

**CE 1353 - CONSTRUCTION PLANNING AND SCHEDULING**

**TWO QUESTION & ANSWERS**

**SIXTH SEMESTER**

**BY**

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## UNIT-1

### **1. What is planning?**

Planning aims at formulation of a time based plan of action for coordinating various activities and resources to achieve specified objectives. Planning is the process of developing the project plan. The plan outlines how the project is to be directed to achieve the assigned goals. It specifies a predetermined and committed future course of action, based on discussions and decisions made on the current knowledge and estimation of future trends.

### **2. What is construction planning**

The construction planning process is stimulated through a study of project documents. These documents include but are not limited to the available technical and commercial studies and investigations, designs and drawings, estimation of quantities, construction method statements, project planning data, contract documents, site conditions, market survey, local resources, project environment and the client's organization. The planning process takes in to account, the strengths and weakness of the organizations.

### **3. What are the objectives of planning?**

Proper design of each element of the project

Proper selection of equipment and machinery in big projects, the use of large capacity plants are found economical

Procurement of materials well in advance

Proper arrangement of repair of equipment and machinery

Employment of trained and experienced staff on the project

To provide incentive for good workers

To arrange constant flow of funds for the completion of project

To provide proper safety measures and ventilation, proper arrangement of light and water.

#### **4. What are the types of project plans?**

Planning the entire project from its inception to completion requires a vast coverage, varied skills and different types of plans. The nature of plans encountered in a typical construction project are indicated below

##### **Types of project plans**

Development stage	nature of plan
Inception stage	project feasibility plan
Engineering stage	project preliminary plan
Implementation stage	project construction plan

#### **5. Define work tasks?**

Work tasks represent the necessary frame work to permit scheduling of construction activities, along with estimating the resources required by the individual work tasks and a necessary precedence or required sequence among the tasks. The terms work tasks or activities are often used interchangeably in construction plans to refer to specific defined items of work.

**6. List out the project planning techniques?**

<b>Stages</b>	<b>Planning process</b>	<b>Techniques/methods</b>
Planning time	Breaking down project work, developing time network plans	Work break down, network analysis, gnat chart
Planning resources	Forecasting resource requirements, manpower requirements, planning material requirements, budgeting costs, designing organizational structure	Man power scheduling Material scheduling Resource allocation Cost planning & budgeting Equipment selection and scheduling
Planning implementation	Formulating monitoring methodology	Resource productivity control, time control, contribution control, budgetary control

**6. What are the steps involved in planning?**

- a. defining the scope of work to be performed
- b. preparing the logic or network diagram to establish a relationship among activities and integrating these diagrams to develop the network model
- c. analyzing the project network or models to determine project duration, and identifying critical and non-critical activities
- d. Exploring trade-off between time to cost to arrive at optimal time and costs for completing the project.

- e. Establishing standards for planning and controlling men, materials, equipment, costs and income of each work package
- f. Forecasting input resources, production costs and the value of the work done
- g. Forecasting the project budget allocations for achieving targets assigned to each organizational unit
- h. Designing a control system for the organization
- i. Developing the resources, time and cost control methodology

**8. What is the purpose of coding?**

- a. To identify the data connected with each work package, as work packages from the database for managing various project functions.
- b. To aid in the organization of data from the very detailed to the very broad levels
- c. To enable the processing, sorting, and extraction of information required at various levels of management and functional units.
- d. To computerize the data processing system

**9. How many categories available in codification?**

In construction projects, the codes used can be broadly divided in to two categories i.e. project interfacing codes or simply referred as project codes and department specialized codes.

**Project interface codes:**

These are the common codes used for developing an inter department database. Ex: a project code for the foundation of a building.

