SRM VALLIAMMAI ENGINEERING COLLEGE

(An Autonomous Institution)

SRM Nagar, Kattankulathur – 603 203

DEPARTMENT OF CIVIL ENGINEERING

QUESTION BANK

VI SEMESTER

PCE204 CONSTRUCTION, PLANNING AND MANAGEMENT

Regulation – 2023

Academic Year 2025-2026

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DEPARTMENT OF CIVIL ENGINEERING

QUESTION BANK

SUBJECT CODE/NAME: PCE204 CONSTRUCTION, PLANNING AND MANAGEMENT
SEM/YEAR: VI / III

UNIT I - CONSTRUCTION PLANNING

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

PART A			
Q.NO	QUESTIONS	BT LEVEL	COMPETENCE
1.	Name any two coding systems used in the construction industry.	BT-1	Remembering
2.	Prepare a flow chart representing the role of planning in different stages.	BT-1	Remembering
3.	Write any two objectives of planning.	BT-1	Remembering
4.	Explain briefly the precedence relationship among activities.	BT-1	Remembering
5.	What are the necessities of planning?	BT-1	Remembering
6.	List out the significance of coding system.	BT-1	Remembering
7.	Discuss about the construction planning.	BT-2	Understanding
8.	State activity precedence with an example.	BT-2	Understanding
9.	Differentiate activity and event.	BT-2	Understanding
10.	List out the uses of coding system.	BT-2	Understanding
11.	Define work task.	BT-1	Remembering
12.	Classify the different project planning techniques.	BT-1	Remembering
13.	Describe the significance of choice of technology.	BT-1	Remembering

14.	List out project planning techniques?	BT-1	Remembering
15.	Identify the various resources used for construction project.	BT-2	Understanding
16.	Explain the process involved in planning.	BT-2	Understanding
17.	Write short notes on choice of construction method.	BT-3	Applying
18.	How will you estimate the activity duration?	BT-3	Applying
19.	Explain the basic concepts involved in development of construction plan.	BT-3	Applying
20.	Summarize the learning curve and define the different phases of learning.	BT-1	Remembering
21.	What do you mean by fast track approach in construction?	BT-1	Remembering
22.	What is planning?	BT-1	Remembering
23.	What are the types of project plan?	BT-2	Understanding
24.	List the role of project managers on construction management?	BT-1	Remembering
	PART B		
1.	Explain in detail about the estimation of activity durations and importance of learning curves.	BT-3	Applying
2.	Write short notes on i. Choice of construction technology (7) ii. Choice of construction method (6)	BT-1	Remembering
3.	Prepare a generalized report on stages of planning by different agencies.	BT-2	Understanding
4.	Define the precedence relationship among various activities and justify the relationship.	BT-1	Remembering
5.	Describe the importance of coding system of activities with examples.	BT-2	Understanding
6.	List out the factors deciding activity durations.	BT-3	Applying
7.	Explain the procedure to formulate activity network with	BT-3	Applying

	suitable example.		
8.	i. Write down the importance of construction planning. (7) ii. What are the steps involved in planning? (6)	BT-1	Remembering
9.	How do you specify precedence relationship in activity on node and activity on branch network?	BT-2	Understanding
10.	How will you estimate the resources for work activities?	BT-2	Understanding
11.	i. Define WBS (3) ii. Draw a typical WBS tree diagram for residence building construction. (10)	BT-2	Understanding
12.	i. Describe the role of planning in the different stages of a Project? (7) ii. Mention the types of plan and objectives of planning? (6)	BT-2	Understanding
13.	Demonstrate the precedence definition for site preparation and foundation work.	BT-1	Remembering
14.	Define construction planning. Explain in detail about the basic concept involved in the development of construction plan.	BT-3	Applying
15.	Explain the procedure of the estimating the resource requirements for activities.	BT-1	Remembering
16.	Explain the stages development of construction planning in detail.	BT-1	Remembering
17.	Prepare work breakdown and activity network for a tunnelling project by defining the precedence relationship.	BT 3	Applying

UNIT II - SCHEDULING PROCEDURES AND TECHNIQUES

Relevance of construction schedules-Bar charts - The critical path method-Calculations for critical path scheduling and PERT -Activity float and schedules-Presenting project schedules Critical path scheduling for Activity-on-node and with leads, Lags and Windows- Resource oriented scheduling-Scheduling with resource constraints and precedences -Use of Advanced Scheduling Techniques-Scheduling with uncertain durations-Calculations for Monte Carlo Schedule Simulation- Crashing and time/cost tradeoffs -Improving the Scheduling process – Introduction to application software(Primavera, MS Project)

