Total No. of Questions : 12] [Total No. of Pages : 2

P1016

[3364] - 452
B.E. (E & TC)
COMPUTER NETWORKS
(404214) (2003 Course)

Time : 3 Hours] *[Max. Marks : 100*

Instructions to the candidates:-

1) *Answer three questions from each section.*
2) *Answers to the two sections should be written in separate books.*
3) *Neat diagrams must be drawn wherever necessary.*
4) *Figures to the right indicate full marks.*
5) *Use of logarithmic tables, slide rule,mollier charts, electronic pocket calculator and steam tables is allowed.*
6) *Assume suitable data, if necessary.*

SECTION -I

Q1) a) Explain Lower 4 layers of OSI model. **[12]**

b) What are service primitives? Explain with example. **[6]**

OR

Q2) a) Compare OSI & TCP reference models. **[6]**

b) Explain wireless LANs. **[6]**

c) Explain any three network design issues. **[6]**

Q3) a) What is DSL? Explain any two types of DSL. **[6]**

b) What is message switching? Explain. **[4]**

c) Explain any two unguided media. **[6]**

OR

Q4) a) Explain any two modem standards. **[6]**

b) What is circuit switching? Explain. **[4]**

c) Explain any two guided media. **[6]**

Q5) a) Explain CSMA/CD protocol. **[6]**

b) A channel with 10 kbps bit rate & propagation delay of 10 msec, what should be the frame size to obtain efficiency of at least 50% for stop and wait ARQ. **[4]**

c) Explain Token ring protocol. **[6]**

OR

P.T.O.

Q6) a) Explain any three functions of DLL. [6]

b) ALOHA protocol is used to share 56 kbps satellite channel. If each packet is 1000 bits long find maximum through put in pockets/sec. [4]

c) Explain Token bus protocol. [6]

SECTION -II

Q7) a) What services are provided by network layer to transport layer? [6]

b) Explain token bucket algorithm. [6]

c) Draw TCP header. Explain function of each field. [6]

OR

Q8) a) What services are provided by transport layer to upper layer? [6]

b) Explain leaky bucket algorithm. [6]

c) Explain distance vector routing. [6]

Q9) a) What are security issues in communication network? [6]

b) What is DNS? Explain. [4]

c) What is HTTP? Explain. [6]

OR

*Q10)*a) Discuss public key cryptography. [6]

b) What is RSA algorithm? [4]

c) What is Telnet? Explain. [6]

*Q11)*a) Explain various IPV4 address formats. [6]

b) What is ARP protocol? Where is it used? [4]

c) What is Trivial FTP? Explain. [6]

OR

*Q12)*a) Explain RARP protocol. [6]

b) Explain various IPV6 addresses. [4]

c) What is ICMP? Explain. [6]

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Total No. of Questions :12] [Total No. of Pages : 2

P1251

[3364]-455
B.E. (E & T/C)
VLSI DESIGN
(2003 Course) (404217)

Time : 3 Hours] *[Max. Marks : 100*

Instructions to the candidates:

1) *Answer any three questions from each section.*
2) *Answers to the two sections should be written in separate books.*
3) *Neat diagrams must be drawn wherever necessary.*
4) *Use of electronic pocket calculator is allowed.*
5) *Assume suitable data, if necessary.*

SECTION - I

Q1) a) What do you mean by configuration? Explain with suitable example. [8]

b) Write VHDL code for 4 bit shift register for SISO and SIPO operation. [8]

OR

Q2) a) What is need of attributes? Explain any two attributes in detail. [8]

b) Write VHDL code for 4 bit counter. Write separate function to check clock. [8]

Q3) a) What is metastability? How to avoid? [8]

b) Write VHDL code for traffic light controller. [8]

OR

Q4) a) Explain with suitable examples Static & Dynamic Timing Analysis. [8]

b) Write VHDL code for lift controller. [8]

Q5) a) With suitable schematic explain Antifuse, SRAM & flash technologies for PLD. [9]

b) Explain the architecture of CPLD in detail. [9]

OR

P.T.O.

