.
- (iv) Benefits of using prototyping.
- (v). The services provided by a component model implementation.

**IV. (a) Discuss three classes of framework in application frameworks. (5 marks)**  
**(b) Write down extreme programming practices. (10 marks)**

**IV. (a) Explain the advantages and disadvantages of a shared repository. (10 marks)**  
**(or)**

Briefly explain about the client- server architectures in detail. (10 marks)

**(b) Describe the various types of specialization of a software product line may be developed. (10 marks)**  
**(or)**

The essentials of component-based software engineering (10 marks)

**IV. Design an architecture with Case Study for the LIBSYS system based on the layer model. In this system, allows users to access documents in libraries and download these for printing. You have added detail to each layer in the model by identifying the component that support user communications and information retrieval and access. You should also notice that the database is distributed database. (15 marks)**

**Department of Technology Promotion and Coordination**

**University of Computer Studies**

**Third Year (B.C.Sc), First Semester Examination**

**CS-305(Computer Application Techniques III)**

**March, 2016**

**Zone IV**

**Answer all questions.**

**Time allowed- 3:00hours**

1. Write C# statements for the following:

(20 marks)

(a). Write a program to calculate  $(a+b)^2$  with Console Application. Hint:  $(a*a+b*b+2*a*b)$

(b). Write a program to print the following using for loop.

1  
22  
333  
4444  
55555

(c). Create a delegate Action that take three integer parameters and reverse the order of parameters and display all in console window. And then invoke this delegate with 3 integers.

(d) Create a generic dictionary collection object with given data and display them in console window as follow:

[1, Sunday]  
[2, Monday]  
[3, Tuesday]  
[4, Wednesday].

(e). Create a class named Person with six data members (FirstName, LastName, Street, City, State and Zip). Create a  $2 \times 2$  array containing objects of the Person class. Initialize them to hold the names Ann Archer, Ben Baker, Cindy Cant and Dan Deevers.

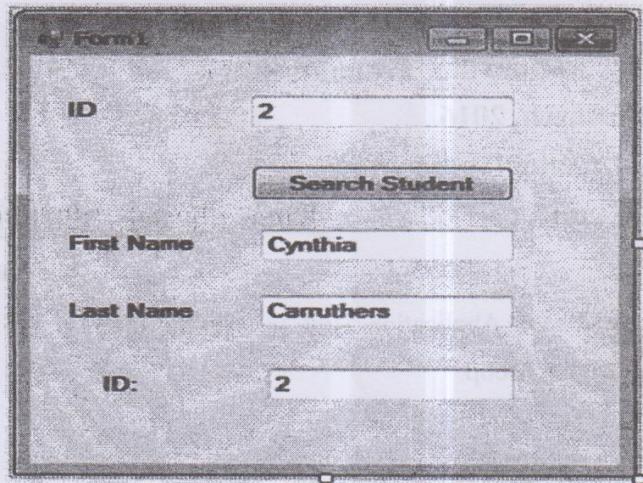
2(a). Define an abstract class named **Employee** that contain three attributes: name, age and basic salary and one parameterized constructor ( ). Define another class named **Saleperson** that contain one attribute commission. Commission will be inserted by a method (10% of salary). Saleperson class inherits from abstract class Employee. Develop a console application to create three instances of Saleperson objects and display them. (10 marks)

2(b). Create a console application project with following:

Create a class named Customer with three data members (ID, Name, Balance). Create an array of customer class and fill data for 3 customers. And then display the information of customer whose balance is greater than 20000 by ascending order of balance. (use LINQ Query). (5 marks)

3(a) Make a program that define a Student class that contains three members: StudentId, FirstName, LastName and a LookupStudent factory method. Using two arrays containing first and last name in the method and use the student's ID as an index number. User click a button named "btn1", called LookupStudent factory method.

