

**College of Engineering, Pune**  
**End-Semester Exam – May 2012**  
**F.Y. M.Tech (Civil Construction and Management)**  
**CM-512- Construction Cost Dynamics**

Day & Date- Friday 11th May 2012  
Maximum Marks: 100

Time: - 9.00 am to 12.00 am  
Duration – Three hrs.

**Instructions**

1. All Questions are compulsory.
2. Figures to the right indicate full marks.
3. Assume suitable data if necessary with appropriate justification.

- Q. 1 a) Explain the factors affecting Demand & Supply. Also Explain the determinants of price elasticity of demand (10)
- b) What are the causes of inflation in India & measures to check the same (10)
- Q. 2 a) Explain difference between Public & Private Projects & also explain the methods to evaluate public projects with significant cost considerations (10)
- b) Explain the concept of Earned Value management(EVM) with its features with graphs & steps for implementation. How EVM is scaled from simple to Advanced Implementations (10)
- Q. 3 a) Explain the steps in Capital Budgeting process (05)
- b) A company sells its product at Rs.60/- per unit .In 2006 ,the company operated at margin of safety of 40%.The fixed Cost amounted to Rs.3.6 Lacs & variable cost ratio was 80%.in 2007,the variable cost expected to go up by 20% & Fixed cost by 10% .Find the selling price required to be fixed in 2007 to earn same P/V ratio & contribution as in 2006. (05)
- c) A company had incurred fixed expenses of Rs.4.5 Lacs with sales of Rs.5 Lacs & earned profit of Rs.3 Lacs during the first half year .Secon half year , it suffered loss of Rs.1.5 Lacs.Calculate break-even point & margin of satey for the whole year.Also draw a break-even chart showing Contribution, profit & All Costs lines (10)
- Q. 4 a) Explain the relevance of Time Value of Money in Financial Decisions (05)
- b) 1.Calculate the exact doubling period of money invested at 9% & 12% interest p.a. (02)
2. Deposit of Rs.10000/- invested in a bank offers10% interest p.a. compounded twice in a year. What's the difference in interest ,if the same is compounded 4 times in a year (03)
- c) Calculate Minimum acceptable rental payments received in advance to a owner. Asset value is Rs.5 Lacs .Income Tax Rate- 30%.Depreciation -5 years straight line method & rate of return 10%.Calculate Annual Equivalent cost to the owner if the rental payments recd. at the end of the month (10)

- Q. 5 a) The Management of X Ltd. is considering selection of a machine .Cost of capital is 12% and income tax rate is 30%.Depreciation is charged on straight line method . (10)  
You are required to :  
1.Calculate the Discounted pay-back period, NPV & IRR of each machine  
2.Advise the management of X Ltd. As to which machine they should purchase

Machine	X	Y
Cost	10 Lacs	15 Lacs
Expected Life	5 Yrs.	6 Yrs.
Annual Income before Tax & Depreciation	3.45 Lacs	4.55 Lacs

- b) A Ltd. Is thinking of replacing its existing machine by new machine which will cost Rs.60 Lacs. (10)  
The new machine is expected to increase the production capacity by 20000 units to 1 Lac units .  
The selling price will remain unchanged at Rs.200 per unit. The cost structure of a unit for both machines is as follows :  
The existing machine has book value of Rs.1 Lac & Estimated life is 5 years. The supplier of new machine has offered to accept the old machine for Rs.2.5 Lacs. Its market value is Rs.1.5 Lacs & expected to be Rs.0.35Lac after 5 years  
The new machine has life of 5 years & expected salvage value of Rs.2.5 Lacs after 5 years. Tax rate is 30%. Depreciation is charged on straight line basis. Rate of return is 15%  
Required :  
1.Calculate NPV of the replacement decision  
2.Should the company go ahead with replacement decision

Cost in (Rs. Lac)	Existing machine	New Machine
Materials	75.00	63.75
Wages	71.25	62.50
Repairs & Maintenance	11.25	7.50
Power & Fuel	15.50	14.25
Depreciation	0.25	5.00
Allocated Overheads	10.00	12.50
<b>Total (Rs. Lac)</b>	<b>183.25</b>	<b>165.50</b>

**College of Engineering, Pune**  
**End-Semester Exam – May 2012**  
**F.Y. M.Tech (Civil Construction and Management)**  
**CE-5204- Construction Techniques**

