6E 6051

Roll No. _____ [Total No. of Pages : 3]

6E6051

B.Tech. VI Semester (Main) Examination,May - June 2015

Electronics And Communication Engg.

6EC1A Microwave Engg. - II

Time : 3 Hours **Maximum Marks : 80**

Min. Passing Marks : 24

Instructions to Candidates:

*Attempt any **five** questions, selecting **one** question from **each unit**. All questions **carry** equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.*

Use of following supporting material is permitted during examination.

1. Smith Chart

Unit - I

1. a) Discuss the printed inductors and capacitor. **(6)**

   b) Match a load impedance of $Z_L = 100+j\,80$ to a 50Ω line using a single series open-circuit stub, Assuming that the load is matched at 2GHz, And that the load consists of a resistor and inductor in series, plot the reflection coefficient magnitude from 1GHz to 3 GHz. **(10)**

OR

1. a) Explain single section quaster-wave transformer. **(6)**

   b) A load impedance $Z_L = 200+j160\Omega$ is to be matched to a 100Ω line using a single shunt-stub tuner.Find two solutions using open - circuited stubs. **(10)**

Unit - II

2. a) Explain with suitable sketch the construction, working and application of a varactor diode. **(8)**

   b) A low-level point contact detector diode has R_j=2 ohms,R_s = 5 ohms and C_j = 0.5 pf. Calculate the power loss in dB for operation at 5 GHz. **(8)**

OR

2. a) Explain the Gunn effect and principle of operation of Gunn diode. **(8)**

b) An IMPATT diode with nominal frequency 10GHz, has $C_j = 0.5$pf, Lp =0.5nH and Cp = 0.3 pF at breakdown bias of 80v and bias current 80mA. The RF peak current is 0.65A for $R_d = -2$ ohm. Find

i) The resonant frequency of oscillation.

ii) The efficiency. **(8)**

Unit - III

3. a) Explain the geometry of silicon bipolar transistor and microwave equivalent circuit with its characteristics. **(8)**

b) A Si microwave transistor has reactance of 1 ohm, transit time cut-off frequency of 4GHz, maximum E - field 1.6×10^5 v/m and saturation drift velocity 4×10^5 m/s. Determine the maximum allowable power. **(8)**

OR

3. a) Explain the principles of operation and small signal equivalent circuit of MESFET. **(8)**

b) Derive the expression for transducer gain with unilateral transistor. **(8)**

Unit - IV

4. a) Describe the mechanism of operation and modes of oscillation for reflex klystron. **(8)**

b) A reflex klystron is operated at 9GHz with a dc beam voltage of 600v for $1^{3/4}$ mode, repeller space length of 1 mm, and dc beam current of 10mA. The beam coupling coefficient is assumed to be 1. Calculate the repeller voltage electronic efficiency and output power. **(8)**

OR

4. a) Explain the resonant mode, Operation and mechanism of oscillations of cavity magnetron. **(8)**

b) A pulsed cylindrical magnetron is operated with the following parameters.

Anode Voltage = 25kV

Calculate:

a) The angular frequency

b) The cutoff voltage

c) the cutoff magnetic flux density **(2+3+3=8)**

Unit - V

5. a) Discuss the basic schematic and mechanism of operation of two cavity klystron amplifier. (8)

   b) A two - cavity klystron amplifier is operated with a beam voltage of 3kV of the coupling coefficient is 0.9 and the magnitude of the signal voltage at the input cavity gap is 100v, find the velocities of the electrons leaving the input gap. (8)

OR

5. a) Draw the basic schematic of helix type TWT tube and explain its operation. (8)

   b) A helix travelling-wave tube operates at 4 GHz under a beam voltage of 10kV and beam current of 500mA. If the helix impedance is 25 ohms and the interaction length is 20cm. find the output power gain in dB. (8)

6E 6052

Roll No. _____ [Total No. of Pages : 3]

6E 6052

B.Tech. VI Semester (Main) Examination, May-June 2015
Electronics And Communication Engg.
6EC2A Microprocessors

Time : 3 Hours **Maximum Marks : 80**
Min. Passing Marks : 24

Instructions to Candidates:

*Attempt any **five** questions, selecting **one question** from **each unit**. All questions **carry** equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.*

Unit - I

1. Explain pin description and signal flow diagram of 8085. Explain all the signals used for 8085 in brief **(16)**

OR

1. a) Explain the programming model of microprocessors with the help of suitable block diagram **(8)**

   b) Explain the types of memory used in microprocessors **(8)**

Unit - II

2. a) Write an assembly language program to find largest and smallest numbers out of ten 8 bit integers stored at 3000H onwards. Store the result at 3050H and 3051H. Also draw flow chart for this program **(12)**

   b) Explain MVI and LXI instructions using suitable example **(4)**

OR

2. a) Write an assembly language program to multiply two 8-bit numbers stored in register-B and register-C. The 16-bit result should be stored in DE register pair

   $B \rightarrow AZH, C \rightarrow OBH$ **(8)**

b) Write short notes on any two (8)

i) Instruction size

ii) Op code format

iii) flow chart

Unit - III

3. a) Why time delay is required for microprocessor classified techniques? calculate the maximum time delay for using one 8-bit register technique. The clock frequency of 8085 microprocessor is 3 MHz (12)

b) Explain the use of counter in microprocessor programming (4)

OR

3. a) Explain BCD to binary code conversion technique (4)

b) Draw machine cycle timing diagram for the instruction given:- STA 4050H, memory address starting at 2052H and Hex code for STA in 32H (12)

Unit - IV

4. a) Classify the type of interrupts used for 8085 microprocessor. Explain each interrupt with its functioning in brief. (10)

b) Explain SIM and RIM instruction operations. (6)

OR

4. a) Draw schematic diagram for serial input/output interfacing. Also explain synchronous and asynchronous transmission (8)

b) Explain serial Input/Output standards in details. (8)

Unit - V

5. a) Draw and explain the block diagram of 8255 programmable peripheral interface. **(8)**

   b) Draw the block diagram of 8259 programmable interrupt controller and briefly explain each block. **(8)**

OR

5. a) Draw and explain the block diagram of 8279 keyboard/display interface **(10)**

   b) Briefly describe the various operating modes of 8254 programmable interval timer. **(6)**

6E 6053

Roll No. _____ [Total No. of Pages : 3]

6E 6053

B.Tech. VI Semester (Main/Back) Examination, May-June 2015

Electronics and Communication Engg.

