930

6E6051

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

6E6051

B.Tech. VI Semester (Main/Back) Examination, April/May - 2017

Electronics & Communication Engg.

6EC1A Microwave Engg. - II

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

Min. Passing Marks : 26

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 suitable be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.*

Unit - I

1. a) Discuss the Lumped Element for MICs and MMICs with proper diagram. **(8)**

   b) Discuss Impedance matching with Lumped (L-Networks) elements. **(8)**

OR

1. a) Discuss single stub tuning in microstrip circuit using shunt stub. **(8)**

   b) Discuss single section quarter wave transformer. **(8)**

Unit - II

2. a) Explain the following Detector Diodes with neat and clean diagram. **(8)**

      i) Silicon Crystal Diode.

      ii) Schottky Diode.

   b) Explain the equivalent circuit and characteristic of PIN Diode. **(8)**

OR

2. a) Explain the Gunn Effect in Gunn Diode also explain two valley model in Gunn diode with diagram. **(8)**

   b) Explain IMPATT Diode with its characteristics, negative Resistance, output power and efficiency. **(8)**

Unit - III

3. a) Explain the principle of operation of n-channel JFET with neat and clean diagram. **(8)**

b) A si n-p-n bipolar transistor has the following Parameters. **(8)**

Collector current Ic = 6mA

Common emitter current gain factor $h_{FE} = 120$

Operational temperature T = 300°K

Cross-sectional Area $W_D = 10^{-8}$ cm^2.

Then compute :

i) a mutual conductance gm.

ii) The input conductance g_b and resistance R_i.

iii) The electron diffusion coefficient D_n.

iv) The Diffusion capacitance C_{be}.

OR

3. a) Explain the Basic structure and principle of operation of MESFET. **(8)**

b) Explain the single stage FET Amplifier in detail. **(8)**

Unit - IV

4. a) Explain the bunching process. Derive the expression for the induced current in the catcher cavity for two cavity klystron. **(8)**

b) Describe the construction of Reflex klystron and explain how its is work as an oscillator? **(8)**

OR

4. a) Explain Mechanism of oscillations of Magnetrons oscillator? Also explain voltage tunable magnetron. **(8)**

b) A Frequency agile coaxial Magnetron has the following operation parameters. **(8)**

Pulse duration $\tau = 0.25, 0.50, 1.0$ μsec.

Duty cycle Dc = 0.001

Pulse on target N = 16 per scan.

Compute the following

i) Agile excursion

ii) Pulse to pulse frequency separation.

iii) Signal frequency.

iv) Time for N pulses.

v) Agile Rate.

Unit - V

5. a) Describe the mechanism of velocity modulation in a two cavity Klystron and hence obtain an expression for the bunched beam current. Also find out condition for maximum power output. **(8)**

b) A two cavity klystron amplifier has the following **(8)**

Parameter, $V_0 = 1000V.$

$R_0 = 40k\Omega$

$I_0 = 25mA$

$f = 3$ GHz,

Gap spacing in both cavity d = 1 mm. Spacing between the two cavity L=4cm Effective shunt Impedance Excluding beam loading R&h = 30kΩ determine.

i) Input gap voltage to give max. voltage V_2.

ii) Voltage gain, neglecting the beam loading in output cavity.

iii) Efficiency of Amplifier.

iv) Beam loading conductance and Show that neglecting it was justified in the proceeding calculation.

OR

5. a) Explain the wave modes of helix type travelling wave tube and show that output Power gain of TWT is AP = –9.54 + 47.3 μc dB. **(8)**

b) Explain with a neat diagram how TWT is used as microwave amplifier. **(8)**

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233

6E6052

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

6E6052

B.Tech. VI Semester (Main/Back) Examination, April/May - 2017

Electronics & Communication Engg.

