JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY
WAKNAGHAT
TEST-3 (Nov. 2008)
M.Tech. 1st Semester Civil Engg.

COURESE NAME : Construction Technique
COURSE CODE : 07M11CE101
COURSE CREDIT : 03

MAX. MARKS : 30
TIME : 1 Hr. 30 Min.

Note : Attempt all questions
         All questions carry equal marks

Q.1 What are the fire protection requirements for multi storied buildings?

Q.2 Write short note on prefabrication.

Q.3 What are the requirements of innovative construction techniques?

Q.4 Define terrazzo flooring in brief.

Q.5 What do you understand by modular construction?

Q.6 What are the upper floors? Define in brief.

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JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY
WAKNAGHAT

T-3 M.Tech I and B.Tech VII Semester 2008

Subject Code: 08B71EC410
Subject Name: Speech Coding and Processing

Max Marks 30
Max Time 1½ hrs

Attempt all seven questions

1. Describe how Max's (pdf optimized) quantizer can be designed. Why is this quantizer not commonly used?

    (5)

2. Describe the sub-band coding of speech. Explain how the optimum bit allocation is obtained.

    (5)

3. Describe any artificial speech production instrument, and compare it with the human speech production mechanism.

    (4)

4. Describe how the filter bank can be used as a model for the auditory system.   (4)

5. List and explain the linguistic categories for ASR.

    (4)

6. Explain Dynamic Time Warping. Why is it required?

    (4)

7. Describe statistical sequence recognition.

    (4)

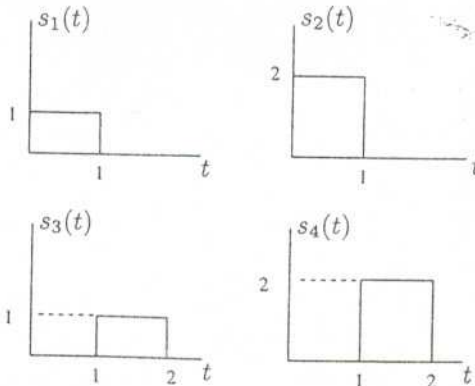# Jaypee University of Information Technology Waknaghat

Test3–Advanced Communication Systems (Elective) (07M11EC101)

For MTech and VII Semester ECE students
Time 1hr 30 min; Marks 30; Nov-Dec 2008
All questions carry equal marks

1. A receiver is made up of the following four stages:
(a) Stage 1 an antenna with a noise temperature of 273^0K and $A_{er} = 100m^2$, Poynting vector magnitude $= 10^{-12}$W/m^2, bandwidth=1MHz (Boltzmann's constant=1.38×10^{-23}W/^{0}K $-$ Hz); (b) Stage 2 gain=20 dB and NF=6 dB; (c) Stage 3 is 3 dB lossy network and (d) Stage 4 is an amplifier of gain=60 dB and a noise figure of 16 dB

(i) Find the power of the signal and SNR at the input and output of every stage

(ii) Repeat (i) with stage 2 removed

2. Consider the parity coefficient matrix **P** matrix

$$P = \begin{bmatrix} 1 & 1 & 1 \\ 1 & 0 & 1 \\ 0 & 1 & 1 \\ 1 & 1 & 0 \end{bmatrix}$$

(a) Find the generator matrix **G** (b) Find all codewords corresponding to all message words (c) Find **H** the parity check matrix. (d) Compute the syndromes corresponding to the received codewords 1001101 and 1111000. Are these valid codewords?

3. Using the Gram-Schmidt process of orthnormalisation find the orthonormal waveforms for the waveforms given below:

After doing so show how these orthonormal functions may be used in a baseband communication system.

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY
WAKANAGHAT
TEST-3
M.Tech. (CTM) 1st Sem. 2008

Course Code: 07M11CE103   Max.Time: 1 Hr. 30 Mins
Course Name: Construction Planning and Control   Max.Marks: 30
Course Credit: 3

Q1. Table below gives the data about durations and costs of various activities of a network.

Activity	Time in weeks		Direct costs (Rs.)	
	Normal	Crash	Normal	Crash
1-2	4	2	4000	12000
2-3	5	2	3000	7500
2-4	7	5	3600	6000
3-4	4	2	5000	10000

The project overhead costs are Rs.2000 per week. Find the optimum duration and the cost associated with it. Also, draw the least cost network.

(20)

Q2. Write short notes on:
   a. Importance of site records.
   b. Progress recording.
   c. Control of resources.