6EC3A Industrial Electronics

(Common for AI,EC,EI)

Time : 3 Hours **Maximum Marks : 80**

Min. Passing Marks : 24

Instructions to Candidates:

*Attempt any **five** questions, selecting **one** question from **each unit**. All questions carry **equal** marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.*

Unit - I

1. a) What is a thyristor? Give constructional details of a typical thyristor. Describe the mode of a typical thyristor with the help of its static V-I characteristics. **(8)**

   b) Give the cross-sectional view of a triac and explain its turn-on process with relevant diagrams. Hence show that a triac is rarely operated in first quadrant with negative gate current and in third quadrant with positive gate current **(8)**

OR

1. a) How does a GTO differ from a conventional thyristor. Give its circuit symbol and static V-I characteristics. Under what conditions, it may work as a low gain transistor. **(5)**

   b) Discuss the turn off process in a GTO with the help of appropriate voltage and current waveforms. **(6)**

   c) Give the merits and demerits of a GTO as compared to conventional thyristor. **(5)**

Unit - II

2. a) For a single-phase one-pulse controlled convertor system, sketch waveforms for load voltage and load currents for

   i) RL load and

   ii) RL load with freewheeling diode across RL. (8)

   b) Describe the working of a single-phase half bridge inverter what it its main drawback? Explain how this drawback is overcome. (8)

OR

2. a) Describe the working of a single phase one pulse SCR controlled converter with RLE load through the waveform of supply voltage, load voltage, load current and load voltage across the SCR (8)

   b) Explain the voltage source inverter with the help of suitable circuitry and waveforms (8)

Unit - III

3. a) What is SMPS? Give its operating principle and industrial applications (8)

   b) Describe the principle of step-up chopper. Derive an expression for the average output voltage in terms of input dc voltage and duty cycle. State the assumption made. (8)

OR

3. a) Explain the uninterruptible power supply with their suitable diagrams. (8)

   b) A step-up chopper has input voltage of 220V and output voltage of 660V. If the non-conducting time of thyristor is $100\,\mu s$. compute the pulse width of output voltage (8)

Unit - IV

4. a) Induction motor speed control with constant-supply voltage and reduced-Supply frequency is rarely used in practice. Justify this statement (6)

   b) Describe Stator frequency control for the speed control of a 3-phase induction motor. Discuss why during this method of speed control, an induction motor is said to be working in field-weakening mode. (10)

OR

4. Describe how the speed of a separately-excited dc motor is controlled through the use of two 3-phase full converters. Discuss how two-quadrant drives can be obtained from this scheme.

   Derive expression for rms values of source and thyristor currents state the assumptions made. **(16)**

Unit - V

5. Write short note on the following **(8)**

   a) Variable reluctance stepper motor **(8)**

   b) Induction heating control

OR

5. Write short note on the following

   a) Permanent magnet stepper motor **(8)**

   b) Dielectric heating control **(8)**

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6E 6054

Roll No. _____ [Total No. of Pages : 4

6E 6054

B.Tech. VI Semester (Main/ Back) Examination, May -June 2015

Electronics And Communication Engg.

6EC4A Digital Communication

Time : 3 Hours

Maximum Marks : 80
Min. Passing Marks : 24

Instructions to Candidates:

*Attempt any **Five** questions, selecting **one** question from each **unit**. All questions carry **equal** marks. (Schematic diagrams must be shown wherever necessary. any data you feel missing suitably be assumed and stated clearly.) Units of quantities used/ calculated must be stated clearly.*

Assume erfc 2.23=2.54×10^{-3}, erfc 3.16= .1×10^{-5}

Unit - I

1. a) When Quantization noise as well as channel noise are considered, derive an expression for the destination signal to noise ratio of a binary PCM system. **(8)**

   b) What is meant by slope over load distortion in a Delta modulation system? How it can be avoided? **(4)**

   c) Determine the out put SNR of a DM system for 1 KHz sinusoid sampled at 32KHz with out slope overload and followed by 4-KHz post reconstruction filter. **(4)**

(OR)

1. a) In a binary PCM system, the output signal to Quantization noise ratio is to be held to a 40dB determine the number of required levels, and find the corresponding output signal to Quantizing noise ratio. **(8)**

   b) With the help of block diagrams of the transmitter and receiver, explain the working of an ADM system with a discrete set of values for the step size. **(8)**

UNIT - II

2. a) What is "a raised cosine spectrum"? How does it help us to avoid ISI? **(4)**

b) Binary data is transmitted at the rate of 48 kbps using a baseband binary PAM system designed to have a raised cosine spectrum what is the transmission band width required if the roll off factor e=0.5 , 0.75? **(8)**

c) Consider the binary sequence 0100101. Draw the waveforms for the following formats

i) Unipolar NRZ

ii) Bipolar RZ

iii) AMI RZ

iv) Man Chester **(4)**

(OR)

2. a) Draw the block diagram of an optimum linear receiver for binary baseband signalling and explain its working. If a rectangular pulse is applied on matched filter find impulse response of matched filter. **(10)**

b) For an NRZ polar binary data, the received signal is either +3V or -3V during a time slot The signal is corrupted by white noise of PSD $\eta = 10^{-4}\ Volt^2/Hz$. If an receiver is used what should be the minimum duration of the time slot. If Pe is not to exceed to 10^{-5}? **(6)**

UNIT - III

3. a) What is QPSK? Write an expression for the signal set. Draw the signal - space diagram and show the signal constellation. Calculate the probability of error also. **(10)**

b) Given the input binary sequence 1100100010, sketch the modulated wave obtained by QPSK. **(6)**

(OR)

3. a) A binary band pass system transmits binary data at the rate of 2.5×10^6 bits/ second. During the course of transmission, zero mean AWGN of 2 sided PSD equal to 10^{-14}W/Hz is added to the signal In the absence of noise, the amplitude of the received sinusoidal wave for digit '1' or '0' is 1 mv. Find the average probability of symbol error for the

   i) Coherent BFSK

   ii) Coherent BPSK **(8)**

   b) Draw the block diagrams of transmitter and receivers of MSK and explain working **(8)**

UNIT - IV

4. a) What is 'shannon limit' with reference to an AWGN power limited Gaussian channel Define an ideal system. **(8)**

   b) An analog signal having 4 KHz B.W. is sampled at 0.25 times the Nyquist rate and each sample is Quantized into one of 256 equally likely levels. Assume that the successive samples are statistically independent.

   i) What is the information rate of source?

   ii) Can the output of this source be transmitted without error over an AWGN channel with a band width of 10 KHz and an (S/N) ratio of 20 dB? **(8)**

(OR)

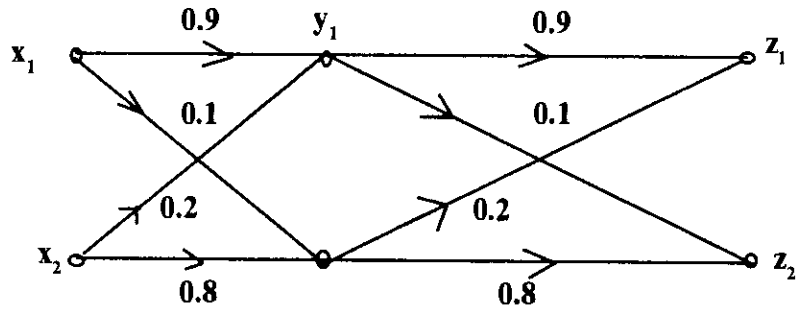
4. a) Explain mutual information & differential entropy **(3)**

   b) Verify the equations **(8)**

   i) $H(x,y) = H(x/y)+H(y)$

   ii) $I(x:y) = I(y:x)$

c) Two binary channels are connected in cascade find $P(z_1)$ and $P(z_2)$ when $P(x_1) = P(x_2) = 0.5$ **(5)**