6EC2A Microprocessors

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

Min. Passing Marks : 26

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 suitable be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.*

Unit - I

1. Draw and explain the block diagram as well as pin diagram of 8085 microprocessor. **(16)**

OR

1. State and explain the various types of addressing modes available in 8085. **(16)**

Unit - II

2. State and explain the conditional call and return instructions of 8085 along with suitable examples. **(16)**

OR

2. State the various data transfer instructions of 8085. Explain them with suitable examples. **(16)**

Unit - III

3. Explain the arithmetic operations related to memory counter and time delays. **(16)**

OR

3. Explain the 16 bit data operations and arithmetic instructions. **(16)**

Unit - IV

4. What are vector interrupts? State and explain them. **(16)**

OR

4. State an explain the interrupts for serial I/O and data communication. **(16)**

Unit - V

5. Explain the programmable peripheral devices, along with the pin and block diagram of 8255 PPI. **(16)**

OR

5. Write short notes on : **(8 × 2 = 16)**

   i) DMA controller.

   ii) Interval timer.

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235

6E6053

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

6E6053

B.Tech. VI Semester (Main & Back) Examination, April/May - 2017
Applied Electronics & Instrumentation Engg.
6AI3 Industrial Electronics
Common EC & AI

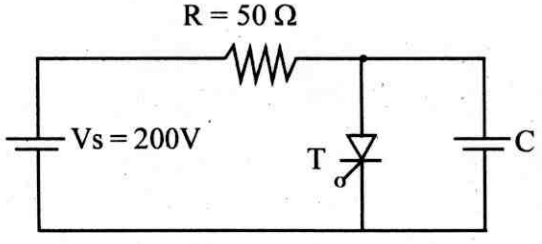
Time : 3 Hours **Maximum Marks : 80**
Min. Passing Marks : 26

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 suitable be assumed and stated clearly). Units of quantities used/calculated must be stated clearly.*

Unit-I

1. a) In the circuit shown in figure SCR is forced commutated by circuitry. Compute the minimum value of 'c' so that SCR does not get turned on due to re-applied dv/dt. The SCR has minimum charging Current of 5mA to turn it on and its junction capacitance is 25 pf. **(8)**



b) Define latching and holding currents as applicable to an SCR. Show these currents on its static I-V characteristics. What are the necessary conditions for turning - on of an SCR? **(8)**

OR

1. a) Describe the switching characteristics of an IGBT. How does latch up occur in an IGBT? **(8)**

b) Discuss why PMOSFET has no reverse blocking voltage where as in an IGBT. **(4)**

c) An SCR has half cycle surge current rating of 3000A for 50Hz supply. Calculate its one cycle surge rating and I^2t rating. **(4)**

Unit-II

2. a) A 3 phase bridge rectifier, using diodes delivers power to a load of R =10 Ω at a dc voltage of 400V. Determine the ratings of the diodes and of the three phase delta star transformer. **(10)**

   b) Describe the evaluation of three phase six pulse diode rectifier from 3 phase 3 pulse diode rectifier with appropriate circuits. **(6)**

OR

2. a) Describe a single phase current source inverter with L load. Write appropriate expression governing its performance and prove there from that total circuit turn-off time for this inverter is given by $t_o = \left(1+\frac{\pi}{2}\right)\sqrt{LC}$. **(12)**

   b) Compare the voltage and current source inverters. **(4)**

Unit-III

3. a) Describe flyback SMPS with relevant circuits and waveforms. Derive the various expressions for voltage and current involved. **(12)**

   b) Briefly explain the principle of uninterrupted power supply. **(4)**

OR

3. a) A step down/up chopper has input dc voltage of 660V. If the conduction time of thyristor is 120 μ sec. Compute the pulse width of load voltage. In case pulse width is increased three times its previous value, for constant frequency operation, calculate the new value of average output voltage. **(8)**

   b) Draw the circuit diagrams and relevant waveforms for A,B,C,D,E choppers. **(8)**

Unit-IV

4. a) The speed of a separately exited dc motor is controlled by a 3-ϕ semiconverters, 415V, 50Hz supply. The motor constants are L = 10 mH, resistance 0.9Ω, armature constant 1.5 rad/s (Nm/A). Calculate the speed of this motor at a torque of 50Nm, when the converter is fired at 45^0. **(8)**

   b) Describe how the speed of a separately excited dc motor is controlled through the use of two three phase full converter. **(8)**

OR

4. a) Describe how the speed of dc series motor can be controlled by means of a dc chopper. **(8)**

b) Describe the use of 3-ϕ semiconverter for a speed control of dc series motor. **(8)**

