

(Please Write your Roll No immediately)

Roll No.....

Mid-Term Examination

B. Tech – 6th Semester

Paper Code: ETEE -302

Time: 1 $\frac{1}{2}$ hours

April 2022

Subject: Power System - II

Max. Marks: 30

Note: Q. No. 1 is compulsory. Attempt any one more Question from the rest.

Q1. Write Short Notes on the following. (2x5 =10 Marks)

- (a) Fault in power system. Difference between circuit breaker, relay and isolator.
- (b) Current Transformer and Potential Transformer?
- (c) The principle of duality in static relay?
- (d) Induction Type relay.
- (e) Define Operating Force, restraining force, operating time and pick up value of a relay.

Q2 (a) Discuss in brief Numerical Relay. (5 Marks)

(b) Discuss in brief Capacitance Voltage Transformer (5 Marks)

Q3 (a) Discuss in brief the protection of generator against unbalanced loading (5 Marks)
(b) Discuss in brief Differential Protection of Transformers. (5 Marks)

Q4 (a) Discuss in brief Bus Bar Protection Differential Scheme. (5 Marks)

(b) Discuss in brief Amplitude Comparator. (5 Marks)

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Roll No. _____

First Term Examination

VI Semester [B. tech.]

April 2022

Paper Code: ETEC-302

Sub.: Microwave Engg.

Time: 1.5 Hrs.

Max. Marks: 30

Note: Attempt Q. No.1 which is compulsory and any two more questions from remaining.

Q.1. (a) Define the dominant mode, higher mode and degenerate mode. Write the dominant mode of rectangular waveguide & circular waveguide.

(b) Design a circulator using directional coupler.

(c) Explain from fundamental principle why a waveguide behaves like a high pass filter?

(d) Write Maxwell's equations in integral form.

(e) What will be the spacing between centers of two holes in directional coupler and why? (2x5)

Q.2. (a) An air filled rectangular waveguide has dimension of $a=6\text{cm}$ and $b=4\text{cm}$. The distance measured by travelling detector maximum and minimum is 4.55 cm. Compute the following for the Dominant mode.

i) Cut off Frequency

ii) Frequency in dominating mode

iii) Phase velocity

iv) Wave impedance

(b) Find out the S- Matrix of Magic Tee. (5+5)

Q.3. (a) Prove that it is impossible to construct a perfectly matched lossless, reciprocal 3-port junction using scattering matrix of a 3-port circulator.

(b) Write short note on:

(I) Isolator

(II) Directional Coupler

(5+(2.5x2))

Q.4. (a) Show that TM_{01} and TM_{10} modes in a rectangular waveguide do not exist.

(b) Derive the equation of resonating frequency for a circular cavity resonator. Discuss the term unloaded Q, loaded Q, critical coupled Q & under coupled Q with reference to a cavity resonator. (5+5)

Note: Necessary Data may be assumed wherever necessary and same may be clearly indicated.

(Please write your roll no immediately)

Roll no:

Mid-Term Examination (Regular)

VI Semester [B-Tech]

April-2022

Subject Code: ETIC-302

Subject: Pneumatic and Hydraulic Instrumentation

Time: 1¹/₂Hrs.

Max. Marks: 30

Note: Attempt Q.1 and any two more questions. Assume the missing data, if any.

Q. 1.a) What is the purpose of pneumatic valves?(2*5)

b) What is the purpose of pilot operated valve?

c) Explain application of fast exhaust valve.

d) Draw the symbol of valve used for controlling flow rate.

e) List the parameters used for controlling speed of cylinder.

Q. 2 a) Describe the construction and functioning of non relieving pressure regulator. (4)

b) Explain the circuit used to control the load run away condition during extension of double acting cylinder. (6)

Q. 3 a) Explain how a single acting cylinder is to be operated manually using two push buttons with the condition that extension of cylinder takes place only when two push buttons are activated. (5)

b) Explain working of variable volume pump. (5)

4 a) Why synchronization is required for unbalanced load? Explain any arrangement for synchronization of two cylinders with unbalanced load. (6)

b) Draw and explain construction of cylinder used for loading and unloading application of vehicle. (4)

(Please write your Roll Number)

Roll No.

