Department of Higher Education
University of Computer Studies, Hinthada
Third Year (B.C.Sc. / B.C.Tech.)
Final Examination
English
September, 2018

Answer All Questions. **Time Allowed: 3 Hours**

I. Read the passage below and answer the following questions. **(20 Marks)**

A. Every autumn, when recruitment of new graduates and school leavers begins, major cities in Japan are flooded with students hunting for a job. Wearing suits for the first time, they run from one interview to another. The season is crucial for many students, as their whole lives may be determined during this period.

B. In Japan, lifetime employment is commonly practised by large companies. While people working in small companies and those working for sub-contractors do not in general enjoy the advantages conferred by the large companies, there is a general expectation that employees will in fact remain more or less permanently in the same job.

C. Unlike in many Western countries where companies employ people whose skills can be effective immediately, Japanese companies select applicants with potential who can be trained to become suitable employees. For this reason, recruiting employees is an important exercise for companies, as they invest a lot of time and money in training new staff. This is basically true both for factory workers and for professionals. Professionals who have studied subjects which are of immediate use in the workplace, such as industrial engineers, are very often placed in factories and transferred from one section to another. By gaining experience in several different areas and by working in close contact with workers, the engineers are believed, in the long run, to become more effective members of the company. Workers too feel more involved by working with professionals and by being allowed to voice their opinions. Loyalty is believed to be cultivated in this type of egalitarian working environment.

D. Because of this system of training employees to be all-rounders, mobility between companies is low. Wages are set according to educational background or initial field of employment, ordinary graduates being employed in administration, engineers in engineering and design departments and so on. Both promotions and wage increases tend to be tied to seniority, though some differences may arise later on as a result of ability and business performance. Wages are paid monthly, and the net sum, after the deduction of tax, is usually paid directly into a bank account. As well as salary, a bonus is usually paid twice a year. This is a custom that dates back to the time when employers gave special allowances so that employees could properly celebrate bon, a Buddhist festival held in mid-July in Tokyo, but on other dates in other regions. The festival is held to appease the souls of ancestors. The second bonus is distributed at New Year. Recently, bonuses have also been offered as a way of allowing workers a share in the profits that their hard work has gained.

E. Many female graduates complain that they are not given equal training and equal opportunity in comparison to male graduates. Japanese companies generally believe that female employees will eventually leave to get married and have children. It is also true that, as well as the still-existing belief among women themselves that nothing should stand in the way of child-rearing, the extended hours of work often do not allow women to continue their careers after marriage.

F. Disappointed career-minded female graduates often opt to work for foreign firms. Since most male graduates prefer to join Japanese firms with their guaranteed security, foreign firms are often keen to employ female graduates as their potential tends to be greater than that of male applicants.

G. Some men, however, do leave their companies in spite of future prospects, one reason being to take over the family business. The eldest sons in families that own family companies or businesses such as stores are normally expected to take over the business when their parents retire. It is therefore quite common to see a businessman, on succeeding to his parents' business, completely change his professional direction by becoming, for example, a shopkeeper.

H. On the job, working relationships tend to be very close because of the long hours of work and years of service in common. Social life in fact is frequently based on the workplace. Restaurants and ***nomi-ya***, "pubs", are always crowded at night with people enjoying an evening out with their colleagues. Many companies organise trips and sports days for their employees. Senior staff often play the role of mentor. This may mean becoming involved in the lives of junior staff in such things as marriage and the children's education.

I. The average age of retirement is between 55 and 60. For most Westerners, retirement may be an eagerly awaited time to undertake such things as travel and hobbies. Many Japanese, however, simply cannot get used to the freedom of retirement and they look for ways of constructively using their time. Many look for new jobs, feeling that if they do not work they will be abandoned by society. This has recently led to the development in some municipalities of municipal job centres which advertise casual work such as cleaning and lawn mowing. Given that Japan is facing the problem of an increasingly ageing society, such activities may be vital in the future.

Questions 1-8

Choose the correct heading for paragraphs A-H from the list of heading below.

List of Headings

- **i.** how new employees are used in a company
- **ii.** women and Japanese companies
- **iii.** why men sometimes resign from Japanese companies
- **iv.** permanency in employment in Japan
- **v.** recruiting season: who, when and where
- **vi.** the social aspect of work
- **vii.** the salary structure
- **viii.** the recruitment strategy of foreign firms
- **ix.** Japanese people after retirement

1. **Paragraph A**
2. **Paragraph B**
3. **Paragraph C**
4. **Paragraph D**
5. **Paragraph E**
6. **Paragraph F**
7. **Paragraph G**
8. **Paragraph H**

Questions 9-10

Complete the sentences below with words taken from the reading passage. Use **NO MORE THAN THREE WORDS** for each answer.