Unit-V

5. Write the short note on any three : **(6+5+5 = 16)**

i) Dielectric heating

ii) Expression for induction heating losser

iii) Variable reluctance stepper motors

iv) Hybrid stepper motors

v) Factors affecting induction heating and applications

238

6E6054

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

6E6054

B.Tech. VI Semester (Main & Back) Examination, April/May-2017
Electronics & Communication Engg.
6EC4A Digital Communication

Time : 3 Hours **Maximum Marks : 80**
Min. Passing Marks : 26

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 suitable be assumed and stated clearly). Units of quantities used/calculated must be stated clearly.*

Unit-I

1. a) Explain the technique which is required to convert the analog signal to digital signal with proper block diagram. **(8)**

   b) In a single integration Delta Modulation system, the voice signal is sampled at rate of 64 KHz. The maximum signal amplitude $A_{max} = 1$.

   i) Determine the minimum value of the step size σ to avoid slope overload.

   ii) Determine the granular noise power N_o if the voice signal bandwidth is 3.5 KHz.

   iii) Assuming that the voice signal is sinusoidal, determine S_o and SNR.

   iv) Assuming that the voice signal amplitude is uniformly distributed in the range (–1, 1), determine S_o and the SNR.

   (2×4)

OR

1. a) What is meant by slope overload distortion and granular noise in Delta modulation system? How it can be avoided? **(4+4)**

   b) Write short note on T1 carrier system. **(8)**

Unit-II

2. a) Consider the binary sequence 0100101, draw the waveforms for the following formats. **(2×4)**

   i) Bipolar RZ

   ii) Unipolar NRZ

   iii) AMI RZ

   iv) Manchester

   b) A binary PCM wave is to be transmitted over a low pass channel with an absolute maximum bandwidth of 75 KHz. The bit duration is 10 micro seconds. Find a raised cosine spectrum that satisfies these requirements. **(8)**

OR

2. a) Derive the Nyquist's criterion for distortion less base band binary transmission in the absence of noise. **(8)**

   b) Describe the detection process of matched filter and its applications with suitable diagram. **(8)**

Unit-III

3. a) Explain and compare the BPSK and QPSK modulation techniques w.r.t. bandwidth requirement, probability of error and data rate and their advantages and disadvantages also. **(4+4)**

   b) Explain the selection criteria for digital modulation techniques and applications for different modulation techniques. **(8)**

OR

3. a) Draw the signal space diagram for coherent binary PSK system. Derive the average probability of symbol error for coherent BPSK. **(4+4)**

   b) What do you mean by union bound approximation? Explain with suitable diagram and justification. **(4+4)**

Unit-IV

4. a) For a continuous random variable x constrained to a peak magnitude M ($-M < x < M$). Show that the entropy is maximize when x is uniformly distributed in the range of (–M, M) and has zero probability density outside the range. Show that the maximum entropy is given by "log 2M". **(8)**

   b) State and explain the Shannon's channel capacity theorem and its bound. **(6+2)**

OR

4. a) A television picture is composed of approximately 3,00,000 basic pixels. Each of theses elements can assume 10 distinguishable brightness levels with equal probability. Find the information content of a television picture frame. **(8)**

b) For a noiseless channel, prove that H(X/Y) = 0. **(8)**

Unit-V

5. a) A source emits six messages with probabilities 1/2, 1/4, 1/8, 1/16, 1/32, 1/32 respectively find the entropy of the source. Obtain the compact binary code and find the average length of the code word. Determine the redundancy and efficiency of the code. **(4+4)**

b) Describe performance comparison of coded and uncoded system. **(4+4)**

OR

5. a) A DMS has an alphabet of eight letters x_i, i = 1, 2, 3...8 with probabilities 0.25, 0.20, 0.15, 0.12, 0.10, 0.08, 0.05 and 0.05.

i) Use the Huffman encoding procedure to determine a binary code for the source output.

ii) Determine the average number $\overline{R}$ of binary digits per source letter.

iii) Determine the entropy of the source and compare it with $\overline{R}$.

(4+2+2)

b) For (7,4) cyclic code and $G(x) = 1+X^2 + X^3$ Determine : **(4+4)**

i) Let data word 1010 find corresponding code word.

ii) Code word is 100101-find data word.

241

6E6055

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

6E6055

B.Tech. VI Semester (Main/Back) Examination, April/May - 2017

Electronics & Communication Engg.