First-Term Examination

Sixth Semester (B.Tech)

April-2022

Paper Code: ETCS-302

Subject: Compiler Design

Time: 1 Hr 30 Mins

Max. Marks: 30

Note: Q1 is compulsory and attempt any two questions out of remaining three.

Q1 Attempt all five parts (5*2 =10)

- a) What is a cross compiler and how it is different from native compiler?
- b) What is the need for separating the parser from scanner?
- c) Find leftmost derivation, rightmost derivation and derivation tree of a string ‘aacbbcc’ from following grammar productions { $S \rightarrow aAcB|Bds$, $B \rightarrow aAcA|cAB|b$, $A \rightarrow aB|aBc|a$ }.
- d) What are the responsibilities of Loader, Linker and Assembler in the compiler environment?
- e) Write steps involved in compilation of following sentence
$$\text{pos} = \text{interest} + \text{rate} * 60$$

Q2 Attempt both parts (2*5=10)

- a) Remove indirect left recursion from the following grammar:
$$S \rightarrow Aa \mid b$$

$$A \rightarrow Ac \mid Sd \mid e$$
- b) Prove that the following grammar is ambiguous and convert it to unambiguous one.
$$S \rightarrow S+S \mid S^*S \mid (S) \mid a$$

Q 3 (1*10=10)

Write Algorithm to construct predictive parser. Design a predictive parser for the given grammar and show the processing of one string.

$$\begin{aligned} S &\rightarrow aABb \\ A &\rightarrow c \mid \epsilon \\ B &\rightarrow d \mid \epsilon \end{aligned}$$

Q 4 Attempt both parts (2*5=10)

- a) Draw the finite automata which can be used by lexical analyzer to recognize identifier, number and operators.
 - b) What is operator grammar? Write operator precedence parsing table for following grammar:
$$S \rightarrow (L) \mid a$$

$$L \rightarrow L, S \mid S$$
-

B. Tech Mid Term Examination
April 2022

Name of the Subject: INFORMATION THEORY AND CODING

TIME 1:30 Hr.

Subject Code: ETEC-304

M.M. 30

Semester: SIXTH

- Attempt three questions. All question carry equal marks.
- Question No 1 is compulsory

Q.No.1. a) A DMS generates two events with probabilities $P(x_1) = 0.25$ and $P(x_2) = 0.75$, calculate the information content in each event. (2)

b) Define Entropy? What is the possible minimum and maximum value of entropy? (2)

c) Compare Fixed length codes and variable length codes with suitable example. (2)

d) What is meant by prefix code? (2)

e) State the channel coding theorem. (2)

Q.No.2. a) A DMS emits five symbols S_1, S_2, S_3, S_4 , and S_5 with $P(S_1) = 0.40$, $P(S_2) = 0.18$, $P(S_3) = 0.17$, $P(S_4) = 0.15$, and $P(S_5) = 0.10$. Construct Huffman code for the source and calculate its efficiency. (5)

b) Define Mutual Information and mention its properties. Prove that $I(X;Y) \geq 0$. (5)

Q.No.3. a) Verify that $C = \log_2(m)$, where 'C' is the channel capacity of a lossless channel and 'm' is the number of symbols in X (5)

b) Consider an AWGN channel with 4-KHz bandwidth and the noise power spectral density $(\eta/2) = 10^{-12}$ W/Hz. The signal power required at the receiver is 0.1mW. Calculate the capacity of this channel. (5)

Q.No.4. a) For the given Joint Probability Matrix, $P(X_j, Y_k)$, calculate $H(X)$ and $H(Y)$, where rows represent the input ' X_j ' and columns represent the output ' Y_k ' (6)

$$\begin{bmatrix} 0.05 & 0 & 0.20 & 0.05 \\ 0 & 0.10 & 0.10 & 0 \\ 0 & 0 & 0.20 & 0.10 \\ 0.05 & 0.05 & 0 & 0.10 \end{bmatrix}$$

b) Explain i) Lossless channel ii) Binary Symmetric channel (4)

(Please write your Roll No. immediately)

Roll No.-----

First Term Examination

Semester 6th [EEE]
Paper Code: ETEE- 304
Time: 1½ Hrs.