9. Employees receive their wages monthly and a bonus ----------.
10. Japanese workers often form close personal relationships and older staff may even become a ---------- to junior staff.

II. (A). Complete the sentences below with *a /an* or *the*. **(10 Marks)**

If no article is needed, put a cross (✖).

1. I can play ……. piano.
2. I have applied to study at ……. University of Edinburgh.
3. My husband is ……. doctor.
4. I am going to take a cruise down …… river Nile.
5. My husband collects ……. antiques. He is always going to auctions.
6. My father likes ……. Classical music.
7. I come from ……. United Arab Emirates.
8. I usually go to work by …….. bus.
9. Sorry I am late - ……. car would not start this morning.
10. ……. sun was shining and it was a lovely day.

(B). Choose the correct word. **(10 Marks)**

1. I am going shopping. I need to buy **a few / a little** things for tonight's party.
2. There are **some / any** pretty dresses in the store.
3. I can't wait for you. I have got **a few / a little** time.
4. Would you like **some / any** tea?
5. There is **a few / a little** snow on the ground. The children can't make a snowman.
6. There isn't **some / any** water in the glass.
7. We need **a few / a little** milk and **a few / a little** eggs to make a cake.
8. The baby is asleep. Don't make **some / any** noise.
9. There isn't **some / any** information in this book.

III. Fill the gaps in the following paragraph using the words in the box. **(20 Marks)**

dials	**loud**	**one**	**the**	**troublesome**
under	**well**	**but**	**bursts**	**background**
limits	**heard**	**and**	**numbers**	**performance**
noise	**exposed**	**to**	**ability**	**air-traffic**

The noise was quite disruptive at first, but after about four minutes the subjects were doing just as ---(1)--- on their tasks as control subjects who were not ---(2)--- to noise. Their physiological arousal also declined quickly to ---(3)--- same levels as those of the control subjects. But there are ---(4)--- to adaptation and loud noise becomes more ---(5)--- if the person is required to concentrate on more than ---(6)--- task. For example, high noise levels interfered with the ---(7)--- of subjects who were required to monitor three ---(8)--- at a time, a task not unlike that of an aeroplane pilot or an ---(9)--- controller (Broadbent, 1957). Similarly, noise did not affect a subject's ---(10)--- to track a moving line with a steering wheel, ---(11)--- it did interfere with the subject's ability to repeat ---(12)--- while tracking (Finkelman and Glass, 1970).

Probably the most significant finding from research on ---(13)--- is that its predictability is more important than how ---(14)--- it is. We are much more able to 'tune out' chronic ---(15)--- noise, even if it is quite loud, than to work ---(16)--- circumstances with unexpected intrusions of noise. In the Glass ---(17)--- Singer study, in which subjects were exposed ---(18)--- bursts of noise as they worked on a task, some subjects ---(19)--- loud bursts and others heard soft ---(20)---.

Department of Higher Education
University of Computer Studies, Hinthada
Third Year (B.C.Sc. / B.C.Tech.)
Final Examination
Operating System (CST-301)
September 2018

Answer All Questions. **Time Allowed: 3 Hours**

1. Choose the correct answer of the followings. **(10 marks)**

(i) The primary purpose of an operating system is to
- A. Make computer easier to use
- B. Keep system programmers employed
- C. Make the most efficient use of the hardware
- D. Allow people to use the computers

(ii) In which of the storage placement strategies a program is placed in the smallest available hole on the main memory?

A. Best-fit B. First-fit C. Worst-fit D. Buddy

(iii)Indicate which is a preemptive scheduling algorithm
- A. Round-robin
- B. Shortest-process-next
- C. Priority-based
- D. All of them

(iv)The main function of the dispatcher is
- A. Swapping a process to the disk
- B. Assigning ready process to the CPU
- C. Suspending some of the processes when the CPU load is high
- D. Bring processes from the disk to the main memory

(v) _____ is used to keep track of both main and secondary memory.

A. I/O table B. File table C. Process table D. Memory table

(vi) In paging, the chunks of a process, known as_____.

A. Pages B. Segments C. Frames D. Register

(vii)_____is important because I/O operations often form a bottleneck in a computing system.

A. Generality B. Efficiency C. Performance D. I/O processor

(viii) Multiprogramming
- A. Is a method of memory allocation by which the program is subdivided into equal portions, or pages and core is subdivided into equal portions or blocks
- B. Consists of those addresses that may be generated by a processor during execution of a computation
- C. Is a method of allocating processor time
- D. Allows multiple programs to reside in separate areas of core at the time

(ix) One technique for overcoming external fragmentation is.....

