

Ajay Kumar Garg Engineering College, Ghaziabad

Department of MCA

Sessional Test-2 Solution

Course: MCA
 Session: 2017-18
 Subject: Software Engineering
 Max Marks: 50

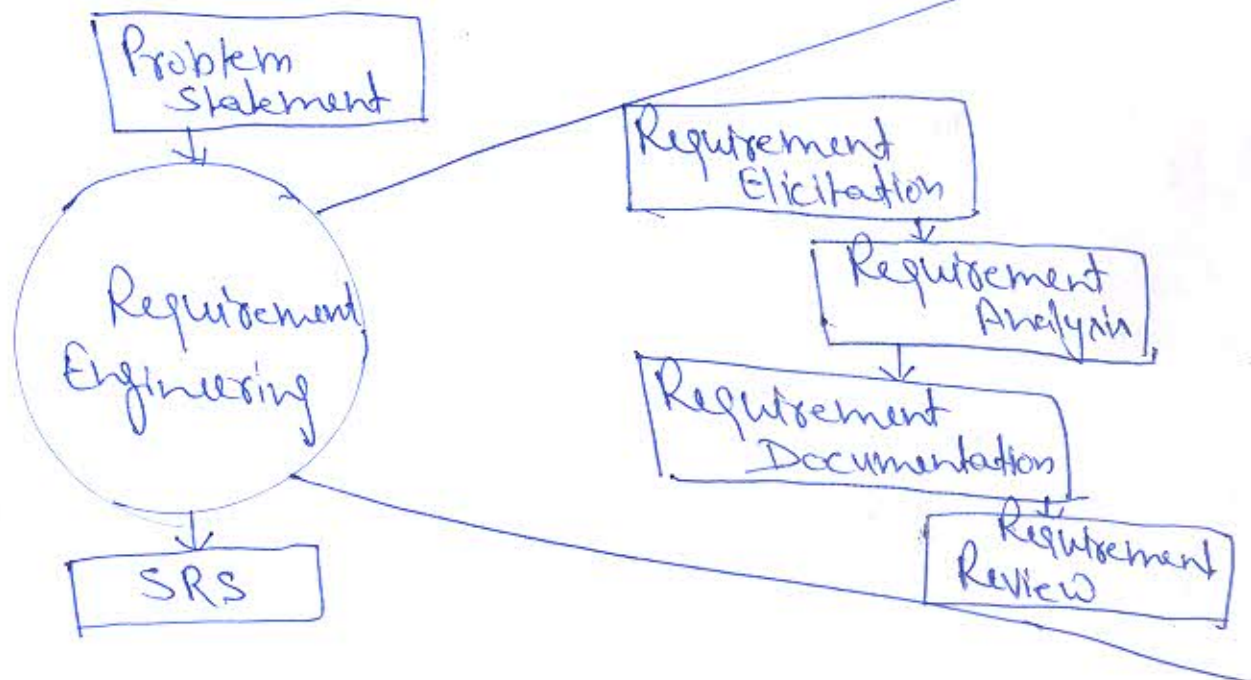
Semester: V
 Section: MCA-1 & 2
 Sub Code: NMCA-512
 Time: 2 hour

Note: Answer all the sections.

Section-A

Q.1 Enlist various steps of requirement engineering.

Ans:-



Q.2:- Which ISO standard is applicable for software?

Ans:- The ISO 9001 is applicable for software because this standard defines for quality assurance in design, development, installation and servicing.

Q.3:- State Software Quality Assurance (SQA).

Ans:- The Software quality assurance is a process for providing adequate quality that the software product and processes in the project life -

cycle conforms to their specific requirement. (2)

Q.4:- What is the difference between Conceptual and technical design? [2]

Ans:- Conceptual Design

1. Conceptual Design describes the system in large understandable to the customer.

2. It does not contain any details and is independent of implementation,

Technical Design

Technical Design describes the hardware configuration, shows input output of the system that translates in to the solution to customer's problem.