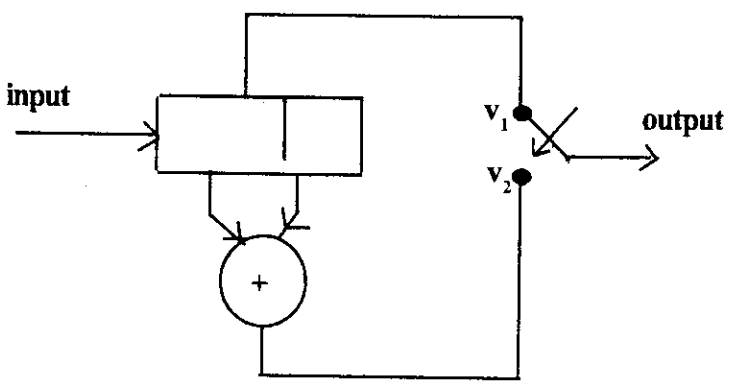
UNIT - V

5. A "DMS" 'X' has five equally likely symbols $P(x_i)$=0.2 Construct a shannon Fanocode for 'X' and calculate the efficiency of the code. Repeat for Huffman code&compare result. **(16)**

(OR)

5. a) Let 'C' be a (7,4) cyclic code with $g(x) = 1+x+x^3$ Find a Generator matrix 'G' for C and find the code word for d = (1 0 1 0) **(10)**

b) Consider the convalutional encoder shown in figure and find the impulse response using the impulse response determine the output code word for input data d = (1 0 1) **(6)**



6E 6055

Roll No. _____ [Total No. of Pages : 4

6E6055

B.Tech. VI Semester (Main/Back) Examination, May-June 2015

Electronics And Communication Engg.

6EC5A Control Systems

Time : 3 Hours **Maximum Marks : 80**

Min. Passing Marks : 24

Instructions to Candidates:

*Attempt any **five** questions, selecting **one** question from **each unit**. All questions carry **equal** marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.*

Unit - I

1. a) Represent the following set of equations by a signal flow graph and determine the overall gain relating x_5 and x_1.

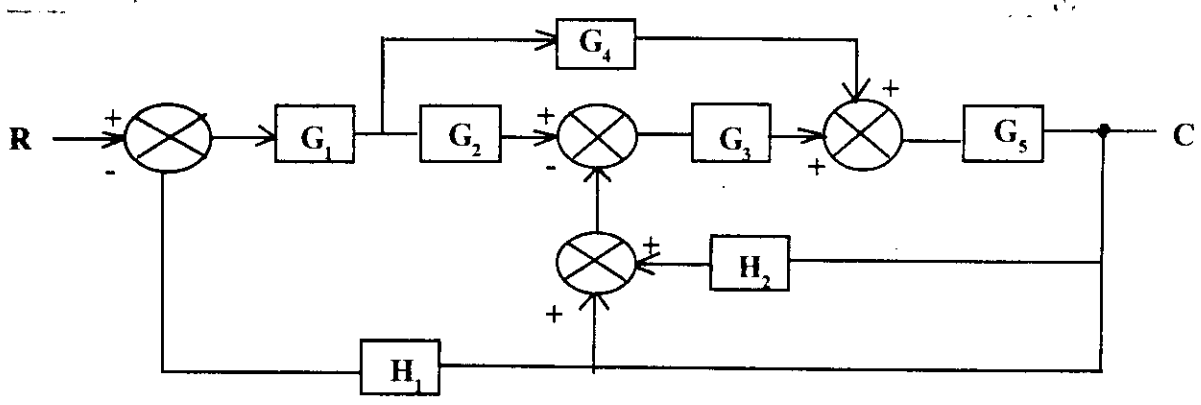
$x_2 = ax_1 + fx_2; x_3 = bx_2 + ex_4$

$x_4 = cx_3 + hx_5; x_5 = dx_4 + gx_2$ **(10)**

b) What is feedback and explain closed loop control system with example and also compare closed loop control system with open - loop control system. **(6)**

OR

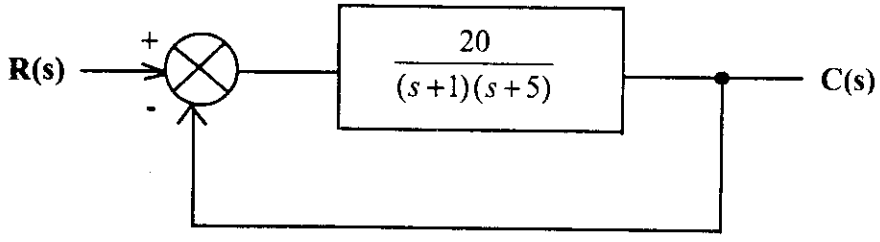
1. a) Apply mason's gain formula to determine the overall transfer function of a control system having the block - diagram given below in fig. **(10)**



b) Explain force - voltage and force - current analogy with complete details. **(6)**

Unit - II

2. a) The block - diagram of a unity feedback control system is shown in fig.



Determine the characteristics equation of the system, W_n, ξ , W_d, t_p, M_p, the time at which the first undershoot occurs, the time period of oscillations and the number of cycles completed before reaching the steady state. **(12)**

b) Explain asymptotic and relative stability. **(4)**

OR

2. a) Determine the stability of a system having following characteristics equations:

$s^6 + s^5 + 5s^4 + 3s^3 + 2s^2 - 4s - 8 = 0$. **(8)**

b) The closed - loop transfer function of a unity feedback control system is given below:

$$\frac{C(s)}{R(s)} = \frac{Ks + \beta}{s^2 + \alpha s + \beta}$$

Determine the steady - state error for unit ramp input. **(8)**

Unit - III

3. a) Determine the critical values of k for the stability of a unity feedback control system whose open - loop transfer function is given by

$G(s)=\frac{Ke^{-0.5s}}{(s+1)}$. Use Nyquist plot method. **(12)**

b) Explain the salient features of root locus plot. **(4)**

OR

3. The transfer function of a unity feedback control system is given by

$$G(s)=\frac{K}{s(s+2)(s+4)}$$

Determine :

a) The value of k to have 40% over - shoot for unit step input. **(4)**

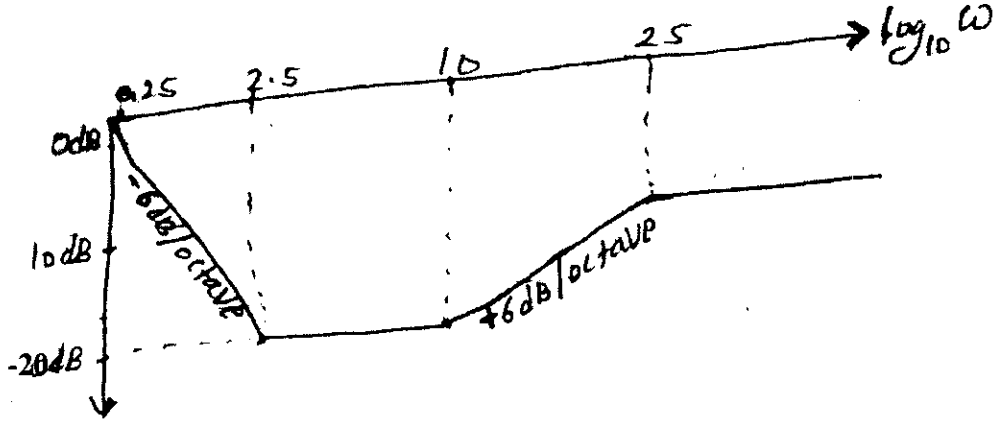
b) The value of k_v for sustained oscillations in output. **(4)**

c) The value of k_v corresponding to value of k as obtained in (a) **(4)**

d) The value of settling time t_s. Using root locus method. **(4)**

Unit - IV

4. a) Determine the transfer function for the bode plot shown in fig.