**Departmental specified codes:**

These codes are developed by the departmental heads for their use. Ex: to indicate the location of materials in site ware houses

**10. Define the types of labeling approach?**

- a. alphabet codes**
- b. numerical codes**
- c. alphanumeric codes**

**Alphabet codes:**

Alphabet letters A to Z, single or combined, can be used to represent a code. An alphabet in a single character space can represent 26 variations as compared to numerals 0 to 9, which can depict maximum of 10 variations

**Numerical codes:**

It is the most important form of coding in numerical codes, each character can be represented by a numerical varying from 0 to 9

**Alpha numerical codes:**

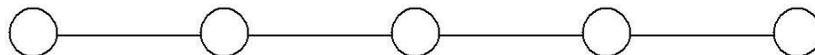
It is the combination of alphabets and numerals to develop a each code.

**11. Defining precedence relationship among activities?**

Precedence relations between activities signify that the activities must take place in a particular sequence. Numerous natural sequences exist for construction activities due to requirements for structural integrity, regulations and other technical requirements.

**For example**

Excavate      place formwork      place reinforcement      pour concrete  
Trench



## 12. Define the following terms?

- i. activity
- ii. event

**Activity:** a project can be broken down in to various operations and process necessary for its completion. Each of these operations and processes, which consume time and possibly resources, is called activity. The activities are represented by arrows.

**Event:** it is the state between the completion of a preceding activity and the beginning of the succeeding one. It has no duration an event is shown by a circle or ellipse

## 13. Define activity direct cost?

This is the cost that can be traced in full with the execution of a specific activity. It consists of costs of direct labour, direct equipment and other direct costs. For example: in the activity of roof concreting, the following direct costs would be involved.

<b>Types of costs</b>	<b>item of costs</b>
Direct materials	cost of concrete and steel
Direct labour	cost of labour employed

## 14. Define activity indirect cost?

This is the cost that incurred while performing an activity, but cannot be traced directly to its execution. In other words, all costs other than the direct ones fall in this category. These represent the apportioned share of supervision; general and administration costs are commonly refer to as overhead.

## UNIT – II

### **1. What is the object of scheduling?.**

Scheduling means putting the plan on calendar basis. A project network shows the sequence and inters dependencies of activities, their time and their earliest and latest completion time, but these needs to be scheduled to determine commencement and termination dates of each activity. Using optimum resources or working within resource constraints, it is a time table of work. A basic distinction exists between resource oriented scheduling techniques. The project is divided into number of operations.

### **2. List out the advantages of scheduling.**

1. By studying of any work and the many alternative methods of execution, we can choose the best one.
2. It gives a clear idea regarding the required men, materials and equipments at different stages of work.
3. Resource utilization is optimized.
4. Actual progress of the work is monitored with the actual plan. If there is any delay, proper remedial measures can be taken to avoid such delays.

### **3. What is the purpose of work scheduling?**

The bar – chart type work schedule provides a simplified version of the work plan, which can easily be understood by all concerned with planning, co – ordination, execution and control of the project.

(b) It validates the time objectives:

A work schedule shows the planned sequence of activities, data – wise while putting the work plan on a calendar basis, it takes into account reduced efficiency of resources to adverse climatic conditions and other factors.

( c) It evaluates the implications of scheduling constraints:

A work schedule brings out the implications of constraints and enables preparation of a plan of work within the frame work of these constraints.

#### **4. What are the steps involved in schedule chart?**

(a) Select the EST point of activity layout on the graph, and draw a line sloping equal to its rate of execution i.e., 1 unit per day.

( b) Plot the lowest rate slowing line and mark its intersection with the top to foundation horizontal line.

( c ) Starting from the point of intersection, move forward horizontally on the top line and identify latest completion point of subsequent activity as indicated by the set back.

#### **5. What are the factors affecting work scheduling?**

##### **(a) Time:**

Most of the projects carry time constraints in the form of imposed dates, these dates may include constraints on start and completion of activities.

##### **(b) Manpower:**

Man power is one of the main in the successful execution of projects. The idle labour time is paid for and the strikes and breakdown of work are kept in view by manpower.

##### **(c) Materials:**

Construction materials are increasingly becoming scarce and their procurement is a time consuming process. The schedule aids in forecasting of materials and their timely supply determines the economics and progress work.

