

18/6/2011

T.E EXTC VT (Rev)  
Elective-Digital Telephony

8 : 1st half-11(d)-JP

Con. 3549-11.

(REVISED COURSE)

RK-2712

(3 Hours)

[ Total Marks : 100

- N.B.** (1) Question No. 1 is compulsory.  
(2) Attempt any four questions out of remaining six questions.

1. (a) Draw and explain with block diagram different elements of a switching system. 5  
(b) Explain Waiting Time Jitter. 5  
(c) Write short note on SIP protocol for VOIP. 5  
(d) Compare features of ATM and frame relay. 5
2. (a) Compare between TST and STS. 5  
(b) Describe Lost Calls Held (LCH) system. 5  
(c) What is the blocking probability of a PBX to a central office trunk group with 10 circuits servicing a first attempt offered traffic load of 7 erlangs ? What is the blocking probability if the number of circuits is increased to 13 ? Assume random retries for all blocked calls. 10
3. (a) Explain step-by-step switching system in detail. 10  
(b) Over a 20-minute observation interval, 40 subscribers initiate calls. Total duration of the calls is 4800 seconds. Calculate the load offered to the network by the subscribers and the average subscriber traffic. 10
4. (a) Explain Time Division Time Switching in detail. 10  
(b) Explain following terms with respect to Digital Switched Networks :— 10
  - (i) Network Synchronization
  - (ii) Network Control.
5. (a) Explain common channel signalling and SS7 signalling protocol in ISDN. 10  
(b) Explain ATM layers in details. 10
6. (a) Explain ISDN physical layer protocol. 10  
(b) Describe TCP/IP architecture in detail. 10
7. Write short notes on :— 20
  - (a) Broadband-ISDN.
  - (b) Benefits of ATM.
  - (c) DTMF.
  - (d) H-323 protocol.

18/6/2011

TE EXT C VI (Rev)  
Elective - Neural Network &  
fuzzy logic  
RK-2722

10 : 1st half, 11-AM(o)

Con. 3802-11.

(REVISED COURSE)

(3 Hours)

[ Total Marks : 100

- N.B. :** (1) Question No. 1 is **compulsory**.  
(2) Attempt any **four** questions out of remaining **six** questions.  
(3) Assumptions made must be **clearly stated**.

1. Solve any **four** of the following :— 20
- (a) Show that any  $\lambda$ -cut relation (for  $\lambda > 0$ ) of a fuzzy tolerance relation results in a crisp tolerance relation.
  - (b) Explain common activation function used in neural network.
  - (c) Distinguish between Supervised and Un-supervised training.
  - (d) Compare LMS and Perceptron Learning Laws.
  - (e) What are the features of the Kohonen's self-organizing learning algorithm ?
  - (f) Explain Recurrent Neural Network.
2. (a) What is meant by simulated annealing ? Explain Boltzman machine with its training phase. 8
- (b) Design a Hopfield network for 4-bit bipolar patterns. The training pattern are 8
- $S_1 = [1, -1, -1, -1]$   
 $S_2 = [-1, 1, 1, -1]$   
 $S_3 = [-1, -1, -1, 1]$
- Find the weight matrix and energies for three input samples. Determine the pattern to which the sample  $S = [-1, 1, -1, -1]$  associates
- (c) State difference between full counter propagation and forward only counter propagation network. 4
3. (a) What is self-organizing map ? Explain Kohonen self organizing maps. 8
- (b) Prove that the properties of symmetry, reflexivity and transitivity are preserved under inversion for both crisp and fuzzy relation. 8
- (c) Explain Delta learning rule. 4

4. (a) Prove the following properties of  $\lambda$ -cut on fuzzy relation : 8
- (i)  $\left( \underset{\sim}{RUS} \right)_{\lambda} = R_{\lambda}US_{\lambda}$
- (ii)  $\left( \underset{\sim}{R \cap S} \right)_{\lambda} = R_{\lambda} \cap S_{\lambda}$
- (iii)  $\left( \overline{\underset{\sim}{R}} \right)_{\lambda} = \overline{R_{\lambda}}$
- (b) What is a Hopfield net ? Discuss the relation between the stable states of binary Hopfield net and the graded version of model. 8
- (c) What is called De-fuzzification ? Mention its types and explain any one. 4
5. (a) Explain the operation of the Fuzzy logic control with process inference block. 8
- (b) Write about Genetic algorithm and give its one of application. 8
- (c) State and prove perceptron convergence theorem. 4
6. (a) How pattern recognition problem can be solved with neural network approach ? 8
- (b) Explain briefly about the fuzzy rule base for the home heating system with fuzzy rule function condition. 12
7. (a) Write a short note on the following :— 16
- (i) Brain-State-in-a box model
- (ii) ART-I Network.
- (b) Explain K-means algorithm. 4
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18/6/2011

TE EXTC VT (REV)  
Elective - Radar Engg

P4-Exam-May-11-181

Con. 3244-11.

