



ANJUMAN-ISLAM'S

**AIKTC KALSEKAR TECHNICAL CAMPUS**

INNOVATIVE TEACHING · EXUBERANT LEARNING

School of Architecture

School of Engineering & Technology

School of Pharmacy

*Knowledge Resource & Relay Centre (KRRC)*

AIKTC/KRRC/SoET/ACKN/QUES/2017-18/

Date: \_\_\_\_\_

School: SoET

Branch: ME-CEM

SEM: II

To,  
Exam Controller,  
AIKTC, New Panvel.

Dear Sir/Madam,

Received with thanks the following Semester/Unit Test-I/Unit Test-II (Reg./ATKT) question papers from your exam cell:

Sr. No.	Subject Name	Subject Code	Format		No. of Copies
			SC	HC	
1	Advanced Construction Technology	CEM-201			
2	Infrastructure Development	CEM-202			
3	Project Economics & Financial Management	CEM-203			
4	Institute Level Optional Course-II (Research Methodology)	CEM-201X			
5	Department Level Optional Course-II (Energy Conservation Technique in Building Construction)	CEM-202X			
6					

Note: SC – Softecopy, HC - Hardcopy

(Shaheen Ansari)  
Librarian, AIKTC

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Master's Civil - sem-II - ACT (Choice Based)  
(Const. Engg & mgmt)

15/5/18

Q. P. Code: 26018

3 Hours

80 Marks

Attempt any four questions.

- Q.1 Answer briefly. Each question carries 05 marks. (20)**
- a Explain the working mechanism of Maglev Trains.
  - b Draw a neat sketch showing various components of a RMC plant. Approximately how much space and cost is required if you have to set up a RMC plant?
  - c Explain Pilot tunnel, shaft, Invert level, Heading, Drift with suitable sketch.
  - d Explain the applications of Geotextiles & Geogrids in Construction practices.
- Q.2 (20)**
- a Draw a neat sketch showing various components of an atomic power plant. List any 3 major atomic power plants in India with their generation capacities. 10
  - b Write a detailed note (with diagram) on New Austrian Tunneling Method covering the steps involved, Cost of working, Equipments required, Applications and practical examples where it is being used. 10
- Q.3 (20)**
- a Write a note on Prefabricated construction techniques covering planning for precasting, fabrication, transport, site erection & safety measures during erection. 10
  - b Explain Slip-form, jump-form and modular shuttering alongwith sketches, applications, practical examples and working process. 10
- Q.4 (20)**
- a Write a detailed note (with diagram) on Diaphragm wall construction covering the steps involved, Cost of working, Equipments required, Applications and practical examples where it is being used. 12
  - b Explain the different types of constructions to be done for underground railway. 08
- Q.5 (20)**
- a Explain Incremental launching method of Bridge construction. 08
  - b Write notes on 1) Self-Compacting Concrete. 2) High performance Concrete. 07
  - c Differentiate between: Diaphragm wall and Secant pile construction. 05
- Q.6 (20)**
- a Explain Cut holes, Rim holes, Reliever holes, Relief holes and various patterns of drilling holes for blasting in tunnel. 10
  - b With a neat sketch/flowchart, Explain the working of:  
Thermal power plant  
Hydro power Plant. 10

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Master's Qul - sem-II - Choice Based - ID  
(cont Engr & mgmt)

17/5/1

**Q.P. Code: 25331**

(3 Hours)

Total Marks: 80

- N.B** 1) Answer any four out of six questions.  
2) Each Main Question carries equal marks.  
3) Draw sketches, wherever required.

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- Q1.a)** Explain with examples the features & characteristics of construction industry in India -- 10M.
- b)** Define, Infrastructure. Mention the salient features of Infrastructure. Also explain the importance of Infrastructure. -- 10M.
- Q2.a)** Explain the detailed classification of Infrastructure projects. --- 10M.
- b)** Explain the role of infrastructure development in economic growth of country. --- 10M.
- Q3.a)** Explain by mentioning facts how government policies affects Infrastructure development? --- 10M.
- b)** Which are various measures of economy of the nation? Explain clearly. --- 10M.
- Q4 a)** What you understood by F.D.I? Explain the role of F.D.I in construction industry --- 10M.
- b)** Explain the sources of finance required for infrastructure development in India? --- 10M.
- Q5 a)** What is Public Private Partnership? Explain with examples. Also explain the benefits of P.P.P. --- 10M.
- b)** Explain main provisions of 12<sup>th</sup> five year plan. ---10M.
- Q6.** Write short notes on followings ( Any four) ----20M.
- a) Role of FICCI                      b) Time Over run & Cost Over run
- c) Golden Quadrilateral project.    d) G.D.P. growth in India
- e) PPP Models                          f) Environment & Infrastructure.
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M.E - Civil - Cont. Engg & Mgmt.  
PEFM