PART – A

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

Table within Question 2:

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

14.	Explain the terms total float and independent float.	BT 2	Understanding
15.	Write down the necessity of resources oriented scheduling.	BT 3	Applying
16.	Distinguish between crash cost and crash time.	BT 2	Understanding
17.	Discuss about the purpose of numbering events?	BT 3	Applying
18.	Explain resource leveling and crashing.	BT 3	Applying
19.	State the reason why resource oriented scheduling is necessary.	BT 2	Understanding
20.	Define activity cost slope.	BT 3	Applying
21.	What is resource limited schedule	BT 3	Applying
22.	Define resource construct.	BT 2	Understanding
23.	Differentiate activity and node.	BT 2	Understanding
24.	Define scheduling problem.	BT 1	Remembering
PART – B			
1.	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?	BT 4	Analyzing

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

2.	Explain in relation to network analysis, the terms critical activity, non-critical activity, independent float and free float?	BT 3	Applying
3.	Draw the network and design the critical path and calculate the ES, EF, LS and LF of the project whose activities are as follows.	BT 3	Applying

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

4.	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.	BT 4	Analyzing

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

5.		BT 3	Applying

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

1. Draw the project network and identify the critical path. (5)

2. Calculate all the activity times (EST, EFT, LST and LFT) (5)

3. Calculate TOTAL FLOAT and FREE FLOAT for all the activities. (3)

6.	The details of a network are given below, where the durations are in days. Find the critical path and project completion time.	BT 3	Applying

Activity	A	B	C	D	E	F	G	H	I
Predecessor	-	-	A	A	B,C	B,C	D,E	D,E	F,G
Duration (Days)	4	3	8	7	9	12	2	5	6

7.	Calculate the critical path and all the floats by constructing activity on branch network?	BT 4	Analyzing

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

8.	(i) Define and differentiate between CPM and PERT. (7) (ii) Compare "Precedence network analysis and critical path method? (6)	BT 4	Analyzing

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.	BT 4	Analyzing

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

10.	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.	BT 3	Applying

ACTIVITY	NORMAL TIME (WEEKS)	COST(Rs)	CRASH 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.	Describe the techniques used for scheduling a project with uncertain duration? Explain any one of them in detail?	BT 5	Evaluating
12.	Explain critical path method with neat sketch.	BT 3	Applying
13.	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.	BT 5	Evaluating
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	BT 4	Analyzing

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

	ii. Estimate the optimum duration of the project and their corresponding cost using cost time function.		
15.	The details of a network are given below where the duration is in days.	BT 4	Analyzing

ACTIVITY	t_0	t_m	t_p
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?

16.	Prepare a CPM network from the list of operations and time for each operation. Prepare a table giving ES, EF, LS, LF times and total float for each operation. Mark on the diagram the critical path and also the minimum time required for the completion the project.	BT 3	Applying

Activity	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
Duration weeks	3	5	4	7	6	11	6	4	3	6	5	7	5	3	2
Preceed	-	A	A	B	B	C	D	E,F	C	G	H,I	I	H,I	K	L
Success	B,C	D,E	F,I	G	H	H	I	K	K,L	M	N	O	N	-	-

17.	The detail of a network are given below where duration are in days. Find the critical path project completion time and all floats.	BT 3	Applying

Activity	A	B	C	D	E	F	G
Predecessor	-	-	A,B	C	C	D	D,E
Duration	3	5	4	6	3	2	4

UNIT III - 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	BT LEVEL	COMPETENCE
1.	What is meant by contingencies and define income?	BT 1	Remembering
2.	What are the project cost budget monitoring parameters?	BT 1	Remembering
3.	List out the sources of cash inflow and cash outflow.	BT 1	Remembering
4.	Differentiate financial and managerial accounting.	BT 1	Remembering
5.	Explain the term project budget.	BT 1	Remembering
6.	List out the classification of cost control.	BT 1	Remembering
7.	Write down the advantages of financial accounting.	BT 2	Understanding
8.	Explain the objectives of cost accounting and necessity for project management.	BT 2	Understanding
9.	Differentiate between fixed cost and variable cost.	BT 2	Understanding
10.	Classify the types of accounting system.	BT 2	Understanding
11.	Compare cost committed from cost exposure.	BT 3	Applying
12.	Explain schedule control.	BT 3	Applying
13.	Define project cash flow.	BT 1	Remembering
14.	Compare percentage completion method and completed contract method	BT 3	Applying
15.	Distinguish between budget cost and revised cost.	BT 3	Applying
16.	Create the S-curve and mention its uses.	BT 3	Applying
17.	List out the components of cash flow status report.	BT 3	Applying
18.	Rewrite the formula for schedule control.	BT 1	Remembering
19.	Discuss about the account payable journal and accounts receivable journal.	BT 3	Applying
20.	Define cost accounting.	BT 1	Remembering
21.	Define cost ratio.	BT 2	Understanding

