

ESHAN COLLEGE OF ENGINEERING, FARAH, MATHURA

DEPARTMENT OF CIVIL ENGINEERING

PUT (2021-2022)

B.TECH II YR (CIVIL)

HEM (KCE-403)

Time allowed: 3.00 Hr.

Max Marks:100

SECTION-A

NOTE: - ATTEMPT ALL QUESTIONS.

(10*2=20)

- (a) Define Open channel flow?
- (b) Define the Pump.
- (c) Define critical depth and specific energy?
- (d) What is Cavitation ?
- (e) What is Centrifugal Pump.
- (f) What are the Limitations of GVF?
- (g) Define the term Celerity Of Surge.
- (h) What is Hydraulic Jump?
- (i) What is the Function of Casing in Turbine ?
- (j) Define the Term Impact Of Jet.

CO-1
CO-4
CO-1
CO-5
CO-4
CO-2
CO-3
CO-3
CO-4
CO-5

SECTION-B

NOTE: - ATTEMPT ANY THREE QUESTIONS.

(3*10=30)

- (a) A rectangular channel 2 m wide and carries discharge $1.5 \text{ m}^3/\text{s}$. The Channel has a specific energy of 1.5 m then calculate alternate depths and corresponding Froude numbers. (CO-1)
- (b) A Rectangular Channel with a bottom width of 4.0 m and a bottom slope of 0.0008 has a discharge of $1.50 \text{ m}^3/\text{s}$. In GVF in this channel, the depth at certain location is found to be 0.30m. Assuming manning coefficient $n=0.016$. determine the type of GVF Profile. (CO-2)
- (c) A Pelton Wheel Turbine has a mean bucket speed of 10 m/s with a jet of water flowing at the rate of $0.7 \text{ m}^3/\text{s}$ under a head of 30 m. the bucket deflect the jet through an angle of 160° . Calculate the power given by the water to the runner and hydraulic efficiency of the turbine. Assuming Coefficient of Velocity 0.98. (CO-5)



- (d) A hydraulic Jump occurs in a 4m wide rectangular channel carrying $5 \text{ m}^3/\text{s}$ on a slope of 0.004. depth after the Jump is 1.2 m find out the
 (i) Depth Before Jump (ii) Losses of Energy **(CO-3)**
- (e) A Turbine is Operate under a head of 25 m at 200 rpm. The discharge of turbine is $9 \text{ m}^3/\text{s}$ and overall efficiency is 90% then determine the Performance of Turbine.
(CO-4)

SECTION-C

NOTE: - ATTEMPT ALL QUESTIONS.

(5*10=50)

- (a) Derive the relationship of specific energy and critical depth for Triangular channel and also find and Froude number. **(CO-1)**

OR

Show that in a Most Efficient Rectangular Channel Depth of flow equal to the Half of the width of the Channel. **(CO-1)**

- (b) Describe the Pelton Wheel Turbine with Neat Figure **(CO-4)**

OR

What is Draft Tube: What are the Types of Draft Tubes .Describe **(CO-4)**

- (c) Derive the Expression of GVF Flow with Assumptions. **(CO-2)**

OR

Derive the Expression of Hydraulic Jump with Assumptions **(CO-3)**

- (d) Sketch all the Profile of Water Surface. **(CO-2)**

OR

Describe the all Main Parts of Centrifugal Pump **(CO-5)**

- (e) What is Specific speed of Turbine? Derive the Expression. **(CO-4)**

OR

Describe the Various Types of Head Used in Pumps **(CO-5)**

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



2/I
04

ESHAN COLLEGE OF ENGINEERING, FARAH, MATHURA

CT-I (M.Tech Ist Sem/Ist Year)

Odd Semester (2022-23)

Max Marks: 30

Times: 1:30 hr

Subject – Advanced Algorithm

Subject Code: MTC102

SECTION – A

Note: - Attempt all the questions.

