CVR COLLEGE OF ENGINEERING

An UGC Autonomous Institution - Affiliated to JNTUH

B.Tech. IV Year I Sem. **I Mid Examinations**, August - *2018*

Subject: **Microwave Engineering**

Branch: **ECE**

Date: 16-08-2018(AN) Time: 2 hours Max. Marks: **40 M**

PART – A

Answer **ALL** questions **5x2 = 10 M**

1. Write short notes on the Applications of Microwaves.
2. Define the terms Phase velocity and Group velocity.
3. Define Wave Impedance and write its expression for TM Waves.
4. Write about Coupling Loops.
5. What is the significance of S- Matrix?

PART – B

Answer **ALL** questions **3x10 = 30 M**

6. Starting from Maxwell's equations, derive the field components for TM mode.

(OR)

7. a) Derive the expressions for (i) The Cutoff frequency (ii) Phase velocity (iii) Group velocity.

   b) A 3.5 GHz signal is propagating through a rectangular waveguide has the dimensions as 7 X 3.5 Cm in the dominant mode. Calculate the (I) The Cutoff frequency (ii) Phase velocity (iii) Group velocity.

8. With a neat sketch, explain the operation of a Two Hole Directional coupler and derive its S-Matrix.

(OR)

9. What is the need for Attenuators? With a neat sketch, explain about the Rotary vane attenuator.
10. Derive the S- Matrix of E- plane Tee junction with a neat sketch.

(OR)

11. a) Calculate the lowest resonant frequency of a rectangular cavity resonator with dimensions as **a= 2 Cm, b=1Cm** and **d= 3Cm.**

    b) The dimensions of a waveguide are 2.5 X 1 Cm. The frequency is 8.6 GHz. Find (i) The possible modes of propagation and (ii) Guide wavelength.

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CVR COLLEGE OF ENGINEERING

An UGC Autonomous Institution - Affiliated to JNTUH

B.Tech. IV Year I Sem. **I Mid Examinations**, August - *2018*

Subject: **VLSI Design**

Branch: **Common to ECE & EIE**

Date: 20-18-2018(AN) Time: 2 hours Max. Marks: **40 M**

PART – A

Answer **ALL** questions **5x2 = 10 M**

1. Define Channel Length modulation and sub-threshold conduction
2. Derive the trans conductance(g_m) of the MOSFET
3. Write about the Pseudo NMOS inverter using circuit diagram
4. Discuss power dissipation in CMOS circuits.
5. Draw the stick diagram of 2- input NAND using NMOS design style

PART – B

Answer **ALL** questions **3x10= 30 M**

6. Explain the construction, operation and characteristics of Enhancement n-channel MOSFET using neat sketches.

(OR)

7. Explain the CMOS fabrication process using P-Well with neat diagrams.
8. Determine the ratio of pull-up to pull-down (Zpu/Zpd) for a NMOS inverter driven by another NMOS inverter.

(OR)

9. Explain the operation of CMOS inverter in detail.
10. Draw the schematic, stick diagram and layout for a 2-input CMOS OR gate.

(OR)

11. Draw the schematic and Stick diagram and Layout for EX-NOR gate using NMOS design style.

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CVR COLLEGE OF ENGINEERING

An UGC Autonomous Institution - Affiliated to JNTUH

B.Tech. IV Year I Sem. I Mid Examinations, August - *2018*

Subject: EMBEDDED C

Branch: ECE

Date: 21-08-2018(AN) Time: 2 hours Max. Marks: 40 M

PART – A

Answer ALL questions 5x2 = 10 M

1. What is the minimum software environment you need to create an embedded C program?
2. What are the memory addresses for Port 0, Port 1 ,Port 2 and Port 3.
3. How do you create a delay without using any hardware(timer) resources?
4. List the Embedded C data types for 8051.
5. What is the difference in the timer lengths in mode 0, 1 and 2.

PART – B

Answer ALL questions 3x10= 30 M

6. a) Write in detail applications of embedded systems.
   b) Differentiate Desktop processor and embedded processor.