A. Segmentation B. Compaction C. Buddy system D. Worst fit

(x) When a thread completes, its register context and stacks are deallocated.

A. Spawn B. Finish C. Unblock D. Block

2. **Define ANY FIVE of the followings:** **(10 marks)**
   (i) Long-term queue
   (ii) Process control block (PCB)
   (iii) Multithreading
   (iv) Logical address
   (v) Throughput
   (vi) Seek time
   (vii) Record

3. **Differentiate ANY THREE of the followings:** **(12 marks)**
   (i) Monolithic kernel and Microkernel
   (ii) Interrupt and Trap
   (iii) User Level Thread (ULT) and Kernel Level Thread (KLT)
   (iv) Turnaround time and Response time
   (v) Logical I/O and Device I/O

4. **Write short notes on ANY FOUR of the followings:** **(16 marks)**
   (i) What are two main problems in serial processing?
   (ii) Discuss the role of the process control block.
   (iii) Describe the two disadvantages of ULT compared to KLT.
   (iv) Give three placement algorithms in dynamic partitioning.
   (v) List and briefly explain five storage management responsibilities of a typical operating system.
   (vi) Describe the types of operations that may be performed on a directory.

5. **Answer ANY TWO of the followings:** **(12 marks)**
   (i) What are the services provided by the operating system?
   (ii) Briefly explain about a five state model with figure.
   (iii) What requirements is memory management intended to satisfy.
   (iv) Describe seven RAID levels.

6.(i) Consider a simple paging system with the following parameters: 2^{32} bytes of physical memory; page size of 2^{10} bytes; 2^{16} pages of logical address space. **(5 marks)**
   a. How many bits are in a logical address?
   b. How many bytes in a frame?
   c. How many bits in the physical address specify the frame?
   d. How many entries in the page table?
   e. How many bits in each page table entry? Assume each page table entry contains a valid/invalid bit.

   (ii) A 1-Mbyte block of memory is allocated using the buddy system. **(5 marks)**
   a. Show the results of the following sequence in a figure: Request 70; Request 35; Request 80; Return A; Request 60; Return B; Return D; Return C.
   b. Show the binary tree representation following Return B.

7. Create the following tables for the following three scheduling policies. **(15 marks)**

Process	Arrival Time	Service Time	Start Time	Finish Time	Turnaround Time	Tr/Ts
A	0	3				
B	1	5				
C	3	2				
D	9	5				
E	12	5				
				Average		

(i) First Come First Served (FCFS) (ii) Shortest Process Next (SPN)
(iii) Highest Response Ratio Next (HRRN)

8. Consider the disk scheduling problem: we assume that a disk with 200 tracks and that the disk request there has random request in it. The requested tracks, in the order received by the disk scheduler are 129, 25, 110, 186, 145, 48, 10, 70 and 84. (Assume that starting track is 100 in the direction of increasing track number). Calculate the average seek length for FIFO, SSTF, SCAN and C-SCAN scheduling algorithms.
(i) Illustrate the performance of disk scheduling algorithms.
(ii) Compare the results in tabular form. **(15 marks)**

**********END**********

Department of Higher Education
University of Computer Studies, Hinthada
Third Year (B.C.Sc/B.C.Tech.)
Final Examination
Mathematics of Computing III (CST-302)
September, 2018

Answer All Questions **Time Allowed: 3 Hours.**

1. (a) Solve the linear system given explicitly or by its augmented matrix. Show details.

$$x + y - z = 9$$
$$8y + 6z = -6$$
$$-2x + 4y - 6z = 40$$

(b) Find the inverse of the matrix $A = \begin{bmatrix} 0 & 1 & 0 \\ 1 & 0 & 0 \\ 0 & 0 & 1 \end{bmatrix}$ by Gauss-Jordan elimination and check by using $AA^{-1} = A^{-1}A = \mathrm{I}$.

2. (a) Given $A = \begin{bmatrix} 0 & 3 & 5 \\ 3 & 5 & 0 \\ 5 & 0 & 10 \end{bmatrix}$. Find the rank and a basis for the row space and a basis for the column space.

(b) Find the eigenvalues and eigenvectors of the matrix, $A = \begin{bmatrix} 5 & -2 \\ 9 & -6 \end{bmatrix}$. Is it symmetric, skew-symmetric, or orthogonal?

3. (a) (i) Find the smallest positive solution of $\sin x = e^{-x}$, $x_0 = 1$, by fined-point iteration. Use 5D. Do 5 steps.