If the student is found, then first name, last name and id are displayed in text boxes respectively. Otherwise, all text boxes are clear. (10marks)



3.(b). Create an interface named ITest that include a method named Disp() that doesn't return a value and a method named Multiply() that returns a double value. Create a class named One that implements the interface ITest. In this class, (a) declare two data members to accept the value 20 and 20.12. (b) Implements Disp() method of ITest interface that display the value of two data members in the console. (c) Implement Multiply() method of ITest interface that display the multiplication of first data member and 5. Develop a console application to print as follow which create an object for class One and access the methods from class as specified in the interface. (5 marks)

i=20

j=20.12

100

4. (a) A firm has prepared the sale budget:

Jan	Feb	Mar	Apr
150	200	200	210

Production budget:

Jan	Feb	Mar	Apr	May	Jun
120	200	200	210	250	300

- Opening balance is \$1,000.
- All units are sold for \$20 each; half of the customers are cash sales. Half of the remainders are one month credit and others are two month credit. Sale in Dec and Nov were 180 units and 220 units.
- Raw material costs are \$3 per kilo of production, materials need to 2 kilo per product. Materials are paid for two month before being used in production.
- The firm is initially employing three assistants who will be paid \$ 60 per week each.
- The firm will receive for incomes by \$ 2,000 for other investment in February.
- Other costs: office expenses \$750 per month. Buy machinery of \$5,000 in March.

Prepare the cash budget forthcoming four months. (10 marks)

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- 4.(b).A firm that uses budgetary control techniques has devised a budgeted Profit & Loss account for the year ended May 2011.The actual figures have now been received and the Profit & Loss account drawn up. The details are as- (10 marks)

	Budgeted	Actual
Sales in units	100,000\$	119,000\$
Revenue	850,000	1029,350
Materials	210,000	255,850
Direct Labour	165,000	184,450
Production Overheads	105,000	113,000
Selling Overheads	45,000	45,000
Administration Overheads	90,000	88,000
Net Profit	235,000	343,050

Required: Devise a Flexible budget for 119,000 units and calculate any variances.

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5 marks)

- 5.(a) The Lo Hak company is deciding whether to scrap on old but still serviceable machine bought four years ago to produce fruit pies, and replace it with new machine. The new machine is intended to purchase at cost of 297,650. To finance it has 1/3 of incremental outlay from debt, and the remaining is equity. Assume that the cost of capital with 18% of debt (loan) and 14% of equity.

It is assumed that the demand for the fruit pies will last for a further four Years only and will be as follows:

	Year 1	Year 2	Year 3	Year 4
Possible demand	\$120,000	\$90,000	\$125,000	\$125,000

Assume that the products of 12000 units per annum and the operating cost is 1.25 per unit. The purposed machine has a life of 4 years with \$25,000 residual value.

- Calculate the weighted average cost of capital to the nearest whole percent.
- Prepare net present value for this new machine, using the percentage rate calculated (a).
- Calculate the IRR, rate at 10% and 20%. And then give the suggestion for this machine.

The present value of \$1 is:

	10%	12%	15%	16%	20%
Year 1	.909	.893	.870	.862	.833
Year 2	.826	.797	.756	.743	.694
Year 3	.751	.712	.658	.641	.579
Year 4	.683	.636	.572	.552	.482

(20 marks)

- 5.(b)List the steps involve in Capital Budgeting. What are the methods used in Capital Budgeting. (10 marks)

(10 marks)