(REVISED COURSE)

(3 Hours)

RK-2724

[Total Marks : 100

Note: 1) Question no. 1 is compulsory and answer any 4 questions out of remaining six questions.

2) Assume suitable data wherever necessary.

3) Figures to the right indicate full marks.

1. a) Compare CW and frequency modulated radar. 5
- b) Explain radar frequencies and applications. 5
- c) Explain effect of weather on radar. 5
- d) What in brief about receiver bandwidth and applications of CW radar. 5
2. a) Derive radar range equation in terms of signal to noise ratio. Explain its significance. 10
- b) Explain the method of integration of radar pulses to improve detection. Define integration improvement factor. How does it affect the radar equation? 10
3. a) Explain in details different radar system losses. 10
- b) What is delay-line canceller? Draw and explain its frequency response. 10
4. a) Explain Doppler filter banks. What are their advantages and disadvantages? 10
- b) Draw and explain with block diagram MTI radar system. What are its limitations? 10
5. a) Draw the block diagram of a amplitude comparison monopulse tracking of radar and explain its principle of operation with suitable sketches in one angle. How it can be modified for two angles. 10
- b) Differentiate between amplitude comparison and phase comparisons methods of monopulse tracking. 5
- c) Discuss the different sources of atmospheric echoes in radar systems 5
6. a) Describe surface-clutter radar equation and its importance. Explain how it differs from the conventional radar range equation dominated by noise. 10
- b) Differentiate between land clutter and sea clutters. 5
- c) Explain in brief radar resolution cell. 5
7. a) Explain effect of noise in radar receiver's performance? Describe noise figure and noise temperature parameters? 10
- b) Write a short note on: i) Staggered PRFs ii) PRF and range ambiguities in radar. 10

18/6/2011

T.E. EXT.C VT (Rev)  
Elective - Acoustics Engg.

144. 1st half, 11-PH(I)

Con. 3799-11.

RK-2715

(REVISED COURSE)

(3 Hours)

[Total Marks : 100

N.B. : (1) Question No. 1 is compulsory.

(2) Attempt any **four** questions out of remaining **six** questions.

(3) Assume suitable data if **required**.

1. (a) Give reason—Logarithmic scale (decibel) is used to describe the sound level. 5  
(b) Explain the radiation impedance of the acoustic wave propagated into the fluid. 5  
(c) Explain SWR for sound waves. 5  
(d) Explain moving coil electrodynamic microphone. 5
2. (a) Derive the equation for intensity reflection and transmission coefficients for 10  
transmission of sound waves from one fluid to another for normal incidence.  
(b) What are the different fundamental properties of hearing ? 10
3. (a) What are different fundamental properties of transducers ? 10  
(b) Explain microphone directivity and microphone sensitivity. 10
4. (a) Explain Helmholtz resonator and show that at resonance Helmholtz resonator 10  
acts like an amplifier of gain  $Q$ .  
(b) Find out the ratio of stored mechanical energy to total energy for electrostatic 10  
transducer using canonical equation.
5. (a) Find and compare the speeds of sound in air and hydrogen at 1atm and  $0^{\circ}\text{C}$ . 10  
Air has density  $1.21 \text{ kg/m}^3$  and specific heats 1.402 at  $0^{\circ}\text{C}$  whereas hydrogen  
has density  $0.09 \text{ kg/m}^3$  and specific heats 1.41 at  $0^{\circ}\text{C}$ .  
(b) Explain the simple model for the growth of sound in a room. 10
6. (a) Explain speech interference and highway noise. 10  
(b) Explain the principle of acoustic reciprocity and how is it applied to simple source. 10
7. Write short notes on (any two) :- 20  
(a) Method of images.  
(b) Acoustic filter  
(c) Loudspeaker cabinet

14/6/2011

Con.3527-11

( REVISED COURSE )

T-E EXTC VI (ew)  
Industrial Economics &  
Telecom Regulation  
RK-2709

(2 Hours)

[ Total Marks : 50

- N.B. : (1) Question No. 1 is **compulsory**.  
(2) Attempt any **four** questions from **remaining**.  
(3) **All** questions carry **equal** marks.

