

MINISTRY OF SCIENCE AND TECHNOLOGY
THE DEPARTMENT OF ADVANCED SCIENCE AND TECHNOLOGY
UNIVERSITIES OF COMPUTER STUDIES
FIRST SEMESTER EXAMINATION
SECOND YEAR (B.C.Sc./B.C.Tech.)

MARCH 2013

ENGLISH

Time allowed: 3 hours

Answer all questions.

QUESTION - I

Behind the scenes at the museum

With more and more of what museums own ending up behind locked doors, curators are hatching plans to widen access to their collections.

- A When, in 1938, the Smithsonian National Museum of Natural History, in Washington, DC, decided it had run out of space, it began transferring part of its collection from the cramped attic and basement rooms where the specimens had been languishing to an out-of-town warehouse. Restoring those specimens to pristine conditions was a monumental task. One member of staff, for example, spent six months doing nothing but gluing the legs back on to crane flies. But 30 million items and seven years later, the job was done.
- B At least for the moment. For the Smithsonian owns 130 million plants, animals, rocks and fossils and that number is growing at 2-3% a year. On an international scale, however, such numbers are not exceptional. The National History Museum in London has 80 million specimens. And, in a slightly different scientific context, the Science Museum next door to it has 3000,000 objects recording the history of science & technology. Deciding what to do with these huge accumulations of things is becoming a pressing problem. They cannot be thrown away, but only a tiny fraction can be put on display.
- C The huge, invisible collections behind the scenes at science and natural history museums are the result of the dual functions of these institutions. On the one hand, they are places for the public to go and look at things. On the other, they are places of research - and researchers are not interested merely in the big, showy things that curators like to reveal to the public.
- D Blythe House in West London, the Science Museum's principal storage facility, has, as might be expected, cabinets full of early astronomical instruments such as astrolabes and celestial globes. The museum is also custodian to things that are dangerous. It holds a lot of equipment of Sir William Crookes, a 19th century scientist who built the first cathode ray tubes, experimented with radium and also discovered thallium – an extremely poisonous element. He was a sloppy worker. All his equipment was contaminated with radioactive materials but he worked in an age when nobody knew about the malevolent effects of radioactivity.
- E Neil Brown is the senior curator for classical physics, time and microscopes at the Science Museum. He spends his professional life looking for objects that illustrate some aspect of scientific and technological development. Collections of computers, and domestic appliances such as television sets and washing machines are growing especially fast. But the rapid pace of technological change, and the volume of new objects, makes it increasingly hard to identify what future generations will regard as significant. There were originally, for example, three different versions of the videocassette recorder and nobody knew at the time, which was going to win. And who, in the 1970s, would have realized the enormous effect the computer would have by the turn of the century?
- F The public is often surprised at the Science Museum's interest in recent objects. Mr. Brown says he frequently turns down antique brass and mahogany electrical instruments on the grounds that they already

have enough of them , but he is happy to receive objects such as the Atomic domestic coffee maker, and a 114 piece Do- It- Yourself toolkit with canvas case, and a green beer bottle.

G National history museums collect for a different reason. Their accumulations are part of attempts to identify and understand the natural world. Some of the plants and animals they hold are “ type specimens”. In other words , they are the standard reference unit, like a reference weight or length, for the species in question. Other specimens are valuable because of their age. One of the most famous demonstrations of natural selection in action was made using museum specimens. A study of moths collected over a long period of time showed that their wings became darker (which made them less visible to insectivorous birds) as the industrial revolution made Britain more polluted.

H Year after year, the value of such collections quietly and reliably increases, as scientists find uses that would have been unimaginable to those who started them a century or two ago. Genetic analysis, pharmaceutical development , bio- mimetics (engineering that mimics nature to produce new designs) and bio- diversity mapping are all developments that would have been unimaginable to the museums’ founders.

I But as the collections grow older, they grow bigger. Insects may be small, but there are millions of them and entomologists would like to catalogue every one . And when the reference material is a pair of giraffes or a blue whale , space becomes a problem. That is why museums such as the Smithsonian are increasingly forced to turn to out of town storage facilities. But museums that show the public only a small fraction of their material risk losing the fickle goodwill of governments and public , which they need to keep running. Hence the determination of so many museums to make their back room collections more widely available.

Questions 1- 9

The reading passage has nine paragraphs A – I. From the list of headings below , choose the most suitable heading for each paragraph.

List of Headings

- i An unexpected preference for modern items
- ii Two distinct reasons for selection in one type of museum
- iii The growing cost of housing museum exhibits
- iv The growing importance of collections for research purposes
- v The global ‘size’ of the problem
- vi Why some collections are unsafe
- vii Why not all museums are the same
- viii The need to show as much as possible to visitors
- ix How unexpected items are dealt with
- x The decision - making difficulties of one curator
- xi The two roles of museums
- xii Who owns the museum exhibits?
- xiii A lengthy, but necessary task

Paragraphs

- 1 Paragraph A
- 2 Paragraph B
- 3 Paragraph C
- 4 Paragraph D
- 5 Paragraph E
- 6 Paragraph F
- 7 Paragraph G
- 8 Paragraph H
- 9 Paragraph I

Questions 10- 15

Complete the following sentences below using **NO MORE THAN THREE WORDS** from the passage.