April, 2022
Sub: Utilization of Electrical Energy and Electric Traction
Max. Marks: 30

Note: Attempt any three questions including Q.No.1 which is compulsory.

Q.1 a) Define in context of illumination a) Depreciation Factor b) Utilization factor
c) Mean Spherical Candle Power d) Luminous Intensity (4)

b) A 0.3 metre diameter diffusing sphere of opal glass having 15% absorption, encloses an incandescent lamp with a luminous flux of 4500 lumens. Calculate average illumination of the sphere. (2)

c) Give the advantages of Electric Heating. (2)

d) What are the essential properties of resistance heating elements? (2)

Q.2 a) Explain the principle of operation of induction heating. (4)

b) Give comparison of light performance of LED lamp, tungsten filament lamp and Compact Fluorescent Lamp (CFL). (4)

c) Discuss, why tungsten is the best material chosen for the filament of Incandescent lamps. (2)

Q.3 a) Discuss some advantages of resistance welding. (2)

b) Discuss one application of eddy current heating. (2)

c) Two lamp posts are 14 m apart and are fitted with 200 C. P (candle power) lamp each at a height of 5 m above the ground. Determine

- i) Illumination mid-way between them.
- ii) Illumination under each lamp. (6)

Q.4. Write short note on any two from the following:

- a) High pressure mercury vapour (HPMV) lamp
- b) Submerged Arc Furnace
- c) Polar Curve

(5*2=10)

Mid term

ETIC-304

Process control

Max time – 1.5 hrs

Max marks – 30

Note: All questions carry equal marks. Q.1 is compulsory. Attempt two from other three

Q.1 (a) what do we need process control?

(b) How will you remove dead time in a system?

(c) Compare the features of pneumatic and electrical signals?

(d) Discuss the role of ISE , IAE and ITAE ?

(e) what do you mean by semi batch process ?

Q.2 (a) what do you mean by feedback control? Explain it with at least two practical examples and expression?

(b) Write short note on dead time compensator?

Q.3 (a) what is PID controller? How will you tune it?

(b) Discuss stability in detail?

Q.4(a) Develop a mathematical model for non interacting tank ?

(b) Discuss role of P, PI and PID controller?

Mid Term Examination

B.Tech (CSE/IT)- 6th Semester

April 2022

Paper Code:ETCS-304

Subject: Operating Systems

Time: 1 ½ Hrs.

Max. Marks: 30

Note: Attempt Q. No. 1 which is compulsory and any two more questions from remaining.

Q.1. Answer all the following questions briefly: [2 X 5 = 10]

- a) Compare Parallel Systems and distributed Systems.
- b) Justify the statement “OS works as a resource manager”.
- c) Differentiate between Preemptive and non-Preemptive scheduling.
- d) Calculate the average amount of internal fragmentation paging scheme may suffer w.r.t to page size.
- e) Draw process state diagram.

Q.2.

- a) Define interrupts. Why interrupts are important for the functioning of the system. [5]
- b) In a byte addressable system, the logical address space is of 24 bit where as physical address space is 16 bit. The frame size is 1 KB and each entry in page table requires 2 bytes. Find (i) No. of frames (ii) No. of pages (iii) No. of pages required to store the page table.

Q.3.

- a) Differentiate paging and segmentation with the help of neat diagrams. [5]
- b) Consider a system with following data

Process	Burst time in ms	Arrival Time in ms
P0	6	0
P1	2	2
P2	1	4
P3	2	5

Calculate average waiting time and turn around time for SJF and SRTF algorithms.

Q.4.

- a) Define following (i) PCB (ii) Context switching (iii) Swapping (iv) Thread (v) IPC [5]
- b) Assume 3 frames available. The page reference string is 1,2,1,3,2,1,4,5,2,3,1,6,5,4,3,2,1. Calculate no. of page faults in case of FIFO and LRU page replacement algorithms in case of pure demand paging.