(OR)

7. a) Explain in detail about super loop architecture in Embedded system.
   b) Why C is preferred programming language for embedded system

8. a) Write 8051 C program to toggle all the bits of P0 and P2 continuously with 250 ms using software delay.
   b) Write C program to convert packed BCD 0x29 to ASCII and display the bytes on P1 and P2.

(OR)

9. Write C program to get a byte of data from P0. If it is less than 100, send it to P1; otherwise, send it to P2.

10. Assuming XTAL =22 MHZ, write a program to generate a pulse train of 2 seconds period on pin P2.4 Use Timer 1 in mode 1.

(OR)

11. Assuming XTAL = 22 Mhz, write program to generate a square wave of frequency 1 Khz on pin P1.2.

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CVR COLLEGE OF ENGINEERING

An UGC Autonomous Institution - Affiliated to JNTUH

B.Tech. IV Year I Sem. I Mid Examinations, August - 2018

Subject: Multirate Signal processing

Branch: ECE

Date: 24-08-2018/AN Time: 2 hours Max. Marks: 40 M

PART – A

Answer ALL questions 5x2 = 10 M

1. What is decimation?
2. What is sample-rate conversion?
3. What is the need of anti-imaging filter after up sampling a signal?
4. What is a digital filter bank?
5. What is the condition for perfect Reconstruction of a uniform DFT bank?

PART – B

Answer ALL questions 3x10= 30M

6. Describe the up sampling process with a factor of M and obtain the necessary expressions in time domain and in frequency domain?

(OR)

7. With the help of block diagram explain the sampling rate conversion by a rational factor I/D. Obtain necessary expressions?

8. Sate and prove noble identities?

(OR)

9. a) Show that up sampler and down sampler are time invariant systems?
   b) Consider a signal x(n)={ 1,3,2,5,4,-1,-2,6,-3,7,8,9} show that a cascade of D down sampler and I up sampler is interchangeable only when D and I are co-prime?

10. a) What are types of Digital filter banks?
    b) What is a Uniform DFT filter bank and Describe Polyphase implementation of uniform Filter banks?

(OR)

11. Explain about two channel Quadrature – Mirror filter banks?

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CVR COLLEGE OF ENGINEERING

An UGC Autonomous Institution - Affiliated to JNTUH

B.Tech. IV Year I Sem. I Mid Examinations, August - 2018

Subject: Managerial Economics and Financial Analysis

Branch: ECE

Date: 25-08-2018(AN) Time: 2 hours Max. Marks: 40 M

PART – A

Answer ALL questions 5x2 = 10 M

1. What is demand function?
2. How is test marketing used in demand forecasting?
3. Define isoquant and isocost.
4. What is Margin of Safety?
5. Write a short note on market structure.

PART – B

Answer ALL questions 3x10= 30 M

6. Explain the nature and scope of Managerial Economics.

(OR)

7. What is Demand forecasting? Explain the various demand forecasting techniques.

8. Elaborate on the Law of returns when there are two variable inputs.

(OR)

9. The operating results of a company for the last two years are as follows:

Year	Sales(Rs.)	Profit(Rs.)
2016	270000	6000
2017	300000	9000

Calculate 1) P/V ratio 2) BEP 3) Fixed cost 4) Margin of safety for the year 2017.

10. What are the factors influencing 'Market Structures' and describe briefly different types of market structures.

(OR)

11. Explain how price is determined in perfect competition in short run period.

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CVR COLLEGE OF ENGINEERING

An UGC Autonomous Institution - Affiliated to JNTUH

B.Tech. IV Year I Sem. II Mid Examinations, October - 2018

Subject: Multirate Signal Processing

Branch: **ECE**

Date: 29-10-2018(AN) Time: 2 hours Max. Marks: **40 M**

PART – A

Answer **ALL** questions **5x2 = 10 M**

1. What are the advantages of QMF bank based systems? Aliasing & distortion is eliminated
2. What is M-Channel Filter Bank? Aliasing cancelation, perfect reconstruction
3. What is a cosine –modulate filter bank? Synthesis and analysis — single prototype filter is proper cosine modulation scheme.
4. What is sub band coding?
5. What are the sampling rates used in digital audio systems? 48KHz