10. Keeping the specimens to their original conditions was afor curators.
11. The writer has introduced the idea that museums have far more exhibits behind the scenes than on show and it is becoming
12. In the passage, the writer pointed that the museum is also the to things that are dangerous, by giving the example of Sr. William Crookes’s experiment.

13. are persons who study insects.

14. Some accumulations collected by Natural history museums are (standard reference unit) of some plants and animals.

15. In order to retain public and government support, museum..... are keen to show as many of their back-room items as possible..

QUESTION II

Write a second sentence so that it has a similar meaning to the first. Use the word in brackets.

Example: Perhaps Susan knows the address. (may)

Susan may know the address.

1. We should be careful. (ought)

.....
2. I managed to finish all my work. (able)

.....
3. I realize that it was a terrible experience for you. (must)

.....
4. It's against the rules for players to have a drink. (allowed)

.....
5. The best thing for you to do is sit down. (better)

.....
6. The report must be on my desk tomorrow morning. (has)

.....
7. It is possible that Joanne did not receive my message. (might)

.....
8. It's impossible for Martin to be jogging in this weather. (can't)

.....
9. Tessa wants a cup of coffee. (like)

.....
10. It was not necessary for Nancy to clean the flat. (didn't)

QUESTION III

Choose the correct form. Just write down the number and the answer.

1. Do you eat meat / a meat?

2. The house is built of stone / a stone.

3. Everyone was watching the football match / the match of football.

4. We had to take our luggage through customs / a customs.

5. The band is / are proud of their success.

6. I haven't got many / much friends.

7. Three hours is / are long enough to look round the museum.

8. I wear this glass / these glasses when I go out.

9. My father had a job at the steelwork / steelworks.

10. We couldn't find an / any accommodation.

11. Each team wear / wears a different colour.

12. The contents of the box was / were thrown away.

13. Noise / A noise woke me up in the middle of the night.

14. Cattle was / were driven hundreds of miles by the cowboys.

15. One of the windows is / are open.
16. What would it be like to travel at the speed of light / a light?
17. Is there a sport club / sports club near here?
18. E-mail is a relatively new mean / means of communication.
19. We make furniture out of many different wood / woods.
20. Someone has / have kidnapped the President!

QUESTION IV

Describe *the place where you grew up*. You should say:

- *name of place*
- *location*
- *good points / bad points*
- *the reason you like*

You should write at least about 150 words.

QUESTION – V

Write an **ESSAY** on the following topic.

Plants can provide food , shelter, clothing, or medicine. What is one kind of plant that is important to you or the people in your country? Use specific reasons and details to explain your choice.

THE END

Department of Advanced Science and Technology

**University of Computer Studies
B.C.Sc / B.C.Tech. (Second Year)
CST -201 (Java Programming)**

First Term Examination

March 2013

Answer All questions.

Time allowed : 3 hours.

1. (a) Create a *UserAccount* class which includes *username* and *password* as Strings. The class should have a 2-arguments constructor to initialize the account objects. Then the method *login(String name, String pwd)* will compare the input data *name* and *pwd* with the instance variables of objects and return true or false based on the comparison result. Test your program in a user class by creating two *UserAccount* objects and try to log in. If the log in process is OK, then display a message "Login Successful!". Otherwise, display a message "Login Fail!".
- (b) Write a Java program to generate the factorial of n until the factorial reaches 720. Your output should resemble as below:

```
0! = 1
1! = 1
2! = 2
3! = 6
4! = 24
5! = 120
6! = 720
```

You should write *computeFactorial(int n)* method and invoke it in the main method.

2. (a) A 3x3 normal magic square is a 3x3 matrix where the numbers on each row, each column, and both diagonals all add up to the same number, and the square contains the numbers 1 to 9 exactly. For example, the following is the sample magic square:

4	9	2
3	5	7
8	1	6

→ 15
→ 15
→ 15
↓ 15 15 15 15

Write a Java program that implements a function, *checkMagicSquare (int[][] m)*, given a two-dimensional 3 by 3 array (matrix) of integers and returns a boolean that tells us if the given matrix is a normal 3 by 3 magic square or not. In the main method, call this function with the above sample square.

Note: Your function should consider only for 3 x 3 matrix, not the general n x n matrix.