*****ALL THE BEST*****

(Please write your Exam Roll no.)

Exam Roll No.

MID TERM EXAMINATION

SIXTH SEMESTER [B.TECH.] APRIL 2022

Paper Code: ETEC -306

Subject: Digital Signal Processing

Time: 1Hour 30 Min.

Maximum Marks: 30

Note: Attempt any three questions including Q. No. 1 which is compulsory.

Q1. (a) Compute the 4-point DFT of the sequence, $x(n) = \cos(n\frac{\pi}{2})$. [2]

(b) Illustrate the properties of Twiddle Factor. [2]

(c) Why Bit-reversal concept is important in FFT algorithms? [2]

(d) What are the conceptual differences between FIR and IIR filters. [2]

(e) List the advantages and disadvantages of digital filters. [2]

Q2. (a) Let $x(n) = \{1, 1, 1, 1\}$ and $h(n) = \{1, 1, 1, 1\}$. Evaluate circular convolutions for (i) N=7, (ii) N=4. [5]

(b) Compute the 4-point FFT of the sequence $x(n) = \{0, 1, 2, 3\}$ using DIT-FFT algorithm. Draw the signal flow graph. [5]

Q3. Design an IIR low pass Butterworth filter using bilinear transformation to meet the following specifications.

$$\text{Passband: } 0.8 \leq |H(e^{j\omega})| \leq 1 \quad \text{for } 0 \leq \omega \leq 0.2\pi$$

$$\text{Stopband: } |H(e^{j\omega})| \leq 0.2 \quad \text{for } 0.6\pi \leq \omega \leq \pi \quad [10]$$

Q4. (a) Realize the given transfer function in cascade form. [5]

$$H(z) = \frac{5z(z+0.4)}{(z-0.2)(z-0.6)}$$

(b) Let $x(n) = \{n + 1\}, 0 \leq n \leq 9$ and $h(n) = \{1, 0, -1\}$. Implement the overlap-save method to compute $y(n) = x(n) \otimes h(n)$. [5]

(Write your Roll No. immediately)

Roll No: _____

Mid Term Examination

6th Semester [B. Tech] CSE
Paper Code: - ETCS 306
Time: - 1½ hour

April, 2022
Paper Title: Computer Network
Max Marks: - 30

Note: - Attempt Q.No.1 which is compulsory and any two more questions from the remaining.

Ques1. (2*5 marks)

- a) What is the difference between Circuit switching and Packet switching?
- b) What is the maximum data rate of a channel with a bandwidth of 300 KHz if we use four levels of digital signaling?
- c) Justify the purpose of cladding in an optical fiber? Discuss its density relative to the core.
- d) Why Ethernet is said to be 1-persistent protocol?
- e) For 'n' devices in a network, what is the number of Input-Output ports required for each device in a mesh, ring, bus and star topology?

Ques2.

- a) Compare the OSI reference model and TCP/IP model while discussing layered architecture. (5 marks)
- b) 11-bit messages are transmitted using a Hamming Code. Consider the message 10011011011. Calculate the Hamming code word for this message? Assume that even parity is used in the Hamming Code. (5 marks)

Ques3.

- a) What are Hidden Station and Exposed Station problem in wireless LAN protocol. How can these be prevented? (5 marks)
- b) A group of N stations share 100 Kbps slotted ALOHA channel. Each station output a 500 bits frame on an average of 5000 ms even if previous one has not been sent. What is the required value of N? (5 marks)

Ques4.

- a) A bit stream 1101011011 is transmitted using the standard CRC method. For a generator polynomial is x^4+x+1 . What is the actual bit string transmitted? Express answer as a bit sequence with no spaces (5 marks)
- b) How is selective repeat better than Go-Back N, Explain with help of an example? (5 marks)

(Please write your **Roll no** immediately)

Roll no _____

FIRST TERM EXAMINATION (Regular)

Sixth Semester [B.Tech] April 2022

Code ETCS-308

Subject: Web Engineering

Time: 1 ½ hours

Max Marks: 30

Note: Attempt Q.**No.1** which is compulsory and any two more questions.