Day & Date- Tuesday 8th May 2012  
Maximum Marks: 100

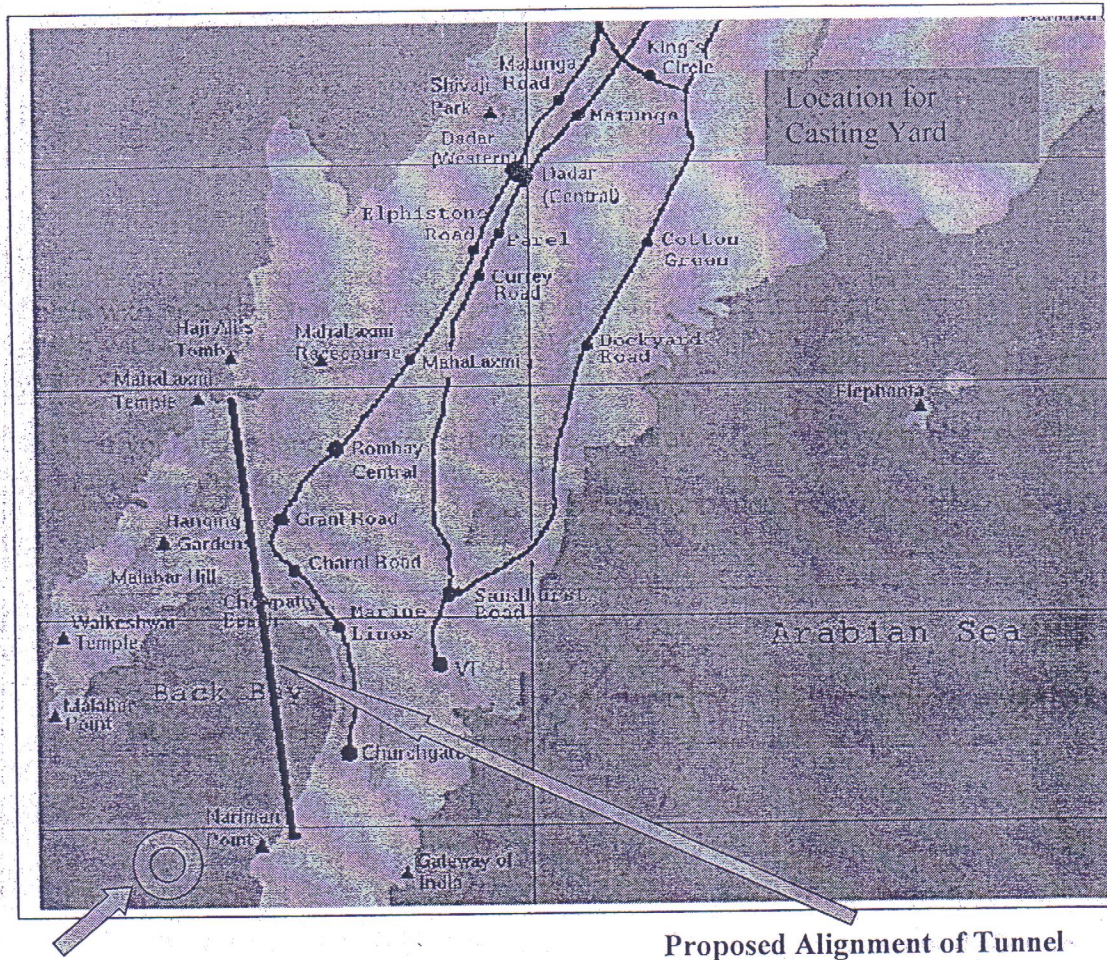
Time: - 9.00 am to 12.00 am  
Duration – Three hrs.

**Instructions**

1. **Question No. 1 is compulsory.** Solve **any Three** Questions **from the remaining.**
2. Figures to the right indicate full marks.
3. Neat figures must be drawn where necessary.
4. Assume suitable data if necessary with appropriate justification.