(8)

b) The open loop transfer function of a feedback control system is given by

$$G(s)\,H(s)=\frac{K}{(s+1)(2s+1)(3s+1)}.$$

Find the value of K such that the gain margin is 20db. **(8)**

OR

4. a) A unit step input is applied to a unity feedback control system whose open - loop transfer function is given by

$$G(S)=\frac{K}{S(ST+1)}$$

Determine the values of k & T given that maximum overshoot Mp = 25% and resonant frequency W_r =8 rad/sec. Calculate the resonance peak M_r gain crossover frequency and phase margin. **(12)**

b) Explain gain margin and phase margin with stability conditions. **(4)**

Unit - V

5. a) Explain feedback compensation technique. **(8)**

b) The state equations of a control system are given below:

Examine for complete state controllability.

$$\dot{x}_1=\frac{-1}{T_1}x_1+\frac{1}{T_1}u \;\;\&\;\; \dot{x}_2=\frac{-1}{T_2}x_2+\frac{1}{T_2}u.$$ **(8)**

OR

5. a) Obtain the state transition matrix in the e^{At} and determine the time response for the system, $\dot{X}=AX$

Where $A=\begin{bmatrix}0 & 1\\ -2 & 0\end{bmatrix}$ & $x_1(0)=1, x_2(0)=1$. **(8)**

b) What is controllers and explain PID controllers with effect of P, I, D individually **(8)**

6E 6058

Roll No. _____ [Total No. of Pages : 3

6E 6058

B.Tech. VI Semester (Main) Examination, May-June 2015

Electronics and Communication Engg.

6EC6.3A Optical Fiber Communication

Time : 3 Hours **Maximum Marks : 80**

Min. Passing Marks : 24

Instructions to Candidates:

*Attempt any **five** questions, selecting **one** question from **each unit**. All questions carry **equal** marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.*

Unit - I

1. a) What are the functions of the core and cladding in an optical fiber? Why should their refractive indices be different? would it be possible for the light to be guided without cladding **(8)**

b) A multimode step index fiber with a core diameter of 80 μ m and a relative index difference of 1.5% is operating at a wavelength of 0.85 μ m. If the core refractive index is 1.48, estimate

i) The normalized frequency for fiber

ii) The number of guided modes **(4+4)**

OR

1. a) What is dispersion? Explain dispersion shifted and dispersion flattened fiber with their applications **(8)**

b) List the major advantages of vapour phase deposition in the preparation of glasses for optical fiber. Explain outside vapour phase oxidation (OVPO) process **(4+4)**

Unit - II

2. a) Compare the properties of laser diode and LED's used for optical communication. **(8)**

b) The radiative and nonradiative recombination lifetimes of the minority carriers in the active region of a double heterojunction LED are 60 ns and 100 ns respectively. Determine the total carries recombination lifetime **(8)**

OR

2. a) Describe the common LED structures for optical fiber communication discussing their relative merits and drawbacks **(8)**

b) What is population inversion? Explain threshold condition for laser oscillation **(4+4)**

Unit - III

3. a) Explain the detection principle of PIN photodiode and compare it with avalanche photodiode(APD). **(8)**

b) A 80/125 μm graded-index(GI) fiber with a NA of 0.25 and α of 2.0 is jointed with a 60/125 μm GI fiber with an NA of 0.21 and α of 1.9. The axes are perfectly aligned and there is no air gap. Calculate the insertion loss at a joint for the signal transmission in forward and backward directions. **(5+3)**

OR

3. a) What is splicing in fiber? Explain different types of techniques use for splicing the optical fiber with neat diagram **(2+6)**

b) A P-N photo diode has a quantum efficiency of 50% at a wave length of 0.9 μm calculate

i) Its responsivity at 0.9 μm

ii) The received optical power if the mean photo current is 10^{-6} *Amp*

iii) The corresponding number of received photons at this wavelength **(2+3+3)**

Unit - IV

4. a) Explain the working principle of optical time domain reflectometry (OTDR) with neat diagram and its application in optical communication **(8)**

b) A 2 Km length of multimode fiber is attached to apparatus for spectral loss measurement. The measured output voltage from the photo receiver using the full 2Km fiber length is 2.1 V at a wavelength of 0.85 μm. When the fiber is than cutback to leave a 2m length the output voltage increases to 10.7V. determine the attenuation per kilometer for the fiber. **(8)**

OR

4. a) Explain the time domain technique for dispersion measurement **(8)**

   b) Describe the measurement technique for numerical apperture(NA) in optical fiber **(8)**

Unit - V

5. a) List the different types of application of optical fiber communication in daily life **(8)**

   b) Explain the mach-Zehnder interferometric sensor for fiber optic **(8)**

OR

5. a) Describe wavelength division multiplexing use in optical communication **(8)**

   b) Write short note on optical amplifiers use in optical communication **(8)**

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6E 3085

Roll No. _____ [Total No. of Pages : 3]

6E3085

B.Tech. VI Semester (Back) Examination, May 2015

Electronics & Communication Engg.

6EC1(O) Microwave Engg - II

Time : 3 Hours **Maximum Marks : 80**

Min. Passing Marks : 24

Instructions to Candidates:

*Attempt any **five** questions, selecting **one** question from **each unit**. All questions carry **equal** marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.*

Unit - I

1. a) Explain the power measurement. **(8)**

   b) In an VSWR measurement at 10 GHz, the distance between the successive minima is 0.1cm. Inside dimensions of waveguides are 4cm. and 2cm. respectively. TE_{10} mode is propagating through the waveguide. Calculate the VSWR. **(8)**

OR

1. a) Explain impedance measurement by reflectometer. **(8)**

   b) In a calorimeter - wattmeter power measurement system mass of water taken is 1000 gm and rise in temp. is 100^0c. Calculate the amount of incident microwave power. **(8)**

Unit - II

2. a) Why microstrip transmission line is preferred over any other type of transmission line? And mention the factors on which the selection of dielectric depends for microstrip line. **(8)**

   b) Write down some of the important features of a slot line and a co-planar line. **(8)**

OR

2. a) Make a comparative study between different planar transmission lines. **(8)**

b) A certain microstrip line has the following parameters $E_r = 523$, h = 7 mils, t = 2.8 mils and w = 10 mils. Calculate the characteristic impedance z_0 of the line. **(8)**

Unit - III

3. a) Find the s - matrix of a length l of a lossless transmission line terminated by matched impedance. **(8)**

b) The s - parameter of a two - port network are given by $S_{11} = 0.2\angle 0^{\circ}, S_{22} = 0.1\angle 0^{\circ}, S_{12} = 0.6\angle 90^{\circ}, S_{21} = 0.6\angle 90^{\circ}$. Prove that the network is reciprocal but not lossless. **(8)**

OR

3. a) Find the ABCD matrix of a length of lossless microstrip transmission line terminated in its characteristics impedance Z_0. **(8)**

b) A shunt impedance Z is connected across a transmission line with characteristics impedance Z_0. Find the S - matrix of the junction. **(8)**

Unit - IV

4. a) Explain different modes of operation of a Gunn diode. And explain why it is possible to obtain amplification by using a negative resistance device. **(8)**

b) The drift velocity of electrons is 2×10^7 cm/s through the active region of length 10×10^{-4}cm. Calculate the natural frequency of the diode and the critical voltage. **(8)**