Question No 1.

(2*5=10)

- a. Differentiate between HTML and XHTML.
- b. What are the different components of CSS?
- c. Explain the scope of local and global variables in Javascript.
- d. State the difference between internet and www.
- e. What is NaN?

Question No 2.

- a. How to create form in HTML and validate the email and name field using JavaScript. (7)
- b. Discuss the internal and external style sheets in detail. (3)

Question No 3.

- a. Write a program to print HELLO WORLD using JavaScript. (4)
- b. Define Servlets. Explain Servlet life cycle. (6)

Question No 4.

- a. Write a JavaScript conditional statement to find the sign of product of three numbers. Display an alert box with the specified sign.

Sample numbers : 3, -7, 2 (7)

- b. Explain for-in loop with the help of example. (3)

MID TERM EXAMINATION

EIGHTH SEMESTER [B. TECH.] APRIL 2022

Paper Code: ETIC-308

Subject: Analytical Instrumentation

Time: 1Hour 30 Min.

Maximum Marks: 30

Note: Attempt any Three questions including Q. No. 1 which is compulsory.

Q1. a) What is the principle behind spectroscopy?

- b) What is chromatography?
- c) Explain the steps of Analytical Instrumentation?
- d) Explain X-ray tube.
- e) Explain photothermal spectrometer. (5x2=10)

Q2. a) Explain any two types of detectors used in liquid chromatography. (5)

b) What are Analytical Instruments? Explain with a block diagram element of analytical system. (5)

Q3. a) Draw and explain Raman spectroscopy. (5)

b) Explain the basic principle of NMR. (5)

Q4. a) Describe the working of double beam mass spectrometer. (5)

b) What are the two commonly used detectors in gas chromatography? Explain any one detector in detail. (5)

(Please write your Roll No. immediately)

Roll No. _____

Mid Term Examination

B.Tech-Semester-VI

April,2022

Paper Code:ETEC-308

Subject: VLSI Design

Time: 1:30 hours

Max. Marks: 30

Note: Q1 is compulsory. Attempt any two more questions from the rest.

Q1. (a) Differentiate between enhancement and depletion MOSFET.

(b) Discuss evolution of VLSI

(c) Define flat-band voltage w.r.t. MOSFET (2×5=10 Marks)

(d) What is channel length modulation w.r.t. MOSFET, also give proper equations

(e) At $V_{in} = 0.5 \text{ VDD}$, Evaluate $(W/L)_P : (W/L)_n$ for CMOS inverter.

Q2 (a) Derive the expression for I_{ds} , using gradual channel approximation, for

MOSFET (all regions of operation) (5 Marks)

(b) Calculate the threshold voltage V_{To} at $V_{SB} = 0$, for a poly-silicon gate n-channel

MOS transistor, with the following parameters:

$$N_A = 10^{16} \text{ cm}^{-3}, N_D = 2 \times 10^{20} \text{ cm}^{-3}, t_{ox} = 500 \text{ } \overset{\circ}{\text{A}}, N_{ox} = 4 \times 10^{10} \text{ cm}^{-2}$$

(Assume relevant data values) (5 Marks)

Q3. (a) Discuss n-well process for CMOS fabrication, along-with latch-up inCMOS

(5 Marks)

(b) Implement a 2×1 Mux using transmission gate (5 Marks)

Q4. (a) Discuss scaling and its effects on MOSFET (5 Marks)

(b) Draw the stick diagram for CMOS based 2 input NAND gate (5 Marks)

(Please write your Roll No. immediately)

Roll No. _____

Mid Term Examination

VI Semester [B. Tech.] March 2022

Paper Code: ETEC-310

Subject: Data Communication &
Networks (Common to MAE, EEE, IT)

Time: 1½ hr

Max. Marks: 30

Note: 1. Attempt Q1 which is compulsory and any two more questions from the remaining.
2. Necessary data may be assumed and the same may be clearly indicated.