PART – B

Answer **ALL** questions **3x10 = 30 M**

6. Define M-Channel Filter Bank and represent it Polyphase form.

(OR)

7. Explain Tree Structured Filter Banks.

8. Describe Cosine Modulated Pseudo QMF Bank and explain about Alias Cancellation.

(OR)

9. Describe Closed Form Expression and Polyphase Structures of Cosine Modulated filter Banks.

10. Explain the application of multirate signal processing in Digital audio systems.

(OR)

11. Explain about Transmultiplexer.

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CVR COLLEGE OF ENGINEERING

An UGC Autonomous Institution - Affiliated to JNTUH

B.Tech. IV Year I Sem. II Mid Examinations, October - *2018*

Subject: **Managerial Economics and Financial Analysis**

Branch: **ECE**

Date: 24-10-2018(AN) Time: 2 hours Max. Marks: **40 M**

PART – A

Answer **ALL** questions **5x2 = 10 M**

Define the following:

1. Price discrimination.
2. Time value of money.
3. Define IRR.
4. Accounting cycle.
5. Earnings per share.

PART – B

Answer **ALL** questions **3x10 = 30 M**

6. What is Monopoly competition and write about price -output determination under Monopoly competition.

(OR)

7. Discuss different types of pricing strategies.

8. a) What is capital and explain types of capital.
   b) Write about working capital cycle

(OR)

9. Modern electronics Co. Ltd. is considering the purchase of a machine. Two machines A and B are available, each costing Rs. 50,000. In comparing the profitability of these machines a discount rate of 10% is to be used. Net cash flows are expected to be follows:

Year	Cash inflow(Rs.) of Machine A	Cash inflow(Rs) of Machine B
1	15,000	5,000
2	20,000	15,000
3	25,000	20,000
4	15,000	30,000
5	10,000	20,000

Evaluate the project using:

(a) The pay-back period, 4 years 3.4 months

(b) The net present value method 1512

(c) The profitability index

P.T.O

10. The following figures have been extracted from the record... Concern as on 31-12-2016:

Particulars	Amount(Rs.)
Furniture	15,000
Capital	54,000
Cash in hand	3,000
Opening stock	50,000
Cash at bank	1,44,600
Purchases	3,00,000
Drawings	5,000
Provision for bad debts	3,000
Salaries	19,000
Carriage inwards	41000
Insurance	6,000
Rent	22,000
Sundry debtors	60,000
Sales	6,06,000
Advertisement	10,000
Postage expenses	3,400
Bad debts	2,000
Printing and stationary	9,000
General charges	13,000
Sundry creditors	40,000

Prepare Trading, Profit and Loss account and Balance Sheet after taking into consideration of following Adjustments:

a) Closing stock was Rs. 10,000 b) Outstanding Salary is Rs. 2000.

(OR)

11. The following are the extracts from the financial statements of Blue and Red Ltd. On 31st March 2016 and 2017 respectively.

Particulars	31st March 2016	31st March 2017
	Amount (Rs)	Amount (Rs)
Stock	10,000	25,000
Debtors	20,000	20,000
Bills receivables	10,000	5,000
Cash in hand	18,000	15,000
Bills payable	15,000	20,000
Bank overdraft	---	2,000
9% debentures	5,00,000	5,00,000
Sales for the year	Credit sales:1,50,000 Cash sales: 2,00,000	Credit sales:1,00,000 Cash sales: 2,00,000
Gross Profit	70,000	50,000

Compute for both the years the following:

(a) Current ratio

(b) Quick ratio

(c) Gross profit ratio

(d) Debtors turnover ratio and debt collection period

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CVR COLLEGE OF ENGINEERING

An UGC Autonomous Institution - **Affiliated to JNTUH**

B.Tech. IV Year I Sem. II Mid Examinations, October - *2018*

Subject: Microwave Engineering

Branch: ECE

Date: 23-10-2018(AN) | **Time: 2 hours** | **Max. Marks: 40 M**

PART – A

Answer **ALL** questions **5x2 = 10 M**

1. Define Gap Transit angle of a two cavity klystron amplifier.
2. State the significance of Bunching parameter in Reflex klystron.
3. Illustrate Gunn effect.
4. What is Avalanche Breakdown?
5. What is the function of a Bolometer sensor?