OR

4. a) Explain with suitable sketch the construction, working and application of a varactor diode. **(8)**

b) An IMPATT diode with nominal frequency 10 GHz, has C_j = 0.5Pf, Lp = 0.5nH and Cp = 0.3 pf at breakdown bias of 80 v and bias current 80 mA. The Rt peak current is 0.65A for Rd = -2 ohm. Find

i) The resonant frequency of osillation

ii) The efficiency. **(8)**

Unit - V

5. a) Compare different properties of the material used for MM/Cs. **(8)**

   b) Explain the fabrication technology for MM/Cs. **(8)**

OR

5. a) Describe the hybride IC techniques. **(8)**

   b) An interdigitaled capacitor fabrication on a Ga As substrate has the following Parameters

   Number of fingers N = 8

   Relative dielectric constant of Ga As $E_r = 13.10$

   Substrate height h = 0.254 cm

   Finger length l = 0.00254 cm

   Finger-base width w = 0.051 cm

   Compute the capacitance. **(8)**

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6E 3093

Roll No. _____ [Total No. of Pages : 4

6E 3093

B.Tech. VI Semester (Main & Back) Examination, May -June 2015

Electronics & Communication

6EC6.3 Optimization Techniques

Time : 3 Hours **Maximum Marks : 80**

Min. Passing Marks : 24

Instructions to Candidates:

*Attempt any **Five questions**, selecting **one question** from **each unit**. All questions carry **equal** marks. (Schematic diagrams must be shown wherever necessery. any data you feel missing suitably be assumed and stated clearly.) Units of quantities used/ calculated must be stated clearly.*

UNIT - I

1. a) Briefly decribe the methodology of optimization techniques. **(8)**

   b) Discuss the significance and scope of Optimization Techniques in decision making with special reference to Engineering Applications. **(8)**

(OR)

1. a) Discuss various classification schemes of optimization problems **(8)**

   b) Production of a certain chemical mixture should contain 80mg. Chlorides, 28mg. nitrates and 36mg of sulphate per kilogram. The company can use two substances and a base (assume this is costless) Substance X contain 8mg. chlorides, 4mg. nitrates and 6mg. sulphates per gram. Substance Y contains 10mg. chlorides, 2mg, nitrates and 2 mg. sulphates per gram. Both substances cost Rs. 20 per gram It is require to produce the mixture using substances X and Y so that cost is minimized. Formulate the problem as mathematical programming problem. **(8)**

UNIT - II

2. a) Use simplex methods to solve the following LPP:

$$\begin{aligned} \textit{Maximize} \quad & Z = 4x_1 + 10x_2 \\ S.t \quad & 2x_1 + x_2 \le 50 \\ & 2x_1 + 5x_2 \le 100 \\ & 2x_1 + 3x_2 \le 90 \\ & x_1 \ge 0, x_2 \ge 0 \end{aligned}$$ **(8)**

b) Solve the following problem by Revised simplex method.

$$\begin{aligned} Min \; Z &= 2x_1 + x_2 \\ S.t \quad & 3x_1 + x_2 \le 3 \\ & 4x_1 + 3x_2 \ge 6 \\ & x_1 + 2x_2 \le 3 \\ & x_1, x_2 \ge 0 \end{aligned}$$ **(8)**

(OR)

2. a) State and prove basic duality theorem. **(8)**

b) Consider the LPP :

$$\begin{aligned} Max \; Z &= -x_1 + 2x_2 - x_3 \\ S.t \quad & 3x_1 + x_2 - x_3 \le 10 \\ & -x_1 + 4x_2 + x_3 \ge 6 \\ & x_2 + x_3 \le 4 \\ & x_1, x_2, x_3 \ge 0 \end{aligned}$$

Determine the ranges for discrete change in the components b_2 and b_3 of the requirement vector so as to maintain the feasibility of the current optimum solution **(8)**

UNIT - III

3. a) Prove that in an assignment problem if we add (Or subtract) a constant to every element of a row (Or Column) of the cost matrix $[C_{ij}]$, then an assignment plan that minimizes the total cost for the new cost matrix also minimizes the total cost for the original cost matrix. **(8)**

b) A departmental head has four subordinates, and four tasks to be performed. The subordinates differ in efficiency and the task differ in their intrinsic difficulty this estimate, of the time each man would take to perform each task is given in the matrix below.

	Man			
Task	E	F	G	H
A	18	26	17	11
B	13	28	14	26
C	38	19	18	15
D	19	26	24	10

How should the tasks be allocated. One to a man, so as to minimize the total man hours. **(8)**

(OR)

3. Determine the optimum basic feasible solution to the following transportation problem :

		To			
		A	B	C	Available
From	I	50	30	220	1
	II	90	45	170	3
	III	250	200	50	4
Required		4	2	2	

(16)

UNIT - IV

4. a) Use Dischotomous search method to find the maximum of

$f(x) = x(5-x)$ in $[0,8]$, take $\delta = 0.001$ **(8)**

b) Solve the non linear programming problem :

Minimize $Z = 2x_1^2 - 24x_1 + 2x_2^2 - 8x_2 + 2x_3^2 - 12x_3 + 200$

Subject to constraints $x_1 + x_2 + x_3 = 11$, $x_1, x_2, x_3 \geq 0$ **(8)**

(OR)

4. Use the Kuhn-Tucker conditions to solve the following NLPP:

Minimize $Z = 2x_1 + 3x_2 - x_1^2 - 2x_2^2$

Subject to Constraints $x_1 + 3x_2 \leq 6$

$5x_1 + 2x_2 \leq 10$

$x_1, x_2 \geq 0$ **(16)**

UNIT - V

5. Use Dynamic programming to solve the following problem : **(16)**

Minimize $Z = y_1^2 + y_2^2 + y_3^2$ subject to

Constraints $y_1 + y_2 + y_3 \geq 15$ *and* $y_1, y_2, y_3 \geq 0$

(OR)

5. Use Dynamic Programming to solve the following LPP

$$\text{Maximize } Z = 3x_1 + 5x_2$$

$$\text{Subject to constraints } x_1 \leq 4$$

$$x_2 \leq 6$$

$$3x_1 + 2x_2 \leq 18$$

$$x_1, x_2 \geq 0$$

(16)

6E6061

Roll No. _____ [Total No. of Pages : 2

6E6061

B.Tech. VI Semester(Main) Examination, May-June 2015
Electronics Instrumentation and Control Engg.
6EI1A Process Control Systems

Time : 3 Hours **Maximum Marks : 80**
Min. Passing Marks : 24

Instructions to Candidates:

*Attempt any **five** questions, selecting one question from **each unit**. All questions carry **equal** marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.*

Unit - I

1. a) Explain the role of "functional identification" and " loop identification". **(8)**
   b) How is location of an instrument interpreted in R&I diagram. And what do the following term mean in P&I diagram- DDI, SSH, TE and KQI? **(8)**

OR

1. a) Give an example of self-regulating system in hydraulic system. **(8)**
   b) Derive the mathematical modelling of non interacting two-tank system with linear resistance element **(8)**

Unit - II

2. a) What are the areas in which mathematical modelling is used in process control. **(8)**
   b) Derive the derivation of liquid level control system with non linear resistance element. **(8)**

OR

2. Explain the concentration response of a stirred tank and also describe the temperature response of a stirred tank. And also derive the mathematical modelling. **(16)**