**Department of Technology Promotion and Coordination**

**University of Computer Studies**

**Third Year (B.C.Sc.)**

**First Semester Examination**

**Advanced Java Programming (CS-306)**

**March, 2016**

**Zone IV**

**Answer all questions.**

**Time allowed: 3 hours**

1. Choose the correct answer for the following questions. (10 marks)
- (i) IP Ports are represented by a 16-bit number \_\_\_\_\_, commonly known as the port number.  
A. 0-65535      B. 0-65565      C. 0-65545      D. 1-65535
- (ii) What is used for incoming request mapping to Servlet/JSP?  
A. web.xml      B. JSP page      C. URL pattern      D. Servlets
- (iii) Which of the following container provides a runtime environment to manage deployed Web components, such as servlets and JSP?  
A. Web container      B. Applet container  
C. EJB container      D. All of the above
- (iv) Which method is used to specify before any lines that uses the PrintWriter?  
A. setPageType( )      B. setContentType( )  
C. setContextType( )      D. setResponseType( )
- (v) \_\_\_\_\_ method of HttpServletRequest will return null if session does not exist.  
A. getSession()      B. getSession(true)  
C. getSession(false)      D. getNewSession()
- (vi) Use \_\_\_\_\_ when the resource require dynamic data or change frequently.  
A. <jsp:insert>      B. <jsp:include>  
C. <jsp:directive.include>      D. <%@include%>
- (vii) Servlet mapping defines \_\_\_\_\_.  
A. An association between a URL pattern and a servlet  
B. An association between a URL pattern and a request page  
C. An association between a URL pattern and a response page  
D. All of the above
- (viii) \_\_\_\_\_ used to insert arbitrary Java code into servlet's `jspService()` method.  
A. declarations      B. directives      C. scriptlets      D. None of the above
- (ix) Which of the following statements may be used to set the `rollno` property of the bean?  
A. <jsp:setValue name="s" property="rollno" value="1"/>  
B. <jsp:setProperty name="s" property="rollno" value="1"/>  
C. <jsp:setProperty name="s" property="rollno" value="1"/>  
D. <jsp:setProperty id="s" property="rollno" value="1"/>

- (x) JSP pages have access to implicit objects that are exposed automatically. Name the implicit object that is of type HttpSession.

A. session      B. application      C. httpSession      D. httpsession

2. (a) Develop a Client-Server system in which the client connects to a server at localhost. The server is listening to the incoming connection at port (5000). When a connection is established, the client then sends a base number (x) and a power value (y) to the server. The server accepts these two numbers, calculates  $x^y$  (x to the power of y) and sends the result back to the client. For example, the client sends 2 and 3, then the server give the result 8 to the client. Write two programs for client side and server side. (10 marks)
- (b) Convert Fahrenheit to Celsius temperature in client-server architecture using RMI protocol. The server gets Fahrenheit temperature from the client and returns the Celsius temperature to the client. (10 marks)
3. (a) Write an application for Student that contains Registration.html, LoginServlet.java and checkServlet.java. First the user must register name, password, gender, interest and address. If the registration is successful, then the user can login with name and password. If login success, "Login Successful" message will be displayed, otherwise "Login failed". (20 marks)

**Student Registration**

Name:

Password:

Gender  Male  Female

Interest:  Reading  Swimming  Singing

Address:

**User Login**

Login Name:

Password:

(b) Write a Servlet for Staff Entry Form as follows:

(10 marks)

Staff Entry Form	
Name:	<input type="text"/>
Rank:	<input type="text"/>
Department:	<input type="text"/>
Salary:	<input type="text"/>
<input type="button" value="Submit"/>	

After the user fill all staff information and click submit button, the staff information will be displayed as follows. You can use Cookie or Session for session tracking if you need.

Staff Information	
Bo Bo, Manager, Sale, 300000	
Aye Aye, Staff, Sale, 150000	

4. Implement an online Air Ticket Reservation System which includes Ticket No, Passenger Name, Journey Date, No of Seats, Price using action, JSP page directive and JSP error page.

(20 marks)

5. (a) Write a JSP program using JSTL that display a "5 times" multiplication table. The output should be the following:

(10 marks)

1x5=5
2x5=10
....
12x5=60

(b) Suppose that your company stores the employee information in relational database, named **EmployeeInformation**. The employee has attributes (name, age, department, salary) these are stored in Employee table. Write JSP/Servlet to show all of the employee information stored in relational database.