(ii) Solve $f = 2x - \cos x$, $x_0 = 1$, by Newton's method. Use 5D. Do 5 steps.

(b) Compute $\cosh 0.56$ by Newton's forward difference interpolation of the data;
$\cosh(0.5) = 1.127626$, $\cosh(0.6) = 1.185465$, $\cosh(0.7) = 1.255169$, $\cosh(0.8) = 1.337435$.
estimate the error.

4. (a) Evaluate the integral $J = \int_0^1 x^2\, dx$ by Trapezoidal rule with $n = 10$, $h = 0.1$, and compare the exact values known from calculus.

(b) Show the factorization and solve by Doolittle method.

$$3x_1 + 9x_2 + 6x_3 = 4.6$$
$$18x_1 + 48x_2 + 39x_3 = 27.2$$
$$9x_1 - 27x_2 + 42x_3 = 9.0$$

5. (a) Compute the matrix norm and the condition number corresponding to L_1-vector norm,

$$\begin{bmatrix} -2 & 4 & -1 \\ -2 & 3 & 0 \\ 7 & -12 & 2 \end{bmatrix}.$$

(b) Fit a parabola to the given points $(0,1.8), (1, 1.6), (2, 1.1), (3, 1.5)$ and $(4, 2.3)$ by least squares. Check the result by sketching the points and the line.

Department of Higher Education
University of Computer Studies, Hinthada
ThirdYear (B.C.Sc. /B.C.Tech.)
Final Examination
Computer Networking (CST-303)
September, 2018

Answer All Questions. **Time Allowed: 3 Hours**

1. Choose the correct answer to the following questions. **(20 marks)**

(i). Which of the following protocols is used on the transport layer of OSI basic reference model?
(a) FTP (b) PPP
(c) SNMP (d) UDP

(ii). When the subnet mask "255.255.255.0" is used in a "Class A" network, how many host addresses can be assigned to network devices?
(a) 254 (b) 256
(c) 2^{16} (d) 2^{24}

(iii). A flowspec contains the elements. They are RSpec, TSpec and ----------.
(a) Service class (b) Source address
(c) Destination address (d) Destination port

(iv). It is a set of data sent across a computer network to many users at the same time.
(a) Unicast (b) Multicast
(c) Anycast (d) Broadcast

(v). In a TCP/IP network, which of the following is used to check if a computer or device is accessible across a network?
(a) BOOTP (b) DHCP
(c) RTP (d) Ping

(vi). BGP provides----------.
(a) Intra-AS routing (b) Inter-AS routing
(c) Hot-potato routing (d) Broadcast routing

(vii). The time is spent at each node setting up the route of the connection is called ----------.
(a) Propagation delay (b) Transmission delay
(c) Node delay (d) Processing delay

(viii). What are the functions of the transport layer?
(a) Multiplexing/Demultiplexing (b) IP Datagram Fragmentation
(c) Connectionless service (d) Connection oriented services

(ix). TCP and UDP are called ----------.
(a) Application protocols (b) Transport protocols
(c) Session protocols (d) Network protocols

(x). The ---------- is a device that connects n inputs to m outputs.
(a) Cross point (b) Modem
(c) Cross bar (d) RAM

2. Write short notes on **ANY FOUR** of the following questions. **(20 marks)**
   (a) The two advantages of a multiple-stage switch
   (b) Three phases of circuit switching networks
   (c) Several drawbacks of FIFO queuing discipline
   (d) Three additional protocol capabilities in ARQ protocols
   (e) Three steps in TCP connection management
   (f) Three fields appearing in the IPv4 datagram are no longer present in the IPv6 datagram
   (g) Three identifiable phases in a virtual circuit

3.(a) Match the following (Column A) with its definition (Column B) by answering the appropriate letter only (e.g .i.A). **(10 marks)**

	Column A		Column B
i.	WF style	A	255.255.255.255
ii.	Space Division	B	255.255.255.252
iii.	Error control	C	It is switching technique that paths in the circuit are separated from one another spatially.
iv.	Broadcast address	D	It specifies a single resource reservation to be shared by all senders to this address.
v.	Subnet mask	E	It is a service that is provided by transport layer.

(b) Explain the difference between datagram and virtual circuit operation. **(10 marks)**

4.(a) Discuss about the purpose of ISA to enable the provision of QoS that supports over IP-based internets. **(10 marks)**

(b) Describe the GBN protocol with figures.

(OR)

(b) Illustrate the TCP segment structure and explain them. **(10 marks)**

5. (a) Describe a number of ways used to accomplish switching packets from input port to output port. **(10 marks)**

(b) Compare and contrast link-state and distance-vector routing algorithms.