(b) What is the output of the following program?

```
public class Test{  
    public static void main(String[] args){  
        int x=10;  
        int y=x10;  
        int z=0x10;  
        System.out.println("x=" +x);  
        System.out.println("y=" +y);  
        System.out.println("z=" +z);  
    }  
}
```

3.
 - (a) Write a Java program which includes a function, *findLargestDigit(int num)*, that accepts an integer as a command line argument and returns the largest digit of all over the digits in the input integer. For example, *findLargestDigit* (1354) returns a value of 5 as largest digit.
 - (b) Write a Java class that represents an address book entry consisting of title, name and address, all of String type. Define methods for the class to update the value of each of its instance variables. For example, the name variable should have a *setName(String newName)* method. Write a user class and create an instance of entry using the default constructor and update title, name and address as "Ms", "Myo Myo" and "Pyay Road 123" respectively.
4. Consider the following case scenario:

Assume that you have a file named "exam.txt" under "D:\\" that have stored the students' exam data with the following format (RollNo, Name, Subject1, Subject2, Subject3) as follow:

```
1#Mg Mg#90#89#97  
2#Mya Mya#80#76#70  
3#Su Su#37#45#77  
4#Hla Hla#69#58#51
```

Assume there also exists a Student class with *Student (int rollNo, String name, int subject1, int subject2, int subject3)* constructor. (i.e you are no need to write this class, but you can use in your program.)

Write a Java program that will evaluate the exam result for the students. The program will read the contents of the "exam.txt" file and create Student instances with retrieved parameters, storing them in an array of students. Then compute results and produce the result in the file "result.txt" as follows: (The fail students are not included in the result file.)

```
1 - Mg Mg => pass with distinction  
2 - Mya Mya => pass with credit  
4 - Hla Hla => pass
```

The grade calculation rules are as follows:

Pass : (all subject marks ≥ 50)

Credit : (Pass and average mark is between 65 and 79)

Disction : (Pass and average mark is between 80 and 100)

Fail : Otherwise

- 5.
- Create an abstract base class *Shape* which contains a color as String, a method *getColor()* which returns a color and a method *calculateArea()* which is abstract. Create other two more subclasses, *Rectangle* and *Triangle*, which contains their specific values (*width, height* for Rectangle and *base, height* for Triangle). Each class define arguments constructor and implement *calculateArea()* method. Then create a user class which creates two Shape objects and show their information such as color, area.
 - An employee of a company has three attributes: name, age and basic salary. A sales person is a specialized type of employee. Like all other employees, a sales person has the three attributes plus an additional attribute: commission. In order to develop an application to display the sorted lists of sales person based on the natural ordering of their *name*, you have to provide the name comparator to be used in the *Arrays.sort()* method. Write a Java code segment for such name comparator by using *Comparable* or *Comparator* interface.

Department of Advanced Science and Technology
University of Computer Studies
B.C.Sc./B.C.Tech. (Second Year)
Mid Term Examination
Mathematics of Computing II (CST-202)
March, 2013

Answer ALL Questions.

Time Allowed: 3 hours.

1.(a) Find the area of the region enclosed by the curves: $x + y^2 = 0$ and $x + 3y^2 = 2$.

(b) Find the volume of the solid generated by revolving the region bounded by the x-axis, the curve $y = 3x^4$, and the lines $x = 1$ and $x = -1$ about the x-axis.

2.(a) Find the length of the curve $y = \left(\frac{1}{3}\right)(x^2 + 2)^{\frac{3}{2}}$ from $x = 0$ to $x = 3$.

(b) Find the inverse of $f(x) = 5 - 4x$ and show the graphs of f and f^{-1} together. Evaluate

$$\frac{df}{dx} \text{ at } x = a \text{ and } \frac{d(f^{-1})}{dx} \text{ at } x = f(a) \text{ where } a = \frac{1}{2}.$$

3. Find the derivative of y with respect to x (i) $y = \ln\left(\frac{\sin x \cos x}{1+2\ln x}\right)$ (ii) $\log_{10}(3x+1)$

(iii) $y = \tan^{-1}\sqrt{x+1}$ (iv) $y = \frac{x+5}{x \cos x}$ (Use logarithmic differentiation)

4.(a) Solve the initial value problem: $\frac{d^2y}{dt^2} = \sec^2 t$, $y(0) = 0$, and $y'(0) = 1$.

(b) Express the integrand as a sum of partial fraction and evaluate $\int \frac{dx}{x^3+x^2-2x}$.

5. Evaluate the following integrals.

(i) $\int x^2 \sin 2x dx$ (ii) $\int \frac{e^x dx}{e^{2x}+3e^x+2}$ (iii) $\int \frac{x^2 dx}{\sqrt{9-x^2}}$ (iv) $\int_0^1 \frac{3x^2-7x}{3x+2} dx$

Department of Advanced Science and Technology

University of Computer Studies

B.C.Sc/B.C.Tech. (Second Year)

CST-203 (Operating System)

First Term Examination

March 2013

Answer All questions.

Time allowed : 3 hours.