## **6. What is the purpose of numbering events?**

- i. It simplifies the identification and description of an activity in terms of event numbers.
- ii. The activities are coded as i- j where i and j are the event numbers as commencement and termination of an activity.
- iii. It helps in developing identification code for computer application.
- iv. It systematizes the computations of critical path for each activity as far as possible, the number of the preceding event it should be less than that of the succeeding event.

## **7. Define the following terms:**

### **1. Critical path:**

The longest path through the network is called critical path and its length determines the minimum durations in which the project can be completed.

### **2. PERT ( Programme Evaluation and Review Technique):**

PERT is event oriented. It is probabilistic model i.e., it takes into account uncertainties involved in the estimation time of a job or an activity. It uses three estimates of the activity time, optimistic time and pessimistic time and, most likely time.

### **3. Dummy activity:**

It is superimposed activity, which does not represent any specific operation or process. It has zero duration and consumes no resources, its purpose is two fold.

(a) To provide a logical link to maintain the correct.

(b) To simplify the description of concurrent activities in terms of event numbers. The dummy activity is drawn like any other activity, but with dotted lines.

## **8. What is the significance of critical path?**

(a) It is the longest path in the network, however it is possible for a network to have more than one critical path. The sum of the durations of critical activities along the critical path determines the duration of the project.

(b). It is the most sensitive path, any change in duration critical activities along the critical path is bound to effect the duration of the entire project.

**9. Define the following terms.**

**1. EST ( Earliest Start Time) :**

This is the earliest time an activity can be started, assuming that all the activities prior to it have taken place as early as possible.

**2. LST (Latest Start Time) :**

This is the latest time an activity can start consistent, with the completion of the project in the stipulated time. The LST of an activity is determined by subtracting the activity duration from the LFT of succeeding event.

**3. EFT ( Earliest Finish Time):**

It is the earliest time by which an activity can be completed assuming that all the activities prior to it begin at their EST.

**4. LFT (Latest Finish Time):**

It is the latest time by which an activity must be completed to ensure the completion of project within the stipulated time.

**10. What are the classification of networks?**

1. Skeleton network
2. Master network
3. Detail network
4. Summary network.

**11. Define the following terms:**

**(a) Float:**

The difference between the latest start time and earliest start time of an activity is called as float. Float is a measure of the amount of time by which the start of an activity can be delayed consistent with the completion of the project on time.

**(b) Total Float:**

Total float of an activity is defined as the difference between the maximum duration of time available for the completion and duration required to carry out that duration.

**12. What is mean by resource leveling and crashing? Resource leveling:**

The aim is reduce the peak resource requirements and smooth out period to period assignment within a constraint on the project duration.

**Crashing:**

Higher amounts of direct activity cost would be associated with smaller activity duration times, while longer duration time would involve comparatively lower direct cost. Such deliberate reduction of activity times by putting in extra effort is called Crashing.

**13. Define the following terms:**

**1. Normal cost:**

Normal cost is the lowest possible direct cost required to complete an activity.

**2. Normal time:**

Normal time is the maximum time required to complete an activity at normal cost.

**3. Crash time:**

Crash time is the minimum possible time in which an activity can be completed using additional resources.

**4. Crash cost:**

Crash cost is the direct cost i.e., anticipated in completing an activity within the crash time.

**14. Define activity cost slope.**

Activity cost slope is the rate of increase in the cost of activity per unit with a decrease in time. The cost slope indicates the additional cost incurred per unit of time saved in reducing the duration of an activity.

Activity Cost slope =

$$\frac{\text{crash cost} - \text{Normal cost}}{\text{Normal time} - \text{Crash time}}$$

### UNIT-III

#### **1. List out any 5 indirect cost.**

Temporary utility

Cleaning

Unloading

Ware housing

Work shop

#### **2. What is meant by Contingencies?**

Contingency is a cushion of cost to deal with uncertainties. Few factors resulting in contingencies are minor design changes, under estimate of cost, lack of experience, unanticipated price changes, safety problems etc.