(OR)

(b) Give a brief description of the Open Shortest Path First (OSPF) protocol. **(10 marks)**

**********END**********

Department of Higher Education
University of Computer Studies, Hinthada
Third Year (B.C.Sc.)
Final Examination
Database Management System (CS-304)
September, 2018

Answer All Questions **Time Allowed: 3 Hours**

I. Choose the correct answer for the following statements: (15 marks)

1. In a relational algebra, the traditional set operators are union, intersection, _____ and Cartesian product.
   (A) join (B) restrict (C) difference (D) product
2. An attempt to delete database _____ keyword is used.
   (A) Drop (B) Delete (C) Insert (D) Update
3. Defining the data to be included in a views or snapshots that is also called _____.
   (A) defining integrity constraints (B) defining security constraints
   (C) defining derived relvars (D) defining referential constraints
4. A range variable does not exist in WFF (well-formed formula) that is called _____.
   (A) bound variable (B) free variable (C) range variable (D) All of these
5. A range variable defined range over domain.
   (A) Domain Calculus (B) Tuple Calculus (C) Relational Algebra (D) All of these
6. All of statistical information will be kept in the system _____.
   (A) Tables (B) Catalog (C) Views (D) Library
7. Return a relation containing all possible tuples that are a combination of two tuples, one from each of two specified relations.
   (A) Project (B) Restrict (C) Product (D) Union
8. _____ allow the same data to be seen by different users in same ways at the same time.
   (A) Snapshots (B) Views (C) Base relvars (D) All of these
9. Union, intersection and join operator are all _____ .
   (A) Commutative (B) Idempotence (C) Associative (D) All of these
10. A divide and conquer strategy is suitable for _____ processing environment.
    (A) sequential (B) parallel (C) random (D) All of these
11. It can be regarded in a sense as embodying the skills and services of the best human programmers.
    (A) Optimizer (B) Programmer (C) Compiler (D) Administrator
12. The extend operator performs the analogous function for "horizontal" or "_____" computations in relational algebra.
    (A) column-wise (B) row-wise (C) whole table (D) base relvar
13. Which stage in the optimization process involves the optimizer performs a number of optimizations that are "guaranteed to be good"?
    (A) first (B) second (C) third (D) fourth
14. The database must not contain any unmatched foreign key values.
    (A) Golden Rule (B) Entity Integrity (C) Referential Integrity (D) Data Integrity

15. A _____ matches data from two or more tables, based on the values of one or more columns in each table.

(A) join (B) view (C) subquery (D) snapshot

II. Consider the supplier-parts-projects database schemas: (30 marks)

S (Sid, Sname, Status, City)
P (Pid, Pname, Color, Weight, City)
J (Jid, Jname, City)
SPJ (Sid, Pid, Jid, Qty)

Write the following queries in Relational Algebra and Relational Calculus (**tuple oriented & domain oriented**) statements.

(a) Get supplier numbers for suppliers supplying at least one part supplied by at least one supplier who supplies at least one red part.
(b) Get supplier names for suppliers who do not supply part P2.
(c) Get the total number of projects supplied by supplier S1.

III. (a) Consider the Boat-reservation database schemas: (9 marks)

Sailor (Sid, Sname, rating, age)
Boat (bid, bname, color)
Reservation (sid, bid, reservedate)

(i) Create a view that represents rating per sailor in descending order.
(ii) Create a view that represents the boats information that reserved from '19.2.2017' to '31.3.2017'.
(iii) Create a view that represents all sailors' information who served in "Marina" boat.

(b) Consider the supplier-parts database there are five suppliers in the database; (6 marks)

Let view SC be defined as

SC{S#, CITY}

A sample value for this view is as shown in the following table:

S#	CITY
S1	London
S2	Paris
S3	Paris
S4	London
S5	Athens

Consider the following view updatable mechanism on the view SC.

(i) An attempt to insert the tuple (S3, Athens) into SC will success or fail. Why?
(ii) An attempt to update the SC tuple (S1, London) to (S2, London) will success or fail. Why?
(iii) An attempt to delete the tuple (S5, Athens) from SC will success or fail. Why?

IV. Consider the Boat-reservation database schemas:

Sailor (Sid, Sname, rating, age)
Boat (bid, bname, color)
Reservation (sid, bid, reservedate)

(a) Derive the optimize method for the following query: (10 marks)
"Get the boat names that reserved in '13-9-2015'."
The database contains 50 tuples Sailor, 100 tuples Boat and 1200 Reservations, of which only 30 tuples are reservation date in '13-9-2015' and 50 tuples at most can stay in main memory.