Q6) a) What is the selection criterion of CPLD/FPGA in an application. [9]

b) With suitable schematic explain the architecture of FPGA in detail. [9]

SECTION - II

Q7) a) What is need of power optimization? Explain the techniques. [8]

b) Explain SRC & DRC rules in brief. [8]

OR

Q8) a) Draw the schematic & explain I/O architecture. [8]

b) What are techniques of DRAM cell architecture? [8]

Q9) a) Draw the low freq. & high freq. equivalent model of MOSFET. Explain body effect. [8]

b) What is technology scaling? What are the effects of it? [8]

OR

*Q10)*a) Design CMOS logic for Y = ABC+D. Calculate area needed on chip. [8]

b) Explain power dissipations in brief. Derive an expression for power delay product. [8]

*Q11)*a) Why is DFT needed? Explain in brief with suitable example. [9]

b) What are the types of fault? Explain with schematic. [9]

OR

*Q12)*a) With the help of suitable schematic explain the architecture of TAP controller. [9]

b) What is BIST? Why is it needed? Design BIST for 4 bit synchronous counter. [9]

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Total No. of Questions : 12] [Total No. of Pages : 3

P1021

[3364] - 461
B.E. (E & TC)
ELECTRONIC MEASUREMENT SYSTEM
(404222) (Theory) (2003 - Course)

Time : 3 Hours] *[Max. Marks : 100*

Instructions to the candidates:-

1) ***Answer three questions from Section - I & three questions from Section - II.***
2) ***Answers to the two sections should be written in separate books.***
3) ***Figures to the right indicate full marks.***
4) ***Use of logarithmic tables, slide rule, and electronic non-programmable pocket calculator is allowed.***
5) ***Assume suitable data, if necessary.***
6) ***Neat diagrams must be drawn wherever necessary.***

SECTION -I

Q1) a) Explain following term w.r.t. measuring instrument: **[8]**

i) Accuracy. ii) Resolution.

iii) Precision. iv) Linearity of measuring instrument.

Also give typical value of above parameter for 0-100V AC voltmeter.

b) Draw and explain block diagram of a digital multimeter. **[8]**

OR

Q2) a) What is digital LCR-Q meter? Give its important specifications and applications. **[8]**

b) With the help of block diagram explain rector impedance meter. **[8]**

Q3) a) Why calibration is required? How calibration should be carried out for a given instrument. **[6]**

b) Compute the value of self capacitance of a coil when the following measurements are made. At frequency $F_1 = 3$ MHz the tunning capacitor is set at 260 pf when the frequency is increased to 6 MHz the tunning capacitor is tunned at 50 pf. **[6]**

c) Pointout difference between primary and secondary standards. **[6]**

OR

P.T.O.

Q4) a) What is the need of Regression analysis? Indicate difference between linear and multiple regression analysis. **[10]**

b) Explain following w.r.t. measuring instruments: **[6]**

i) Validity of calibration.

ii) Traceability.

c) Why international standards are required? **[2]**

Q5) a) If you are required to ask the quotations of DSO for your microwave measurement lab from supplier what parameters you will look for? Justify your need. **[8]**

b) Why CRO probes are important to carryout measurement? Listout different probes used. **[6]**

c) Give typical specification of CRO probe used in your measurement lab. **[2]**

OR

Q6) a) Write advantages and disadvantages of DSO over analog CRO. **[4]**

b) Draw and explain typical schematic block diagram of DSO **[8]**

c) How math functions of DSO are useful to do analysis of signal. **[4]**

SECTION -II

Q7) a) Suggest suitable schematic block diagram for carrying out harmonic analysis of received signal. **[8]**

b) Explain functional block diagram of heterodyning wave-analyzer. **[8]**

OR

Q8) a) Write important specifications of: **[12]**

i) Harmonic analyzer.

ii) FFT analyzer.

iii) Distortion factor meter.

b) Write short note on " Protocol analyzer". **[4]**

Q9) a) How s-parameters measurement is carried out using network analyzer, explain it with suitable block diagram & necessary steps. **[6]**

b) What is the utility of network analyzer? Classify them & write suitable applications of them. **[6]**

c) Write short note on "SINAD Test". **[6]**

OR

Q10) For communication transmitter and receiver how following measurement is carried out for following: **[18]**

i) Sensitivity.

ii) Selectivity.

iii) SNR.

Give typical values of above parameters.

Q11) a) Explain ATE setup with necessary block diagram for testing of signal generator. **[8]**

b) Write short note on Lab view software. **[8]**

OR

Q12) Write short note on: **[16]**

a) OTDR.

b) IEEE 488 bus.

c) PCI/PCI express.