#### **3. What is meant by Budget?**

Budget is an estimate of cost planned to be spent to complete a particular activity.

#### **4. What are the types of cost flow?**

1) Cash Inflow

2) Cash outflow

#### **5. What is meant by Cost Forecasting?**

Cost Forecasting is the requirement of cost to continue with the project at the desired speed.

#### **6. What is meant by Cash Flow control?**

Cash Flow control is the additional planning required to arrange for the cash to meet the demand for the funds.

#### **7. What are the sources of cash inflow?**

Sales of goods

Investment from the owner Debt financing (loan)

Sales of shares

**8. What are the sources of cash outflow?**

Purchase of shares  
Payment of dues for loans  
Payment of bills  
Taxes

**9. List out the cost control problems**

Equipment rate variance  
Equipment operating variance  
Labour rate variance  
Material wastages  
Equipment variance  
Other common reasons

**10. What are the project cost budget monitoring parameters?**

Budget cost of work Scheduled(BCWS)  
Budget cost of work Performed(BCWP)  
Actual cost of work Performed (ACWP)

**11. What are the methods of measuring progress of work?**

Ratio method  
Repetitive type of work progress  
Non Repetitive complexwork progress  
Start/Finish method

**12. What are the types of accounting?**

- 1) Financial Accounting
- 2) Cost Accounting

**13. What are the types of Assets?**

1. Current Assets
2. Liquid Assets
3. Fixed Assets
4. Intangible Assets

**5. What are the types of Liabilities?**

- i. Current Liabilities
- ii. Fixed Liabilities

**15. Give the hourly Productivity forecasting formula.**

$$C_f = w * h_f * u_t$$

Where,

$C_f$  = Total units of work

$W$  = Total units of work

$h_f$  = Time Per unit

$u_t$  = Cost per unit time

## UNIT-IV

**1. What are the types of statistical sampling?**

- 1) Sampling by attributes
- 2) Sampling by variables

**2. What are the standards measured in safety construction?**

Provide Helmets for workers Requiring  
Eye Protection  
  
Requiring Hearing Protection Supply Safety  
Shoes  
  
Provide First Aid facility

**3. What are the Various temporary Safeguards in construction?**

Guy lines Barricades  
  
Braces  
  
Railings  
  
Toe Boards

**4. How do you improve the job site in construction?**

Design  
  
Choice of technology Educating  
workers  
  
Pre-qualification of contractors

**5. What do you mean by Sampling by attributes?**

The acceptance and rejection of a lot is based on the number of defective or a non defective item in the sample. This is referred to as sampling by attribute.

**6. How do you improve in total control?**

- 1) To improve worker enthusiasm
- 2) To reduce the defective items
- 3) To increase the cost of items
- 4) To insure safe and effective construction

**7. What are the material Specifications available in construction?**

- 1) The American Society for Testing and materials (ASTM)

- 2) The American National Standards Institute(ANSI)
- 3) Construction Specification Institute(CSI)
- 4) American Welding Society(AWS)

**8. What are the factors affecting Quality in construction?**

- 1) Incorrect Design
- 2) Improper workmanship
- 3) Lack of attention in worksite
- 4) Lack of training in construction work

**9. Define Quality.**

Quality is defined as the fitness for the purpose and it satisfies the customer.

**10. Mention the causes of Accident in a construction industry.**

- 1) Physical Accident
- 2) Physiological Accident
- 3) Psychological Accident

**11. What are the functions of Inspection?**

- 1) Material Inspection
- 2) Process Inspection
- 3) Equipment Inspection
- 4) Finished Job Inspection

**12. What are the Various Safety equipments?**

Helmet  
Gloves  
Shoes  
Goggles  
Safety Belts

**13. Mention two safety Quotation.**

Make safety a habit  
Good work is a Safe work

**14. What are the technical services required for inspection?**

1. Engineers/Designers/Architect/Geologists

2. Supervisors
3. Scientists
4. Technicians

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- 1) Physical Accident
- 2) Physiological Accident
- 3) Psychological Accident