1. Define any Five of the followings:

- | | | |
|--------------|----------------------|----------------------|
| (a) Monitor | (b) Accumulator (AC) | (c) Process spawning |
| (d) Deadline | (e) Access time | (f) Interrupt |

2. Answer any five of the followings:

- (a) Differences between a monolithic kernel and microkernel.
- (b) What are two distinct disadvantages of ULTs compare to KLTs?
- (c) Difference between turnaround time and response time.
- (d) What are the distinction between RAID level 2 and RAID level 3.
- (e) What is the difference between block-oriented devices and stream-oriented devices?
- (f) Describe the comparison on shared memory multiprocessor and cluster.

3. Write short notes any five on the followings:

- (a) What is cache memory? List four categories of cache design.
- (b) Describe the role of process control block.
- (c) Briefly describe about the SMP organization.
- (d) What is the aim of processor scheduling? List the processor scheduling policies.
- (e) Why a mode switch between threads may be cheaper than a mode switch between processes?
- (f) Briefly explain about a five state model with figure.

4. (a) Consider the design consideration of disk cache, when a new sector is brought into the disk cache and one of the exiting blocks must be replaced. Describe the two replacement algorithms and briefly explain them.

(b) Consider the disk scheduling problem: we assume that a disk has 200 tracks and the sequence of disk track requests: 29, 150, 40, 128, 55, 39, 120, 45, 180, 89. Assume that the disk head is initially positioned over track 100 and is now moving in the direction of increasing track number. Find the average seek length using scheduling policies such as FIFO, SSTF, SCAN, CSCAN and compare the results in tabular form.

5. (a) Write short notes on the following concern with long-term scheduling:

- (i) How to determine which programs are admitted to the system upon which factors?
- (ii) Describe two decisions when the long-term scheduler creates processes from the batch queue.
- (iii) On which condition the scheduler may decide to add one or more new jobs from the batch queue into the system?

(iv) When the decision makes to which jobs to admit next, which criteria and which basic factor are used?

(b) Consider the following set of process with their arrival time and execution time. Analyze the performance criteria as an average turnaround time for preemptive scheduling policies. Which scheduling policy provides the minimum average turnaround time? (Hints: the time slice is 2 unit)

Process name	Arrival Time	Execution time
P	0	3
Q	2	5
R	4	2
S	6	5
T	8	4

**Department of Advanced Science and Technology
University of Computer Studies
Second Year B.C.Sc/B.C.Tech
Mid Term Examination
Database Management System(CST-204)
April, 2013**

Answer all questions.

Time Allowed : 3 hours

I. Define any five of the following:

(15 marks)

- (i) DBA
- (ii) Persistent Data
- (iii) Data Dictionary
- (iv) Base relvar
- (v) Data Model
- (vi) Optimization

II. (a) Briefly explain the components of database system.

(12 marks)

(b) Give some examples of database utilities.

(6 marks)

III. (a) Describe the three levels architecture of the database system and explain external level.

(12 marks)

(b) What is database system? List the benefits of the database approach.

(8 marks)

IV. (a) Write the data definition language for the following:

(10 marks)

(i) Create the following tables which contain the following associate fields and choose the suitable key.

STUDENT(SNAME, SID, CLASS, MAJOR)
COURSE(CID, CNAME, CREDIT_HOURS, DEPT)
GRADE_REPORT(SID, CID, GRADE)

(ii) Write a program with embedded SQL statements to list all student details for all students in the major given by the host variable M.

(b) Write SQL statements for the following problems using the tables create in IV (a).

(15 marks)

- (i) Change the class of student 'John' to 4.
- (ii) Insert new course ('C502', 'Agent System', 8, 'SW').
- (iii) Delete the record for the student whose name is 'Smith' and class number is 5.
- (iv) Get total numbers of students in each major.
- (v) Update the major description of major number M-204 to 'DBMS'

V. (a) Suppose we are given relvar R with attributes A,B,C,D,E,F and the functional dependencies FDs:

$$A \rightarrow BC$$

$$AB \rightarrow E$$

$$CD \rightarrow EF$$

Show that the FD $AD \rightarrow F$ for R and describe which inference rules you have applied.
(6 marks)

(b) Explain the Insert, Delete and update anomalies found in Normalization
(1NF, 2NF, 3NF).
(16 marks)

Department of Advanced Science and Technology
University of Computer Studies
B.C.Sc. Second Year, Mid Term Examination
CS-205 Computer Application Technique II
April, 2013

Answer all questions

Time Allowed: 3 hours

1(a) Explain the Web client-server interaction.

