

# GUJARAT TECHNOLOGICAL UNIVERSITY

6<sup>th</sup> Semester Civil Engineering - PDDC

**Subject Code & Name:** X60601 - Construction Management and Economics

Sr. No.	Course content
1.	<b>General:</b> Construction as industry, scope, objectives and functions of administration in construction industry, interactions of construction economy, engineer and constructor, construction resources and co-ordination.
2.	<b>Management:</b> Management, definitions, functions, principles, systems, tools and techniques
3.	<b>Planning:</b> Definition, Bar charts, network techniques, network analysis, Crashing, optimization, updating, resource allocation, resource levelling, resource smoothing.
4.	<b>Organising:</b> Definition, functions, types of organization structures suitability
5.	<b>Controlling:</b> Definition, establishing control standards. Measurements of variations with respect to control standards.
6.	<b>Monitoring:</b> Definition, mitigating, variations with respect to control standards.
7.	<b>Human Resource Management:</b> Characteristics, sources, labour relations, legislature and welfare, labour turn-over efficiency, wages and other incentives.
8.	<b>Materials Management:</b> Modes and limits of procurement, types of materials and storage, distribution, accounting and control, order point and order quantity, disposal of surplus materials, selective inventory control, Job layout
9.	<b>Equipment Management:</b> Classification and characteristics of construction equipment, sources, owning and operating cost, economic life, replacement analysis, equipment v/s labour intensive works, and their balancing
10.	<b>Economic Analysis:</b> Economic analysis of alternatives and decision making, equivalence, break-even & sensitivity analysis, and construction cost index and its applications. Budget, functions, inflation deflation, engineer's budget.
11.	<b>Quality Management:</b> Quality Control system, Quality assurance system, Quality review and Quality audit based on ISO: 9001-2001 series
<b>References Books:</b> <ol style="list-style-type: none"><li>1. Construction planning equipment &amp; methods By R.L.Peurifoy &amp; C.J.Schexnayder</li><li>2. Construction Equipment and its planning and application By Dr. Mahesh Verma</li><li>3. Construction Management and Accounts By Harpal singh</li><li>4. Construction Management and Accounts By V.N.Vazirani and S.P.Chandola</li><li>5. Project planning and Control with PERT and CPM By Dr.B.C.Punamia and K.K.Khandelwal</li><li>6. Engineering Economics By R.Panneerselvam</li><li>7. Construction Engineering &amp; Management By S.Seetharaman</li><li>8. Construction of Structures and Management of Works By S.C.Rangwala</li></ol>	

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**PDDC - SEMESTER-VI EXAMINATION – WINTER 2015**

**Subject Code: X60601****Date: 10/12/2015****Subject Name: Construction Management and Economics****Time: 02:30pm to 05:00pm****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) What is a bar chart Explain with sketches and write down limitation of bar chart **07**  
 (b) Differentiate between Conventional Technique and network technique **07**

- Q.2** (a) Explain the following term a) Critical Activity b) Float c) Total float **07**  
 (b) What is ISO? Explain ISO 9001 in detail. **07**

**OR**

- (b) Draw a job layout for Bridge construction. **07**

- Q.3** (a) Draw the network from following data also find out critical path, critical activity, project duration **07**

Sr.No	Activity	Duration	Precedence	Successor
1	A	5	---	E
2	B	4	----	C,D
3	C	3	B	F
4	D	2	B	G
5	E	1	A	I
6	F	6	C	H
7	G	7	D	-----
8	H	8	F	-----
9	I	9	E	-----

- (b) Differentiate between PERT & CPM **07**

**OR**

- Q.3** (a) Draw the network from following Data, also find out critical Activity, Critical path, Project Duration. **07**

Sr.No	Activity	Duration
1	1-2	10
2	1-3	8
3	2-5	12
4	3-4	9
5	4-7	1
6	5-6	4
7	5-7	6
8	6-8	7
9	7-8	8
10	7-9	15
11	8-10	2
12	9-10	11