It contains the technical details and always depend on implementation

Q.5:- What is the purpose of metric and measurement? [2]

Ans:- The purpose of metric and measurement is to monitor the extent to which a product or process meets desired specification.

Q.6;- Why is SRS also known as blackbox specification?
Also describe the desirable characteristics of good SRS? [5]

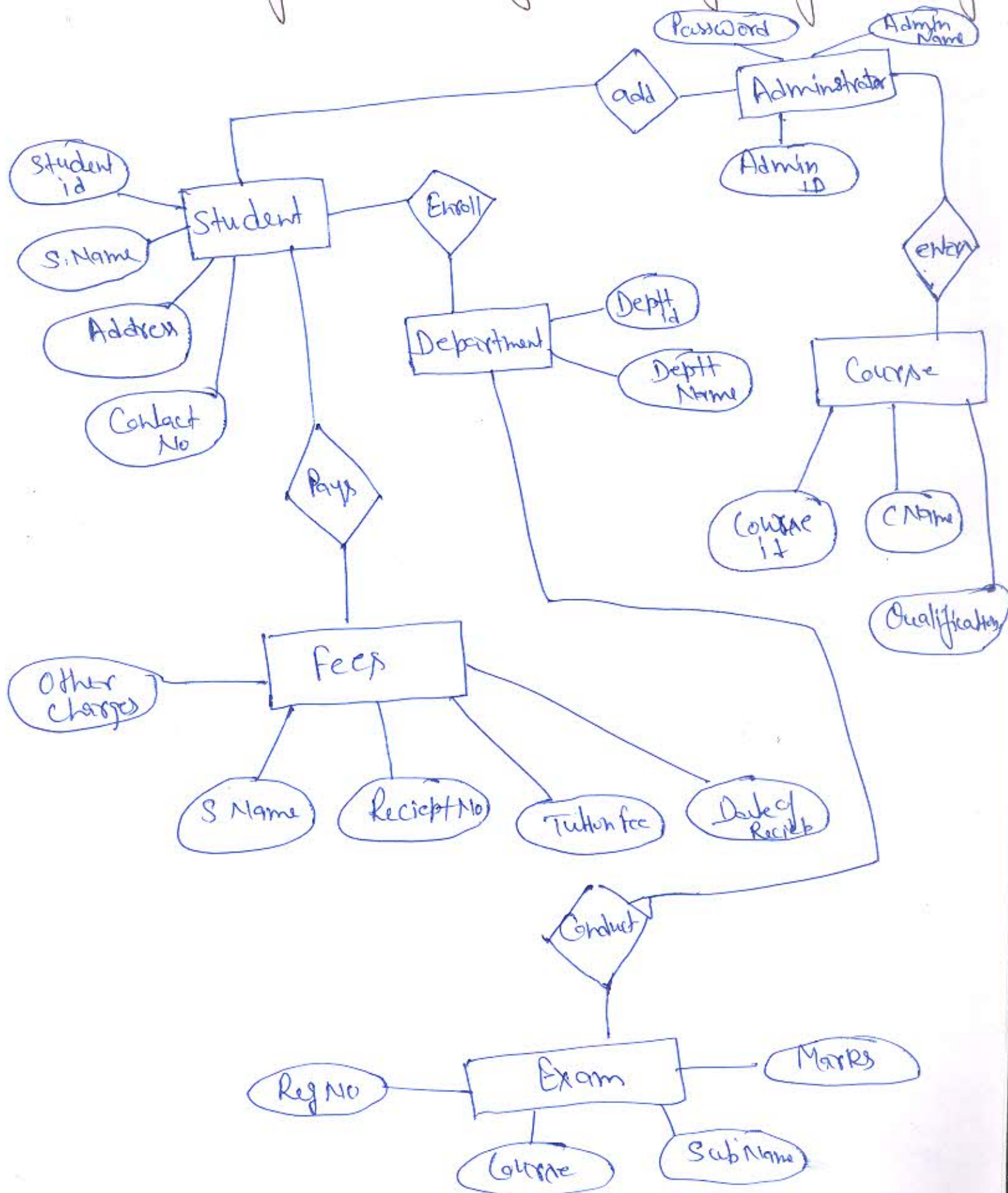
Ans;- The SRS document is known as black box specification because it should only specify what the system should do and refrain from stating how to do. This means that SRS document only specify the external behaviour of the system and not discuss the implementation issue.