PART – B

Answer **ALL** questions **3x10 = 30 M**

6. Explain the principle of operation of a reflex Klystron oscillator and derive an expression for the bunching parameter.

(OR)

7. Derive an expression for the Hull cut off condition for cylindrical magnetron oscillator.

8. Illustrate the operation of a Gunn Diode.

(OR)

9. Justify the operation of a TRAPATT Diode.

10. Explain the measurement of Power.

(OR)

11. Explain the measurement of VSWR using Microwave bench setup.

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CVR COLLEGE OF ENGINEERING

An UGC Autonomous Institution - Affiliated to JNTUH

B.Tech. IV Year I Sem. II Mid Examinations, October - *2018*

Subject: VLSI Design

Branch: Common to ECE & EIE

Date: 25-10-2018(AN) Time: 2 hours Max. Marks: 40 M

PART – A

Answer ALL questions **5x2 = 10 M**

1. What are the changes in the power dissipation and delay due to MOS scaling?
2. Draw the logic gate level diagram of one's detector
3. Draw the Circuit diagram of Barrel shifter
4. Mention the types of memory and write differences
5. List out the applications of FPGAs.

PART – B

Answer ALL questions **3x10= 30 M**

6. Draw the 4-bit magnitude comparator and explain the operation with one example.

(OR)

7. Write short notes on lambda based design rules for wires and transistors

8. Explain the operation of Booth Multiplier with an example.

(OR)

9. Explain the operation of Carry Look Ahead Adder.

10. Draw the circuit diagram of 6T SRAM cell and explain.

(OR)

11. a) Why testing is needed in VLSI design? Explain the principle of testing.
    b) Write short notes on stuck at faults

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CVR COLLEGE OF ENGINEERING

An UGC Autonomous Institution - Affiliated to JNTUH

B.Tech. IV Year **I** Sem. **II Mid Examinations,** October - *2018*

Subject: Embedded C

Branch: ECE

Date: 26-10-2018(AN) Time: 2 hours Max. Marks: **40 M**

PART – A

Answer **ALL** questions **5x2 = 10 M**

1. Draw and explain IE and IP registers for 8051 microcontroller.
2. Write type Nos and vector addresses for interrupts of 8051 microcontroller.
3. Explain pin diagram of 16X2 LCD .
4. Define key debounce time.
5. What is need for pull up resistors in switch interfacing?

PART – B

Answer **ALL** questions **3x10= 30 M**

6. Write a C program that continuously gets a single bit of data from P1.7 and sends it to P1.0, while simultaneously creating a square wave of200 µs period on pin P2.5. Use Timer 0 to create the square wave.
Assume that XTAL = 11.0592 MHz.

(OR)

7. Write a C program using interrupts to do the following:
   (a) Receive data serially and send it to P0
   (b) Read port P1, transmit data serially, and give a copy to P2
   (c) Make timer 0 generate a square wave of 5 kHz frequency on P0.1
Assume that XTAL = 11.0592 MHz. Set the baud rate at 4800.