Total No. of Questions : 12] [Total No. of Pages : 3

P1022 BE- E&TC May-June08

[3364] - 462

B.E. (E & T/C)

TELECOM NETWORK MANAGEMENT

(2003 Course)

Time : 3 Hours] *[Max. Marks : 100*

Instructions to the candidates:-

1) *Use two separate answer books for Section I and Section II.*
2) *Read the questions carefully and concentrate on intensions of questions asked.*
3) *Answering to the point will be given the weightage.*
4) *Whenever necessary, use neat diagrams to express your views.*
5) *If necessary, use of Logarithmic Tables or Slide Rule or Pocket calculator.*
6) *Figures on the right side of question indicates marks.*
7) *Assume suitable data if necessary.*

SECTION -I

Q1) On what basis you will classify various telecommunication networks? Based on various classification criteria you decided or thought of, classify various types Telecommunication Networks. Describe in brief each type of network covered in your classification charts. **[18]**

OR

Q2) Based on how switching technologies progressed, Describe circuit switching, Data switching, packet switching and virtual switching in a comparative manner by focusing relative advantages and disadvantages of these switching techniques. **[18]**

Q3) a) Explain how broadband communication networks are different than Baseband Networks. **[6]**

b) Explain Wireless Local Loop (WLL). **[4]**

c) Compare ATM, Frame Relay and X.25 services. **[6]**

OR

Q4) What are the types of services offered by ISDN? What types of channels and interfaces are used when offering these services. Explain ISDN channels and interfaces. Discuss ISDN Interface Reference points with the help of ISDN reference model block diagram. **[16]**

P.T.O.

Q5) Write short notes on:

a) Cable Modem. [5]

b) Digital Loop Carrier Systems (DLC) and Next Generation Loop Carrier System (NGDLC). [5]

c) Compare SDSL and ADSL. [6]

OR

Q6) Write Short Notes on:

a) Local Multi Point Distribution System (LMDS) [5]

b) Multi Channel Multi Point Distribution System (MMDS) [5]

c) Digital subscribes lines (DSL) [6]

SECTION -II

Q7) a) Draw a neat diagram of network routing model between autonomous systems and explain the routing model drawn. [8]

b) Answer in one sentence: [5]

What is Interior routing protocol (IRP)?

What is exterior routing Protocol (ERP)?

BRI-ISDN interface is represented by how many bearer and signalling channels?

What are the names of layers of ISO-OSI Model?

What is pulse dialing?

c) State whether following sentences are true or false? [5]

Border Gateway Protocol (BGP) is Exterior Routing Protocols (ERP) or Inter-Domain routing protocol

Routing Information Protocols (RIP) is one of the Distance Vector Routing Protocol (DVRP)

Basic Digital Channel has a rate of 64 Kbps

Distance vector routing protocol is implemented using Bellman Ford algorithms

Link state routing protocol is implemented using Dijktra's Algorithms

OR

Q8) a) Classify various types of routing Protocols describe them briefly and give one example of each type of routing. [8]

b) Write a Notes on: [10]

Single path verses Multi-Path routing

Flat verses hierarchical routing

Q9) What causes poor service quality in telecommunication networks, What is jitter? What are the effects of jitter on data? With the help of block diagram explain how jitter can be measures? **[16]**

OR

*Q10)*a) Which layer is responsible for providing QoS? How that Layer provides QoS? Explain functioning of transport layer in general. **[8]**

b) How repeaters are useful in providing QoS by way of improving signals. **[8]**

*Q11)*a) Describe various issues in Network operation and maintenance? **[8]**

b) Discuss security aspects of networks and how security is ensured? **[8]**

OR

*Q12)*a) Describe how telecommunication networks are managed? **[8]**

b) Describe the features of Configuration Management Systems? **[8]**

Total No. of Questions : 12] [Total No. of Pages : 4

May-June 2008

P1023

[3364] - 463
B.E. (E & TC)
OPTICALAND MICROWAVE COMMUNICATION
(404224) (Theory) (2003 Course)

Time : 3 Hours] *[Max. Marks : 100*

Instructions to the candidates:-

1) *Attempt Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, from section - I and Q.7 or Q.8, Q.9 or Q.10, Q.11 or Q.12 from section - II.*
2) *Answers to the two sections should be written in separate books.*
3) *Neat diagrams must be drawn wherever necessary.*
4) *Figures to the right indicate full marks.*
5) *Use of electronic pocket calculator is allowed.*
6) *Assume suitable data, if necessary.*