Important characteristics of SRS

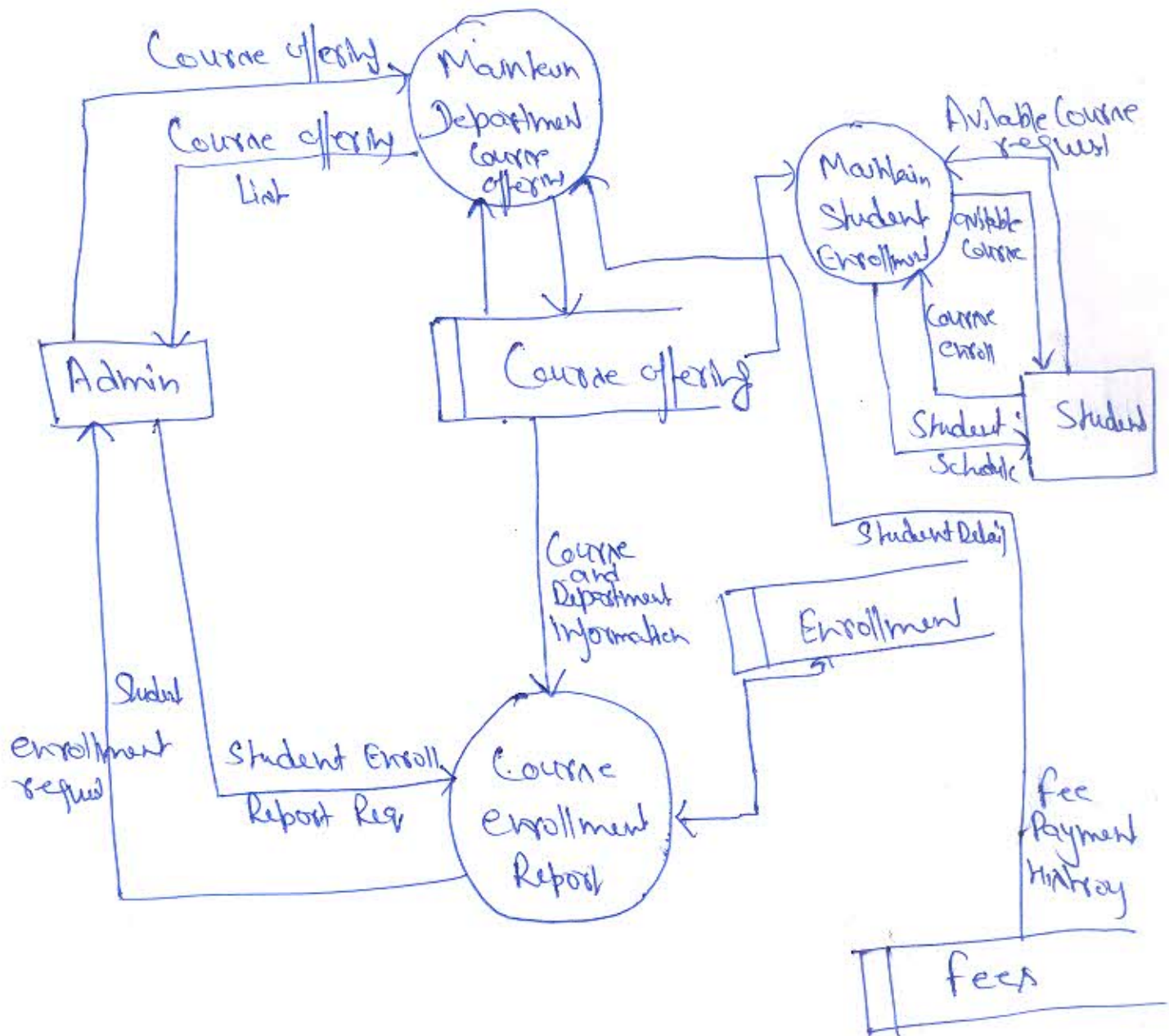
1. Correct and Concise;- The SRS document should be correct, concise at the same time unambiguous, consistent and complete. The SRS is unambiguous if and only if every requirement stated has one and only one specification.
2. Structured;- The SRS document should be well structured. A well structured SRS is easy to understand and modify.
3. Verifiable;- All requirements of the system as documented in the SRS document should be verifiable. It should be possible to determine whether or not requirement have met in an implementation.
4. Modifiable;- flexible enough to accept modifications in the SRS.
5. Traceable;- Every requirement entitled in SRS must be traced to its source who has proposed this.