(6)

Q3. What are early warning systems? Explain monthly cost-value reporting and cost value reports.

(5)

11-93p.

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT
TEST-3
M.Tech. (CTM) 1st semester, 2008

COURSE CODE: **07M11CE105**   MAX. TIME: **1 hr. 30 mins.**
COURSE NAME: **Mechanical and Electrical Systems in Buildings**
COURSE CREDITS: **03**   MAX. MARKS: **30**

Note: All questions are compulsory. Marks are indicated against questions.

Q.1. (a) Deduce the emf equation of a transformer. **(2)**

(b) A single-phase, 250-kVA, 11-kV/415-V, 50-Hz transformer has 80 turns on the secondary. Calculate (*i*) the approximate values of the primary and secondary currents, (*ii*) the approximate number of primary turns, and (*iii*) the maximum value of the flux. **(1 + 1 + 1 = 3)**

Q.2. (a) Draw a typical torque-slip characteristic curve of an induction motor. **(2)**

(b) A 3-phase, 6-pole, 50-Hz induction motor has a slip of 1 % at no load and 3 % at full load. Find (*i*) the synchronous speed, (*ii*) the no-load speed, (*iii*) the full-load speed. **(1 + 1 + 1 = 3)**

Q.3. (a) Explain with diagrams the following: (a) one-pipe heating system and (b) two-pipe heating system. **(3)**

(b) Describe the requirements of gas-supply system in a residential building. **(2)**

Q.4. (a) Write a note on communication installations in a building. **(2)**

(b) What is rolling sphere theory of lightning? Explain the conventional methods of lightning protection of buildings. **(3)**

Q.5. Under what circumstances pump is necessary? Explain working of airlift pump with neat sketch. **(4)**

Q.6 Water is required to be pumped from a well for a colony having population of 10000. Following data are made available. **(6)**

Rate of water supply = 150 litres/cap/day	RL of full supply level of reservoir = 125 m
Maximum rate = 2 times the avg.	Length of rising main = 1000 m
Hours of pumping = 16	RL of pump = 107 m
RL of bottom of well = 100 m	Minor losses = 10%
RL of foot valve = 101 m	Friction factor = 0.03
RL of Low water level = 102 m	Efficiency of pump sets = 70%
RL of ground level = 106 m	Velocity of water at discharge end = 1 m/s
RL of maximum water level = 104 m	

Find the horse power of the motor and running cost per month if energy charges are Rs. 2.5 per unit.

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JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY
WAKNAGHAT

Test 3- Nov, 2008
M.Tech 1 st Semester

Course Code: 07M11CE102   **Max. Marks**: 30
Course Name: Estimating & Costing   **Max. Time**: 1 hr 30 min
Course Credit: 3

Note: All Questions are compulsory
Assumption if made should be written explicitly

Q 1. A small steel frame structure is to be erected and an estimate of the cost is required. The unloading, erection, temporary bolting, and plumbing will be done by a crew of 1 foreman, 1 crane operator, and 4 structural steel workers with a crawler crane. The bolting will be done by two structural steel crew using power tools. The painting will be done by a crew of 3 painters with spray equipment. For unloading at site erection , temporary bolting and plumbing allow 7 labor hours per ton for the roof trusses and 5 labor hours per ton for the remaining steel. Assume 60 crew hours will be required for bolting and 1.11 labor hours per ton for painting.

Assume appropriate equipment productivity cost, labor cost and cost involved in any type of development process. The profit earned maybe kept as 12 % of all cost.

Given the material required: A 36 structural steel for truss: 15 tons and columns: 50 tons.   **[8 marks]**

Q 2. Prepare analysis of rates for first class brick laid in cement mortar 1: 7 in super structure up to 4 m height. Assume material and labor cost.   **[4 marks]**

Q 3. .Explain in detail the procedure for following estimating activities: **[10 marks]**

  i.   Earth work

  ii. Adjustment to parametric data

Q 4. Write explanatory note on the following: **[8 marks]**

  i.   Time and Location adjustments in estimating

  ii. Statistical techniques in CER development.

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Jaypee University of Information Technology, Waknaghat
Test - 3
M.Tech 1st Semester, 2008

Course code: 07M11CE104   Max Time: 1 hr 30 min
Course name: Construction Safety and Health
Credits: 3   Max marks: 30

Note: Attempt all 6 questions. Each question is worth 5 marks.