(10 marks)

**Department of Technology Promotion and Coordination  
University of Computer Studies  
Third Year (B.C.Tech.)  
First Semester Examination  
Electronic I (CT-304)**

**March, 2016  
Zone IV**

**Answer All Questions**

**Time Allowed: 3 hours**

1. (a) Determine the forward voltage and forward current for the diode in Figure 1(a) for each of the diode models. Also find voltage across the limiting resistor in each case. Assume  $r_d = 10 \Omega$  at the value of forward current. (The diode is Silicon) (10-marks)

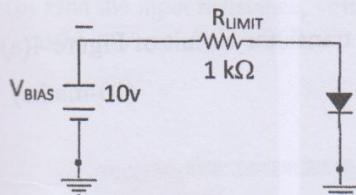


Figure 1(a)

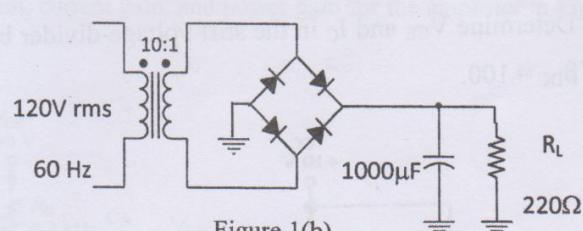


Figure 1(b)

- (b) Determine the ripple factor for the filtered bridge rectifier in Figure 1(b). (10-marks)

- 2.(a) Consider the circuit in Figure 2(a).

- (i) What type of circuit is this?
- (ii) What is the total peak secondary voltage?
- (iii) Find the peak voltage across each half of the secondary.
- (iv) Sketch the voltage waveform across  $R_L$ .
- (v) What is the peak current through each diode?
- (vi) What is the PIV for each diode? (10-marks)

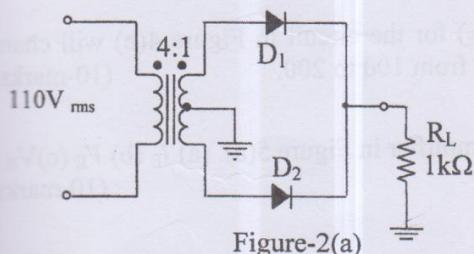


Figure 2(a)

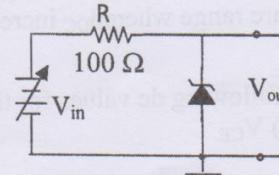


Figure 2(b)

- 2.(b) Determine the minimum and maximum input voltages that can be regulated by the zener diode (IN4736A) in Figure 2(b). The data sheet gives the following information:  $V_Z = 6.8V$  @  $I_Z = 1mA$ ,  $I_Z = 37mA$ , and  $Z_Z = 3.5\Omega$ . (10-marks)

- 2.(c) For the transistor in Figure 3(a), (i) What is  $V_{CE}$  when  $V_{in} = 0V$ ? (ii) What minimum value of  $I_B$  is required to saturate this transistor if  $\beta_{DC}$  is 200? Neglect  $V_{CE(sat)}$ . (iii) Calculate the maximum value of  $R_B$  when  $V_{in} = 4V$ . (10-marks)

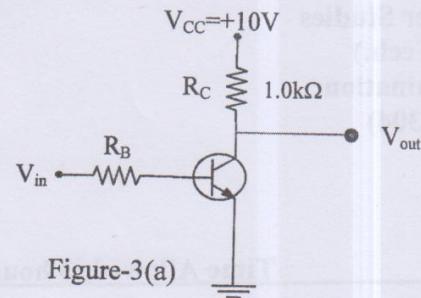


Figure-3(a)

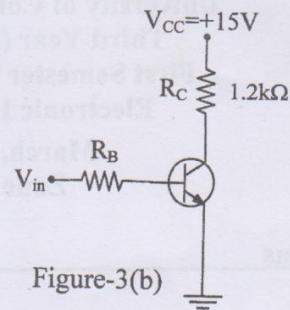


Figure-3(b)

