KONGUNADU COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

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DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR: 2023-24 (ODD Semester)

20CE810PE CONSTRUCTION PLANNING AND SCHEDULING
QUESTION BANK

UNIT 1- CONSTRUCTION PLANNING

Basic concepts in the development of construction plans-choice of Technology and Construction method-Defining Work Tasks- Definition- Precedence relationships among activities-Estimating Activity Durations-Estimating Resource Requirements for work activities-coding systems.

PART A

Q.NO	QUESTIONS
1.	Name any two coding systems used in the construction industry.
2.	Prepare a flow chart representing the role of planning in different stages.
3.	Write any two objectives of planning.
4.	Explain briefly the precedence relationship among activities.
5.	What are the necessities of planning?
6.	List out the significance of coding system.
7.	Discuss about the construction planning.
8.	State activity precedence with an example.
9.	Differentiate activity and event.
10.	List out the uses of coding system.
11.	Define work task.
12.	Classify the different project planning techniques.
13.	Write the significance of choice of technology.
14.	List out project planning techniques?
15.	Identify the various resources used for construction project.
16.	Explain the process involved in planning.
17.	Write short notes on choice of construction method.
18.	How will you estimate the activity duration?
19.	Explain the basic concepts involved in development of construction plan.
20.	Summarize the learning curve and define the different phases of learning.

PART B & C

S.No	QUESTIONS
1.	i. Prepare work breakdown and activity network for a tunneling project by defining the precedence relationship. (8) ii. Explain in detail about the estimation of activity durations and importance of learning curves. (8)
2.	Define construction planning. Explain in detail about the basic concept involved in the development of construction plan.
3.	Prepare a generalized report on stages of planning by different agencies.
4.	Define the precedence relationship among various activities and justify the relationship.
5.	Describe the importance of coding system of activities with examples.
6.	List out the factors deciding activity durations.
7.	Explain the procedure to formulate activity network with suitable example.
8.	i. Write down the importance of construction planning. (8) ii. What are the steps involved in planning? (8)
9.	i. How do you specify precedence relationship in activity on node and activity on branch network? ii. Demonstrate the precedence definition for site preparation and foundation work?
10.	How will you estimate the resources for work activities?
11.	i. Define WBS (2) ii. Draw a typical WBS tree diagram for residence building construction. (6) iii. What are the different methods to estimate the time duration of activities? (8)
12.	i. Describe the role of planning in the different stages of a project? (8) ii. Mention the types of plan and objectives of planning? (8)
13.	i. Describe in detail the relationship between choice of technology – construction method and the project time frame and budget limitations. (8) ii. Explain with reference to a high rise building comparing cast-in-situ and precast construction methods for the RCC structure. (8)
14.	Define construction planning. Explain in detail about the basic concept involved in the development of construction plan.

UNIT II- SCHEDULING PROCEDURES AND TECHNIQUES

Event	Immediate predecessor	Event	Immediate predecessor
1	-	6	3,5
2	1	7	3,4
3	2	8	3,7
4	2	9	7
5	2	10	3,6,8,9

PART A

Q.NO	QUESTIONS
1.	Write down the significance of critical path?
2.	Prepare a network for the given activity.
3.	Compare CPM and PERT
4.	Define the terms: - i) Dummy activity ii) EST iii) EFT
5.	Define and differentiate between float and slack.
6.	How will you create an activity node and activity event.
7.	How you will estimate the expected time for an activity.
8.	Define the terms: - i) LFT ii) LST
9.	List the types of networks.
10.	What are the three time estimates used for determining the activity duration in pert procedure?
11.	What are the steps involved in schedule chart?
12.	List out the factors affecting scheduling.
13.	Discuss about the constraints in scheduling.
14.	Explain the terms total float and independent float.

15.	Write down the necessity of resources oriented scheduling.
16.	Distinguish between crash cost and crash time.
17.	Discuss about the purpose of numbering events?
18.	Explain resource leveling and crashing.
19.	State the reason why resource oriented scheduling is necessary.
20.	Define activity cost slope.