Unit - III

3. a) Compare P, PI and PD controllers in terms of their transient and steady state performance for IInd order system. **(8)**
   b) A PI controller is used to control the temperature in CSTR. The temperature in CSTR varies 20-220^{0}C. the control valve on steam inlet goes from fully open to fully closed state when the pressure signal varies from 15psi to 3psi. A temperature variation of + 10^{0}C around the set point of 120^{0}C changes the pressure signal of valve by 12psi up on error changes by +5^{0}C, the control value gat fully closed after. 1min. Calculate kp, PB, and ki. Assume that the valve was 50% open and the temperature was at set point at beginning. Assume air to close value. **(8)**

OR

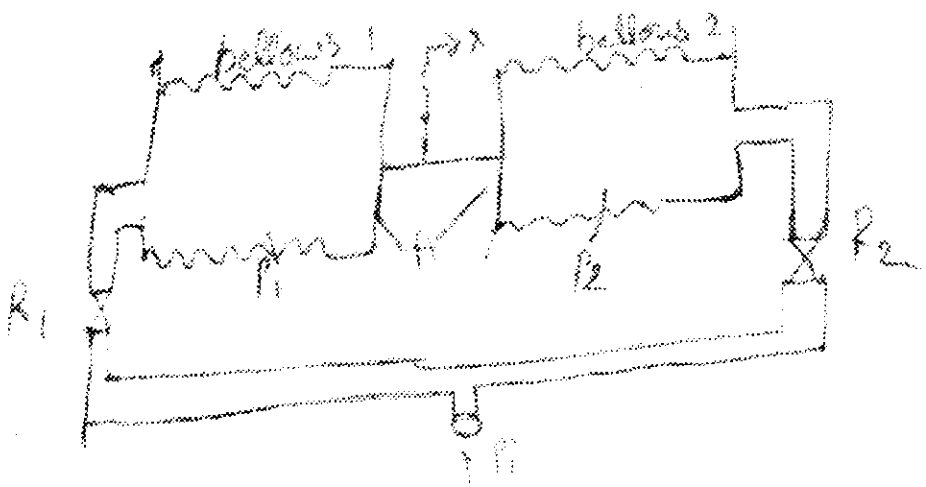
3. a) A controller outputs a 4-20mA signal to control motor speed from 140-600 r p m with linear dependence calculate
   i) the current corresponding to 310 r.p.m.
   ii) the value of current and also expressed as a percentage of control output **(8)**
   b) Explain the integral wind up and anti wind up for process control with suitable diagram. **(8)**

Unit - IV

4. a) Explain the performance criteria for process control application and tuning based on integral criteria **(8)**
   b) Explain the process reaction curve method with suitable diagram. **(8)**

OR

4. a) Draw the basic flapper nozzle system what is the need of fixed orifice in a flapper nozzle system. **(8)**
   b) Consider the pneumatic pressure system shown below where in the two bellows are assumed to be identical the output ends of the two bellows are connected by a link from which the mechanical (linear) movement X is picked up; x being proportional to the differential force of the bellows. The zero position of the output motion (x) corresponding to steady input pressure relate the changes in input pressure pi with the output motion (x) in the form of the transfer function X(s)/pi (s) stiffness of the two bellow is ks. What is x (steady state) for unit step change in input pressure.



Unit - V

5. a) Define distillation column also explain the operating principal for bottom composition with suitable diagram. **(10)**
   b) Explain multivariable process control with suitable diagram and model equations. **(6)**

OR

5. Write the short notes on
   a) Basic feature of composition control schemes. **(8)**
   b) Split range and selective control. **(8)**

6E 6062

Roll No. _____ [Total No. of Pages : 2

6E 6062

B.Tech. VI Semester (Main) Examination, May-June 2015

Electronics Instrumentation And Control Engg.

6EI2A Fibre Optics & Instrumentation

Time : 3 Hours **Maximum Marks : 80**

Min. Passing Marks : 24

Instructions to Candidates:

*Attempt any **five** questions, selecting **one question** from **each unit**. All questions carry **equal** marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.*

Unit - I

1. a) Write down the comparison of single mode & multimode and step index and graded index optical fibres **(4+4)**

   b) A glass clad fibre is made with core glass of refractive index 1.5 and the cladding is spread to give a fractional index difference of 0.0005. calculate **(4×2)**

   i) The cladding index
   ii) The critical internal reflection angle
   iii) The external critical acceptance angle
   iv) The numerical appesture

OR

1. a) What is dispersion? Explain different types of dispersion in optical fiber losses **(8)**

   b) What are the materials requirement for optical fibres? Discuss the different optical fibres on the basis of materials used **(8)**

Unit - II

2. a) What do you mean by population inversion? Explain direct bandgap and indirect bandgap materials use for optical source **(8)**

   b) Calculate internal quantum efficiency for LED whose radiative and non radiative life time are 2.5ms and 60 ms respectively **(8)**

OR

2. a) Explain the different types of structures use for LED as optical source. Also give their applications (6+2)

   b) Describe the working of laser and its characteristics use for optical fibre instrumentation (8)

Unit - III

3. a) Explain the following terms of photo diode

   i) Quantum efficiency

   ii) Responsivity (4+4)

   b) A 32x32 port multimode fibre star coupler has 1 mw of optical power launched into a single input port. The average measured optical power at each output port is 14 μw. Calculate the total loss incurred by the star coupler and the average insertion loss through the device (8)

OR

3. a) What is splicing? Explain the losses caused by longitudinal, lateral and angular displacement in splicing of fibre (8)

   b) Describe the different types of noises occured in optical detectors. (8)

Unit - IV

4. a) Explain the measurement technique for refractive index profile in optical fibre with neat diagram (8)

   b) Explain the principle and working of optical time domain refectonatory(OTDR) and its application (8)

OR

4. a) Write short note on holography use in optical fibre instrumentation and its characteristics (8)

   b) A trigonometrical measurement is performed in order to determine the numerical apperture of a step index fibre. The screen is positioned 10cm from the fibre end face. when illuminated from a wide angled visible source the measured output pattern size is 6.2cm. Calculate numerical aperture of fibre. (8)

Unit - V

5. a) Describe the wavelength devision multiplexing (WDM) and compare with DWDM for optical fibre (8)

   b) Write short note on optical sensors use in fibre optic. (8)

OR

5. a) List the different types of applications and its advantages for optical fiber (8)

   b) Explain different types of optical amplifiers use in fibre optic instrumentation (8)

6E 6063

Roll No. _____ [Total No. of Pages : 2

6E 6063

B.Tech. VI Semester (Main/Back) Examination, May -June 2015
Electronics Instrumentation and Control Engg.
6EI3A Industrial Measurements

Time : 3 Hours **Maximum Marks : 80**
Min. Passing Marks : 24

Instructions to Candidates:

*Attempt any **Five questions**, selecting **one question** from each unit. **All** questions carry **equal marks**. (Schematic diagrams must be shown wherever necessery. any data you feel missing suitably be assumed and stated clearly.) Units of quantities used/ calculated must be stated clearly.*

UNIT - I

1. a) Explain the different techniques used to eliminate the lead wire effect of RTD connection in a bridge circuit. **(8)**

b) What are the basic components of Magnetic tape recorders. Explain with neat sketches. **(8)**

(OR)

1. a) Explain the working principle and applications of X-Y type recorders **(8)**

b) The emitted radiant energy from a piece of metal is measured and the temperature is found to be 1130°C assuming a surface emissivity of 0.85. It was later found out that the true emissivity is 0.76. Calculate the error in temperature measurement. **(8)**

UNIT - II

2. a) An LVDT has the following data :

Input = 6.3V, Output = 5.2V, range = ± 0.5 inch.