- (b) The transistor in Figure 3(b) has a  $\beta_{DC}$  of 50. Determine the value of  $R_B$  required to ensure saturation when  $V_{in}$  is 5V. What must  $V_{in}$  be to cut off the transistor? Assume  $V_{CE(sat)} = 0V$ . (10-marks)

4. (a) Determine  $V_{CE}$  and  $I_C$  in the stiff voltage-divider biased transistor circuit of Figure 4(a) if  $\beta_{DC} = 100$ . (10-marks)

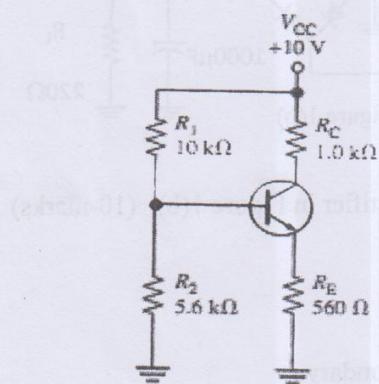


Figure 4(a)

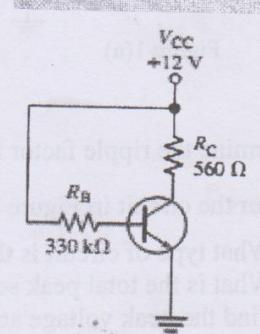


Figure 4(b)

4. (b) Determine how much the Q-point ( $I_C$ ,  $V_{CE}$ ) for the circuit in Figure 4(b) will change over a temperature range where  $\beta_{DC}$  increases from 100 to 200. (10-marks)

5. (a) Determine the following dc values for the amplifier in Figure 5(a). (a)  $I_E$  (b)  $V_E$  (c)  $V_B$  (d)  $I_C$  (e)  $V_C$  (f)  $V_{CE}$  (10-marks)

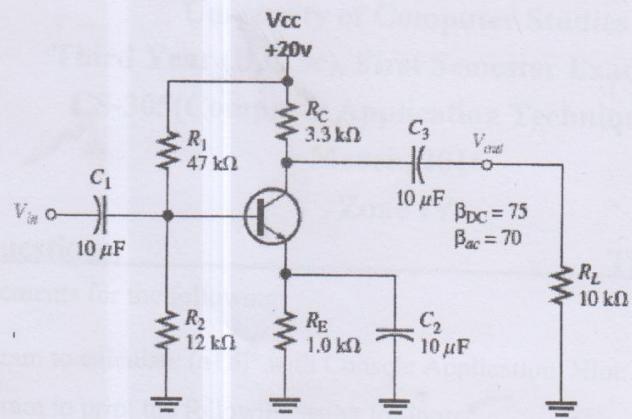


Figure- 5(a)

5. (b) Find the input resistance, voltage gain, current gain, and power gain for the amplifier in Figure 5(b) Assume  $\beta_{DC} = 200$ .

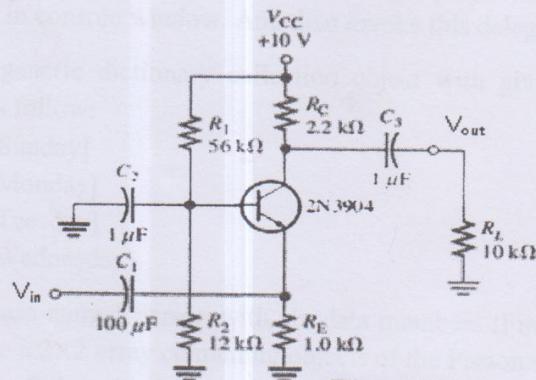


Figure 5(b)

(10-marks)