- (b) Write short note on “Updating” 07
- Q.4** (a) What is break even analysis? Where we use breakeven analysis? 07
- (b) The original cost of a Excavator is 35,00,000/- and its salvage value is 8% of the original cost and its life is 5 year. Cost of owning and operating is Rs.30000/- per month. The hiring charges for the excavator inclusive of repair and maintenance is Rs. 95000/- per month. Suggest whether the equipment is buy or Hire 07
- OR**
- Q.4** (a) Write factors affecting Owning and Operating cost for equipment. 07
- (b) Determine the breakeven for the following 07
- |                          | Products |      |      |
|--------------------------|----------|------|------|
|                          | A        | B    | C    |
| Sales(Units)             | 5000     | 6000 | 4000 |
| Unit selling Price(Rs.)  | 10       | 15   | 18   |
| Unit variable Price(Rs.) | 6        | 4    | 13   |
- Fixed cost of the product is Rs. 40000/-
- Q.5** (a) Write short notes 1)Resource allocation 2) Labour welfare and laws 07
- (b) Enlist the different type of equipment and explain Excavating equipment. 07
- OR**
- Q.5** (a) Write short on Labour incentive. 07
- (b) Draw and explain the Mobile tower crane. 07

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**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**PDDC - SEMESTER-VI • EXAMINATION – SUMMER • 2015**

**Subject code: X 60601****Date: 08/05/2015****Subject Name: Construction Management and Economics****Time: 10:30 am - 01:00 pm****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) Why material management have more important in construction project? **07**  
 (b) Write a short note on a) Three time estimate network technique **07**  
 b) Standard equipment.

- Q.2** (a) Explain in detail the function of construction management. **07**  
 (b) Following table are the construction project data for duration and cost of each activity. The indirect cost of the project is Rs. 2000 / day **07**  
 Find out the Total project cost with out crashing. Cost slope and write down which activity will crash first and why?

Activity	Normal duration in Days	Normal cost in Rs.	Crash Duration in Days	Crash Cost in Rs.
1-2	10	10000	3	17000
1-3	12	15000	6	24000
2-4	15	12000	5	18000
3-4	7	5000	2	10000
3-5	18	25000	5	51000
4-5	2	5000	2	5000

**OR**

- (b) Write a short note on a) Updating b) Resource leveling **07**

- Q.3** (a) What is a bar chart? Explain with sketch and limitation of barchart. **07**  
 (b) Determine the break even sales for the following **07**

	Product		
	A	B	C
Sales (Units)	5000	6000	4000
Unit Selling Price (Rs.)	10	15	18
Unit variable Price (Rs.)	6	4	13
Fixed cost of the product is Rs. 40,000/-			

**OR**

- Q.3** (a) Draw the barchart of following activity and find out the project duration. **07**

Sr.No	Activity	Duration
1	M	6
2	N	10

3	O	25
4	P	1
5	Q	7
6	R	5
7	S	3

Activity M is starting activity, activity N,O,P,Q are sequential activity and start after completion of each other, activity R& S are parallel activity and start after completion of activity Q

- (b) The purchase cost of machine is 1000000 and is used for 2000hours per year **07**  
 Life of machine = 5 yrs  
 Salvage value = 8 % of the original cost.  
 Owning and operating cost = 60 per hr.

Hiring charges = Rs40000/- including maintenance and repair cost per month.

Suggest this machine should be purchased or Hire.