Q.7] "A Network Based Course registration system for your University". Develop an ERD and level 1 DFD for the above? [5]

Ans.7 ERD for Course Registration System of University.



Level 1 DFD for Course registration System of University ⑤



Q.8:- What do you mean by total quality management? Discuss Mgeault's quality model in detail? (5)

Ans:- The degree to which a system component or process meets specified requirement or the degree to which a system component or process meets customer expectation.

Mgeault has proposed a quality circle or triangle for achieving the required quality outcomes. There are various important quality factors are given below.



Mgeault Quality Attributes

Product operation:- These factors are related to the operation of a product.

Product Revision:- The factors which are required for testing and maintenance are come under Revision.

Product Transition:- When we have to transfer the product from one platform to another or from one

technology to another. Then these factors related to transfer are to be combined.

Q.9:- Compute function point value for a project with the following domain characteristics:

Functional Units	Weighting factor
No of I/P = 30	4
No of O/P = 62	5
No of O/P = 24	4
No of files = 8	10
No of files = 2	7

Assume that all the complexity adjustment values are average.

Ans:-
$$UFP = \sum W_{ij} Z_{ij}$$
$$= 30 \times 4 + 62 \times 5 + 24 \times 4 + 8 \times 10 + 2 \times 7$$
$$= 620$$

Now we calculate
$$CAF = (0.65 + 0.01 \sum f_i)$$
$$= (0.65 + 0.01(14 \times 3))$$

Because the complexity adjustment factor is average = 3

$$CAF = 0.65 + 0.42$$
$$= 1.07$$

(8)

Now we calculate function point value

$$\begin{aligned} \text{FP} &= \text{UFP} \times \text{CAF} \\ &= 620 \times 1.07 \\ &= 663.4 = 663 \end{aligned}$$

Q.10:- What is the concept of function oriented software design? List some advantage of using this approach? [5]

Ans:- Function oriented design is an approach to software design where the design is decomposed into a set of interacting units where each unit has a clearly defined function. Thus system is designed from functional point of view, for a function oriented design the design can be represented graphically or mathematically by the following:-

- * Data flow diagram
- * Data Dictionaries
- * Structure chart
- * Pseudocode

Advantage of function oriented design:-

1. In function oriented design, the system is comprised in many sub smaller systems called functions.

2. The functions are capable of performing ^⑦ significant task in the system. The system is considered as top view of all functions.
3. The whole system is seen as how data flows in the system by means of data flow diagram.
4. Data flow diagram depicts that how data and state changes the flow of entire system.
5. The entire system is logically broken in to smaller units known as functions on the basis of their operation in the system.

Q. 11. What do you understand by requirement elicitation and Analysis? Discuss various techniques of requirement elicitation in detail?