PART B

Q.NO	QUESTIONS
1.	i) The duration of activities of a project is as follows. Draw the PERT network diagram. Identify various paths. Identify the critical path. Tabulate the computations. Evaluate the project time? (10) 	Activity	1-2	1-3	2-4	2-5	4-7	5-7	7-8	3-6	6-8	 	---	---	---	---	---	---	---	---	---	---	 	Duration in days	5	10	1	6	12	3	4	7	6	 ii) Compare "Precedence network analysis and critical path method? (6)
2.	(i) Explain in relation to network analysis, the terms critical activity, non-critical activity, independent float and free float? (10) (ii) Define and differentiate between CPM and PERT. (6)
3.	 	ACTIVITY	DURATION IN DAYS	PRECEDING ACTIVITY	 |---|---|---| 	A-B	7	-	 	B-C	10	A-B	 	B-D	15	A-B	 	C-D	7	B-C	 	C–E	12	B-C	 	D-E	3	B-D,C-D	 	E-F	5	C-E,D-E	 Draw the network and design the critical path and calculate the ES, EF, LS and LF of the project whose activities are as follows.

The activities of a project are listed below, draw the network diagram and find out the critical path. Find the completion time of the project. Calculate EST, EFT, LST, LFT and mark in the diagram calculated total float and free float, Tabulate the details.

4.

Activity item	Duration in days	Activities immediately	
		Preceding	Following
			B,C D D
A B	3	- A	D,E G
C	4	A	I H,J I
D E	6	B, C C	L K L
F G	3	D E G	-
H I J	6	F,H G	
K L	4	J I,K	
	5		
	3		
	6		
	4		
	4		
	4		

Activity	A	B	C	D	E	F	G	H	I	J	K
Predecessor	-	-	A	A	B	B	E	C,G	C,G	F,H	D,I,J
Duration (Days)	10	12	8	12	6	5	8	8	10	6	12

5.

1. Draw the project network and identify the critical path.

2. Calculate all the activity times (EST, EFT, LST and LFT)   (6)

3.   Calculate TOTAL FLOAT and

(6)

FREE FLOAT for all the activities.

(4)

The details of a network are given below where the duration is in days.

6.

ACTIVITY	t_0
	t_m
	t_p

Activity	A	B	C	D	E	F	G
Predecessor	-	A	A	A	D	C,E	D,F
Duration (Days)	3	6	16	10	8	5	3

ACTIVITY	NORMAL		CRASH	
	TIME (month)	COST(Rs)	TIME (month)	COST(Rs)
0-1	3	5000	2	5500
1-3	14	10000	11	13000
1-2	7	6000	4	9000
2-3	9	11000	6	18000
3-4	4	9000	3	12000
4-5	3	6000	2	7800

	1-2	2	5	8
	1-3	1	4	7
	2-3	0	0	0
	2-4	2	4	6
	2-6	5	7	12
	3-4	3	5	10
	3-5	3	6	9
	4-5	7	6	10
	4-6	2	5	8
	5-6	2	4	6

Describe the critical path, float and project completion time?

7.	Calculate the critical path and all the floats by constructing activity on branch network?
8.	Define crashing of activities, rules for crashing and draw the corresponding graphs and explain direct cost, indirect cost(overhead cost), crashing cost and total cost.

9.	Determine the minimum cost and optimum duration for the following project. The data of each activity of network is given in the table. Indirect cost is Rs.4000/week.
10.	Explain in detail about resource oriented scheduling?

ACTIVITY	NORMAL		CRASH	
	TIME (WEEKS)	COST(Rs)	TIME (WEEKS)	COST(Rs)
10-20	3	12000	2	16000
10-30	6	18000	3	24000
20-40	2	20000	1	23000
30-40	4	16000	2	21000
40-50	5	30000	4	35000