Determine:

i) Calculate the output voltage Vs core position for a core movement going from +0.45 inch to -0.30 inch.

ii) The output voltage when the core is -0.25 inch from the centre. **(8)**

b) Explain the working and merits, demerits of piezo electric pressure transducers **(8)**

(OR)

2. a) Explain the construction and working of Thermal conductivity type pressure transducers. **(8)**

b) Discuss about the various calibration techniques of pressure gauge. **(8)**

UNIT - III

3. Explain the following with neat diagrams:

a) Electromagnetic flow meters **(8)**

b) Mass flow meters **(8)**

(OR)

3. Explain the following with neat diagrams.

a) Shunt flow meters **(8)**

b) Ultrasonic flow meters **(8)**

UNIT - IV

4. a) How will you measure the liquid level by differential pressure method. Explain with applications, merits and demerits. **(8)**

b) Explain the impulse wheel methods for density measurements. **(8)**

(OR)

4. Write short notes on the following :

a) Radioactive type liquid level measurement **(8)**

b) Ultrasonic densitometers **(8)**

UNIT - V

5. a) What are the different bonding techniques are used in strain Gauge. **(8)**

b) Derive the expression for gauge factor of strain gauge. **(8)**

(OR)

5. a) Explain the various adhesives and protective coatings are used in strain gauges. **(8)**

b) Discuss about the configurations and applications of Rosette gauges **(8)**

6E 6064

Roll No. _____ [Total No. of Pages : 2

6E 6064

B.Tech. VI Semester (Main/Back) Examination, May-June 2015
Electronic Instrumentation and Control Engg.
6EI4A Biomedical Instrumentation

Time : 3 Hours **Maximum Marks : 80**
Min. Passing Marks : 24

Instructions to Candidates:

*Attempt any **five** questions, selecting one question from **each unit**. All questions carry **equal** marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.*

Unit - I

1. State and explain the electrode theory along with different types of electrodes used for biomedical application **(16)**

OR

1. Explain the following human body subsystems along with their electrical and mechanical activities **(2x8=16)**
   i) Neural
   ii) Cardiovascular

Unit - II

2. a) Explain the measurement of cardiac output and heart sounds **(8)**
   b) Explain in detail the plethysmograph **(8)**

OR

2. Explain the following biopotentials:
   i) ENG
   ii) EMG
   iii) ERG
   iv) ECG **(4x4=16)**

Unit - III

3. a) Explain the process of measurement of 0_2 and Co_2 concentrations in blood **(8)**

   b) Explain the CAT and MRI in detail **(4x2=8)**

OR

3. a) What is the significance of pH value in blood? How it can be measured? **(8)**

   b) What are isotopes? Explain their medical use. **(8)**

Unit - IV

4. What is meant by biomedical telemetry? Explain the single and multi channel telemetry systems **(16)**

OR

4. Explain the following devices:

   i) Ventilators

   ii) Heart lung machine

   iii) Muscle stimulator

   iv) Defibrillators **(4x4=16)**

Unit - V

5. How the cardiac disorders can be measured? Draw the ECG pattern of atrial abnormalities and ventricular enlargement **(16)**

OR

5. What is data acquisition system? How, the data from remote can be recorded and managed **(16)**

6E6065

Roll No. _____ [Total No. of Pages : 2

6E 6065

B.Tech. VI Semester (Main&Back) Examination, May 2015

Applied Electronics & Instrumentation Engg.

6AI5,6BM5 And 6E15A Microcontroller & Embedded System

AI,BM,EI

Time : 3 Hours **Maximum Marks : 80**
Min. Passing Marks : 24

Instructions to Candidates:

*Attempt any **five** questions, selecting **one** question from **each unit**. All questions carry **equal** marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.*

Unit - I

1. a) What is the difference between microprocessor and microcontroller **(6)**
   b) Interface 8051 to external ROM and RAM and explain how 8051 access them **(10)**

OR

1. a) What is the difference between timer and counter operation of 8051?How to start/stop the timer/counter of 8051 when GATE control is not used **(10)**
   b) Explain the structure of TCON, TMOD and PCON registers **(6)**

Unit - II

2. a) Explain briefly the five addressing modes of 8051 with example for each **(8)**
   b) Write a subroutine which checks the content of 20H. If it is a positive number, the subroutine facts is two's complement and store it in same location and returns **(8)**

OR

2. a) What are the assembler directives? Explain any four of them **(3)**

b) If the XTAL frequency of 8051 is 8 MHz find the time taken to execute the following program

```
MOV R2 #04
MOV R1,#06
WAIT: DJNZ R2, WAIT
```

(3)

c) Write 8051 assembly language program which check whether the ten numbers stored from external RAM memory address, 2000H are odd/even .The program should store accordingly 00H/FFH from internal location 30H onwards

(10)

Unit - III

3. Write the notes on any two (16)
   a) Free running counter
   b) Multiple sources of interrupt
   c) Interrupt structure in 8051

Unit - IV

4. Interface ADC0808 to 8051 write assembly language program to convert the analog voltage connected to second channel. Display the digital value on LEDs connected to port-0 (16)

OR

4. Discuss about the interfacing of flash memory with 8051 microcontroller (16)

Unit - V

5. Explain in detail the various functional building block of embedded system. (16)

OR

5. Discuss the role of RTOS in interrupt handling and task scheduling (16)

6E 6066

Roll No. _____ [Total No. of Pages : 2

6E 6066

B.Tech. VI Semester (Main) Examination, May-June 2015
Electronic Instrumentation And Control Engg
6EI6.1A Control System Components

Time : 3 Hours **Maximum Marks : 80**
Min. Passing Marks : 24

Instructions to Candidates:

*Attempt any **five** questions, selecting one question from **each unit**. All questions carry **equal** marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.*

Unit - I

1. a) Explain construction working and application of toggle switch **(8)**
   b) Explain construction working selection criterion and application of reed relay **(8)**

OR

1. a) Explain comparison between relay and contactor **(8)**
   b) Explain selection criterion of relays as per specifications **(8)**

Unit - II

2. a) Explain advantage and limitations of pneumatic systems and also discuss main pneumatic components **(8)**
   b) What do you mean by hydraulic circuit and also explain,meter in hydraulic circuit **(8)**

OR

2. a) What do you mean by pneumatic circuit and also explain reciprocating pneumatic circuits **(8)**
   b) Explain pneumatic valves for direction control's flow control in pneumatic systems. **(8)**

Unit - III

3. a) Explain Torque-speed characteristics in DC motor **(8)**

   b) A 230V,10hp dc shunt motor delivers power to a load at 1200 r/min. The armature current drawn by the motor is 200A. The armature circuit resistance of the motor is 0.2Ω & the field resistance is 115Ω. If the rotational losses are 500w, what is the value for load torque **(8)**

OR

3. a) Explain commutation sequence of a single phase BLDC motor driver circuit **(8)**

   b) Explain DC motor control using pulse width modulation **(8)**

Unit - IV

4. a) Explain influence of rotor current on flux in induction motor **(6)**

   b) Explain block diagram of the vector control of AC inductor motors **(10)**

OR

4. a) Explain difference between induction motor and synchronous motor **(6)**

   b) Explain universal motors **(10)**

Unit - V

5. a) Explain stepper motor switching sequence **(8)**

   b) What do you mean by relay logic and also explain ladder diagram with example **(8)**

OR

5. a) Explain variable reluctance stepper motor **(8)**

   b) How to relay logic diagram convert into PLC ladder logic with example **(8)**

6E3041

Roll No. _____ [Total No. of Pages : 2]

6E3041

B.Tech. VI Semester(Main/Back) Examination, May-2015
Applied Elect. Instrumentation Engg.
6AI1 Process Control Systems
(Common for AI, EI)

Time : 3 Hours **Maximum Marks : 80**
Min. Passing Marks : 24

Instructions to Candidates:

*Attempt any **five** questions, selecting one question from **each unit**. All questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/calculated must be stated clearly.