(5*2=10)

Q. No	Question	CO
1	Explain why the statement “The running time of algorithm A is at least $O(n^2)$ ” is meaningless”.	CO1
2	Explain Masters Theorem with the help of cases.	CO2
3	$\{f_1, f_2, f_3 \dots \dots \dots\}$ is an infinite family of function such that each function f_k is a function from natural number to natural number such that $f_k(n) = O(n)$	CO1
4	Explain Time Complexity and Space Complexity of the Algorithm.	CO2
5	What is the running time of HEAP SORT on an array A of length n that is already sorted in increasing order? What about decreasing order?	CO2

SECTION – B

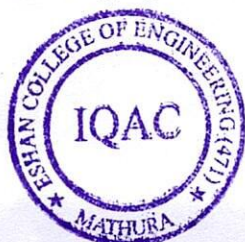
Note: - Attempt all the questions.

(5*4=20)

Q. No	Question	CO
1	Using merge – sort algorithm to sort the following elements: 15,10,5,20,25,30,40,35. OR Show that merging two sorted sequences s_1 and s_2 takes $O(n_1+n_2)$ time, where n_1 is the size of s_1 and n_2 is the size of s_2 .	CO2
2	Apply the quick sort technique on the following list : $A = \{4,5,1,7,8,9,2,88\}$ OR Write down the algorithm of HEAP DELETE, HEAP EXTRACT-MAX with help of diagram.	CO2
3	Use quicksort algorithm to sort :36,15,40,1,60,20,55,25,50,20. OR Illustrate the performance of the heap sort algorithm on the following input sequence: $\{2,5,16,4,10,23,39,18,26,15\}$	CO2
4	Prove that $f(n) = \log_2 n$ is $O(n^\alpha)$ for any $\alpha > 0$ OR Find a tight bound on $f(x) = x^8 + 7x^7 - 10x^5 - 2x^4 + 3x^2 - 17$.	CO1
5	Describe Asymptotic Analysis Algorithm with help of graph. OR Prove that $\sum \log(i)$ is $\theta(n \log n)$.Solve the Recurrence $T(n)=4T(2n)+n^2$. By using Substitution Method.	CO1

CO1: Analysis of algorithm and understand the concepts related to performance of algorithm.

CO2: Demonstrate various sorting algorithms



02/11
05

ESHAN COLLEGE OF ENGINEERING
ClassTest-1st (B.Tech 2nd Year ALL Branches)
Odd Semester (2022-23)

Subject –Computer System Security

Subject Code: KNC301

Max Marks: 30

Time: 1:30 Hour

SECTION –A

Note: - Attempt all the questions.

Q. No	Question	Marks	CO
1	What is Computer Security Problem? What Factors Contribute to it?	2	CO1
2	How Security System Should Evolve to Handle Cyber Security Threats and Vulnerabilities?	2	CO1
3	What is Control hijacking with an example? Explain the term of Buffer overflow in Control hijacking.	2	CO1
4	What is Sample Attacks? What are Different Types of Attacks? What is Error 404 Hacking Digital India Part-1 Chase?	2	CO2
5	What is Detour Unix User Ids, Process Ids and privileges? What is System Call Interposition?	2	CO2

SECTION –B

Note: - Attempt all the questions.

Q. No	Question	Marks	CO
1	What is Control Hijacking with an example? Explain the term buffer overflow in control hijacking.	4	CO1
2	What is the significance of Confinement Principle? What are the goals of confidentiality policies?	4	CO2
3	How to detect Rootkits? Explain how to prevent Rootkits. Explain the need of Software fault Isolation?	4	CO2
4	How are different approaches to use virtual os on desktop? What is Format string vulnerabilities. OR What is Defense against Control Hijacking? What is Platform Defense and What is Run time defense?	4	CO2
5	What is Error 404 digital hacking in india part-2 chase? What is Intrusion Detection System? OR What is Advanced Control Hijacking Attacks? What is Software Fault Isolation?	4	CO2

CO 1	Apply knowledge of database for real life applications.
CO 2	Apply query processing techniques to automate the real time problems of databases.
CO 3	Identify and solve the redundancy problem in database tables using normalization.
CO 4	Understand the concepts of transactions, their processing so they will familiar with broad range of database management issues including data integrity, security and recovery.
CO 5	Design, develop and implement a small database project using database tools.