**Department of Technology Promotion and Coordination  
University of Computer Studies**

**Third Year (B.C.Tech.)**

**First Semester Examination**

**Linear Control System I (CT-305)**

**March, 2016**

**Zone IV**

**Answer all questions.**

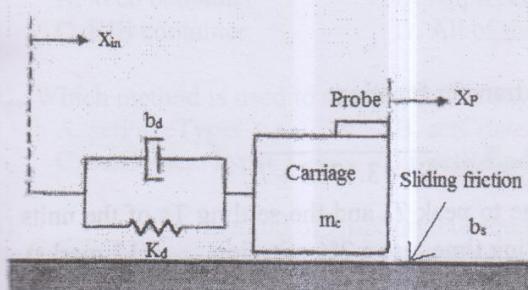
**Time allowed: 3hours**

1. (a) A laser printer uses a laser beam to print copy rapidly for a computer. The laser is positioned by a control input  $r(t)$ , so that we have  $Y(S) = \frac{4(s+50)}{s^2 + 30s + 200} R(S)$ . The input  $r(t)$  represents the desired position of the laser beam (a) if  $r(t)$  is a unit step input, find the output  $y(t)$ . (b) what is the final value of  $y(t)$ ?

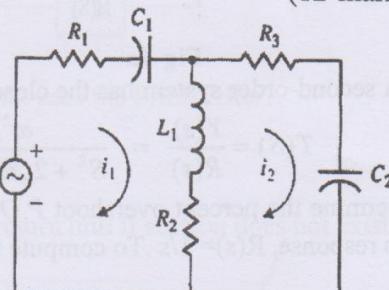
(8-marks)

1. (b) A high precision positioning slide is shown in **Fig-1a**. Determine the transfer function  $\frac{X_p(s)}{X_{in}(s)}$  when the drive shaft friction is  $b_d = 1$ , the drive shaft spring constant is  $K_d = 3$ , carriage mass is  $m_c = 2/3$ , and the sliding friction is  $b_s = 1$ .

(12-marks)



**Fig-1b**



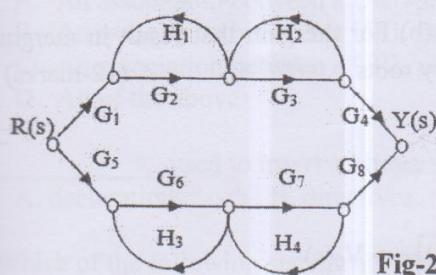
**Fig-1a**

2. (a) An electric circuit is shown in **Fig-2a**. Obtain a set of simultaneous integrodifferential equations representing the network.

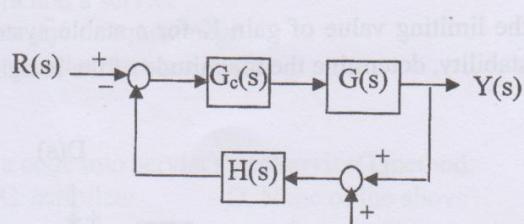
(8-marks)

2. (b) Find the transfer function for the complex system shown in **Fig-2b**.

(12-marks)



**Fig-2b**



**Fig-3b**

3. (a) Consider a unity feedback system with  $G(s) = \frac{12}{s^2 + 2s + 10}$ . Obtain the response and determine the steady-state error.

(8-marks)

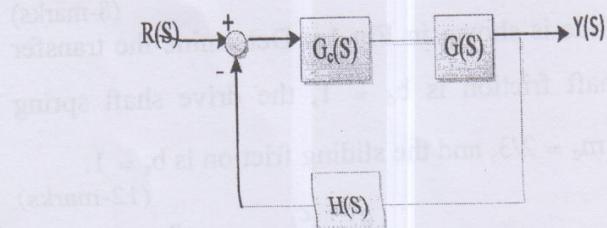
3. (b) In **Fig- 3b**, consider the closed-loop system with measurement noise  $N(s)$ , where

$$G(s) = \frac{100}{s+100} \quad G_c(s) = K_1 \quad H(s) = \frac{K_2}{s+5}$$

In the following analysis, the tracking error is defined to be  $E(s) = R(s) - Y(s)$ .