8. Show the design of an 8031-based system with 8K bytes of programROM and 8K bytes of data ROM.

(OR)

9. Interface 4X4 Keypad with 8051 and write a C program for it.

10. Write a simple C code and Draw the Counting the number of goats using the hardware simulator.

(OR)

11. Write a Restructuring Code for Goat counting and explain its operation.

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CVR COLLEGE OF ENGINEERING

An UGC Autonomous Institution - Affiliated to JNTUH

B.Tech. IV Year I Sem. **II Mid Examinations,** October - *2018*

Subject: **Satellite Communications(PE-III)**

Branch: **ECE**

Date:27-10-2018(AN) Time: 2 hours Max. Marks: **40 M**

PART – A

Answer **ALL** questions **5x2 = 10 M**

1. Draw the TDMA frame structure.
2. What is sun synchronous orbit and give its advantages?
3. How delay and throughput can be affected in satellite communications?
4. What is selective availability in GPS?
5. What are the types of DOPs in GPS measurements?

PART – B

Answer **ALL** questions **3 x 10 = 30 M**

6. a) What is the principle of CDMA? Explain in detail with an example. [5]
   b) Compare and contrast TDMA and FDMA. [5]

(OR)

7. a) Explain onboard processing in satellite communications. [5]
   b) Discuss the features of DAMA. [5]

8. a) What are the HPA configurations used in Earth stations? Explain in detail. [5]
   b) Explain the factors involved while considering coverage of a satellite. [5]

(OR)

9. a) Describe the features of Molniya orbits. [5]
   b) Draw the block diagram of an Earth station and explain each block. [5]

10. a) Describe the GPS location principle with necessary diagrams and equations.[5]
    b) Draw the block diagram of a generic GPS Receiver. [5]

(OR)

11. a) Describe the principle of Differential GPS. [5]
    b) How C/A code is generated in GPS? Describe it with a block diagram. [5]

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CVR COLLEGE OF ENGINEERING

An UGC Autonomous Institution - Affiliated to JNTUH

B.Tech. IV Year I Sem. I **Mid Examinations**, August - *2018*

Subject: Satellite Communications

Branch: **ECE**

Date: 23-08-2018 (AN) Time: 2 hours Max. Marks: **40 M**

PART – A

Answer **ALL** questions **5x2 = 10 M**

1. What do you mean by visibility test of satellite? Give the equation for maximum angular separation between earth station and subsatellite point (SSP).
2. If the altitude of a satellite is 10,255 km, then find its velocity (km/s) and its orbital period (H M S).
3. What is the importance of G/T ratio? The gain of a receiver is 60.6 dB and its system noise temperature is 19 dBk, then find its G/T ratio.
4. What is reliability of a satellite subsystem? Give the equation for the reliability of the device.
5. Why TWTAs give poor performance in FDMA transponders?

PART – B

Answer **ALL** questions **3 x 10 = 30 M**

6. a) What are the Orbital effects in communication system Performance and describe them in Detail. [5]
   b) An earth station situated in the Docklands of London, England, needs to calculate the look angle to a geostationary satellite in the Indian Ocean operated by Intelsat. The details of the earth station site and the satellite are as follows:
   Earth station latitude and longitude are 52.0^0 N and 0^0
   Satellite longitude (sub satellite point) is 66.0^0 E. [5]

(OR)

7. a) What are the methods used to place a satellite in to a geostationary orbit.[5M]
   b) What are the various applications of satellite communication systems? [5]

8. a) Draw the Block diagram of simplified satellite earth station receiver and derive an equation for its system noise temperature. [5]
   b) A 4GHz satellite Receiver has: T_{in} = 25 k, T_{RF} = 50 k, T_{IF} = 1000 k, T_m = 500 k, and G_{RF} = 23 dB, G_{IF} = 30 dB. Calculate the system noise temperature, assuming the mixer has a gain of G_M = 0 dB. Recalculate the system Noise temperature when the mixer has 10 dB loss. [5]

(OR)

9. a) What is the significance of bathtub curve and describe various redundancy connections used in a satellites. [5]
   b) Draw the block diagram of TTC&M and describe in detail. [5]

10. Prove that inter-modulation increases in proportion to the cubes of the signal power in a FDMA system.

(OR)

11. What is the importance of back-off loss in FDMA system and give an equation for overall C/N ratio in the earth station receiver in terms of $(C/N)_{IM}$, $(C/N)_{DN}$ and $(C/N)_{UP}$ and mention its significance.

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