SECTION -I

Q1) a) Draw the structure of DH surface-emitting LED and explain its operation. [8]

b) A multimode SIF with a core diameter of 80 μm and a relative refractive index difference of 1.5% is operating at a wavelength of 0.85 μm. If the core refractive index is 1.48, calculate normalized frequency for the fiber and the number of guided modes. [4]

c) When photons of energy 1.5×10^{-19} J are incident on a photodiode, its quantum efficiency is found to be 70%. Find out the wavelength of operation, incident optical power, and responsivity when the photo current in the diode is 4μA. [6]

OR

Q2) a) Draw the structure of APD and explain its working. List its advantages and drawbacks. [6]

b) What is LASER? Mention population inversion condition. Compare LASER and LED. [8]

c) An optical fiber has core and cladding refractive indices 1.48 and 1.46 respectively. Calculate numerical aperture. Also calculate the maximum angle of entrance of light into air. [4]

P.T.O.

Q3) a) Explain macrobending and microbending effects in optical fibers. **[6]**

b) What is OTDR? Draw the block schematic and explain its working. **[6]**

c) An optical fiber has a core refractive index of 1.5. Two fibers are joined together (Assuming the fiber axes are perfectly aligned), calculate the optical loss in dB at the joint due to Fresnel reflection when there is a small gap between the fiber end faces. **[4]**

OR

Q4) a) What is dispersion? Explain material dispersion. **[6]**

b) What is fiber splice? List the different fiber splicing techniques. Explain in brief elastic tube splicing. **[6]**

c) A multimode graded index fiber exhibits total pulse broadening of 0.1 μsec over a distance of 15km. Calculate: **[4]**

i) The maximum possible BW on the link assuming no intersymbol interference.

ii) The pulse dispersion per unit length.

Q5) a) What are the two analyses usually carried out to ensure the desired performance of optical fiber transmission link? Explain any one of them. **[8]**

b) What is mean by line coding? Explain NRZ and RZ codes in brief. **[8]**

OR

Q6) a) Explain the concept of WDM. Explain the key system features of WDM. **[8]**

b) The 10 to 90% rise times for possible components to be used in D-IM analog optical fiber link are specified as. **[8]**

LED source : 10 nsec.

Fiber cable : Intermodal : 9 ns/km.

Intramodal : 2 ns/km

APD Detector : 3 nsec.

The desired link length without repeaters is 5 km and the required BW is 6 MHz. Determine the above combination of components give an adequate response.

SECTION -II

Q7) a) With the help of diagram, explain the operation of two-hole directional coupler. State its uses. **[8]**

b) Explain how a four port circulator can be constructed using magic tees. **[6]**

c) An air-filled rectangular waveguide of inside dimensions 7cm × 3.5cm operates in the dominant TE_{10} mode. **[4]**

i) Find the cut-off frequency.

ii) Determine the phase velocity of the wave in the guide at a frequency of 3.5GHz.

OR

Q8) a) Write short note on-wave guide termination. **[6]**

b) For a directional the incident power is 550 m watt. Calculate the power in the main arm and auxilary arm. The coupling factor is 30dB. **[6]**

c) Explain working of Isolator and give its applications. **[6]**

Q9) a) Which microwave tube is used in microwave oven and explain working of the same. **[8]**

b) Explain bunching process in klystron tube. **[8]**

OR

*Q10)*a) Draw the structure of TWT and explain its working. **[8]**

b) A two cavity klystron amplifier has the following parameters.

Beam voltage : $V_0 = 900$ V

Beam current : $I_0 = 30$ mA

Frequency : $f = 8$ GHz.

Gap spacing in either cavity : $d = 1$mm

spacing between centres of cavities: $L = 4$ cm.

Determine:

i) The electron velocity.

ii) The d.c. electron transit time.

iii) The input voltage for maximum output voltage

(For maximum, $J_1(x) = 0.582$ at $x = 1.841$) **[8]**

*Q11)*a) Explain LSA mode of Gunn diode. **[4]**

b) Explain power-frequency limitations of a microwave BJT. **[6]**

c) Explain how PIN diode acts as a modulator. **[6]**

OR

*Q12)*a) Explain with the help of block diagram the working of a typical wireless microwave link for long distance communication. **[8]**

b) Compare between Gunn diode and Tunnel diode for microwave applications. **[8]**