17/II

ESHAN COLLEGE OF ENGINEERING
B. TECH CS 2nd Year
(SEM IV) CLASS TEST-2 2021-22
PYTHON PROGRAMMING

Time: 1:30 Hours

Total Marks: 30

SECTION A

1. Attempt all questions in brief.

2 x 5 = 10

Qno.	Question	Marks	CO
a.	What is the difference between list and tuples in Python?	2	CO3
b.	Mention five benefits of using Python?	2	CO4
c.	How is Python an interpreted language?	2	CO2
d.	What type of language is python?	2	CO1
e.	What is Lambda Expressions?	2	CO1

SECTION B

2. Attempt all questions in brief.

4 x 5 = 20

Qno.	Question	Marks	CO
a.	Explain Python Data Structures? What is Tuples, List, Sets And Dictionaries in Python?	4	CO5
b.	Generate prime numbers with the help of an algorithm given by the Greek Mathematician named Eratosthenes?	4	CO3
c.	Explain File and Input Output Operations in Python Programming?	4	CO4
d.	Explain Class and Objects? Also Explain OOPS Properties?	4	CO2
e.	Discuss function in python with its parts and scope. Explain with example. (Take Simple calculator with add, subtract, Division and Multiplication).	4	CO1

CO 1	To read and write simple Python programs.
CO 2	To develop Python programs with conditionals and loops.
CO 3	To define Python functions and to use Python data structures -- lists, tuples, dictionaries
CO 4	To do input/output with files in Python
CO 5	To do searching, sorting and merging in Python



ESHAN COLLEGE OF ENGINEERING, FARAH, MATHURA
SESSION 2021-22 (CT-2)
BTECH CS II YEAR

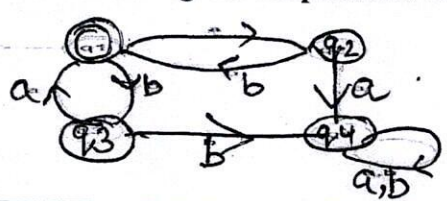
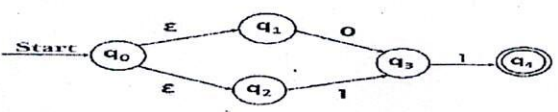
Subject:TAFL
 Sub Code:KCS-402

Time:1hr30min

1.Attempt all the questions

Qno	Questions	Marks	CO
1	State Myhill Nerode Theorem with the help of example.	2	CO4
2	State Arden's Theorem and prove it.	2	CO4
3	Explain Ambiguity in grammar with the help of Example.	2	CO2
4	Write down the Steps to Convert CFG into CNF.	2	CO2
5	State Pumping lemma for Context Free Language.	2	CO4

2.Attempt any Five Questions

Qno	Questions	Marks	CO
1	Convert CFG into GNF having production rules $S \rightarrow ASB$ $A \rightarrow aAS a \epsilon$ $B \rightarrow SbS A bb$	4	CO2
2.	Find out the Regular Expression of Following Machine 	4	CO2
3.	Let L be the language $\{a^i b^j c^k \mid 0 \leq i \leq j \leq k\}$. Show that this language is not a CFL.	4	CO4
4.	Convert Epsilon NFA to DFA. 	4	CO2
5.	Design a Moore Machine that generate 2's Complement and convert into Mealy Machine.	4	CO2
6.	Explain Chomsky Hierarchy in detail with the help of diagram.	4	CO2

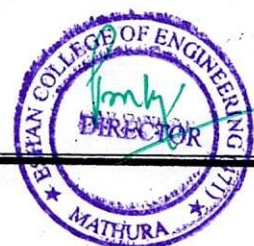
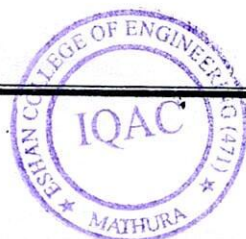
CO1 :Analyse and design finite automata, pushdown automata, Turing machines, formal languages and grammar.

CO 2 :Analyse and design, Turing machines, formal languages, and grammars.

CO 3: Demonstrate the understanding of key notions, such as algorithm, computability, decidability, and complexity through problem solving.