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**17. What are the Various Safety equipments?**

Helmet Gloves  
Shoes Goggles

Safety Belts

**18. Mention the Physical causes of Accident in a construction industry.**

Accidents caused due to Machines  
Accidents caused due to tools  
Accidents caused due to materials  
Accidents caused due to uniform  
Accidents caused in working environment

## UNIT-V

### 1. What are types of project information?

- Cash flow and procurement accounts for each organization
- Intermediate analysis resulting during planning and design
- Design document, including drawings and specifications
- Construction schedules and cost estimates
- Quality control and assurance records
- Construction field activity and inspection logs
- Legal contracts and regulatory documents

### 2. Write the use of project information in construction.

- To find out the overall growth of the project.
- An historical record may be important for use during operation, to assess responsibilities in case of facility failure or for planning similar projects.
- The control and flow of information also important for collaborative work environment may professionals are working on difference aspect of a project and sharing information.
- Information provided for sharing data files tracing decisions and communication via electronic mail or video conferencing.
- To understand the scope alternatives for organizing project information.

### 2. Define database and DBM

Database: Database is a collection of stored operational information used by the management and application systems of some particular enterprise.

DBM:DBM is the software program that directs the storage, maintenance, manipulation and retrieval of data users retrieve or store data by issuing specific request to the DBM. The objective of introducing a DBM is to free the user from the detail of exactly how data are stored and manipulated,

#### **4. What is meant by database administrator?**

Database administrator is an individual or group charged with the maintenance and design of the database, including approving access to the stored information.

In large organization with many users, the database administrator is vital to the success of the database systems.

For small projects, the database administrator might be an assistant project manager or even the project manager.

#### **5. What are the advantages relational models of databases?**

Flexibility

Efficiency

Reduces the redundancy

Manipulation is easy

Alternatives views or external models of the information.

#### **6. Define hierarchical model.**

The hierarchical model is a tree structure in which information is organized as branches and nodes from a particular base. It has the characteristic that each items has a single predecessors and a variable number of subordinate data items.

#### **7. What are the advantages of centralized management systems?**

(i) Reduced redundancy: Good planning can allow duplicate or similar data stored in different files for different applications to be combined and stored only once

(ii) Improved availability: Information may be made available to any application program through the use of the DBM

(iii) Reduced inconsistency: If the data is stored in more than one place, then updating in one place and not everywhere can lead to inconsistencies in the database.

(iii) Enforced data security: Authorization to use information can be centralized.

#### **8. What are the application programs in DBM?**

- Data is drawn from the central database as needed by individual programs
- Information request are typically performed by including predefined function calls to the database management system within an application program.
- One program are stored in the database and can be used by subsequent programs

without specialized translation routines.

## **9. Define data dictionary**

Data dictionary contains the definitions of the information in the database. Data dictionary are limited to descriptions as the information source for anything dealing with the database systems. The data dictionary may be contain user authorization specifying who may have access to particular pieces of information

## **10. What is the main feature of database?**

Database can serve the role of storing a library of information on standard architectural features and compound properties.

These standard compounds can be called from the database library and induced into a new design.

The database can also store the description of a new design, such as number, type and location of building components

## **10. What are the advantages of integrated application systems?**

- Communicate with a single database.
- Integrated system without extensive modifications to existing programs.
- The use of integrated systems with open access to a database is not common for construction activities at the current time.

## **11. What are the disadvantages of centralized database management systems?**

1. Central database systems may be expensive and cumbersome that it becomes ineffective
2. Manual information management can also expensive
3. Installing and maintaining database costly
4. A single database is particularly vulnerable to equipment failure

## **13. Define network model**

The network model or database organization retains the organization of information on branches and nodes, but does not require a tree of structure.

It gives greater flexibility but does not necessarily provide ease of access to all data items.

#### **14. Define relational model**

The relational model is defined as one possible relation to record unit cost data associated with particular activities, included in the database would be one row for each of the various items involved in construction or other project activities.