11.	A project of five activities, whose activity relationships, activity durations (normal and crash) and activity costs (normal and crash) are given in the following table. Estimate the optimum cost and time. Indirect cost is Rs80/ per day.
12.	i) Describe the various methods of presenting project schedules. ii) What are the techniques used for scheduling a project with uncertain duration? Explain any one of them in detail? (8)
13.	i) Discuss about direct cost and indirect cost? (8) ii) What are the constraints of scheduling? Explain how each constraint affects scheduling? (8)
14.	The following table shows the activity needed to compute the project with their normal time and the shortest time in which the activity can be completed for a building contract and the cost per day for reducing the time of each activity. The contract includes a penalty clause of Rs. 100 per day over 17 days. The overhead cost per day is Rs. 160

ACTIVITY	NORMAL TIME (DAYS)	SHORTEST TIME (DAYS)	COST REDUCTION PER DAY
1-2	6	4	80
1-3	8	4	90

		1-4	5	3	30
		2-4	3	3	-
		2-5	5	3	40
		3-6	12	8	200

| 4-6 | 8 | 5 | 50 | |
| 5-6 | 6 | 6 | - | |

i. Cost completing the 8 activities in normal time is Rs.6500. Estimate the normal duration of the project, its cost and its critical path   (8)

ii. Estimate the optimum duration of the project and their corresponding cost using cost time function.   (8)

UNIT 3- COST CONTROL MONITORING AND ACCOUNTING

The cost control problem-The project Budget-Forecasting for Activity cost control - financial accounting systems and cost accounts-Control of project cash flows-Schedule control-Schedule and Budget updates-Relating cost and schedule information.

PART A

Q.NO	QUESTIONS
1.	What is meant by contingencies and define income?
2.	What are the project cost budget monitoring parameters?
3.	List out the sources of cash inflow and cash outflow.
4.	Differentiate financial and managerial accounting.
5.	Explain the term project budget.
6.	List out the classification of cost control.
7.	Write down the advantages of financial accounting.
8.	Explain the objectives of cost accounting and necessity for project management.
9.	Differentiate between fixed cost and variable cost.
10.	Classify the types of accounting system.
11.	Compare cost committed from cost exposure.
12.	Explain schedule control.
13.	Name the controls considered before start of the projects.
14.	Define project cash flow.
15.	Compare percentage completion method and completed contract method
16.	Distinguish between budget cost and revised cost.
17.	Create the S-curve and mention its uses.
18.	List out the components of cash flow status report.
19.	Rewrite the formula for schedule control.

Q.NO	QUESTIONS
20.	Discuss about the account payable journal and accounts receivable journal.

PART B

Q.NO	QUESTIONS
1.	i. Describe the stages of work at which cost control is affected. ii. Classify the cost control systems and explain it. (8)
2.	Brief about the project budget?
3.	Explain in detail about the cash flow control in a project.
4.	List out the various categories of cost involved in a project.Explain it in detail.
5.	Write a brief note on Schedule control.
6.	Explain the different components of accounting system and methods of accounting.
7.	i. Illustrate the main points in determination of cash flow. (8) ii. Explain the elements of cash flow status report. (8)
8.	Discuss how the cost control for a construction project is carried out.
9.	i. How will you calculate the net profit using percentage of completion method and completed contract method (8) ii. Describe the cash flow statement with a typical drawing for a contractor company for one project showing the various inflow and outflow components for 6 months. (8)
10.	i. Describe the Forecasting for activity cost control. (8) ii. Define budget and describe its importance for a construction project and explain how the cost and time trends monitored using S curve. (8)
11.	Write a Short notes on the following i. control estimate (4) ii. cost planning (4) iii. Measurement of cost performance (4) iv. investment appraisal (4)

UNIT 4- QUALITY CONTROL AND SAFETY DURING CONSTRUCTION

Quality and safety Concerns in Construction-Organizing for Quality and Safety-Work and Material Specifications-Total Quality control-Quality control by statistical methods -Statistical Quality control with Sampling by Attributes-Statistical Quality control by Sampling and Variables-Safety.