6EC5A Control Systems

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

Min. Passing Marks : 26

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 suitable be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.*

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. Semilogarithmic paper

Unit - I

1. a) Explain following terminologies in relation to control system :- **(4×2)**

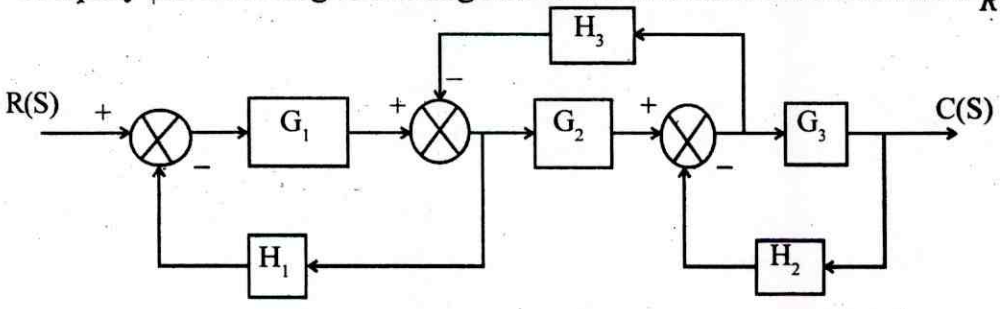
i) Open - loop control system

ii) Controller

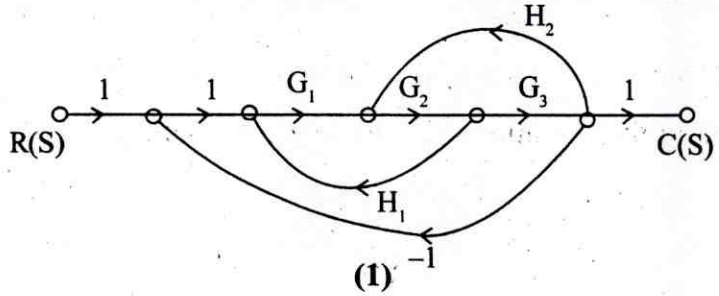
iii) Feedback control system

iv) Disturbance

b) Simplify the following block diagram to calculate the transfer function $\frac{C(s)}{R(s)}$. **(4)**



c) Calculate the transfer function of the following SFG using Mason's formula. **(4)**



OR

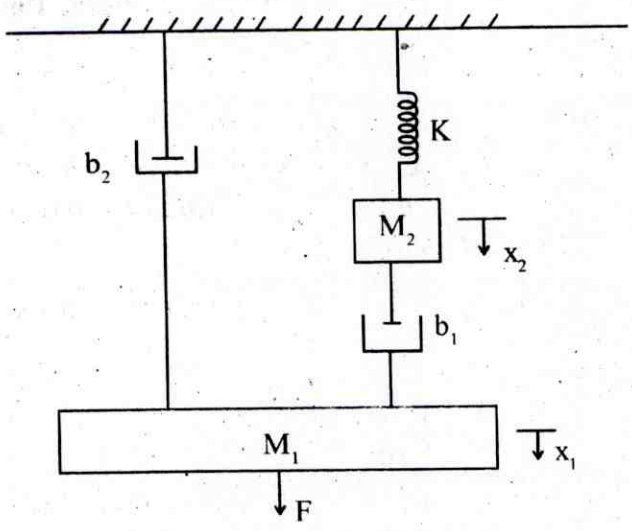
1. a) Define the following in relation to control system : **(4×2)**

   i) Servomechanism iii) Regulatory systems

   ii) Electromechanical systems iv) Transfer function.

   b) Draw the electrical analog of the following mechanical system using. **(2×4)**

   i) Force-voltage Analogy ii) Force-current Analogy



Unit - II

2. a) Derive the response of a second order Underdamped system given by

$$\frac{C(S)}{R(S)} = \frac{W_n^2}{s^2 + 2\xi W_n s + W_n^2}$$; for unit step input. **(10)**

   b) Briefly explain the concept of stable, unstable and marginally stable system. **(6)**

OR

2. a) Define peak time, settling time and maximum overshoot and also calculate them for a unity feedback system whose forward transfer function is given by

$$G(s) = \frac{25}{s(s+6)}.$$ **(1.5×6)**

   b) Consider a sixth order system with the characteristics equation given by : **(7)**

   $S^6 + 2S^5 + 8S^4 + 12S^3 + 20S^2 + 16S + 16 = 0.$

   Comment on the Location of roots of this system.