Q1. Answer the following questions briefly.

[5 x 2 = 10 marks]

- a) How do the layers of Internet model correlate to the layers of the OSI model?
- b) What does Nyquist theorem have to do in data communication?
- c) What kind of arithmetic is used to add data items in checksum calculation?
- d) What is a peer to peer process?
- e) Define random access and list the protocols in this category?

Q2. a) Measurement of slotted ALOHA channel with an infinite number of users show that 20% slots are idle. What is the channel load and throughput? Is the channel underload or overload. Show with the help of graph. [5 marks]
b) How is hub related to a repeater? How does repeater extend the length of a LAN? What is a transparent bridge? [5 marks]

Q3. a) Using 5 bit sequence numbers, what is the maximum size of the send and the receive window for stop-and wait ARQ, G-Back-N ARQ and selective repeat ARQ. Explain in detail. [5 marks]
b) Discuss in detail about the various layers of ISO-OSI reference model. [5 marks]

Q4. a) What is bit stuffing? If the 7 bit Hamming code word received by a receiver is 1011011. Assuming the even parity state, find whether the received code is correct or wrong. If wrong, locate the bit in error. [5 marks]
b) Write short note on

- i) Count to infinity problem
 - ii) IEEE 802.5
- [2 x 2.5 = 5 marks]

(Please write your Exam Roll No.)

Exam Roll No

MID TERM EXAMINATION

SIXTH SEMESTER [B.TECH] APRIL 2022

Paper Code: ETEE-310

Subject: Microprocessor and Microcontroller

Time: 1.5 hrs

Max Marks: 30

Note: Attempt any three questions including Q. No. 1 which is compulsory.

Question 1

- A. Differentiate between Program Counter (PC) and Stack Pointer (SP). (2)
- B. Briefly describe various memory technologies used in microprocessor systems. (2)
- C. What are One Byte, Two Byte and Three Byte Instructions? (2)
- D. Explain the concept of segmented memory in 8086? (2)
- E. Discuss the function of following signals: INTR, NMI, ALE, READY. (2)

Question 2

- A. What is an Assembly Language Program? Explain it with help of any example. (4)
- B. What is a subroutine? Write a software delay routine for 8085. (6)

Question 3

- A. Connect 128K word= (128K*16) RAM with system lines of 8086 microprocessor, assume suitable address. (6)
- B. Draw the timing diagram for 8086 minimum mode memory read cycle. (4)

Question 4

- A. Write a program for 8086 microprocessor (using assembler directives) to add two numbers of 10 byte each? (4)
- B. Draw the Opcode Fetch Cycle timing diagram of 8085. (3)
- C. Briefly explain the various addressing modes in 8085. (3)

MIDTERMEXAMINATION

SIXTHSEMESTER[B.TECH] APRIL2022

PaperCode:ETIC-310

Time:1:30 Hours

Subject:ModernControlSystems

MaximumMarks:30

Note:AttemptanythreequestionsincludingQ.no.1whichis compulsory.Assumemissingdata ifany.

Q1 Write short notes on

[2.5*4=10]

- (a) Advantage of state space analysis over the classical control system.
- (b) Stability analysis of sampled data control system
- (c) Derive the transfer function of zero order hold circuit
- (d) Define controllability and observability.

Q2 (a) Develop the state model in controllable canonical form for the system with transfer function also draw the SFG of it.

[5]

$$\frac{Y(s)}{Z(s)} = \frac{s^3 + 16s + 48}{s^3 + 9s^2 + 23s + 15}$$

Q2 (b) A system has a matrix differential equation

[5]

$$\dot{X} = \begin{bmatrix} 0 & 1 \\ -1 & -2 \end{bmatrix} X + \begin{bmatrix} b_1 \\ b_2 \end{bmatrix} U$$

What values for b_1 and b_2 are required so that the system is controllable?

Q3(a) Solve the following difference equations:

[5]

$$y(k+2) + 3y(k+1) + 2y(k) = 0;; \quad y(-1) = -\frac{1}{2}, y(-2) = \frac{3}{4}$$

Q3 (b) Consider the matrix

[5]

$$A = \begin{bmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ -2 & -4 & -3 \end{bmatrix}$$

Suggest a transformation matrix P such that $A = P^{-1}AP$ is in Jordan canonical form.