- |   |    |
|---|----|
| 1. Solve any <b>two</b> :—  | 10 |
| (a) Black Money   |    |
| (b) Direct and Indirect Tax   |    |
| (c) ITU's role in Global Communication.   |    |
| 2. (a) Explain the concept of multiple credit creation.   | 5  |
| (b) List and explain function of money.   | 5  |
| 3. (a) Explain 4 P's of marketing with suitable example.  | 5  |
| (b) Define supply and explain types of elasticity of supply.  | 5  |
| 4. (a) Explain Foreign Exchange Control.  | 5  |
| (b) Explain the importance of planning.   | 5  |
| 5. (a) Explain New Telecom Policy, 1999.  | 5  |
| (b) Explain guidelines for obtaining License for providing Direct to Home (D.T.H.).                       | 5  |
| 6. Explain the legal framework for Tele communication Regulation. Also explain instruments of Regulation. | 10 |
| 7. (a) Explain the function of Central Bank.  | 5  |
| (b) Explain any one Theory of Motivation.   | 5  |
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18/6/2011

T.E EXTC VT (Rev)  
Elective - Micro Electronics

140 : 1st half-11-PH(1)

Con. 3801-11.

RK-2700

(REVISED COURSE)

(3 Hours)

[Total Marks : 100

- N.B. : (1) Question No. 1 is **compulsory**.  
(2) Attempt any **four** questions out of remaining **six** questions.  
(3) Assumptions made must be **clearly** stated.

1. Solve any **four** of the following :- 20
  - (a) Explain Ion-implantation technique.
  - (b) Distinguish between Diffused Resistor and Thin Film Resistor.
  - (c) Draw the top view of multiple emitter transistor. Show the isolation collector, base and emitter regions.
  - (d) Explain how the parasitic channel, which couples unrelated NMOS transistor in an n-well process, is reduced.
  - (e) Explain IC crossovers.
  - (f) Explain significance of lambda-base design rules for MOS IC.
  
2. (a) What is photolithography ? Give the different techniques involved in it. Explain one of them in detail. 8  
(b) With the help of cross-section diagram explain- 8
  - (i) Lateral pnp
  - (ii) Vertical PnP transistor fabrication.
- (c) Describe the formation of resistors in integrated circuit. 4
  
3. (a) What are various crystal growth technics using in silicon industries ? Explain any one in detail. 8  
(b) Explain various isolation technics in brief. 8  
(c) Explain parasitic effect in BJT. 4
  
4. (a) Describe complete fabrication process for silicon gate NMOS transistor. 8  
(b) What are various types of integrated capacitances ? Draw the structure and explain in short. 8  
(c) Give merits and demerits of Ion-implantation and diffusion process. 4

5. (a) Explain n-well process with cross-sectional diagram. 8
- (b) Explain the following – 8
- Diffused Resistor
  - Epitaxial Resistor
  - Ion- Implanted Resistor
  - Pinched Resistor.
- (c) Give a list of NMOS fabrication masks. 4
6. (a) Design a depletion load NMOS inverter where  $\mu_n C_{ox} = 30 \mu A/V^2$ ,  $V_{T\ driver} = 0.8V$  8  
 $V_{T\ load} = -2.8V$ ,  $\gamma = 0.4 V^{1/2}$ ,  $|2 Q_F| = 0.6V$ ,  $V_{DD} = 5V$
- Determine (W/L) ratio of both transistor
  - Calculate noise margins.
- (b) Draw  $\lambda$  based layout for two input NAND gate with depletion MOSFET as load with aspect ratio of 4 : 1 8
- (c) Distinguish between stick diagram and layout rules. 4
7. (a) Draw stick diagram of – 8
- 4- input NAND gate using depletion NMOS transistor as load
  - 4 input NOR gate using CMOS technology.
- (b) Explain the NMOS inverter with active load – 8
- Enhancement mode NMOS transistor.
  - Depletion mode NMOS transistor.
- (c) With the help of a neat diagram explain the features of butting and buried contacts. 4

Con. 3488-11.

( REVISED COURSE )

RK-2697

(3 Hours)

[ Total Marks : 100

- N.B. :** (1) Question No. 1 is **compulsory**.  
(2) Solve any **four** questions from the remaining **six** questions.  
(3) **Figures** to the **right** indicate **full** marks.  
(4) Assume suitable **data** where **necessary**.