(b) Explain the shared hosting type and virtual dedicated hosting type. (10 marks)

2. Create an HTML pages with following contents: (15 marks)

- (i)** Create a function named change_linkcolor() that will change the link color of document with its parameter value.
- (ii)** Create a function named new_status() that will change the text of status of browser window with "My new project!"
- (iii)** When the page finishes loading, 'I'm done loading now' to the viewer.
- (iv)** Create a text link that doesn't link to actual page, however, when a viewer clicks this link, send the viewer an alert 'I'm empty link'.
- (v)** Create two buttons in a form that will call the change_linkcolor() function with its value when a viewer clicks them. Label them 'Yellow Green' and 'Dark Magenta'.
- (vi)** Create another form with a button that will call to new_status() function when a viewer clicks it. Label it 'New Status!'
- (vii)** Create another form that can be submitted with a submit button. When the viewer submit the form, 'Thank You' alert to the viewer.
- (viii)** Add a text box that asks for the viewer's name. Set it up so that when the viewer gives the text box focus, an alert pops up that says, "Don't leave me blank".
- (ix)** Add a select box that has three options 'First Year', 'Second Year' and 'Third Year'. Set 'Second Year' as default option. If the user changes the default option by choosing a new one, you send an alert 'Aren't you second year student?'

3(a). Create an HTML page with following: (15 marks)

- (i)** Create a function named product that has three properties flavor, productby and size and a method price.
- (ii)** Create a function named get_price() that will calculate the price of a product. The basic price of a product is 10. If the flavor property of an object is 'Strawberry' or 'Blueberry', add 25. Otherwise, add 20. If the productby properties is 'USA' add 30, If it is 'Thailand' add 20. Otherwise add 10. If the size property of an object is small, add 30. If the size is medium, add 40. Otherwise add 50. End the function with a return statement that returns the value for the price. Use this function as a method of product object.
- (iii)** Create three variables that assign the viewer's desired product flavor, productby and size with prompt or fixed value.
- (iv)** Create an instance of product object and named it milk_powder. Send the value of three variables as the parameters.
- (v)** Write the features and price for the viewer desired milk powder to the browser screen.

The information of the Milk Powder

Flavor :	<desired flavor>
Product by:	<desired location >
Size :	<desired size>
Price \$:	

- (b). Create an HTML page with following: (10 marks)
- (i) Create a function named grade_doc() that will make following:
- accept the value of score from text box
 - specify the grade of viewer given score by using following criteria

Score	Grade
81 to 100	A
61 to 80	B
41 to 60	C
<= 40	D

- c. display the grade in new document.
- (ii) Write a heading "JavaScript City" with biggest style by using javascript.
- (iii) Write the following text as Javascript commentary.
- My script will write some text into my HTML document!
- All of this text is ignored by the browser.
- (iv) Create a form named theform.
- (v) Create a text box named thescore that ask for viewer score.
- (vi) Create a button that will call the grade_doc() function when viewer clicks it. Label it 'View Grade'.

- 4(a). Draw up the balance sheet to record the following items using the Standard Layout. (5 marks)

Premises	25000
Stock	2100
Motor vehicle	10000
Capital	34000
Creditors	10500
Cash	100
Debtors	2400
Drawings	6500
Bank	400
Equipment	5000
Profit	7000

- (b). Draw up the double entry accounts to record the following transactions, balance off the accounts at the end of month and extract the Trial Balance. (20 marks)

5 oct Owner invested \$ 3000 in bank account. On the same day he acquires a motor vehicle \$ 700 on credit from Green Co.

7 oct Banked taking for the day \$ 1000.

9 oct Business purchased \$ 1200 worth of goods on credit from Lucky Co.

12 oct Received commission of \$ 200 as a result of selling goods on behalf of Alpha Co. by cheque.

16 oct Cash sales \$ 850 in which received \$ 800 and remaining balance is given as discount.

20 oct Goods returned to Lucky Co. \$ 200 worth of stock because of the quality is lousy.

21 oct Business paid rent for office of \$ 1000 by cash.

25 oct Paid by cheque the amount owing to Green Co.. Business paid \$ 750 to Lucky Co. by cheque.

31 oct Proprietor brings a further \$ 500 into the business bank account.

5(a). The following Trial balance has been drawn up by an inexperienced Account clerk, redraft the Trial balance to show the correct entries. (5 marks)

	Dr	Cr
Sales	50000	
Purchases		10000
Return Out		4200
Stock		31000
Return In	500	
Discount Allowed	340	
Commission Received	210	
Carriage Inwards	280	
Bank		350
Wages	710	
Advertising		1230
Light and Heat	230	
Motor Expense	170	
Stationery		4000
Insurance		5130
Rent	470	
	52910	55910

(b). A firm has produced the following Trial Balance at 31st May 2002. Prepare a Trading, Profit & Loss Account and a Balance Sheet at that date. (20 marks)

	Dr	Cr
Bank	9000	
Cash	6000	
Debtors and Creditors	15000	6000
Provision for bad debts		1000
Bank loan		3500
Premises	16000	
Capital		60800
Fixture and fitting	35000	
Sales and Purchases	18200	50500
Return	200	500
Interest	900	300
Wages	25000	
Discount	800	400
Accumulated Depreciation		3500
Rent	400	
	126500	126500

Adjustments:

1. Closing stock \$ 1000.
2. Rent owing \$ 3500.
3. Wages paid in advance \$ 2500.
4. Provision for bad debt is to be increased 8% of debtors.
5. Calculate depreciation for Fixture and fitting at 10% of cost.