Q4 Consider the system shown in the figure 1. Show that the pulse transfer function $Y(z)/X(z)$ is given by

[10]

$$\frac{Y(z)}{X(z)} = T \left(\frac{z^{-1}}{1 - z^{-1}} \right)$$

Assuming that $y(kT) = \mathbf{0}$ for $k < 0$, show that

$$Y(kT) = T[x(0) + x(T) + \dots + x((k-1)T)]$$

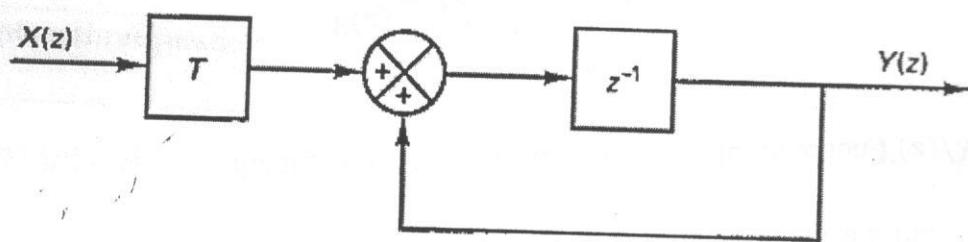


Figure.1Digital integrator with delay.

The output $y(kT)$ approximates the area made by the input. Since $y(0) = \mathbf{0}$ and $y(T) = Tx(0)$, the output starts to appear at $t = T$. This integrator is called a digital integrator with delay.

- (a) Digital differentiator
- (b) Digital integrator
- (c) Digital filter
- (d) digital multiplier
- (e) digital divider

(Please Write your Roll No. immediately)

Roll No

Mid-Term Examination

B.Tech – VI Semester
Paper Code: ETCS-310
Time: 1.5 hour

April, 2022
Subject – Artificial Intelligence
Max Marks: 30

Note: Q.No. 1 is Compulsory. Attempt any two more Question from the rest.

Q1.

(2*5=10 marks)

- a.) Differentiate Propositional logic and FOPL with example.
- b.) What is PEAS? Specify PEAS for an Aerospace System.
- c.) Obtain disjunctive normal form of:
$$p \vee (\neg p \Rightarrow (q \vee (q \Rightarrow \neg r)))$$
- d.) Explain Turing Test. Why Turing Test was criticised and also explain Chinese room Argument Test.
- e.) Differentiate OR graph and AND-OR graph.

Q2. a.) What is heuristic search? Explain Hill Climbing and its limitations.

(5 marks)

b.) Explain Iterative Deepening Depth First Search with example.

(5 marks)

Q3. a.) Represent the following facts in FOPL:

(5 marks)

- i.) All men are mortal
- ii.) Some pet dogs are dangerous
- iii.) All basketball players are tall
- iv.) Lipton is a tea
- v.) Some employees are sick today.

b.) Check the validity of following argument:

(5 marks)

"If I get the job and work hard, then I will get promoted. If I get promoted, then I will be happy. I will not be happy. Therefore, either I will not get the job or I will not work hard".

Q4. a.) Solve following cryptographic puzzle using Constraint Satisfaction procedure:

(5 marks)

$$\begin{array}{r} \text{FOUR} \\ + \text{MICE} \\ \hline \text{FOUND} \end{array}$$

a.) Discuss forward and backward chaining with suitable example.

(5 marks)

(Please write your Roll No. immediately)

Roll No. _____

Mid Term Examination

VI Semester [B.Tech.] April 2022

Paper Code: ETIC-312

Subject: Data Communication & Networks

Time: 1½ hr

Max. Marks: 30

- Note: 1. Attempt Q1 which is compulsory and any two more questions from the remaining.
2. Necessary data maybe assumed.

Q1. Answer the following questions briefly.