(b) Demonstrate the query decomposition steps by using **Divide and Conquer Strategy** for the query "Get the rating of sailor who is less than 40 and reserved 'Marine' boat 'red' color in '29-09-2016' ". (10 marks)

V. (a) If P=6, Q= 8, S=4 and R is UNK, state **the truth values** of the following expression: (10 marks)

(1) P=Q OR (Q>R AND P>S)
(2) P>Q AND (Q>R OR IS_UNK (P-S))
(3) P<R OR Q<R OR NOT (P=R)
(4) Q<S OR Q=S OR Q>S
(5) IS_UNK(S OR P=Q)
(6) NOT(S)
(7) MAYBE (P>Q AND Q>R)
(8) MAYBE (IS_UNK(S))
(9) MAYBE (IS_UNK (P+Q))
(10) IF_UNK(S,P) >Q AND IF_UNK (R,S) >Q

(b) Consider the following tables: (10 marks)

Customer

Cid	Cname
C1	Maria
C2	Cherry
C4	Rose

Sale

Sid	Cid	Qty
S1	C1	100
S2	C1	50
S3	C4	200
S4	NULL	30

(i) List the result tuples for **INNER JOIN ON Customer.cid=Sale.cid.**
(ii) List the result tuples for **LEFT JOIN ON Customer.cid=Sale.cid.**
(iii)List the result tuples for **RIGHT JOIN ON Customer.cid=Sale.cid.**
(iv)List the result tuples for **FULL JOIN ON Customer.cid=Sale.cid.**
(v) List the result tuples for **LEFT JOIN ON Customer.cid=Sale.cid ORDER BY Customer.Cname.**

**********END**********

Department of Higher Education
University of Computer Studies, Hinthada
Third Year (B.C.Sc.)
Final Examination
Computer Application Techniques III (CS-305)
October, 2018

Answer All Questions **Time allowed:3 hours**

1. Write C# statements using ADO.Net for the following. **(20 marks)**

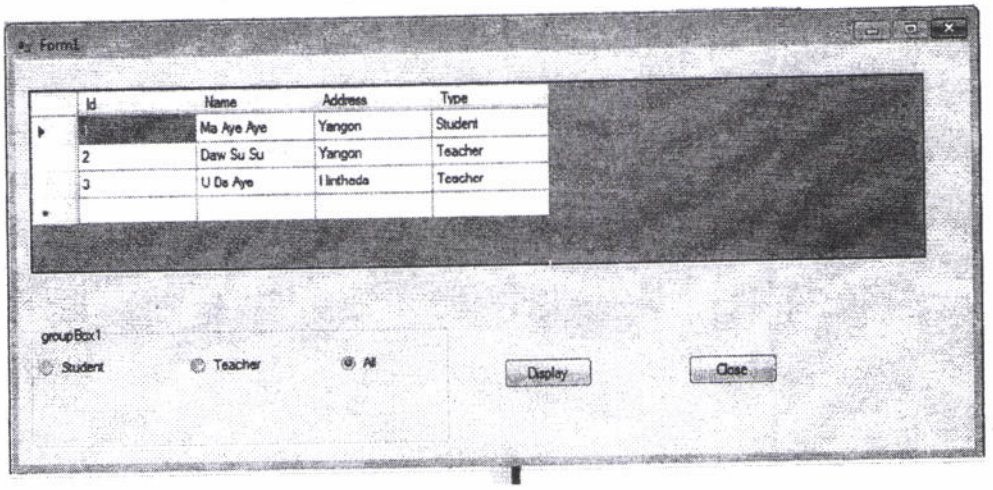
   (a) Create a project with a button that displays the student information with message box who lives in town starts with "Y" and whose mark with descending order. Use "Student" table (studentid, studentname, town and mark) fields in "studentdb" database. Use **Data View Object and filter property**.

   (b) Create a connection object and pass the above connection string. Call the connection object's open method. Create a **DataAdapter** object and a **Dataset** object to extract Products Price are greater than or equal 5000 and less than or equal 10000 in Product table. Display the result in Console window .Use Product table with ProductID, ProductName, Price and Quantity fields.

   (c) Write a procedure that displays the Trip's information (HotelName, Location, Beachname, Price) fields in a message box by using **DataAdapter**. Use "Hotel" table (HotelId, HotelName, Address, Price and Phone) and "Beach" table(BeachID, BeachName, HotelName and Location) in "TourDB" SQL database in local sever.