Unit - I

1. Why is the linearization process of liquid level system used? Explain it in detail with the necessary mathematical expressions. A tank has an area of 2.5 ft^2, a normal depth of 6ft, and a normal discharge rate of 25ft^3/hr. How does the depth change with time if the flow to the tank is suddenly increased to 30ft^3/hr.? Explain the answer by evaluating exact and linearized solution? **(16)**

OR

1. Explain the force balance equation of manometer and evaluate the time response of manometer when it is subjected to the $3\,\mu(t)$ input for the case of
   i) when $\zeta < 1$
   ii) when $\zeta = 1$
   iii) when $\zeta > 1$ & when
   iv) $\zeta = 0$ where $\mu(t)$ is the unit step input signal. **(16)**

Unit - II

2. The major elements of a process control system are given below. Time and constants are in minutes. Calculate the transient response for a step change in load if the controller gain is half the maximum value

Value : $G_v = \frac{4}{0.1s+1}$

Process : $G_P = \frac{1.5}{(2s+1)(10s+1)}$

Transfer function for load changes: $G_L = \frac{3}{10s+1}$

Controller $G_C = Ke$ **(16)**

OR

2. Compare the step response of a true time delay with that of the pade approximant given below;

$$e^{-LS} = 1 - LS + \frac{(LS)^2}{2!} - \frac{(LS)^3}{3!} + \ldots\ldots$$ **(16)**

Unit - III

3. Explain the "process lag" in flow control system and derive its expression. Discuss the various measurement Lags in the flow control system. **(16)**

OR

3. Explain all control schemes for heat exchanger with neat diagrams **(16)**

Unit - IV

4. Explain the followings with neat diagrams

a) Material balance control schemes

b) Internal reflux control scheme **(16)**

OR

4. Explain the following lags arised in the distillation column

a) Lags in liquid flow

b) Lags in vapour flow

c) Concentration Lag **(16)**

Unit - V

5. Explain the "Optimum settings from the plant response using any two method **(16)**

OR

5. Explain the followings

a) Cascade control system with examples

b) Process with inverse response **(16)**

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6E3042

Roll No. _____ [Total No. of Pages : 2

6E 3042

B.Tech. VI Semester(Back) Examination, May-June 2015
Electronics Instrumentation & Control Engineering
6EI6.1 Computer Architecture

Time : 3 Hours **Maximum Marks : 80**
Min. Passing Marks : 24

Instructions to Candidates:

*Attempt any **five** questions, selecting one question from **each unit**. All questions carry **equal** marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.*

Unit - I

1. a) Explain the 4-bit address substractor with diagram? **(8)**
   b) Explain the following
      i) Three state buffer
      ii) Selective set
      iii) Selective-complement
      iv) Selective-clear **(8)**

OR

1. a) Design a bit combinational circuit decremental using four full-adder circuits **(8)**
   b) Design a bus system for four registers? **(8)**

Unit - II

2. a) Convert the following numerical arithmetic expression into reverse polish notation and show the stack operation for evaluating the numerical result: 10*(2+4)+8 **(8)**
   b) Explain the different instruction format? **(8)**

OR

2. a) What are the basic difference between a branch instruction, a call subroutine instruction and program interrupt **(8)**

b) What is pipelining? Explain the instruction pipeline and also calculate the speed-up ? **(8)**

Unit - III

3. a) Explain the booth multiplication steps for (-9)x(-13) and also show the flow chart? **(8)**

b) Explain the floating-point and fixed-point arithmetic operation with example **(8)**

OR

3. a) Design an array multiplier that multiplier two 4-bit numbers. Use AND gates and binary address? **(8)**

b) Explain the addition and substraction with signed -2's complement data data with example? **(8)**

Unit - IV

4. a) Write a short note on address sequencing ? **(8)**

b) Define micro instruction. What are the general attributes of horizontal and vertical micro instructions ? **(8)**

OR

4. a) Explain the difference between hard wired control and microprogrammed control **(8)**

b) Define the following

i) Micro operations

ii) Micro instruction

iii) Micro program

iv) Micro code **(2+2+2+2)**

Unit - V

5. a) How many 128×8 RAM chips are needed to provide a memory capacity of 2048 bytes?

b) Explain cache memory in briefs **(8+8)**

OR

5. Define the following

a) Strobe based and handshake based communication

b) DMA based data transfer **(8+8)**

6E3043

Roll No. _____ [Total No. of Pages : 2

6E 3043

B.Tech. VI Semester(Back) Examination, May - 2015

Electronic Inst. Control Engg.

6EI2 Analytical & Environmental Instrumentation

Time : 3 Hours **Maximum Marks : 80**

Min. Passing Marks : 24

Instructions to Candidates:

*Attempt any **five** questions, selecting one question from **each unit**. All questions carry **equal** marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.*

Unit - I

1. a) Explain the construction & working of X-ray spectroscopy **(8)**
   b) Discuss about the applications advantages & disadvantages of photo acoustic spectroscopy **(8)**

OR

1. a) How will you analysis with the help of mass spectrometers. Explain in brief **(8)**
   b) Explain the construction, working of atomic absorption spectroscopy with neat sketch **(8)**

Unit - II

2. a) Explain the construction & working of ultraviolet absorption analyzers. **(8)**
   b) Discuss about the basic components of chemiluminescence analyzers. **(8)**

OR

2. a) Discuss about the importance of oxygen analyzers in process industry. Explain its working in brief **(8)**
   b) Explain the construction & working of thermal conductivity analyzers **(8)**

Unit - III

3. a) What are the different types of liquid chromatography? Explain any one with suitable examples **(8)**
   b) Explain with neat sketch flame ionization detection systems **(8)**

OR

3. a) Discuss about the basic parts of gas chromatography **(8)**

   b) Explain electron capture detector in detail **(8)**

Unit - IV

4. a) How will you measure & control the carbon-mono-oxide using the air pollution monitoring & controlling instruments **(8)**

   b) Discuss about the nitrogen oxide & sulpher dioxide monitoring instruments **(8)**

OR

4. a) Explain the construction & working of smoke monitoring systems **(8)**

   b) Explain visible emission monitoring system **(8)**

Unit - V

5. a) Explain ammonia & silica analyzers. **(8)**

   b) Explain PH meter **(8)**

OR

5. Write short notes on the following

   a) Conductivity meters

   b) Dissolved oxygen analyzers. **(16)**