[5x2 = 10 marks]

- a) Why do you need encoding of data before sending over a medium?
- b) What do you mean by flow and error control in Data link Layer?
- c) Explain Simplex, Half duplex and Duplex mode of communication?
- d) What do you mean by process-to-process delivery. Explain it with an example?
- e) Explain the use of handshaking to prevent hidden station problem?

Q2.a) Differentiate between Circuit switching and packet switching.

[5 marks]

b) Discuss in detail about HDLC?

[5 marks]

Q3.a) Explain selective repeat ARQ protocol?

[5 marks]

b) Discuss in detail about the various layers of ISO-OSI reference model

[5 marks]

Q4. a) Explain different types of topologies used in DCN?

[5 marks]

b) Explain PPP Protocol with frame format?

[5 marks]

B. Tech Mid Term Examination
April 2022

Name of the Subject: Power Station Practice

TIME 1:30 Hr.

Subject Code: ETEE-312

M.M. 30

Semester: 6th

- Attempt three questions. All question carry equal marks.
- Question No 1 is compulsory

Q. No. 1	From UNIT – I & UNIT - II	Marks
1.	a) What are the different types of electrical energy resources ? b) Why steam Power Plant use Pulverized Coal ? c) Which type of hydro turbines are used for low head and high discharge plant ? d) How ambient temperature affects power output of a gas turbine ? e) Name the main parts of diesel power plant.	(2) (2) (2) (2) (2)
Q. No. 2	FROM- I UNIT	
2.	a) Explain in details how fuel is handled in thermal power plant. b) What is geothermal energy? How can it be used for power generation ?	(5) (5)
Q. No. 3	FROM UNIT – II	
3	a) Explain the working of combined cycle power plant. b) Classify hydraulic turbines and explain any one of them.	(5) (5)
Q. No. 4	From UNIT – I & UNIT - II	
4	a) Write short note on Economizer and Super heater. b) State the advantage and disadvantage of a diesel power plant.	(5) (5)

(Please write your Roll No. immediately)

Roll No.

Mid Term Examination

6th Semester [B.Tech.]

Paper Code: ETEC-314

Time: 1 1/2 hrs

April 2022

Subject: Antenna and Wave Propagation

Max Marks: 30

Note: Attempt Question No. 1 which is compulsory and any two more questions from the remaining.

Q.1.a) Draw transmission line Thevenin equivalent circuit of antenna in transmitting mode and define Antenna Impedance. (2)

b) Differentiate between Fresnel region and Fraunhofer region in the space surrounding the antenna. (2)

c) Calculate effective length of a lossless $\lambda/2$ antenna having radiation resistance, $R_r = 73\Omega$ and maximum effective aperture area equal to $45m^2$. For a dipole antenna, incident power spectral density is given as $E^2/2\eta$. (2)

d) State Reciprocity theorem for antennas in differential and integral forms. (2)

e) Write equations for Electric Field Intensity and Magnetic Field Intensity for an infinitesimal dipole in far field ($kr \gg 1$). (2)

Q.2.(a) By defining the current distribution on thin wire antenna, discuss and illustrate current distribution on linear dipoles. (5)

(b) Obtain the expression for Electric Field Intensity and Magnetic Field intensity due to magnetic vector potential A for electric current source J only. (5)

Q.3.(a) An antenna has a normalized radiation intensity given by $U(\theta) = \cos^2(\theta)$ for $0 \leq \theta \leq \pi/2$ and $0 \leq \phi \leq 2\pi$. Find the HPBW and FNBW in both radians and degrees. (5)

(b) Define array factor $(AF)_n$ for N-element linear array. Differentiate between Broadside array, Ordinary End-fire array, and Phased array. (5)

Q.4.(a) Find Radiation Resistance of half wavelength dipole. (5)

(b) The maximum radiation intensity of a 95% efficient antenna is 200mW/ unit solid angle for $0 \leq \theta \leq \pi/2$ and $0 \leq \phi \leq 2\pi$. Find Directivity and Gain of antenna (dimensionless and in dB) when
(i) Input power = 125.66 mW
(ii) Radiated power = 125.66 mW