PART A

Q.NO	QUESTIONS
1.	Define quality circle
2.	List the important items to be inspected during the construction
3.	List out the safety measures
4.	Define accident
5.	List the applications of quality circle
6.	Define injury frequency rate
7.	Distinguish the health and safety
8.	How will you interpret the quality control when chance cause and assignable cause exists in a process??
9.	Discuss the various causes of accident
10.	Summarize the sampling by attributes
11.	Classify the statistical sampling methods for quality control
12.	Examine how the quality control is important in a construction project
13.	Show the various charts used in statistical quality control
14.	Explain producer's risk and consumer's risk
15.	Explain the total quality control
16.	Differentiate sampling by attributes and sampling by variables
17.	Prepare a list of duties of quality circle?
18.	How will you prepare yourselves for the safety audit?
19.	What are the charts would you recommend for statistical quality control?
20.	How do you assess the injury frequency rate?

PART B

Q.NO	QUESTIONS
1.	Describe the statistical quality control with sampling by attributes.
2.	Describe the total quality management and collect the details about the statistical quality control with sampling by variables.
3.	Describe the accident prevention programme and provide the general safety programme for a construction project
4.	Discuss the importance of quality and safety in construction
5.	Summarize the safety requirements of construction industry.
6.	Classify the different methods of statistical quality control
7.	Explain the problems associated with the safety of a construction site
8.	"Indian construction industry requires a comprehensive legislation for the quality, safety and welfare of its workman" Analyse the above statement and comment on it.
9.	Prepare a list of human factors which causes an accidents and mention the various causes of accident
10.	Summarize the following: (i) Statistical quality control by sampling (8) (ii)Safety in construction (8)
11.	Describe the quality assurance techniques.
12.	(i) Define accidents and the causes for accidents at construction sites and the various cost is associated with accidents (8) (ii) List the safety precautions for the high rise RCC cast-in-situ construction (8)
13.	(i) Define and differentiate between QA and QC with example (8) (ii) Define and differentiate between statistical quality control with sampling of attributes and statistical quality control with sampling of variables (8)
14.	(i) Explain the importance of safety (8) (ii) Give detail about the measurement of safety (8)

UNIT 5- ORGANISATION AND USE OF PROJECT INFORMATION

Types of project information-Accuracy and Use of Information-Computerized organization and use of Information -Organizing information in databases-relational model of Data bases-Other conceptual Models of Databases-Centralized database Management systems-Databases and

application programs-Information transfer and Flow.

PART A

Q.NO	QUESTIONS
1.	Name the PIMS components
2.	List the types of project information in respect of a constructionproject.
3.	Define relational database
4.	List out the information set for the progress of the project
5.	List out the advantages and disadvantages of centralized database management system
6.	Define decision support system
7.	Discuss the different stages in construction
8.	Summarize a few lines about the PIMS
9.	Describe the database management program
10.	Estimate how the centralized DBM is more advantages over stand-alone system.
11.	Examine the performance specifications
12.	Examine how the accuracy is necessary in information
13.	Show the importance of network code specifications
14.	Explain the integrated system design
15.	How will you analyze the network data model?
16.	Compare the organized information and unorganized information
17.	Prepare a list of other conceptual models of databases
18.	How will you generalize the information transfer and flow
19.	Why do you recommend the object oriented data representation?
20.	Compare the relational model of data bases and conceptual models of databases

PART B

Q.NO	QUESTIONS
1.	Describe the database management system
2.	Describe in detail about the various sets of information collected in regard to construction project information

3.	List out the various functions of different managers and the software required for their requirements
4.	Discuss in detail about the computerized organization and use of information in a project.
5.	How will you interpret the database approach to contractor's account and explain it briefly. Mention its advantages and disadvantages also.
6.	Illustrate a frame based data storage hierarchy system adopted in construction industry.
7.	Illustrate a typical flow chart of an integrated accounting system for the generation of financial reports and explain them briefly.
8.	Explain the information transfer and flow in organizing project information.
9.	Design an organization chart for the medium size construction company and explain it briefly.
10	Explain how will you assess the information in an organized manner using computers
11	Describe the importance of information system in the effective management of construction
12	Explain the any two types of DBMS based on Information Systems followed in construction industry
13	Discuss in detail about various quality control by statistical methods
14	Explain the main functions of Project Management Information System? What are the major components of it.