Department of Advanced Science and Technology
University of Computer Studies
B.C.Sc(Second Year), Mid-Term Examination
CS-206 (Software Engineering)
April, 2013

I. Answer **any four** of the followings: (20 marks)

- (i) Emergent system properties, The types of emergent system properties.
- (ii) The important distinctions between the system engineering process and the software development process.
- (iii) The differences between an attack and a threat.
- (iv) Two process models that have been explicitly designed to support process iteration.
- (v) The types of requirements that can be classified from software system requirements.

II. (a) Explain the activities involved in the system design process. (10 marks)

(b) Reliability and safety are related but distinct dependability attribute. Describe the most important distinctions between these attributes and explain why it is possible for a reliable system to be unsafe. To improve reliability, what approaches should we need to think about? (15 marks)

(or)

What are the most important dimensions of system dependability? Explain it. And besides these dimensions, what other system properties can we also consider? Why is the cost of assuring dependability exponential? (15 marks)

III. (a) Discuss the requirement engineering process in detail. (10 marks)

(or)

Briefly discuss the three stages of testing process which is carried out incrementally in conjunction with system implementation. Illustrates how test plans are the link between testing and development activities. (10 marks)

(b) What are legacy systems? Describe the components of a legacy system. (10 marks)

IV. (a) Briefly discuss about milestones and deliverables. (10 marks)

(or)

Project scheduling is a particular demanding task for software manager. What are involved in project scheduling? (10 marks)

(b) Functional requirements for a system describe the functionality or services that the system is expected to provide. Identify a number of functional requirements for a University Library system for students and faculty to order books from other library. (10 marks)

(or)

Describe three different types of non-functional requirement which may be placed on a system. Give examples of each of these types of requirement. (10 marks)

- V. Using the following number of activities, duration (weeks) and proceeding activities. Draw the activity diagram showing the project schedule. (15 marks)

<u>Activity</u>	<u>Duration (Weeks)</u>	<u>Proceeding Activity</u>
A	2	None
B	2	A
C	1	A
D	3	A
E	3	C,D
F	1	D
G	5	B
H	3	D
I	3	G
J	6	A
K	10	J,E,F,H,I
L	1	K

Department of Advanced Science and Technology

University of Computer Studies

Second Year (B.C.Tech)

First Term Examination

Digital Design 1 (CT-205)

March, 2013

Answer all questions.

Time allowed: 3 hours

- 1.(a). For an edge-triggered S-R flip-flop, determine the Q and \bar{Q} outputs for the inputs in Figure 1(a). The flip-flop is initially RESET.

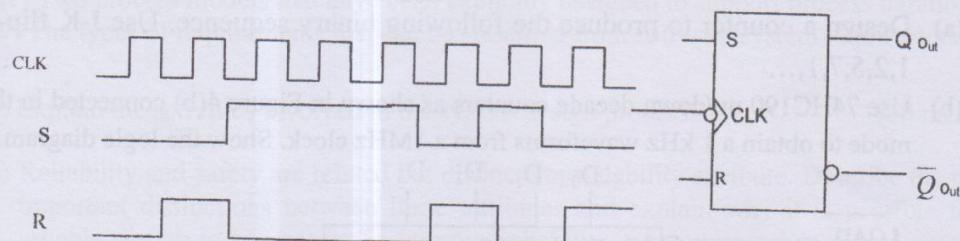


Fig 1(a)

- (b) The following serial data are applied to the flip-flop through the AND gates as indicated in Figure 1(b). Determine the resulting serial data that appear on the Q output. There is one clock pulse for each bit time. Assume that Q is initially 0. Right most bits are applied first.

$J_1 : 0 \ 0 \ 1 \ 0 \ 0 \ 1 \ 1$

$J_2 : 1 \ 0 \ 0 \ 1 \ 0 \ 1 \ 1$

$K_1 : 1 \ 1 \ 1 \ 1 \ 1 \ 0 \ 1$

$K_2 : 1 \ 0 \ 0 \ 1 \ 0 \ 0 \ 1$

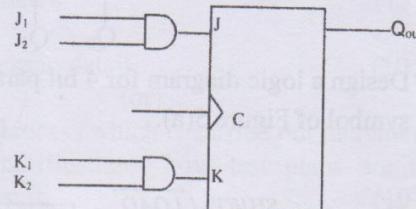


Fig 1(b)

- 2.(a) Explain the Nonretriggerable one-shot action and Retriggerable one-shot action with the aid of waveforms.

- (b) The waveforms in Figure 2(b) are applied to a 74HC163 4-bit synchronous binary counter (CTR DIV 16). Determine the Q outputs and RCO. The inputs are $D_0=1$, $D_1=1$, $D_2=0$ and $D_3=1$.