- (i) Compute the transfer function  $T(s) = Y(s)/R(s)$  and determine the steady-state error due to a unit step response, that is  $R(s) = 1/s$  and assume that  $N(s) = 0$ .  
 (ii) Compute the transfer function  $Y(s)/N(s)$  and determine the steady-state tracking error due to a unit step response disturbance response, that is let  $N(s) = 1/s$  and assume that  $R(s) = 0$ , in this case the desire output is zero. (12-marks)

4. (a) A digital audio system is designed to minimize the effect of disturbances and noise as shown in **Fig-4a**. As an approximation, we may represent  $G(s) = K_2$  (a) Calculate the sensitivity of the due to  $K_2$ . (b) Calculate the effect of disturbance on  $V_0$ . (c) What value would you select for  $K_1$  to minimize the effect of the disturbance? (8-marks)



**Fig-4a**

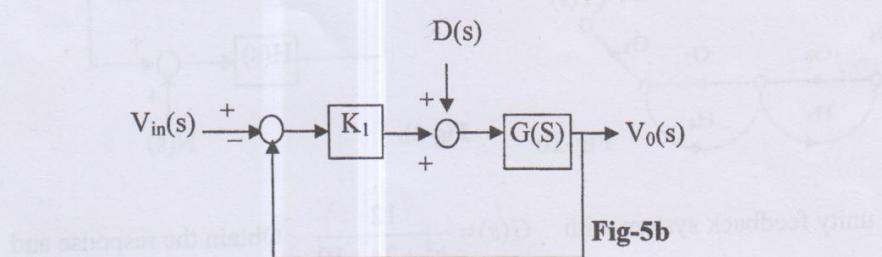
4. (b) A second-order system has the closed-loop transfer function

$$T(s) = \frac{Y(s)}{R(s)} = \frac{\omega_n^2}{s^2 + 2\zeta\omega_n s + \omega_n^2} = \frac{7}{s^2 + 3.175s + 7}$$

Determine the percent overshoot  $P.O$  the time to peak  $T_p$  and the settling  $T_s$  of the units step response,  $R(s) = 1/s$ . To compute the settling time, use a 2% criterion. (12-marks)

5. (a) A system has a characteristic equation  $S^3 + 10S^2 + 2S + 30 = 0$ . Using the Routh Hurwitz criterion, determine if the system is stable. (8-marks)

5. (b) A feedback control system is shown in **Fig-5b**. The controller and process transfer function are given by  $G_c(s) = K$ ,  $G(s) = \frac{S+40}{S(S+10)}$  and  $H(s) = \frac{1}{(s+20)}$ . (a) Determine the limiting value of gain  $K$  for a stable system. (b) For the gain that result in marginal stability, determine the magnitude of the imaginary roots. (12-marks)



**Fig-5b**

**Department of Technology Promotion and Coordination**  
**University of Computer Studies**  
**Third Year (B.C.Tech.)**  
**First Semester Examination**  
**Electrical Circuit II (CT-306)**  
**March, 2016**  
**Zone IV**

**Answer All Questions**

**Time Allowed: 3 hours**

1. (a) Find the current response in a simple series RL circuit when the forcing function is a rectangular voltage pulse of amplitude  $V_0$  and duration  $t_1$  in Figure 1(a). (8 marks)

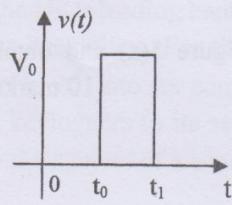


Figure 1(a)

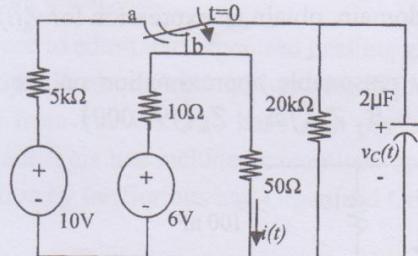


Figure 1(b)