Total No. of Questions :12] [Total No. of Pages :4

P1155

[3364] - 464

B.E. (E & TC) May-June 2008

ADVANCED COMMUNICATION SYSTEMS

(Elective - II) (2003 Course)

Time : 3 Hours] *[Max. Marks :100*

Instructions to the candidates:

1) ***Answer any three questions from each section.***
2) ***Answers to the two sections should be written in separate books.***
3) ***Neat diagrams must be drawn wherever necessary.***
4) ***Figures to the right indicate full marks.***
5) ***Use of logarithmic tables, slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.***
6) ***Assume suitable data, if necessary.***

SECTION - I

Q1) a) What are the properties of an 'Optical Amplifier'? List the types of 'Optical Amplifier' and explain the significance of them. **[10]**

b) Determine the limitation of transmission length caused by fiber loss for Pin = 0.025 mW, Pout = 0.004 mW and fiber attenuation $\alpha = 0.3$ dB/km. On the basis of the above calculation, suggest the typical distance between two amplifiers. **[6]**

OR

Q2) a) Explain the following in detail with neat diagrams: **[10]**

i) WDM System.

ii) WDM Standards.

b) An optical fiber has an attenuation of 0.8 dB/km at 1200 nm wavelength. If the optical power launched in to a 40 km long fiber is 200 μW, find the optical output power. **[6]**

Q3) a) Draw the block diagram of the Optical Time Domain Reflectometry and explain how the backscatter is measured. Also list the applications of OTDR. **[10]**

b) What are the various 'Network Topologies' used in Optical Networks. Explain with neat diagrams. **[6]**

OR

P.T.O.

Q4) Write detailed notes on any four of the following topics: **[16]**

a) SONET/SDH
b) Optical Sensors
c) Optical spectrum Analyzer
d) Optical Ethernet
e) FDDI

Q5) a) Compare LEO, MEO and GEO Satellites. **[6]**

b) What are 'Look Angles?'. Explain in detail. **[6]**

c) A quasi-GEO satellite is in a circular equatorial orbit close to geosynchronous altitude. This quasi-GEO satellite, however, does not have a period of one sidereal day: its orbital period is exactly 24 hours one solar day. Calculate, the radius of the orbit and also the rate of drift around the equator of the subsatellite point in degrees per (solar) day. Assume the Kepler's constant as 3.986×10^5 km^3/s^2. **[6]**

OR

Q6) a) State and explain Kepler's three laws of planetary motion. **[6]**

b) Describe the 'Orbit of Satellite' in detail. **[6]**

c) The earth subtends, a beam width between half power points of the antenna pattern, with an angle of 19°, when viewed from geostationary orbit. Calculate the aperture dimension and gain of a horn antenna that will provide global coverage at 4.4 GHz. You may assume the aperture efficiency η_A of 60%. **[6]**

SECTION - II

Q7) a) Explain the following terms with reference to the digital transmission used on satellite links. **[8]**

i) Bit and Symbol Error rates
ii) Probability of Symbol Error

b) A SCPC-FM satellite link has an RF channel bandwidth of 45 kHz and a base band maximum frequency of 3.1 kHz. De-emphasis provides a subjective improvement in base band S/N ratio of 7dB. Calculate the base band S/N ratio for the voice channel for a receiver C/N ratio of 13 dB. If the FM demodulator has an FM threshold at 6dB, what is the link margin for this system? **[8]**

OR

Q8) a) Explain the following terms with reference to the digital transmission of analog signals used on satellite links. **[10]**

i) Sampling and Quantizing
ii) Compression and Expansion

b) A satellite transponder has a bandwidth of 358.4 MHz. Earth stations use RRC filters with $\alpha = 0.4$. What is the maximum bit rate that can be sent through this transponder with BPSK and QPSK? **[6]**

Q9) a) Explain the following terms (in dBs) with necessary expressions: **[12]**

i) Effective Isotropic Radiated Power

ii) Noise Figure and Noise Temperature

iii) Carrier to Noise ratio

b) Calculate the Noise Temperature (T_s) of a 6 GHz receiver, which has different gains and noise temperatures as given below, **[6]**

T_{in} = 50 K

T_{RF} = 50 K G_{RF} = 23 dB

T_M = 500 K G_M = 0 dB

T_{IF} = 1000 K G_{IF} = 30 dB

OR

Q10) a) Write short notes on 'Direct Broadcast Satellite Television [DBS-TV]'. **[4]**

b) The major parameters of a Ku - band geostationary satellite at a height of 38600 km above ground and operating at the frequency of 14.15 / 11.45 GHz are given below, in clear air atmospheric conditions. **[14]**