Unit - III

3. Sketch the root Locus plot of the transfer function given by $G(s)H(s) = \frac{K(s+1)}{s(s-3)}$. Showing all the salient points and also explain all the rules associated. **(16)**

OR

3. Explain following terms in relation to control system. **(4×4)**
   i) Polar plot
   ii) Mapping
   iii) Nyquist stability Criteria
   iv) Effect of adding pole & zero on Root locus.

Unit - IV

4. Construct the Bode plot for the given open loop transfer function with unity feedback

$$G(s) = \frac{1}{s(1+0.2s)(1+0.02s)}.$$ **(16)**

OR

4. a) Define the following terms with respect to frequency response analysis: **(3×2)**
   i) Gain Margin
   ii) Phase Margin
   iii) Nicholas Chart
   b) Derive any two frequency domain specifications. **(5×2)**

Unit - V

5. a) Determine the transfer function of the system whose state model is given by **(8)**

$$\begin{bmatrix} \dot{x}_1 \\ \dot{x}_2 \end{bmatrix} = \begin{bmatrix} 0 & 1 \\ -6 & -5 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \end{bmatrix} + \begin{bmatrix} 0 \\ 1 \end{bmatrix} u$$

$$y = \begin{bmatrix} 1 & 1 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \end{bmatrix}$$

   b) Convert $\frac{8}{(s+1)(s+2)}$ into state model. **(8)**

OR

5. Write short note on : **(4 × 4)**
   a) Compensator
   b) Controllability
   c) State Model
   d) Canonical Representation.

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2 4 4

6E3093

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

6E3093

B.Tech. VI Semester (Back) Examination, April/May - 2017
Electronics & Communication Engg.
6EC6.3 Elective Optimization Techniques

Time : 3 Hours **Maximum Marks : 80**
Min. Passing Marks : 26

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 suitable be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.*

Unit - I

1. a) Write the Mathematical statement of an optimization problem and discuss the classification of optimization problem. **(8)**

   b) Old hens can be bought at Rs 2.00 and young ones at Rs. 5.00 each. An old hen lays 3 eggs, a young one 5 eggs a week. Each egg is sold for 30P. If the expenses incurred on their feeding be Rs. 1.00 per hen per week, find how many hen of each kind a person having Rs. 80 for investment can purchase to earn maximum profit. If he has accomodation only 20 hens in his house. Formulate the mathematical model. **(8)**

OR

2. a) What is optimization technique? Write the engineering application of optimization. **(8)**

   b) A firm produce headache pills A and B, pills of A contains 2 grains of asprin, 5 grains of bicarbonate and 1 grains of codeine which that of B contain 1 grain of aspirn, 8 grain of bicarbonate and 3 grains of codeine. It has been found by user that for immediate recover, One must take medicines giving them 12 grains of asprin, 74 grains of bicarbonate and 26 grains of codeine. Formulate the mathematical problem & find the minimum number of pills for each type a patient should take to have immediate relief. **(8)**

Unit - II

3. a) Solve the following linear programming problem : **(8)**

Minimum $Z = -x_1 - x_2$

S.t $x_1 + 2x_3 \leq 3$

$x_1 + x_2 \leq 2$

$3x_1 + 2x_2 \leq 6$

and $x_1 \geq 0\ x_2 \geq 0$

b) Solve the following L.P. problem by II-Phase method **(8)**

Minimize $Z = 2x_1 + 9x_2 + x_3$

S.t $x_1 + 4x_2 + 2x_3 \geq 5$

$3x_1 + x_2 + 2x_3 \geq 4$

and $x_1, x_2, x_3 \geq 0$

OR

4. a) Write the dual of the following problem and solve. **(8)**

Min $Z_p = 2x_1 + 3y + 5z$

S.t $x_1 + 3y \geq 5$

$2x_1 + y + z \geq 7$

and $x, y, z \geq 0$

b) Solve the following L.P. problem by Revised Simplex method. **(8)**

Max $Z = 6x_1 - 2x_2 + 3x_3$

S.t $2x_1 - x_2 + 2x_3 \geq 2$

$x_1 + 4x_3 \leq 4$

and $x_1, x_2, x_3 \geq 0$

Unit - III

5. a) Solve the following transpotation problem & Find optimal solution. **(8)**

	D_1	D_2	D_3	Supply
O_1	7	3	4	2
O_2	2	1	3	3
O_3	3	4	6	5
Demand	4	1	5	

b) A company has four machines, on which to do three jobs, each job can be assigned to one and only one machine, the cost of each job on each machine is given in the following table. **(8)**