- Q.4 (a)** Draw the network for following data **07**

Sr.No	Activity	Duration	Predecessor	Successor
01	A	10	-	D,F,F
02	B	05	-	G
03	C	04	-	H,G
04	D	08	A	I,J
05	E	05	A	J
06	F	04	A	G
07	G	08	B,F,C	J
08	H	06	C	K,L
09	I	03	D	-
10	J	04	D,E,G	-
11	K	09	H	-
12	L	08	H	-

- (b) Explain with sketches "Power shovel an excavating equipment. **07**

**OR**

- Q.4 (a)** Explain the term a) Salvage Value b) Depreciation c) Maintenance cost **07**  
 (b) Write down the classification of Equipment. **07**

- Q.5 (a)** Draw & explain a job layout for an industrial building. **07**  
 (b) What is ISO? Explain in detail ISO 9001. **07**

**OR**

- Q.5 (a)** Explain the term a) Critical Path b) Dummy activity c) Standard Deviation **07**  
 (b) What is Breakeven analysis? Where we use Break even analysis. **07**

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**GUJARAT TECHNOLOGICAL UNIVERSITY****PDDC - SEMESTER-VI • EXAMINATION – WINTER • 2014****Subject Code: X 60601****Date: 29-11-2014****Subject Name: Construction Management and Economics****Time: 02:30 pm - 05:00 pm****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) What do you mean by construction management explain in detail. **07**  
 (b) What is a bar chart? Explain in detail with example of bar chart. **07**
- Q.2** (a) What is an ISO? Explain different ISO in detail. **07**  
 (b) Explain with sketches of Job layout for Dam site. **07**

**OR**

- (b) Describe the different type of equipment. **07**
- Q.3** (a) Define the term a) critical activity b) optimistic time c) float d) Indirect cost **07**  
 (b) From the following network draw the network, find out critical activity, critical path, project duration, Total cost of project, cost slope. **07**

Activity	Normal cost	Normal duration in week	Crash cost	Crash Duration in week
1-2	4500	4	6500	2
1-3	7000	6	10000	4
1-4	5000	5	7000	4
2-5	7000	8	7800	3
3-5	4000	4	5000	2
4-5	8000	8	9500	2

Indirect cost = 3000/ week

**OR**

- Q.3** (a) Write factors affecting owning and operating cost of equipment? **07**  
 (b) What are the Qualities required for good construction project manager? **07**
- Q.4** (a) The original cost of a Dumper is 18,00,000/- and its salvage value is 6% of the original cost this dumper is used for 1500 hrs per year and its life is 7 year. Cost of owning and operating is Rs.50 per hr. The hiring charges for the excavator inclusive of repair and maintenance is Rs. 45000/- per month. Suggest whether the equipment is buy or Hire. **07**  
 (b) Differentiate Standard equipment and special equipment. **07**

**OR**

- Q.4** (a) What is a break even analysis? Where we use break even analysis?. **07**  
 (b) What is updating? Why it is necessary to do updating? What are the other factors considered for the updating? **07**
- Q.5** (a) What are the different incentive methods used for labour in construction industry. **07**

- (b) Determine the break even sales for the following

07

	Product		
	A	B	C
Sales (Units)	7000	5500	5200
Unit selling price(Rs.)	13	18	20
Unit Variable Price(Rs.)	9	7	15
Fixed cost of the product is Rss. 45,000			

OR

- Q.5 (a) Why material Management is most important in construction project? Explain with reason. 07
- (b) Differentiate Conventional technique Vs Network technique. 07

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**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**PDDC - SEMESTER-VI • EXAMINATION – SUMMER • 2014**

**Subject Code: X 60601**

**Date: 28-05-2014**

**Subject Name: Construction Management and Economics**

**Time: 10:30 am - 01:00 pm**

**Total Marks: 70**

### Instructions:

- 1. Attempt all questions.**
- 2. Make suitable assumptions wherever necessary.**
- 3. Figures to the right indicate full marks.**

- |            |     |  |           |
|------------|-----|--|-----------|
| <b>Q.1</b> | (a) | Write down importance of construction management to society.           | <b>07</b> |
|            | (b) | What is a bar chart? Explain bar chart with sketches and limitation.   | <b>07</b> |
| <b>Q.2</b> | (a) | What is a job layout draw the job layout for construction of a bridge. | <b>07</b> |
|            | (b) | Differentiate between 1) Conventional method vs Network technique      | <b>07</b> |
|            |     | 2) Standard equipment vs Special equipment                             |           |

**OR**

- |            |   |    |
|------------|---|----|
|            | (b) What is full form of ISO? What is an importance of ISO? | 07 |
| <b>Q.3</b> | (a) What is a float?  | 07 |

In a construction project following activity is planned draw the network and find out total project duration, critical activity, critical path and float at critical activity.