Uplink:

Frequency (f)	14.15 GHz
Antenna diameter (D)	5 meter
Aperture efficiency (η_A)	68 %
Power at transponder input (Pt)	-95.2 dBW
Earth station antenna gain (Gt)	55.7 dB
Satellite antenna gain (Gr)	31.0 dB
Free space path loss (Lp)	-207.2 dB
E/S on 2dB contour (Lant)	-2.0 dB
Other losses (Lm)	-1.0 dB
Transponder noise power (N)	-125.2 dBW
Received power at transponder (Pr)	Pt -123.5 dB

Downlink:

Frequency (f)	11.45 GHz
Aperture efficiency (η_A)	65 %
Satellite transponder output power (Pt)	18.0 dBW
Satellite antenna gain (Gt)	31.0 dB
Earth station antenna gain (Gr)	Gr dB

Free space path loss (Lp)	-205.4 dB
E/S on -3dB contour of satellite antenna (La)	-3.0 dB
Other losses (Lm)	-0.8 dB
Transponder noise power (N)	-130.7 dB W
Received power at transponder (Pr)	Gr - 160.2 dB

Calculate:

i) Uplink antenna gain (Gt) in dB.
ii) Uplink free space path loss (Lp) in dB.
iii) Uplink transmitter power (Pt) required to achieve $(C/N)_{up}$ =30dB.
iv) Power required in to the earth station receiver (Gr) to meet the $(C/N)_{dn}$ = 17.2 dB.
v) Downlink free space path loss (Lp) in dB.
vi) Receiving antenna gain (Gr) in dB.
vii) Receiving earth station antenna diameter (D) in meter.

Q11) a) What are the various 'Multiple Access Techniques' used in modern satellite communications? Compare them. **[8]**

b) A TDMA network of five earth stations shares a single transponder equally. The frame duration is 2.0 ms, the preamble time per station is 20μs, and guard bands of 5μs are used between bursts. Transmission bursts are QPSK at 30Mbaud. Calculate the number of 64 kbps voice channels that each TDMA earth station can transmit. If the earth stations send data rather than digital speech, what is the transmission rate of each earth station in Mbps? What is the efficiency of the TDMA system? **[8]**

OR

Q12) a) What is meant by VSAT? What are their applications? Draw and explain the implementations of various network architectures in detail. **[8]**

b) The parameters of VSAT terminals operating at the frequency (f) 14.0/11.7 GHz at a range (R) of 38500 km, have a message data rate of 128kbps, with BPSK modulation. Assume the system noise temperature (T_s) = 500K (27dBK) and Boltzmann's constant k = 1.38 x 10^{-23}J/K (-228.6 dBW/K/Hz).

Calculate:

i) Free space path losses at both frequencies (Uplink & down link).
ii) Noise bandwidth (B_n) in kHz.
iii) Noise power at the transponder (N_{tr}). **[8]**

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P1254

[3364] - 465

May-June 2008

B.E. (E & TC)

DIGITAL IMAGE PROCESSING

(2003 Course)

Time : 3 Hours] *[Max. Marks :100*

Instructions to the candidates:

1) *Answer any three questions from each section.*
2) *Answers to the two sections should be written in separate books.*
3) *Assume suitable data, if necessary.*

SECTION - I

Q1) a) Explain false contouring effect in image. [6]

b) What is histogram? What will be the effect on histogram of the image in general if. [6]

i) Lower order bit plane is set to zero.

ii) Higher order bit plane is set to zero.

c) Consider the two image subsets s_1 & s_2 as shown in figure - 1C [6]
For V = {1}. Determine whether
'p' & 'q' are

i) 4 connected.

ii) 8 m connected.

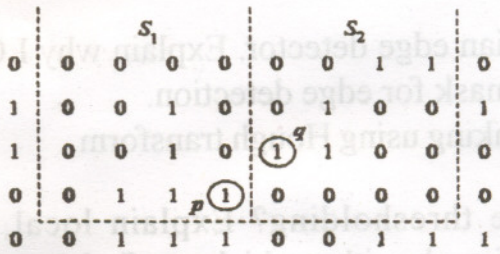

Figure- 1C

Q2) a) Explain Image enhancement using histogram equalization. [8]

b) What is high boost filtering give its applications. [8]

Q3) a) Explain how power law transformation can be used for gamma correction of display device. [8]

b) Explain the difference between image enhancement and image restoration algorithms.
Explain image restoration using inverse filtering. [8]

P.T.O.