Ans:- Requirement Elicitation:- This process is known as gathering of requirement. All the requirements are to be identified with the help of customer and existing system processes, if they are available.

Requirement Analysis:- This process analyze, refine and ~~analyze~~ scrutinize requirement to make consistent and unambiguous requirement. The analysis of requirement starts with requirement elicitation. All the requirements are analyzed in order to identify inconsistency and defects.

Methods of Requirement Elicitation:-

1. Interview:- The objective of conducting an interview is to understand the customer requirement from the software.

2. Brainstorming session:- Brainstorming is a group discussion that may be used during requirement elicitation to understand the requirement.

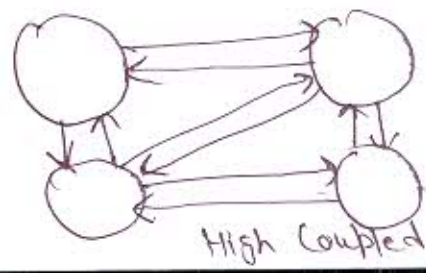
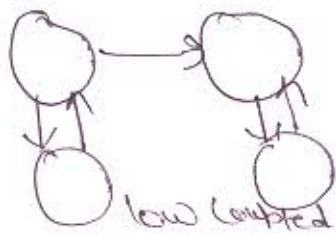
The group discussion may lead to new ideas quickly and help to promote creative thinking.

3. facilitated application specification techniques (FAST) ⁽¹¹⁾
 This approach is similar to brainstorming session and the objective is to bridge the expectation gap between the developers think they are supposed to build and what customer they are going to get. In order to reduce expectation gap a team oriented approach is developed called FAST.
4. Quality function Deployment (QFD) \rightarrow It is a quality management technique that helps to incorporate the voice of customer. The voice is then converted in to the technical requirement.
5. Use Case Approach \rightarrow This approach is a combination of text and pictures in order to improve the understanding of requirement. The Use case define what the system and not how. They only give the functional view of the system.

Q12) - Explain various types of coupling and cohesion [7.5], methods of module dependency.

Ans - Coupling \rightarrow It is a measure of degree of interdependence between modules.

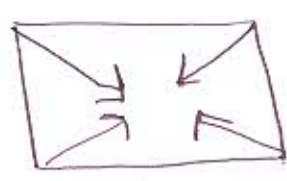
High and low coupling -



Types of Coupling

1. **Data Coupling** :- The communication between modules is accomplished through well defined parameter list consist of data information item.
2. **Stamp Coupling** :- Stamp coupling occurs between module A and B when complete data structure is passed from one module to another.
3. **Control Coupling** :- A module controls the flow of control. This is accomplished by passing control information items as arguments.
4. **Common Coupling** :- Modules share common or global data or file structure. This is the strongest form of coupling. Both modules depend on the detail of common structure.
5. **Content Coupling** :- A module is allowed to access or modify the content of another, e.g. modify its local or private data item. This is strongest form of coupling.

Cohesion :- It is a measure of degree to which the elements of modules are functionally related. Cohesion is weak if elements are bundled simply and strong if all parts are needed for functionality of other parts.



Module Cohesion.

Types of Cohesion

1. **Functional Cohesion** :- Functional Cohesion is said to exist if different elements of module cooperate to achieve single function. Every element in the component is essential to the computation.
2. **Sequential Cohesion** :- If module A output some data which forms the input to B. The output of one part is the input to another.
3. **Communicational Cohesion** :- A module is said to be a communicational cohesion if all the functions of the module refer to or update the same data structure.
4. **Procedural Cohesion** :- It is a form of cohesion obtained when software components are grouped into a module to perform a series of function.
5. **Logical Cohesion** :- A module is said to be logically cohesive if all the elements of the module perform similar operation.
6. **Coincidental Cohesion** :- Coincidental cohesion exist in module that contains instructions that have little or no relationship to one another. All the parts of the components are unrelated.