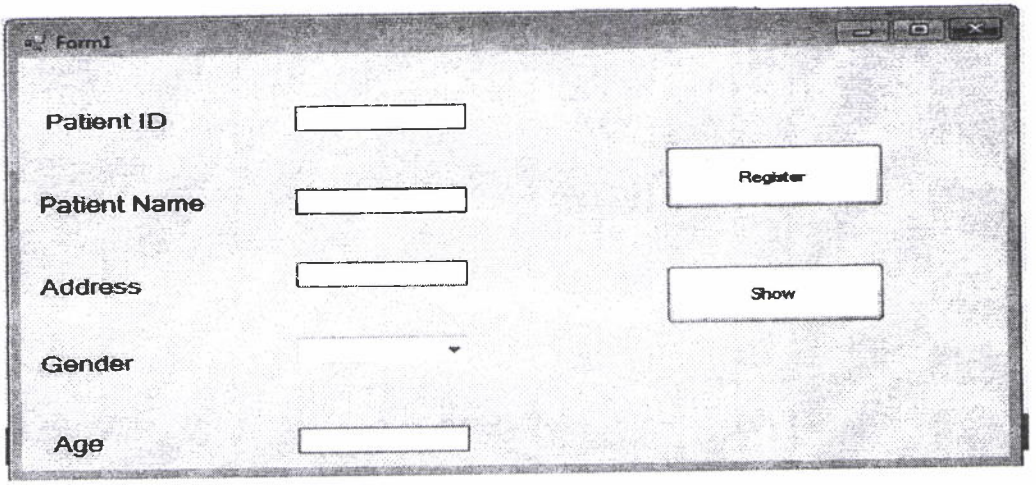
   (d) Create a connection object and command to delete the product record that the quality of products is "bad". Use Product table in SQL server database named "ProductDB" in server. "Product" table has pid, pname, quantity and quality fields.

2. Create a window form application with the following form design. At the start of the form, "All" radio button is checked and all information are displayed in datagridview. When user clicks the "Display" button, desired records will be displayed in data grid view. When user click "Close" button,close project.Use "Information" table with id, name, address and type field in database. **(15 marks)**



3.(a)Create a project to insert new record into "School" table (id, schoolname, dept, rank, address) in "sch" dataset by using **SqlCmmandBuilder** and **Datatable**. And all of the updated School information's are displayed in message box. **(7 marks)**

(b)Create a window form application with following form design. When user clicks "Register" button, user entered data, will be saved into "Patients" table in "PatientDB" database that stored in local SQl Server. "Patient" table has PatienID, PatientName, Address, Gender and Age fields. When user clicks "Show" button, all patient information are shown in message box. **(8 marks)**



4. Write short notes on **ANY FIVE** of the following: **(15 marks)**

(a) Commercial goods
(b) Marketing Mix
(c) Manufacturing systems
(d) Personnel file
(e) Demand pricing
(f) Benefit plans
(g) Economic order quantity system(EOQ)

5. (a) Define the term **marketing**. **(3 marks)**

(b) Describe an information system that supports the sale manager to reach the sales goals set by top management. **(9 marks)**

6. (a) Describe about **capacity requirement planning**. **(3 marks)**

(b) Why is it important to have quality control information systems in manufacturing and production sectors. **(9 marks)**

7. (a) Define the term **"A Job"** and **"A Position"**. **(3 marks)**

(b) Explain **job analysis and design information systems**. **(8 marks)**

Department of Higher Education
University of Computer Studies, Hinthada
Third Year (B.C.Sc.)
Final Examination
Advanced Programming Techniques (CS - 306)
October 2018

Answer All Questions. **Time Allowed: 3 Hours**

1. **Answer the following questions.** **(10 marks)**

(i) Which programming language has dominated scientific computing over the past 50 years?
(A) Ada (B) LISP (C) COBOL (D) Fortran

(ii) What constitutes the stages of compilation process?
(A) Feasibility study, system design and testing
(B) Implementation and documentation
(C) Lexical analysis, syntax Analysis and code generation
(D) None of these

(iii) Which programming language is a hybrid implementation sytem?
(A) APL (B) Javascript (C) COBOL (D) Java

(iv) The intermediate code generator takes _____ as input and produces _____ as output.
(A) Parse tree, source program (B) Parse tree, intermediate code
(C) Token, source program (D) None of them

(v) Which of the following derivation a top-down parser use while parsing an input string? The input is assumed to be scanned in left to right order?
(A) Leftmost derivation (B) Leftmost derivation traced out in reverse
(C) Rightmost derivation (D) Rightmost derivation traced out in reverse

(vi) What does a Syntactic Analyzer do?
(A) Maintain Symbol Table (B) Collect type of information
(C) Create parse tree (D) None of these

