Solved Question Paper December 2010

2.c)Differentiate between object oriented database and relational database(4marks)

Relational Database	Object oriented database
Database that stores data in tables that consist of rows and columns. Each row has a primary key and each column has a unique name.	Database that stores data in objects. An object is an item that contains data, as well as the actions that read or process the data.
relational database rely on relational model.	Object database rely on OOP
relational data base handle a single data.	Object database can handle different types of data.
It is based on mathematical principles called relational algebra.	It is based on objects.
Associations are not directly represented.	Associations are directly represented.
Faster for complex queries	Slower than relational databases for relational databases.
Supports multiple writers and readers.	Does not support multiple writers and readers.
RDBMS store only data.	OODBMS store data and methods.

2.d) Difference between Structured analysis design and Object Oriented Analysis and design. (4marks)

Structured analysis design	Object Oriented analysis and design
Its focus is on processes and procedures.	Its based on the concept of objects.
Most direct way of implementing a desired goal.	Its an indirect way of system development because in this holistic view of application domain is considered, and objects are identified in the related problem domain.
Readjustment of some new changes in the system is very difficult.	It gives space for further enhancement of the system.
It is suitable for well-defined projects with stable user requirements.	It is suitable for risky large projects with changing user requirements.
follows **top-down approach**.	follows **bottom-up approach**.
Programs are divided into small self contained program segment known as **functions**.	Programs are divided into small entities called **objects**.
less secure as there is no way of **data hiding**.	more secure as having data hiding feature.

provides **less reusability,** more function dependency.	provides more reusability, less function **dependency**.
can solve **moderately** complex programs.	can solve any **complex** programs.
Less abstraction and less flexibility.	More abstraction and more flexibility.
Functions and data are not tide together.	Functions and data are tide together.
Modelling techniques used in this are DFD, flowcharts etc..	Modelling techniques used is UML which includes state diagram, class diagram, Use Case diagram, Sequence Diagram etc..
It is an old approach and is not preferred.	It is a common approach nowadays.

2.a)Differentiate between the following with examples :Specialization and Generalization(4marks)

Specialization	Generalization
It is a top-down activity.	It is a bottom-up activity.
Specialization involves the definition of a new class which inherits all the characteristics of a higher class and adds some new ones, in a subclass. Specialization is the reverse process of Generalization means creating new sub classes from an existing class.	Generalization extracts the common features from a collection of classes, and placing them higher in the inheritance hierarchy, in a super class. OR The process of extracting common characteristics from two or more classes and combining them into a generalized superclass, is called Generalization. Generalization is represented by a triangle followed by a line.
The higher level entity may not have lower level entities.	The higher level entity must have lower level entities.
Specialization increases the size of a schema.	Generalization reduces the size of a schema.
Specialization is applied on a single entity.	Generalization entities on group of entities.

Specialization results in forming the multiple entity from a single entity.	Generalization results in forming a single entity from multiple entities. Generalization clubs all the entities that share some common properties to form a new entity.
Creates new objects based on the difference between the existing ones and have some features of the parents.	Takes all the information that have universal nature within the entities and then forms a new entity.
Animal example in study material	Furniture example in study material

2.e) Differentiate between strong typing and week typing (4marks)

Typing enforces object class such that objects of different classes may not be interchanged.

There are two kinds of typing :

Strong Typing : Here, the operation on an object is checked at the time of compilation. In this case, the type is confirmed forcefully. E.g. : Eiffel

Weak typing : The operation is checked only at the time of execution. Operations on any object can be performed. Messages may be sent to any class. Type confirmation is not essential. In these types of languages more errors at execution time may occur. E.g.: Smalltalk

Example :

Consider : Vegetable v; Fruit f; Apple a;

This means 'v' is a variable of class Vegetable, 'f' is a variable of class Fruit and 'a' is a variable of class Apple. Typing ensures that value of 'f' cannot be assigned to 'v' . However, if Apple extends Fruits, then 'f' can be assigned a value of 'a'. i.e., the variable of a sub class can be assigned to variable of super class, but variable of a super class cannot be assigned to variable of sub class(i.e., 'a' cannot be assigned a value of 'f').