Q. 1a Construction by its very nature is hazardous. What are different types of hazards in construction?

Q. 1b List the diseases caused during construction.

Q. 2 Describe major elements of world's best practice in construction safety management.

Q. 3 Author Allan Holt writes, "*Human error* as a simple catch-all explanation for accidents is now discredited. The term, if it means anything at all, does not provide an adequate description of the many ways in which the failure of people at all levels in organization can contribute to the complex phenomenon we call accidents. It is more useful to think about *human failure* …" The human failure involves

1. Active failures
2. Latent failures
3. Errors
4. Slips
5. Lapses
6. Mistakes
7. Violations
8. Routine violations
9. Situational violations, and
10. Exceptional violations

Define these terms such that the differences between them become clear.

Q. 4 "As the key document pulling all the threads of the management process together, the safety policy details the arrangements made to comply with relevant regulations." List three essential elements of a safety policy. Explain each element.

Q. 5a "Risk assessments are used to generate method statements." What are method statements?

Q. 5b "For difficult to identify hazards, we use inductive analysis." What is inductive analysis?

Q. 6 State 6 important rules for successful meetings

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JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY
WAKNAGHAT, SOLAN-173 215, INDIA

Test-3
M. Tech. (1st Semester)
Electronics and Communication Engineering

Course name: Advance Satellite and Fiber Optic Communication   **Time:** 1hr.30min
Course code: 07M11EC102   **Max. Mark:** 30
Course credits: 03

Answer all questions.

Q. N. 1(a) Explain what is meant by orthogonal polarization and the importance of this in satellite communication? [5]

(b) A continuous 12-km long optical fiber link has a loss of 1.5dB/km. (i) what is the minimum optical power level that must be launched into the fiber to maintain an optical power level of $0.3\mu W$ at receiving end? (ii) what is the required input power if the fiber has a loss of 2.5dB/km? [5]

Q. N. 2(a) Explain what are the important parameters those will examine the design optimization characteristics of single mode fiber? [5]

(b) An $8\mu m$ core diameter single mode fiber is having core refractive index of 1.5 and a cladding refractive index of 1.46. Determine the critical radius of curvature at which large bending occur if the operating wavelength is $1.55\mu m$. [5]

Q. N. 3(a) Explain the nonlinear effects on network performance in the fibre optic communication systems. [5]

(b) The directive gain of the antenna is 52dB, and the antenna efficiency is 0.95. What is the power gain of antenna? [5]

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JAYPEE UNIVERSITY OF INFORMATION TECHNOGLOGY
WAKNAGHAT, Minor- III, November 2008
M. Tech. CSE, I Sem

Course Name: Advanced Data Structures   Max. Marks: 30
Course Credit: 3, CODE : 07M11 CI-101   Max. Time: 90 min.

Question 1.   Show that for all n $\in$ N, there exists an AVL tree for which the deletion of a node would cause n rotations (single or double). Show how such a tree is constructed, show the node to be deleted and explain why n rotations are necessary and sufficient.

[Marks: 4]

Question 2.   In NOIDA toll way the toll collections uses a computerized toll collection system. The highway is modeled as an ordered list of toll booths $t_1, t_2, t_3 \dots t_n$ in which toll t_i collects the toll of Rs.a_i $0 \le i \le n$. Design a Data Structure that can perform the following operation in O(log n) time.

   i.   Insert a new toll booth t_k after with toll Rs.a
   ii. Delete toll t_k
   iii. Add Rs.a to the toll of all the toll booths from t_i till t_j both included.

[Marks: 8]

Question 3.   Given an array $a[1\dots n]$ of integers, consider the problem of finding the longest monotonically increasing subsequence of not necessarily contiguous entries in your array. For example, if the entries are 10, 3, 9, 5, 8, 13, 11, 14, then a longest monotonically increasing subsequence is 3, 5, 8, 11, 14. The goal of this problem is to find an efficient dynamic programming algorithm for solving this problem.

[Marks: 8]

Question 4.   Using depth first search, outline an algorithm that determines whether the edges of a connected, undirected graph can be directed to produce a strongly connected directed graph. If so, the algorithm outputs such an orientation of the edges.

[Marks: 5]

Question 5.   Suppose that B-TREE-SEARCH is implemented to use binary search rather than linear search within each node. Show that this change makes the CPU time required $O(\lg n)$, independently of how t might be chosen as a function of n.

[Marks: 2]

Question 6.   Show the results of inserting the keys
   $F, S, Q, K, C, L, H, T, V, W, M, R, N, P, A, B, X, Y, D, Z, E$
in order into an empty B-tree with minimum degree 2. Only draw the configurations of the tree just before some node must split, and also draw the final configuration.

[Marks: 3]

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