Sr.No	Activity	Duration	Predecessor	Successor
1	A	8	---	D
2	B	6	---	E
3	C	5	---	F
4	D	4	A	H
5	E	8	B	G,I
6	F	6	C	G,I
7	G	5	E,F	J
8	H	6	D	J
9	I	9	E,F	--
10	J	8	G,H	--

- (b)** Explain in detail Resource allocation, Resource leveling, resource smoothing. **07**

**OR**

- Q.3 (a)** The following table gives the data for duration and cost of each activity of a project network. The indirect cost of project is Rs.25000 per week. Draw the network, Find out critical path, Total Project duration, find out Normal total cost of the project. Also find out cost slope. **07**

Activity	Normal time	Normal Cost	Crash time	Crash Cost
1-2	5	150000	4	225000
1-3	3	200000	3	200000
2-3	10	175000	8	250000
2-4	5	223300	3	310000
3-4	9	324000	7	405000

- (b) What is updating? Why updating is necessary for any project?** **07**



- Q.4 (a)** What are the qualities required for good construction manager? **07**  
**(b)** Discuss in brief the various factors affecting the selection of construction equipments. **07**

**OR**

- Q.4 (a)** What is a material management? Why we give more importance to material management? **07**  
**(b)** Why labour welfare is required? Why incentive for labour is required? **07**

- Q.5 (a)** Write factors affecting owning and operating cost of equipment? **07**  
**(b)** The original cost of a Roller is 25,00,000/- and its salvage value is 9% of the original cost this machine is used for 1700 hrs per year and its life is 4.5 year. Cost of owning and operating is Rs.160 per hr. **07**  
The hiring charges for the excavator inclusive of repair and maintenance is Rs. 110000/- per month. Suggest whether the equipment is buy or Hire.

**OR**

- Q.5 (a)** Write short note on “ Break even analysis” **07**  
**(b)** Explain with sketches Back hoe an excavating equipment. **07**

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**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**PDDC - SEMESTER-VI • EXAMINATION – WINTER 2013**

**Subject Code: X60601****Date: 04-12-2013****Subject Name: Construction Management and Economics****Time: 02.30 pm - 05.00 pm****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

**Q.1 (a)** Discuss in brief, with neat sketch of job layout of multistoried building in busy area. **07**

**(b)** What is Gantt bar chart? Explain in detail with example and limitation. **07**

**Q.2 (a)** Define the term a) Critical path b) Dummy activity c) Optimistic time d) Standard equipment. **07**

**(b)** What is an ISO? Explain in detail Quality Management system as per ISO: 9000 **07**

**OR**

**(b)** Write a short note on a) Mile stone chart b) Line of Balance **07**

**Q.3 (a)** Write down importance of Material Management in Construction Industry. **07**

**(b)** Draw the network from following three time estimate, find out total project **07**

Activity	Optimistic time	Pessimistic time	Most likely time
1-2	3	5	4
1-3	2	10	6
1-4	4	8	6
2-3	5	9	7
3-5	2	12	10
4-5	2	14	8

duration.

**OR**

**Q.3 (a)** Write down procedure of updating. When can we go for updating? **07**

**(b)** Write down the difference between a) Network technique Vs Conventional technique. b) Standard Equipment Vs Special equipment. **07**

**Q.4 (a)** Data for the project are as follows determine the total project cost on 22 days **07**

Activity	Normal Days	Normal Cost Rs.	Crash Duration Rs.	Crash Cost Rs.
1-2	2	100000	2	100000
1-3	7	50000	3	90000
2-3	6	30000	3	42000
2-4	5	20000	4	25000
3-4	0	0	0	0
3-5	9	60000	4	90000
4-6	11	60000	6	100000
5-6	6	70000	3	91000

Consider indirect cost Rs. 8000 / day.