(vii) Which one of the following is a top-down parser?
(A) Recursive descent parser (B) Operator precedence parser
(C) An LR (k) parser (D) An LALR (k) parser

(viii) _____ are those that are bound to memory cells before execution begins and remains bound to the same memory cell throughout execution.
(A) Stack-dynamic variables (B) Explicit heap-dynamic variables
(C) Static variables (D) Implicit heap-dynamic variables

(ix) Array indexing (subscript) that uses in java language is only _____ type.
(A) float (B) integer (C) double (D) char

(x) A/An _____ defines a collection of data objects and a set of predefined operations on those objects.
(A) descriptor (B) record (C) data type (D) object

2. **Define *Any Five* of the followings.** **(10 marks)**

(i) Exception Handling
(ii) Left-recursive grammar rule
(iii) Lexical analyzer
(iv) Binding and binding time
(v) Descriptor
(vi) Strongly type

3. **Write Short notes *Any Six* of the followings.** **(24 marks)**

(i) Why is readability important to writability?
(ii) Explain detail about the compilation system.
(iii) Describe the two levels of operational semantics.
(iv) What are the primary tasks of a lexical analyzer?
(v) Define lifetime, scope, static scope, and dynamic scope.
(vi) Describe the three string length options.
(vii) Difference between name type equivalence and structure type equivalence.

4. (a) Prove that the following grammar is ambiguous: **(5 marks)**

<S> → <A>
<A> → <A> + <A> | <id>
<id> → a | b | c

(b) Convert EBNF to BNF. **(5 marks)**

<assign> → <id> = <expr>
<id> → A | B | C
<expr> → <expr> { (+ | *) <expr> }
| (<expr>)
| <id>

(c) Using the following grammar, show a parse tree and a leftmost derivation for each of the following statements: **(10 marks)**

<assign> → <id> = <expr>
<id> → X | Y | Z
<expr> → <expr> + <term>
| <term>
<term> → <term> * <factor>
| <factor>
<factor> → (<expr>)
| <id>

(i) X = (X + Y) * Z
(ii) X = Y + Z +X

5.(a) Show a trace of the recursive descent parser for the string a + b * c using the following EBNF description. **(5 marks)**

<expr> → <term> {(+ | -) <term>}
<term> → <factor> {(* | /) <factor>}
<factor> → id | int_constant | (<expr>)

(b) Given the following grammar and the right sentential form, draw a parse tree and show the phrases and simple phrases, as well as the handle. **(10 marks)**

S → AbB | bAc A → Ab | aBB B → Ac | cBb | c

(i) aAcccbbc
(ii) baccBbbbbc

(c) Show a complete parse, including the parse stack contents, input string, and action for the string id + id * id, using the grammar and parse table. **(7 marks)**

1. E → E + T
2. E → T
3. T → T * F
4. T → F
5. F → (E)
6. F → id

	Action							Goto		
State	**id**	**+**	*****	**(**	**)**	**$**		**E**	**T**	**F**
0	S5			S4				1	2	3
1		S6								
2		R2	S7		R2	R2				
3		R4	R4		R4	R4				
4	S5			S4				8	2	3
5		R6	R6		R6	R6				
6	S5			S4					9	3
7	S5			S4						10
8		S6			S11					
9		R1	S7		R1	R1				
10		R3	R3		R3	R3				
11		R5	R5		R5	R5				

6. (a) Consider the following JavaScript program: **(6 marks)**

```
var x, y, z;
function sub1() {
    var a, y, z;
    function sub2() {
        var a, b, z;
        ...
    }
    ...
}
function sub3() {
   var a, x, w;
...
}
```

List all the variables, along with the program units where they are declared, that are visible in the bodies of sub1, sub2, and sub3, assuming static scoping is used.

(b) Consider the following skeletal C program: **(8 marks)**

```
void fun1(void); /* prototype */
void fun2(void); /* prototype */
void fun3(void); /* prototype */
void main() {
  int p, q, r;
  ...
}
void fun1(void) {
    int q, r, s;
    ...
}
void fun2(void) {
    int s, t, w;
    ...
}
void fun3(void) {
    int x, y, z;
    ...
}
```

Given the following calling sequences and assuming that dynamic scoping is used, what variables are visible during execution of the last function called? Include with each visible variable the name of the function in which it was defined.

(i) main calls fun2; fun2 calls fun3; fun3 calls fun1.
(ii) main calls fun3; fun3 calls fun1.
(iii) main calls fun1; fun1 calls fun3; fun3 calls fun2.
(iv) main calls fun3; fun3 calls fun2; fun2 calls fun1.

**********END**********