22.	What are the different compounds of a balance sheet?	BT 2	Understanding
23.	List out any five indirect cost.	BT 2	Understanding
24.	What are the different components of accounting system?	BT 2	Understanding
PART – B			
1.	i. Describe the stages of work at which cost control is affected. (7) ii. Classify the cost control systems and explain it. (6)	BT 4	Analyzing
2.	Brief about the project budget?	BT 4	Analyzing
3.	Explain in detail about the cash flow control in a project.	BT 3	Applying
4.	List out the various categories of cost involved in a project. Explain it in detail.	BT 4	Analyzing
5.	Describe about on Schedule control.	BT 3	Applying
6.	Explain the elements of cash flow status report.	BT 4	Analyzing
7.	Suppose that a company began six jobs in a year, completing three jobs and having three jobs still underway at the end of the year. Details of the six jobs are shown in the table given below. Evaluate the company's net profit.	BT 3	Applying

Net Profit on Completed Contracts (amounts in thousands)

Job 1	1436		
Job 2	356		
Job 3	-738		
Total Net Profit on Completed Jobs	1054		

Status of Jobs underway	Job 4	Job 5	Job 6
Original control price	4200	3800	5630
Contract changes (change orders)	400	600	-300
Total cost to date	3600	1710	620
Payments received or due to date	3520	1830	340
Estimated cost to complete	500	2300	5000

8.	Describe the Forecasting for activity cost control.	BT 5	Evaluating
9.	How will you calculate the net profit using percentage of completion method and completed contract method	BT 4	Analyzing
10.	Define budget and describe its importance for a construction project and explain how the cost and time trends monitored using S curve.	BT 3	Applying
11.	Explain the terms, i. Measurement of cost performance (7) ii. Investment appraisal (6)	BT 4	Analyzing
12.	Give a detailed explanation on schedule and budget updates. Describe the following, i. Control estimate (7) ii. Cost planning (6)	BT 3	Applying
13.	Explain the types of Accounting systems in detail.	BT 4	Analyzing
14.	Explain the different stages of cost control in detail.	BT 3	Applying
15.	Fill the table below. It lists 8 different financial transactions for a construction project. Classify them as Direct cost, Indirect cost, Overhead cost, Cash inflow and outflow. 	S.No	Financial component	Cash inflow, outflow	Direct cost, Indirect cost, Overhead cost
1.	Mobilization advance given by client		
2.	Expenditure for worker accident treatment		
3.	Raw materials purchase		
4.	Payment for advertisement		
5.	Monthly salaries and wages		
6.	Hire charges for machineries		
7.	Deposit paid to client while getting the work		
8.	Constructing the temporary office at site				BT 4	Analyzing
16.	Explain the different components of accounting system and methods of accounting.	BT 4	Analyzing

Q.NO	QUESTIONS	BT LEVEL	COMPETENCE
17.	What are the guide lines to be kept in mind while preparing a budget to make it more effective?	BT 3	Applying

UNIT IV - 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 with Sampling by Variables Safety.

PART – A

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

19.	How do you assess the injury frequency rate?	BT 3	Applying
20.	Define quality circle.	BT 2	Understanding
21.	Define variable	BT 3	Applying
22.	How do you improve in jobsite in construction?	BT 2	Understanding
23.	Mention two safety quotation.	BT 2	Understanding
24.	List out the safety equipment's used in site.	BT 1	Remembering
	PART – B		
1.	Describe the statistical quality control with sampling by attributes.	BT 4	Analyzing
2.	Describe the total quality management and collect the details about the statistical quality control with sampling by variables.	BT 3	Applying
3.	Define accidents and the causes for accidents at construction sites and the various costs are associated with accidents.	BT 3	Applying
4.	Discuss the importance of quality and safety in construction.	BT 4	Analyzing
5.	Summarize the safety requirements of construction industry.	BT 3	Applying
6.	Explain the problems associated with the safety of a construction site.	BT 4	Analyzing
7.	Prepare a list of human factors which causes an accidents and mention the various causes of accident.	BT 4	Analyzing
8.	Summarize the following: (i) Statistical quality control by sampling (7) (ii)Safety in construction (6)	BT 3	Applying
9.	Define and differentiate between QA and QC with example.	BT 3	Applying
10.	List the safety precautions for the high rise RCC cast-in-situ construction.	BT 3	Applying
11.	Define and differentiate between statistical quality control with sampling of attributes and statistical quality control with sampling of variables	BT 4	Analyzing