21/5/18

Q. P. Code: 21370

3 Hours

Marks: 80

Note: 1. Attempt any 4 Questions  
2. Assume suitable data, if required  
3. Figures to the right indicate marks  
4. Attempt sub questions in order

1. a) Draft a detailed report for raising funds for metro rail project in Mumbai city through central and state governments as well as local bodies with their respective shares. Design an innovative model like the Konkan Railway. [12]
- b) What do you understand by a master budget? What are the various steps involved in the preparation of a master budget. [08]
2. Answer the following [20]
- a) Explain CIDC-ICRA grading system of construction entities
- b) Explain the role of 'Lender's Engineer' in developer loan approvals.
- c) What do you understand by an Escrow Account
- d) Explain Mergers and acquisition with examples
3. a) The following data is generated from the income and expenditure statements of a contracting firm on a particular project which includes foreign collaboration: [14]

- Total Project cost: ₹ 3000 crores/-
- i. 1<sup>st</sup> R.A bill: ₹ 500 crores/- Due Date July 2017
- ii. 2<sup>nd</sup> R.A bill: ₹ 700 crores/- Due Date Jan 2018
- Every Running Account bill will be paid in INR
- iii. Cost of materials: 45%
- iv. Cost of labour: 25%
- v. Cost of equipment/machinery/plants: 20%
- vi. Indirect costs: 5%
- vii. Net profit: 5%
- Fluctuating exchange rate is to be considered for billing considerations:
- viii. Material payment is 30% USD, 20% Euro, 18% Yen, 12% Saudi Riyal & 20% in INR
- ix. Labour payment is 15% Bangladeshi Takka, 5% Sri Lankan Rupee & 80% in INR
- x. Equipment payment is 15% Chinese Yuan, 30% Yen, 10% British Pound, 10% USD & 35% in INR

When the bid was awarded in Jan 2017, and in the subsequent half-yearly periods, the exchange rates were as follows:

Currency	No. of Units	Exchange rate (Equivalent INR)		
		Jan 2017	July 2017	Jan 2018
USD	1	67	66	65
Euro	1	89	82	81
Yen	1	0.58	0.52	0.54
Saudi Riyal	1	17.8	17.6	17.8
British Pound	1	82	83	91
Sri Lankan Rupee	1	0.4	0.38	0.42
Chinese Yuan	1	8	8.5	7.5
Bangladeshi Takka	1	0.85	0.85	0.82

Based on the above tender conditions, workout the impact of the above exchange rate fluctuations on the total project direct cost and net profit considering one year from January 2017 to January 2018. Ignore effect of exchange rate fluctuations on indirect costs.

b) Draw a sample Profit and Loss account for a construction contractor's firm. [06]

4. a) Explain with an example Project Portfolio Management [06]

b) A contractor has to take a decision whether to bid for a construction project or not. The decision criteria are based on NPV. The project worth is ₹ 750 crores to be completed in 4 years. Based on the tender conditions and the company policy, following information is generated:

- i. Mobilization Advance: 12% of project worth. Mobilization Advance will be deducted in 3 equal installments, starting from the first year
- ii. C.E Advance: 8% of project worth. It will be deducted in 2 equal installments starting from the 3<sup>rd</sup> year
- iii. Material cost component of the project is 45%. Secured advance against materials brought to site is 50% of the material cost. Secured Advance is accounted in proportion to the yearly bill payable to the contractor. Secured Advance will be deducted in 3 equal installments from the running bills starting from the 2<sup>nd</sup> year
- iv. Contractor has to pay 2% as Performance Security in the beginning and 3% Retention amount, which are deductible from each running bill. Performance Security will be released after the end of the project during the 5<sup>th</sup> year and retention amount will be released in the 6<sup>th</sup> year at the end of defects liability period.
- v. The estimated yearly bills payable to the contractor including the retention amount are as follows:

Year	Estimated Amount (in crore ₹)
1	100
2	250
3	300
4	100

- vi. Net profit from the above project before deduction of taxes is 18%. Profit is accounted yearly in proportion to the bill amount
  - vii. Income tax is charged at 25%. Working capital required to be raised is estimated at 10%. Working capital may be divided in the proportion of yearly bill. Interest on the working capital is 15% (simple interest). Repayment of working capital is to be considered in the 5<sup>th</sup> and 6<sup>th</sup> year together with its simple interest
  - viii. Consider the cost of capital as 10%
  - ix. Estimated cost of the defects arising during d.l.p is 1% of the project worth
- Prepare a cash flow statement for the contractor over the 6-year period. Represent the total yearly inflows and outflows w.r.t time graphically and identify whether additional funds may become necessary. Based on NPV, suggest whether the investment in the above project is feasible or not.

5 a) A typical cost sheet of a manufacturing company provides following particulars: [08]

Sr. no.	Particulars	Amount per units(₹)
1	Element of costing:	
	a. Raw materials	85
	b. Direct labours	50
	c. Overheads	35
2	Profits:	40

The following additional details are available:

- i. Raw material in stock – on an average 2 month

- ii. Material in production – on an average ½ month
  - iii. Finished goods in stock – on an average 1 month
  - iv. Credits allowed by suppliers – 3 months
  - v. Credits allowed to purchasers – 2 months
  - vi. Lagged payment of wages – on an average 1 week
  - vii. Overhead expenses (Lagged payment) – 1 month
  - viii. ¼<sup>th</sup> of goods are sold against cash
  - ix. Cash in hand and bank accounts is desired to be maintained at ₹ 1,50,000/-
- Estimate the working capital needed to be kept ready for production of 1.5 lakh units per annum (assuming production is carried out throughout the year)

b) The details of ABC Company are as under:

[12]

Sales (40% cash sales)	15,00,000
Less: Cost of sales	<u>7,50,000</u>
Gross Profit:	7,50,000
Less: Office Exp. (incl. int. on debentures)	1,25,000
Selling Exp.	1,25,000
Total	<u>2,50,000</u>
Profit before Taxes:	5,00,000
Less: Taxes	<u>2,50,000</u>
Net Profit:	2,50,000

Balance Sheet

Particular	Rs.	Particular	Rs.
Equity share capital	20,00,000	Fixed Assets	55,00,000
10% Preference share capital	20,00,000	Inventory	1,75,000
Reserves	11,00,000	Debtors	3,50,000
10% Debentures	10,00,000	Bills receivable	50,000
Creditors	1,00,000	Cash	2,25,000
Bank-overdraft	1,50,000	Fictitious Assets	1,00,000
Bills payable	45,000		
Outstanding expenses	5,000		
	<u>64,00,000</u>		<u>64,00,000</u>

The opening stock was of Rs. 3,25,000. Taking 360 days of the year, calculate the following ratios; also discuss the position of the company:

1. Inventory turnover ratio.
2. Operating ratio.
3. Current ratio.
4. Liquid ratio.
5. Debtors ratio.
6. Creditors ratio.

6. a) The cost of machine A and B are ₹ 10,00,000 each. Estimated life of both machines is five years. Income generated from both machines is given in table below: [08]

Year No.	Project A in lakh ₹	Project B in lakh ₹
1	2,30,500	2,44,850
2	2,28,950	2,26,550
3	2,17,200	2,19,250
4	2,16,250	2,10,200
5	2,14,850	2,10,000

- Which machines is better from the point of view of payback period?
  - Based on B/C ratio, suggest the better machine
  - Calculate average rate of return when salvage value of machine A turns out to be ₹ 50,000 and when B machine has 30,000 salvage value.
- b) The estimated cost of an expressway to be constructed on BOT basis between 2 megacities is ₹ 1500 crores. The project is to be completed in 4 years and the expected life of the project after vehicles start plying on it is 25 years; after which it needs to be scrapped off and replaced. The commissioning period for the contractor is 10 years, after which the project becomes government property. The contractor had taken a bridging loan of ₹ 500 crores (on simple interest of 12%p.a) at the start of the project which he needs to repay back between the years 6-10 of the project life cycle in equal yearly instalments. The cashflows at the end of each years are estimated as follows: [12]