Job	W	X	Y	Z
A	18	24	28	32
B	8	13	17	19
C	10	15	19	22

OR

6. a) Solve the minimum Assignment problem & find optimal solution. **(8)**

	I	II	III	IV	V	VI
A	9	22	58	11	19	27
B	43	78	72	50	63	48
C	41	28	91	37	45	33
D	74	42	27	49	39	32
E	36	11	57	22	25	18
F	3	56	53	31	17	28

b) Solve the following Transportation problem for minimum cost **(8)**

From / To	A	B	C	D	Demand
1	7	4	3	4	15
2	3	2	7	5	25
3	4	4	3	7	20
4	9	7	5	3	40
Supply	12	8	35	25	

Unit - IV

7. a) Use univariate method to minimize **(8)**

Mini $f(x_1\ x_2) = 2x_1^2 + 2x_1x_2 + x_2^2 + x_1 - x_2$ starting from $x_0 = (0,0)$

b) Minimize $f(x) = 3x_1^2 - 2x_1x_2 + x_2^2 - 4x_1 - 3x_2$ by Hooke and Jeeves method taking the constant steps length $(\Delta x_1, \Delta x_2) = (1,1)$ and starting from $X_0 = (0, 0)$. **(8)**

OR

8. a) Minimize $f(x) = x_1^2 + 2x_2^2$ **(8)**

Subject to $2x_1 + 5x_2 - 10 \leq 0$

Using Exterior panelty method and find solution for $r = 1$, 10 and $r = \infty$. Out side the feasible solution.

b) Minimize $f(x) = 4x_1^2 + 3x_2^2 - 5x_1 x_2 - 8x_1$ starting from (0, 0) using powell's method. **(8)**

Unit - V

9. a) Solve the following L.P. problem by Dynamic programming **(8)**

Maximize Z = $25x_1 + 40x_2$

s.t $0 \leq x_1 \leq 120$

$0 \leq x_2 \leq 90$

$5x_1 + 6x_2 \leq 900$

$x_1 + 2x_2 \leq 240$

b) Solve the following problem using dynamic programming **(8)**

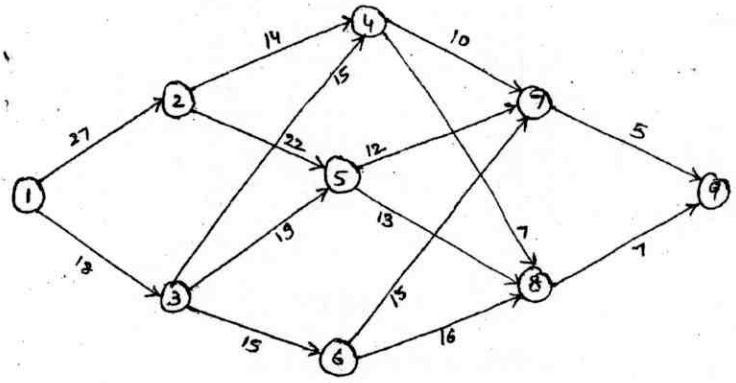
Max Z = $y_1^3 + y_2^3 + y_3^3$

s.t $y_1 y_2 y_3 \leq 5$

$y_i > 0$ are integral

OR

10. a) Find the minimum path for the following travelling salesman problem. **(8)**



b) Use dynamic programming to solve **(8)**

Min Z = $p_1 \log p_1 + p_2 \log p_2 + p_3 \log p_3$

S.t. $p_1 + p_2 + p_3 = 1$

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2468

6E6058

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

6E6058

B.Tech. VI Semester (Main/Back) Examination, April/May - 2017

Electronics & Communication Engg.