1. Answer any **four** questions :—

- |   |    |
|---|----|
| (a) Why an aspect ratio of 4 : 3 chosen for TV ?  | 5  |
| (b) What is chromaticity diagram ?  | 5  |
| (c) Why VSB is used for picture transmission in TV ?  | 5  |
| (d) How a light image is converted into electrical signal using Photoconduction ?                             | 5  |
| (e) Explain the format of a RTSP packet.  | 5  |
|   |    |
| 2. (a) Draw the block diagram of a monochrome TV transmitter and explain the working .                        | 10 |
| (b) Explain the working of Image Orthicon camera tube with the help of a sketch.                              | 10 |
|   |    |
| 3. (a) Explain the various steps involved in the generation of chroma signal from R, G,B signal.              | 10 |
| (b) Draw a neat block diagram of a cable TV transmission and distribution set up and explain the functioning. | 10 |
|   |    |
| 4. (a) Draw the block diagram of PAL colour coder and decoder and explain the working.                        | 15 |
| (b) Explain the design aspects of a Yagi-Uda antenna.   | 5  |

5. (a) Explain the functions of the following in a colour TV receiver: 10
- (i) SAW filter
  - (ii) FBT
  - (iii) ACC
  - (iv) Sync. separator.
- (b) Explain the working of a DTH set up with the help of a neat diagram. 10
6. (a) Explain the following :— 10
- (i) Frequency Interleaving
  - (ii) Interlaced Scanning.
- (b) Draw a neat block diagram of a Digital TV receiver and explain the working. 10
7. Write short notes on any **four** :— 20
- (a) Multicasting
  - (b) CVS
  - (c) AGC
  - (d) Pattern Generator
  - (e) IF Response Curve.
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4/6/2011

T.E. ~~EXTC~~ VI (Rev)  
Digital Communication

Con. 3455-11.

(REVISED COURSE)

RK-2703

(3 Hours)

[ Total Marks : 100

- N.B. (1) Question No.1 is compulsory.  
(2) Attempt any four questions out of remaining six questions.

1. Compare ?
  - a). Systematic and Non systematic codes b). Coherent and Non coherent reception
  - c). Channel Coding and line coding. d). Offset and Non offset QPSK (20)
2. a). What is the advantage of DEPSK over BPSK? With a suitable example, prove that, the ambiguity in the reception of  $b(t)$  in BPSK is removed in DEPSK. (10)  
b). Explain the working of M-ary PSK Transmitter and Receiver. Plot the spectrum and calculate the bandwidth. (10)
3. a). Why is MSK called as shaped QPSK?. For data stream [1 0 1 1 0 1 0 1 1 1 0], draw MSK waveforms. (10)  
b). Find out the error probability in BPSK system (10)
4. a). Consider a (7, 4) cyclic code generated by  $g(x) = 1 + x^2 + x^3$ . Design an encoder using shift registers and using this, find out the code word for the message (1 0 0 1). Suppose the received vector is  $r = (0 0 1 0 1 1 0)$ , find the syndrome using syndrome circuit. Find out the generator matrix for the above cyclic code (15)  
b). Explain the decoding mechanism in Linear block codes. (05)
5. a). Consider (3, 1, 2) convolution code with  $g^{(1)} = (1 0 1)$ ,  $g^{(2)} = (1 1 0)$ ,  $g^{(3)} = (0 1 1)$   
Draw the Trellis diagram with minimum four stages. Using this diagram, find the codeword for the information sequence (1 1 0 0 1). (10)  
b). Derive the code transfer function (05)  
c). Explain Viterbi Decoding algorithm (05)
6. a). The binary data [1 0 1 1 1 0 0 1 0 1] is applied at the input of modified duo binary encoder. Find out the corresponding encoder output and decoder output with precoder. Discuss the merits of modified Duo binary encoder over duo binary encoder (10)  
b). Define
  - i). Information rate ii). Entropy iii) Shannon's theorem on channel capacity
  - iv) Shannon Hartley Theorem (10)
7. Write short notes on any two :- (20)
  - a). ISI and Equalizers
  - b). Binary BCH codes
  - c). Gram Schmidt Procedure
  - d). Matched filters,

31/5/2011

P4-Exam.-May-11-200

Con. 3194-11.