Year No.	Construction costs In crore ₹	Expected Toll to be collected In crore ₹	Expected Repairs and maintenance In crore ₹	Year No.	Expected Toll to be collected In crore ₹	Expected Repairs and maintenance In crore ₹
0				15	950	300
1	300			16	970	330
2	450			17	990	360
3	380			18	1000	390
4	370			19	1020	420
5		800	115	20	1040	750
6		810	130	21	1070	490
7		820	145	22	1100	530
8		830	160	23	1130	570
9		840	175	24	1160	610
10		850	300	25	1190	650
11		870	210	26	1220	700
12		890	230	27	1250	750
13		910	250	28	1200	800
14		930	270	29	1100	700

Determine, based on NPV, whether the project is feasible for both the project parties. Also show the BEP of the project

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Master's Civil-Const. Engg & mgmt.

RM - sem-II - choice Based

Q. P. Code: 24774

25/5/18

(3 hours)

[Total Marks-80]

- N.B. (1) Attempt any four questions out of six questions  
(2) Assume any additional data if necessary and state it clearly  
(3) Explain answers with neat sketches wherever necessary

- 1 a) How Principle Research method different from Methodology? Give example to justify the difference. [10]  
b) Show the classification of research characteristics and discuss at least two classified characteristics with suitable example. [10]
- 2 a) Are quantitative and qualitative research types inter-related with each other? Justify your answer. [10]  
b) What are the methods for analyzing data in quantitative research? [10]
- 3 a) Show the significance of Sample design and describe essential steps to achieve good sampling design. [10]  
b) A car manufacturer claims that his cars will run for an average of 20,000 miles before needing their first repair. To prove this claim, you have tracked a test where you took random sample of 21 cars. It found that the sample average number of miles before repair was 18,700, with a standard deviation of 8,600 miles. If you have been asked to draw the random sample test analysis for this manufacturer what significant test limitations you can suggest or recommend to manufacturer while taking random sample of cars? [10]
- 4 a) There are various stages of scientific research process. Suppose you will have the opportunity to learn how to negotiate solutions to open engineering design problem using systematic design methods. What stages of scientific research process you will follow? Briefly discuss every stage that you like to consider. [10]  
b) What is the characteristic of Good Hypothesis? Explain type I and II errors, level of significance and variables in hypothesis. [10]
- 5 a) Identify any research area you are interested in. What procedural steps you will follow to formulate any research problem in this research area. Be specific to steps you follow and provide relevant description. [10]  
b) Summarize the difference between qualitative and quantitative two data collection methods. [10]
- 6 a) Discuss the validity of research thoroughly. [10]  
b) "Ethics in research is the need of the hour". Justify the statement. [10]



14

Master's Quiz - Choice Based - Sem-II - EETBC  
(Comt Engrg & Mgmt)

23/5/15

**Q.P. Code: 25851**

**(3 Hours)**

**Total Marks: 80**

**N.B.** 1) Answer any **FOUR** questions

2) Neat, labeled sketches, legible handwriting & practical examples will be **appreciated**

**1. Write short notes on ( any 4 )**

**(20)**

- What are evaluation tools for building energy?
- A large open plan office has 180 fluorescent tubes of 54 watt each. Calculate the annual energy consumption.
- Write short note on energy flow diagram.
- Write the check list for energy audit.
- Techniques for reducing energy consumption in building

**2. Answer the following ( 10 marks each )**

- Write short note on waste heat recovery. Explain heat island effect in detail.
- Explain Energy saving in lighting system and different lighting control options

**3. Answer the following ( 10 marks each )**

- Explain legal requirements for conservation of fuel and power in buildings
- Define green building. Explain design of Green building in detail.

**4. Answer the following ( 10 marks each )**

- Explain Principles & Objectives of energy management
- Explain in detail energy efficient and environment friendly building

**5. Answer the following ( 10 marks each )**

- Explain in detail energy recovery dehumidifier.
- Explain in detail passive heating and cooling systems in building services.

**6. Answer the following ( 10 marks each )**

- What are natural building design considerations? Explain in detail.
- What are the various techniques for reducing energy consumption in building.