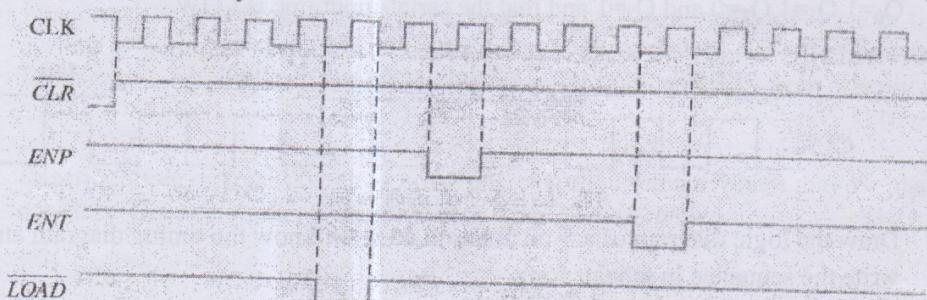


Fig 2(b)

- 3.(a) Show how an asynchronous counter can be implemented having a modulus of twelve with a straight binary sequence from 0000 through 1011.
 (b) Show how the 74LS93 can be used as a modulus-13 counter.

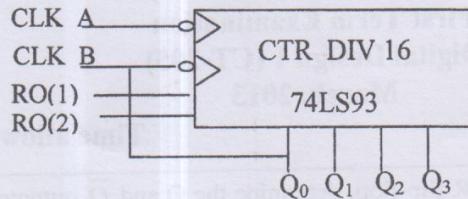


Fig 3(b)

4. (a) Design a counter to produce the following binary sequence. Use J-K flip-flops 1,2,5,7,1,...
 (b) Use 74HC190 up/down decade counters as shown in Figure 4(b) connected in the UP mode to obtain a 1 kHz waveforms from a 1MHz clock. Show the logic diagram.

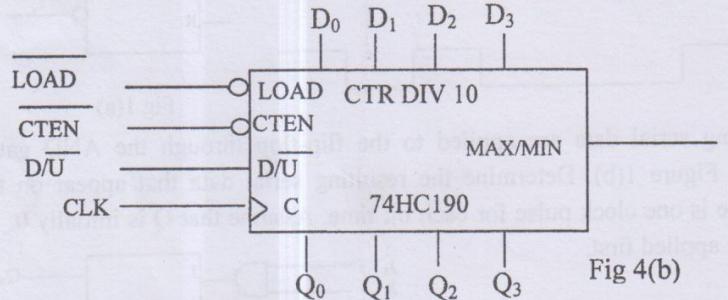


Fig 4(b)

5. (a) Design a logic diagram for 4 bit parallel in / Serial out shift Register as shown in logic symbol of Figure 5(a).

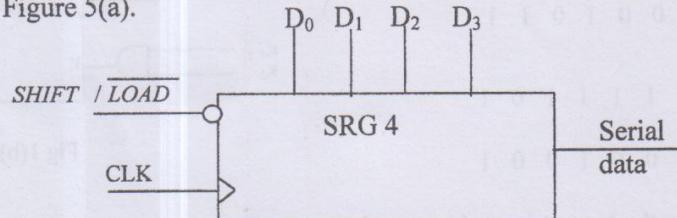


Fig 5(a)

- (b) Determine the state of the bidirectional shift register after each clock pulse for the given RIGHT / LEFT control input waveform in Figure 5(b). Assume that $Q_0=1, Q_1=1, Q_2=0$ and $Q_3=1$ and that the serial-input line is LOW.

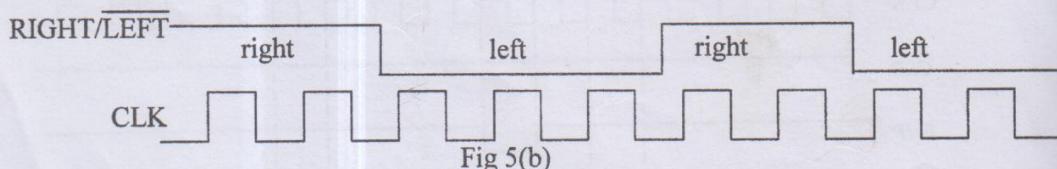


Fig 5(b)

6. (a) Draw the logic diagram of a 5-bit Johnson counter. Show the timing diagram and write the sequence in tabular form.
 (b) If a 10-bit ring counter has the initial state 10 10 000000, determine the waveform for each of the outputs.

Department of Advanced Science and Technology

University of Computer Studies

Second Year (B.C.Tech.)