6EC6.3A OPtical Fiber Communcation

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

Min. Passing Marks : 26

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 suitable by assumed and stated clearly). Units of quantities used/calculated must be stated clearly.*

Unit - I

1. a) What is dispersion? Explain dispersion shifted & dispersion flattened optical fiber cables? **(8)**

   b) Discuss Absorption Losses in optical fiber, comparing and contrasting the intrinsic & extrinsic Absorption mechanisms. **(4)**

   c) A 15 km optical fiber Link uses fiber with a loss of 1.5 dB/km. The fiber is jointed every kilometer with connectors, which give an attenuation of 0.8 dB each. Determine the minimum mean optical power, that must be Launched into the fiber in order to maintain a mean power Level of 0.3μw at the detector. **(4)**

OR

1. a) Define the Relative Refractive Index difference for an optical fiber & show how it may be related to the Numerical Aperture? **(8)**

   b) Explain the fabrication of optical fiber by vapour phase method. **(8)**

Unit - II

2. a) Describe the following characteristics of LASER **(8)**

      i) Threshold current temperature dependence.

      ii) Reliability

      iii) Noise

      iv) Frequency chirp

   b) Describe the optical characteristics of LED with neat sketch? **(8)**

OR

2. a) Write short notes on Q-switching? **(8)**

   b) A Laser Contains a crystal Length 4cm with a Refractive Index of 1.78. The peak emission wavelength from the device is 0.55 μm. Determine the number of longitudinal modes & their frequency separation? **(8)**

Unit - III

3. a) Explain the structure features & working principle of PIN photodiode. What is the functional significance of intrinsic Layer inserted in between the P&N Layer? **(4+4=8)**

   b) What is difference between connector and splices? Explain different types of splices with neat diagram? **(8)**

OR

3. a) Explain the structure & the working of APD with the help of suitable diagram. Write advantages & disadvantages of APD over PIN diode? **(8)**

   b) Ga As has a band gap energy of 1.43 eV at a 300k. Determine the wavelength above which an intrinsic photo detector fabricated from this material will cease to operate. **(8)**

Unit - IV

4. a) Explain Laser based system for measurement of distance with neat diagram. **(8)**

   b) Write a short notes on Holography? **(8)**

OR

4. a) What is the working principle of OTDR? Explain the process of fault location Identification through OTDR infield? **(8)**

   b) Explain the time domain technique for measurement of dispersion with neat diagram? **(8)**

Unit - V

5. a) Write down the applications of optical fiber instrumentation in daily life? Also gives its advantages & draw backs with clarifications? **(8)**

   b) Explain WDM & DWDM in optical fiber. **(8)**

OR

5. a) What is the need of optical Amplifier? Explain Fiber Raman Amplifier (FRA) with neat diagram? **(8)**

   b) Write a short note on Active and Passive components used in optical fiber system? **(8)**

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250

6E3086

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

6E3086

B.Tech. VI Semester (Back) Examination, April/May -2017
Electronics & Communication Engg.
6EC2(O) Micro Processor And Micro Controller
EX, EC

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

Min. Passing Marks : 26

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 suitable be assumed and stated clearly). Units of quantities used/calculated must be stated clearly.*

Unit-I

1. a) Explain in detail the functioning of databus, address bus and control bus. **(8)**

b) Explain briefly the concept of 'bus' in microprocessor. Why multiplexing is done in 'bus'? **(8)**

OR

1. a) Define tri-state logic and explain the function of the following devices : **(4 × 2 = 8)**

i) Buffer

ii) Decoder

iii) Latches

iv) Encoder

b) Is it possible that an output and input port have the same 8-bit address? If yes how does the 8085 MPU differentiate between the ports? If No, why? **(8)**

Unit-II

2. a) Discuss the function of the following signals of 8085, INTR, $\overline{INTA}$ HOLD, HLDA and READY. **(8)**

b) Explain the internal Architecture of 8085 with the help of block diagram. **(8)**