(REVISED COURSE)

(3 Hours)

T.E. EXTC VT (Rev)  
Antenna & Wave Propagation

RK-2718

[Total Marks : 100]

**Note:** 1) Question no. 1 is compulsory and answer any 4 questions out of remaining six questions.

2) Assume suitable data wherever necessary.

3) Figures to the right indicate full marks.

1.
  - a) Explain significance of directivity and radiation pattern of antenna. 5
  - b) Explain in brief basic characteristics of microstrip antenna and its applications. 5
  - c) Describe the concept of near field and far field radiation. 5
  - d) Explain in brief pattern multiplication for antenna arrays. 5
2.
  - a) state and derive FRIIS transmission equation. 10
  - b) What is folded dipole antenna? Explain its operation, equation and properties. 10
3.
  - a) Explain and derive equations for total electric field , directivity , half power beam width in case of two isotropic point sources of same amplitude but opposite phase. 10
  - b) Differentiate between broadside and end fire array. 5
  - c) Calculate the directivity and gain of a given linear broadside uniform array of 5 isotropic elements with a separation of quarter wavelength between the elements. 5
4.
  - a) what are the physical and electrical requirements of loop antenna. 8
  - b) Differentiate between resonant and non resonant long wire antenna. 4
  - c) Explain the working of helical antenna. Give its applications. 8
5.
  - a) Design a long periodic antenna if the scale factor is 1.2. The antenna has to operate in the frequency range of 80 MHz to 120 MHz. 6
  - b) Explain different feeding mechanism of parabolic reflector. 8
  - c) a 64 meter diameter parabolic reflector is fed by a non directional antenna at 1430 MHz calculate beam width between half power points and between nulls. 6
6.
  - a) Explain rectangular patch microstrip antenna along with its characteristics and applications 8
  - b) Explain the dual equations for electric and magnetic current sources 6
  - c) Describe Maxwell's equations in free space on integral form. 6
7.
  - a) classify different types of wave propagation and explain ground wave propagation. 10
  - b) Explain in brief the measurements of following antenna parameters
    - i) Directivity. ii) Polarization. 10

- Note: 1) Question no. 1 is compulsory.  
2) Answer any 4 from question no. 2 to 7

Q.1 A Design 8086 microprocessor based system with following specifications

- i) 8086 microprocessor working at 8 MHz.
- ii) 32 KB EPROM using 8 KB chips
- iii) 32 KB SRAM using 16 KB chips

(12 Marks)

Q.1 B Compare 80286 microprocessor and 80386 microprocessor on the basis of

- ii) Number of address lines
- iii) Number of data lines
- iv) Number of segment registers

(03 Marks)

Q.1 C Write a program for PIC 18 to configure PORTA for input, PORTB & PORTC for output. Read data from PORTA and transfer it to PORTB and PORTC.

(05 Marks)

Q.2 A Draw PSW of 8086 microprocessor and explain setting of different bits with example.

(10 Marks)

Q.2 B Discuss different data transfer modes of DMA controller 8257.

(06 Marks)

Q.2 C Write function of following 8086 microprocessor pins.

(04 Marks)

- i) LOCK
- ii) QS0 and QS1

- Q.3 A Write addressing modes of following 8086 microprocessor instructions.
- i) MOV CL, 25H      ii) MOV [SI],BX
  - iii) ADD BX,DX      iv) SUB CL,[BX+SI]
  - v) IN AL, 80 H
- (05 Marks)
- Q.3 B Explain data and program memory organization of PIC 13. (10 Marks)
- Q.3 C Discuss pipelining used in PIC 18. (05 Marks)
- Q.4 A Draw block diagram of a typical I/O port pin of PIC 18. Which are the different registers involved in the operation of I/O ports of PIC 18 and write their operation. (10 Marks)
- Q.4 B Which are the different methods used for program loop. Explain each method in short. (10 Marks)
- Q.5 A Explain following instructions of PIC 18 (10 Marks)
- i) CLRF F, a      ii) BCF F,b,a
  - ii) DAW      iv) CPFSEQ F,a
  - v) BC n
- Q.5 B Explain Maximum mode of 8086 microprocessor. (10 Marks)
- Q.6 A Draw timing diagram for write operation in minimum mode of 8086 and explain. (10 Marks)
- Q.6 B Explain different string primitives of 8086 microprocessor. (10 Marks)
- Q.7 Write note on (Any two): (20 Marks)
- i) Instruction formats of PIC 18
  - ii) Interrupt structure of 8086 microprocessor
  - iii) Assembler directives
-