12.	Explain the various stages of risk cost management.	BT 3	Applying
13.	Briefly explain about the concept of Total quality control and describe how it is established in construction industry.	BT 4	Analyzing
14.	Explain about the quality circle in construction management.	BT 4	Analyzing
15.	Discuss about the accident prevention programme and provide the general safety programme for a construction project	BT 5	Evaluating
16.	Describe the quality assurance techniques.	BT 4	Analyzing
17.	"Indian construction industry requires a comprehensive legislation for the quality, safety and welfare of its workman" Analyse the above statement and comment on it.	BT 4	Analyzing

UNIT V - ORGANIZATION 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	BT LEVEL	COMPETENCE
1.	Name the PIMS components	BT 1	Remembering
2.	List the types of project information in respect of a construction project.	BT 1	Remembering
3.	Define relational database	BT 1	Remembering
4.	List out the information set for the progress of the project	BT 1	Remembering
5.	List out the advantages and disadvantages of centralized database management system	BT 1	Remembering
6.	Define decision support system	BT 1	Remembering
7.	Discuss the different stages in construction	BT 2	Understanding
8.	Describe the database management program	BT 2	Understanding
9.	Estimate how the centralized DBM is more advantages over stand-alone system.	BT 2	Understanding
10.	Examine the performance specifications	BT 3	Applying
11.	Examine how the accuracy is necessary in information	BT 3	Applying
12.	Show the importance of network code specifications	BT 2	Applying

13.	Explain the integrated system design	BT 1	Remembering
14.	How will you analyze the network data model?	BT 3	Applying
15.	Compare the organized information and unorganized information	BT 3	Applying
16.	Prepare a list of other conceptual models of databases	BT 3	Applying
17.	How will you generalize the information transfer and flow	BT 3	Applying
18.	Why do you recommend the object oriented data representation?	BT 1	Remembering
19.	Compare the relational model of data bases and conceptual models of databases	BT 3	Applying
20.	What are the types of project information?	BT 1	Remembering
21.	Define DBM	BT 2	Understanding
22.	What are the advantages of relational models of databases?	BT 2	Understanding
23.	Define hierarchical model	BT 2	Understanding
24.	Define data dictionary.	BT 2	Understanding
PART – B			
1.	Elaborate in detail about the various sets of information collected in regard to construction project information.	BT 4	Analyzing
2.	List out the various functions of different managers and the software required for their requirements.	BT 3	Applying
3.	Discuss in detail about the computerized organization and use of information in a project.	BT 4	Analyzing
4.	How will you interpret the database approach to contractor's account and explain it briefly? Mention its advantages and disadvantages also.	BT 3	Applying
5.	Illustrate a typical flow chart of an integrated accounting system for the generation of financial reports and explain them briefly.	BT 4	Analyzing
6.	Explain the information transfer and flow in organizing	BT 3	Applying

	project information.		
7.	Describe the network models for organizing project information databases.	BT 5	Evaluating
8.	Describe the importance of information system in the effective management of construction.	BT 3	Applying
9.	Explain the any two types of DBMS based on Information Systems followed in construction industry	BT 4	Analyzing
10.	Explain the main functions of Project Management Information System? What are the major components of it?	BT 3	Applying
11.	Explain how the information can be organized using computers.	BT 4	Analyzing
12.	Explain centralized database management system.	BT 3	Applying
13.	Explain the problems in information system management in detail.	BT 4	Analyzing
14.	Design an organization chart for the medium size construction company and explain it briefly.	BT 4	Analyzing
15.	Explain how you will assess the information in an organized manner using computers.	BT 4	Analyzing
16.	Illustrate a frame based data storage hierarchy system adopted in construction industry.	BT 3	Applying
17.	Explain the types of project information? Write the use of project information in construction.	BT 3	Applying