- (b) Find the capacitor voltage  $v_C(t)$  and the current  $i(t)$  in the  $50\Omega$  resistor of Figure 1(b) for all time. (12 marks)
2. (a) In Figure 2(a),  
 (i) Choose  $R_1$  in the circuit of Figure 2(a) so that the response after  $t = 0$  will be critically damped.  
 (ii) Select  $R_2$  to obtain  $v_{(0)} = 100V$ .  
 (iii) Find  $v(t)$  at  $t = 3ms$ . (10 marks)

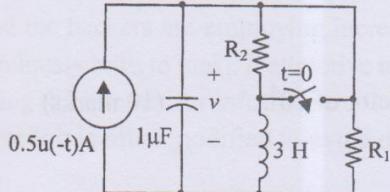


Figure 2(a)

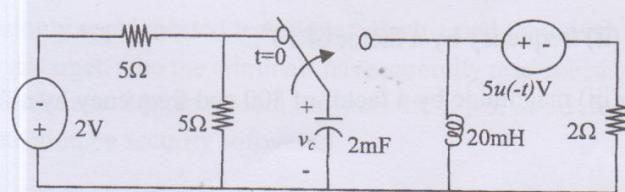


Figure 2(b)

- (b) For the circuit of Figure 2(b), determine  $v_C(t)$  for the time  $t > 0$ . (10 marks)
3. (a) Find the inverse Laplace transform of the function  $V_{(s)} = \frac{2}{s^3 + 12s^2 + 36s}$ . (10 marks)

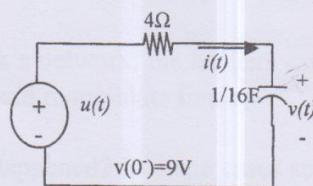


Figure 3(b)

- (b) Determine  $v(t)$  for  $t > 0$  in the series RC circuit shown in Figure 3(b) by using Laplace transform methods. (10 marks)

4. (a) Use nodal analysis to determine the voltages  $v_1$ ,  $v_2$ , and  $v_3$  in the circuit of Figure 4(a). Assume there is zero energy stored in the inductors at  $t = 0^-$ . (10 marks)

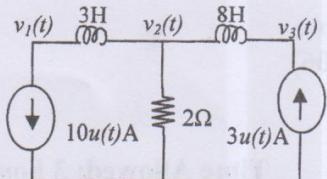


Figure 4(a)

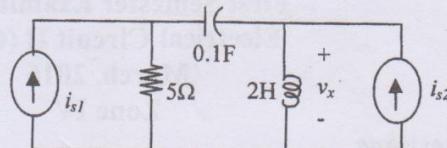


Figure 4(b)

- (b) For the circuit shown in Figure 4(b), let  $i_{s1} = 3u(t)$  A and  $i_{s2} = 5e^{-t}u(t)$  A. Working initially in the s-domain, obtain an expression for  $v_x(t)$ . (10 marks)

5. (a) Make a few reasonable approximation on the network of Figure 5(a) and obtain values for  $\omega_0$ ,  $Q_0$ ,  $B$ ,  $Z_{in}(j\omega_0)$ ,  $Z_{in}(j99,000)$ . (10 marks)

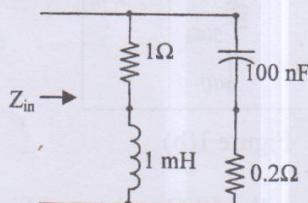


Figure 5(a)

- (b) A parallel resonant circuit is defined by  $C = 0.01$  F,  $B = 2.5$  rad/s, and  $\omega_0 = 20$  rad/s. Find the values of  $R$  and  $L$  if the network is scaled in

- (i) magnitude by a factor of 800;
- (ii) frequency by a factor of  $10^4$ ;
- (iii) magnitude by a factor of 800 and frequency by a factor of  $10^4$ . (10 marks)