Q4) a) Explain HSI color model. Give its advantages and disadvantages over RGB color model. **[8]**

b) What is meant by tristimulus values of color. Explain. **[8]**

Q5) a) State properties of DCT. Compute IDCT for following matrix. **[8]**

$$\begin{bmatrix} 12 & -1.53 & 0 & -3.695 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \end{bmatrix}$$

b) Explain binary erosion & dilation. **[8]**

SECTION - II

Q6) a) In transform based image compression image is subdivided into smaller subimages. Discuss the effect of subimage size on. **[8]**

i) Compression performance.

ii) Computational complexity.

b) With block diagram explain baseline JPEG compression system. **[8]**

Q7) a) Discuss redundancies observed in an image. How we can exploit these redundancies for image compression. **[8]**

b) With suitable example explain 'Arithmetic coding'. **[8]**

Q8) a) Explain Laplacian edge detector. Explain why LOG mask is preferred over laplacian mask for edge detection. **[8]**

b) Explain edge linking using Hough transform. **[8]**

Q9) a) What is image thresholding? Explain local, global & adaptive thresholding. Give algorithm which can find threshold automatically. **[8]**

b) What is image segmentation. Explain splitt & merge segmentation technique. **[8]**

Q10) Write notes on: **[18]**

a) Character recognition.

b) Chain code.

c) Homomorphic filter.

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Total No. of Questions : 12] [Total No. of Pages : 3

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[3364] - 468 May-June 2008

B.E. (E & TC)

SYSTEM PROGRAMMING AND OPERATING SYSTEMS

(404225) (2003 Course)

Time : 3 Hours] *[Max. Marks : 100*

Instructions to the candidates:-

1) *Answer three questions from Section I and three questions from Section II.*
2) *Answers to the two sections should be written in separate books.*
3) *Neat diagrams must be drawn wherever necessary.*
4) *Figures to the right indicate full marks.*
5) *Assume suitable data, if necessary.*

SECTION -I

Q1) a) Describe language processor in detail with various language processing activities. **[8]**

b) Mention different data structure used for language processing. Explain any one data structure in detail. **[8]**

OR

Q2) a) What is compiler? Describe the different phases of compiler in detail. **[8]**

b) Explain in short following terms: **[8]**

i) Loaders. ii) Linker.

iii) Operating system. iv) Assemblers.

Q3) a) Describe the design of single pass assemblers with its advantages and disadvantages. **[8]**

b) Define macro & explain macro expansion with suitable example of nested macro. **[10]**

OR

Q4) a) Describe the design of macro processor. Mention the machine independent features of macroprocessor. **[10]**

b) What is assembler? Describe the structure of assembler assembly process. **[8]**

P.T.O.

Q5) a) What are loaders and linkers? Explain the following loading scheme in detail.

i) Absolute loaders.

ii) Relocation loader.

iii) Dynamic linking loader. **[8]**

b) Write short note on: **[8]**

i) Implementation of MS-DOS linker.

ii) Significance of loaders and linkers.

OR

Q6) a) What is program relocation and how do you perform relocation? Explain in detail. **[8]**

b) Describe the design of direct linking loader. **[8]**

SECTION -II

Q7) a) Define process. Also explain the various states of a process with process state diagram for two state process model & five states process model. **[10]**

b) What are semaphores? With example describe the use of semaphore in mutual exclusion. **[8]**

OR

Q8) a) Describe process synchronization in detail. Explain producer consumer problem. **[10]**

b) Explain following systems **[8]**

i) Batch processing system.

ii) Multi programming system.

Q9) a) What is virtual memory? Mention different techniques used for virtual memory. Explain any one in detail. **[8]**

b) Describe paging technique. Explain the steps of page fault handling in a virtual memory system. **[8]**

OR

*Q10)*a) Explain file system in detail. Also write a note on FAT 32 file system. **[8]**

b) Describe Network File System (N.F.S.) in detail. **[8]**

*Q11)*a) What is device driver? Explain device drivers for USB. **[8]**

b) Explain in detail physical IOCS. **[8]**

OR

*Q12)*Write short notes on: **[16]**

a) I/O Organization.

b) I/O Devices.

c) Device drivers.

d) Advanced I/O programming.