Mid-Term Examination

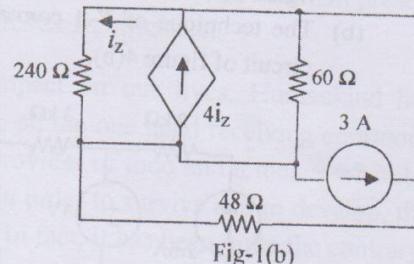
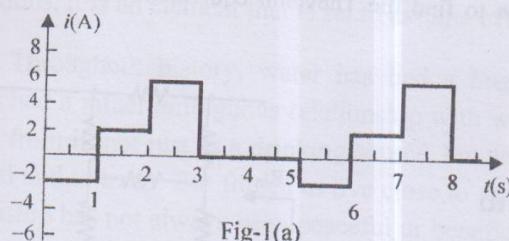
Electrical Circuits I (CT 206)

March, 2013

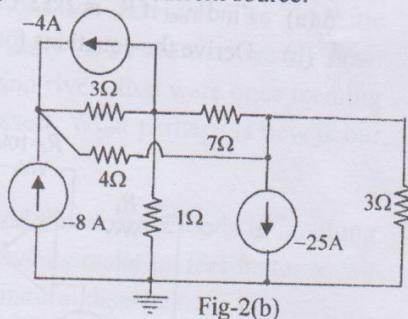
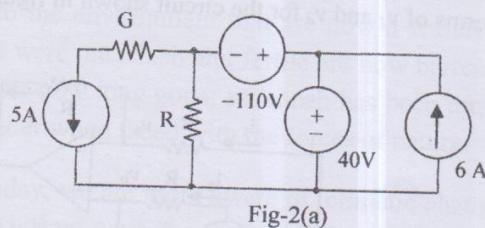
Answer all questions.

Time allowed: 3 hours

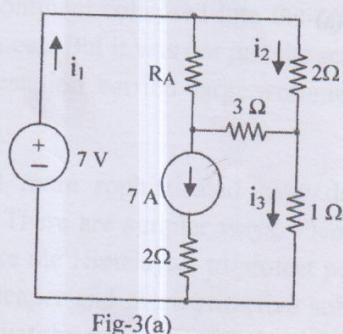
- 1.(a) The waveform shown in figure 1(a) has a period of 5 sec. (i) What is the average value of the current over one period? (ii) If $q(0)=0$, sketch $q(t)$, $0 < t < 5$ sec.
- (b) For the circuit shown in figure 1(b), find the power absorbed by each of the five elements.



2. (a) Find the R and G in the circuit of figure 2(a) if the 5-A source is supplying 100W and the 40-V source is supplying 500 W.
- (b) For the circuit of figure 2(b), compute the voltage across each current source.



3. (a) Using the technique of **mesh analysis**, evaluate the R_A value in figure 3(a) if i_1 is 9A.



- (b) Find v_1 in the circuit of Figure 3(b) using *source transformation* to obtain a simplified equivalent circuit. Calculate the voltage on the dependent current source.

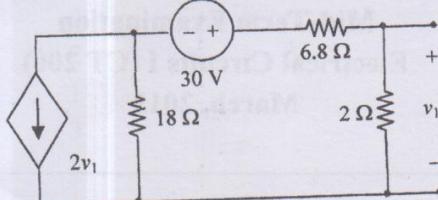


Fig-3(b)

4. (a) Find the *Thevenin* and *Norton equivalents* for the network faced by $1\text{ k}\Omega$ resistor in figure 4(a).
 (b) The technique of *Y-A conversion* to find the Thévenin equivalent resistance of the circuit of figure 4(b).

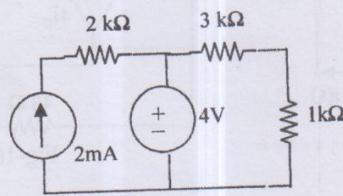


Fig-4(a)

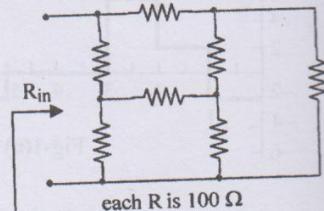


Fig-4(b)

- 5.(a) Find v_{out} if R_L is $2\text{k}\Omega$. Choose R_1 in figure 5(a), to obtain $v_{out} = 333 \sin 3t \text{ mV}$.
 (b) Derive the equations for v_{out} in terms of v_1 and v_2 for the circuit shown in figure 5(b).

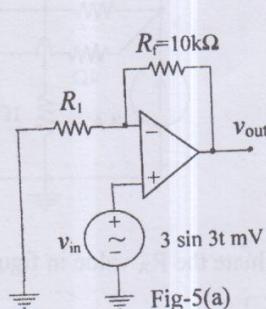


Fig-5(a)

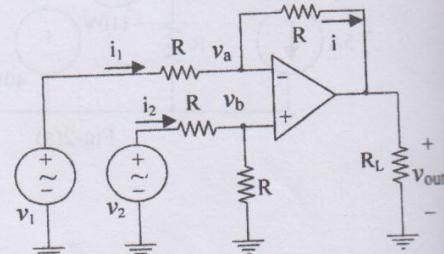


Fig-5(b)