OR

2. a) Explain the contents of accumulator to run SIM instruction. **(8)**

b) Discuss RISC and CISC architecture. **(8)**

Unit-III

3. a) Draw and explain the timing diagram of opcode fetch operation and Memory read operation. **(8)**

b) What do you mean by Instruction set? Explain : **(8)**

i) Flag

ii) Machine cycle

iii) T-states

iv) Addressing mode

OR

3. a) What do you mean by programming and debugging? **(8)**

b) Explain the formats of 8 bit and 16 bit instruction. **(8)**

Unit-IV

4. Draw the interfacing diagram of 8257 DMA-controller with 8085 microprocessor and explain its operation. **(16)**

OR

4. a) What are the different operating modes of 8255? **(8)**

b) What are I/O ports? What are programmable and non-programmable ports? **(8)**

Unit-V

5. Explain arithmetic instructions of 8051. Write an ALP in 8051 to add the contents of 9000 and 9001 address and store the result at address 9002. **(16)**

OR

5. a) Explain with example of various addressing mode of 8051. **(8)**

b) Write short note on : **(8)**

i) Timer & interrupts

ii) Special function registers

6E3085

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

6E3085

B.Tech. VI Semester (Back) Examination, April/May - 2017
Electronics & Communication Engg.
6EC1(O) Microwave Engg. - II

Time : 3 Hours **Maximum Marks : 80**
Min. Passing Marks : 26

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) Why ordinary diodes and transistors are useful in microwave detection and microwave applications? **(4)**

b) How will you detect microwave signals? Explain different methods used for power measurement of low power (< 1 mw), and high power (> 10 mw). **(8)**

c) The double minimum method is used to determine the VSWR and found separation between two adjacent null is 4cm. If twice minimum power points are at 2.5mm, determine the VSWR. **(4)**

(OR)

1. a) Explain the methods of impedance measurement with suitable diagrams. **(10)**

b) An unknown load terminates a 50Ω microwave line. The VSWR measured is 2.4 and the first minima is located at a distance 0.313λ from the load. Find the unknown load and reflection coefficient. **(6)**

Unit-II

2. a) A lossless dielectric filled parallel stripline has characteristic impedance of 50Ω and d = 3.0mm ($\varepsilon_0 = 8.85 \times 10^{-12}$ F/m, $\varepsilon_r = 6$), Calculate. **(10)**

i) Required width of conductor strip
ii) Stripline inductance
iii) Stripline capacitance
iv) Phase velocity

b) What are slot lines and how do they differ from micro striplines. **(6)**

(OR)

2. a) Explain parallel striplines and thus distributed parameters, characteristics impedance and attenuation losses. **(8)**

   b) A micro strip is designed with dielectric constant $\varepsilon_r = 5.23$. The microstrip has width 10 mils, thickness 2.8 mils and it is located at a height h = 7mils. Find the effective dielectric constant and characteristic impedance. **(8)**

Unit-III

3. a) What are [ABCD] parameters? How can these be related to : **(8)**

   i) Z and

   ii) S-parameters

   b) The scattering matrix of a two-port microwave network is given below : **(8)**

$$S = \begin{bmatrix} 0.10 < 0° & 0.90 < -45° \\ 0.90 < 45° & 0.3 < 0° \end{bmatrix}$$

   Find return loss if port 2 is terminated in short circuit

(OR)

3. a) What are signal flow graphs? How are they advantageous in microwave network analysis? **(8)**

   b) The impedance matrix of a certain microwave circuit is $[Z] = \begin{bmatrix} 4 & 2 \\ 2 & 4 \end{bmatrix}$ determine the corresponding scattering matrix. **(8)**

Unit-IV

4. a) What are charge coupled devices? Using suitable diagrams explain the working of burried CCD and CCD structures. **(10)**

   b) Calculate the charge transfer efficiency of a 330 stage CCD, If the charge transfer loss is 0.01%. What fraction of charge pulse remains in packet when finally delivered to the memory circuit? **(6)**

(OR)

4. a) Write short notes on : **(9)**

   i) Tunnel diode

   ii) PIN as switch

   iii) PIN as modulator

   b) What is varactor? Draw a layout of a varactor and hence obtain the equivalent circuit. **(7)**

Unit-V

5. a) Draw all steps involved in the fabrication of MOSFET'S. Discuss the major difference between low frequency and MMIC fabrication. **(10)**

   b) What are the characteristics of substrate material and conductor materials used for MMICs. **(6)**

(OR)

5. a) Outline the planar passive elements used in MMICs. **(8)**

   b) What are the various process used to grow epitaxy layer on the substrate? **(8)**