- Q. 1 Hind Construction is proposing to undertake a project of connecting Nariman Point to Mahalaxmi through partially underground and partially under sea tunnel accommodating six lanes of vehicular traffic. Figure-01 shows the proposed alignment. There is no open land near by for the casting yard for the tunnel segments, for the portion in sea therefore the segments need to be cast in casting yard on shore and brought to the site and then sunk them to the required alignment. Additional details of the requirements are as below: **(25)**
- i) The tunnel under ground has to go under VVIP residential area, work needs to be done without blasting. Most of the alignment below VVIP area has hard rock but, there is a patch of soft soil in the area.
  - ii) The portion below the sea passes through a thick layer of marine sediments which need to be removed before the tunnel segments are aligned.
  - iii) The muck of the tunnel is to be transported for creating an artificial island near Nariman Point coast about 1 km inside sea, for installing a statue of Mother India.
  - iv) As the artificial island is to be constructed modern methods of ground compaction are to be adopted.
  - v) There is Haji Ali Tomb near by area hence maximum care needs to be taken to protect the Tomb.
- You are preparing the Technical details of the Project Proposal for the clients. Prepare your proposal supported by appropriate sketches based on the following points
- a) Method used for casting the tunnel segments and transporting them to the site and aligning them to the proposed alignment layout.
  - b) Method used to remove the layer of marine sediments in the area.
  - c) Construction method for the tunneling under ground in hard strata as well as in the soft portion.
  - d) Method of creating an artificial island using the muck along with
- Q.2 (a) List different Types of Segmental Bridge Structures. Explain construction techniques used for any one of them supported by means of neat sketches. **(15)**
- (b) What do you understand by grout as used in construction. Explain a process of grouting by means of neat sketches. **(10)**
- Q.3 (a) What is a tall building ? What is a super tall building ? What is the need for high rise structures ? What do you understand by structural systems as used in high rise structures ? List different lateral load resisting systems as used in high rise structures. Explain any one of them with neat sketch. **(15)**
- (b) Only list the factors which increase the fire hazard in case of high rise buildings. **(10)**

- Q. 4 (a) List different pile types used for foundation of various civil engineering structures. Explain with neat sketches any one type of pile and its construction procedure. (15)
- (b) Explain with neat sketches the Cellular Arch Method of construction of tunnel. State its advantages. (10)
- Q.5 (a) What do you understand by wick drains or band drains ?. Explain with neat sketches Wicks drain method of ground improvement. (15)
- (b) Enlist different modern innovations that enabled the construction of high rise structures. (10)



Proposed Artificial Island for the Statue of Mother India with island area of  $\frac{1}{2}$  sq km

Figure-01

**COLLEGE OF ENGINEERING**  
(Formerly Government College of Engineering, Pune)

END-SEM EXAM: 2011-12: Semester II

**(CM-502) Construction Project Planning Management**

**M.Tech – CIVIL (Construction Management)**

Timing: 09.00 am – 12.00 noon

Day & Date: Sunday 06/05/12

Duration: 3.00 hrs

Max. Marks: 100

**Instructions:**

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Draw neat diagrams wherever required.
4. Assume suitable data if required and mention it clearly.

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- Q.1 Discuss various wage incentive plans. Explain with reasons the plan you will choose for large scale construction company. (16)
- Q.2 a) Explain the six step approach to method study. (8)
- b) Discuss Taylor's theory of management and its application to the construction industry. (8)
- Q.3 a) Discuss various equipments used for time study. (8)
- b) Explain typical characteristics of construction industry and their impact on application of management techniques to it. (8)
- Q.4 Explain construction project life cycle and its application to the dam project. (16)
- Q.5 a) Draw the network from the data given in Table 1. (06)
- b) Table 2 gives the details of a small project. The fixed cost is Rs. 300 per day. Find out the least cost duration of the project. (10)
- Q.6 Write notes on the following
- a) Matrix organisation
  - b) Process chart symbols
  - c) PERT
  - d) Floats
- (20)

Table 1

Preceding Activity	Activity	Following Activity
B,N	A	C
L	B	A,D,F
A,H	C	G
B,N	D	M
-	E	-
B,J	F	M
C,M	G	-
I	H	C
L	I	H,N
K	J	F
L	K	J
-	L	B,I,K
D,F	M	G
I	N	A,D

Table 2

Activity	Normal		Crash	
	Time (days)	Cost (Rs.)	Time (days)	Cost (Rs.)
1-2	5	1,000	4	1,200
1-3	7	2,100	5	2,300
2-4	3	1,500	2	1,700
3-4	2	1,300	2	1,300
3-5	6	1,200	4	1,400
4-6	5	2,000	4	2,500
5-6	3	1,500	2	1,700