**(b)** What are the different equipment used in construction industry? Explain “Power shovel” with sketch. **07**

**OR**

**Q.4 (a)** Write a short note on “ Break even Analysis”. **07**

- (b) What are the factors affecting for selection of construction equipment? 07
- Q.5** (a) Write down the term a) Depreciation b) salvage value c) Scrape value 07
- (b) The original cost of power shovel is Rs. 750000/- and its salvage value is 8% of the original cost. The power shovel is used for 1500 hours per year and life is 5 years. The hiring charges for the power shovel including maintenance and repairs is Rs. 30000/- per month. Suggest whether the power shovel should be purchased or hired. Owning and operating cost as Rs.170 per hour. 07
- OR**
- Q.5** (a) What is an incentive for labour? Why incentive is required for labour? 07
- (b) What are the good qualities required for project manager 07

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**GUJARAT TECHNOLOGICAL UNIVERSITY****PDDC-Semester –VI (May-2012) Examination****Subject code: X60601****Subject Name: Construction Management and Economics****Total Marks: 70****Date: 08/05/2012****Time: 10.30 am – 01.00 pm****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) What is job layout explain with neat sketch **07**  
 (b) What is construction management and why is it needed? **07**

- Q.2** (a) Describe the different classification of equipment. **07**  
 (b) Differentiate between 1) PERT Vs CPM **07**  
 2) Standard Vs Special Equipment

**OR**

- (b) Differentiate between Network technique Vs Conventional technique. **07**

- Q.3** (a) What is Material Management and write in detail types of material and precaution of storage.? **07**  
 (b) The following table gives the data for duration and cost of each activity of a project network. The indirect cost of project is Rs.3500 per week. **07**  
 Draw the network, Find out critical path, Total Project duration, find out Normal total cost of the project. Also find out cost slope.

Activity	Normal Duration in week	Normal Cost	Crash Duration In week	Crash Cost
1-2	8	7200	3	15500
1-3	6	12000	2	16000
2-3	5	15000	2	17000
2-4	7	8000	3	13000
3-4	4	5000	2	8000

**OR**

- Q.3** (a) What is breakeven analysis? Where we use breakeven analysis? **07**  
 (b) What is updating? Why it is necessary to do updating? What are the other factors considered for the updating? **07**

- Q.4** (a) Write factors affecting owning and operating cost of equipment? **07**  
 (b) The original cost of a Excavator is 30,00,000/- and its salvage value is 8% of the original cost this machine is used for 2000 hrs per year and its life is 5 year. Cost of owning and operating is Rs.50 per hr. **07**  
 The hiring charges for the excavator inclusive of repair and maintenance is Rs. 45000/- per month. Suggest whether the equipment is buy or Hire.

**OR**

- Q.4** (a) What are the Qualities required for good construction manager? **07**  
**Q.4** (b) For the Construction of a commercial building certain activities are to be performed which are as given below **07**

Sr. No.	Activity	Duration
01	A	3
02	B	6
03	C	5
04	D	8
05	E	7

Activity A, B & C are starting activity, activity D start after completion of activity B. Activity E can start after completion of activity C. draw the BARCHART and write down the limitation of bar chart.

- Q.5 (a)** Write the following term : 1) Optimistic Time **07**  
2) Pessimistic Time  
3) Variance

- (b)** Determine the break even sales for the following **07**

Description	Product		
	A	B	C
Sales ( units )	5500	6000	4500
Unit selling price Rs.	12	14	18
Unit variable price Rs	7	5	14
Fixed cost of the product is Rs.35,000/-			

**OR**

- Q.5 (a)** What is Quality Management system as per ISO? **07**  
**(b)** Why labour welfare is required? Why incentive for labour is required? **07**

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