CO 4: Prove the basic results of the Theory of Computation.

CO 5 :State and explain the relevance of the Church-Turing thesis.



17/5

ESHAN COLLEGE OF ENGINEERING

CT-2 EVEN SEM

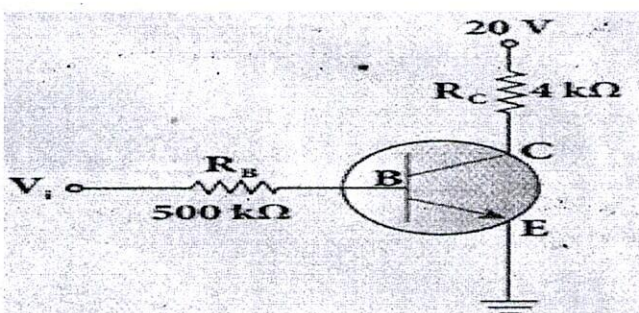
Year: IST YEAR Branch: ALL

Max. Time: 1.30hrs.

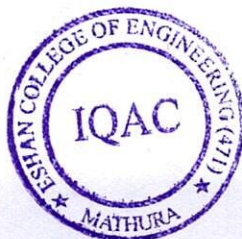
Subject Code: KEC201T

Max. Marks: 30

Subject Name: EMERGING DOMAIN IN ELECTRONICS ENGG

Q. no.	Question	MARKS	COURSE OUTCOME
SEC-A Attempt all parts:		(2X5=10)	
1	What Is BJT? Draw the symbol of npn & pnp transistor.	2	CO-2
2	Draw pnp CE transistor in active region.	2	CO-2
3	Why the Q-point varies in transistors.	2	CO-2
4	Differentiate between Depletion and Enhancement type MOSFET.	2	CO-2
5	Draw the Drain V-I characteristics of n channel JFET.	2	CO-2
SEC-B Attempt all parts:		(4X5=20)	
1	Show the biasing arrangement for the NPN CE configuration so that it works in active region. Describe characteristics for CE configuration. Label all variables and also indicate the regions.	4	CO-2
2	In the circuit shown in the figure, the input voltage V_i is 20 V, $V_{BE} = 0$ V and $V_{CE} = 0$ V. What are the values of I_B , I_C , β ? 	4	CO-2
3	Explain drain characteristics of JFET with ohmic region, saturation region, cut-off Region and break down region.	4	CO-2
4	Explain the working of positive clamper with proper circuit diagram and draw the waveforms at input & output of clamper.	4	CO-1
5	Illustrate how LCD is differing from LED.	4	CO-1
CO-1	Understand the concept of PN Junction and devices.		
CO-2	Understand and analyze the concept of BJT, FET and MOSFET.		

*****BEST OF LUCK*****



only (Ct)
17/1

Eshan College of Engineering

B-Tech - IV Semester (Branch-Civil Engineering)

Paper Code:-KAS401

Time:1:30 Hours

Subject-Engg Mathematics-III

Total Mark :30

Section-A

Note: Attempt all parts of the following

2x5=10

1) Find the inverse Laplace transforms of $\frac{4p+15}{16p^2-25}$	CO2
2) Find the Fourier sine transform of $\frac{1}{1+x^2}$	CO2
3) Find Fourier cosine transform $F(x)=\begin{cases} x & 0 < x < \frac{1}{2} \\ 1-x & \frac{1}{2} < x < 1 \\ 0 & x > 1 \end{cases}$	CO2
4) Find the inverse Laplace transforms of $\log\left(1 + \frac{1}{p^2}\right)$	CO2
5) Show that $L^{-1}\left(\frac{1}{p} \sin \frac{1}{p}\right) = t - \frac{t^3}{(3!)^2} + \frac{t^5}{(5!)^2} - \frac{t^7}{(7!)^2} + \dots$	CO2

Section-B

Note: Attempt all parts of the following

4x5=20

1) Use convolution theorem to $L^{-1}\left(\frac{P}{(p^2+4)^2}\right)$	CO2
2) Find the fourier transform of e^{-ax^2} where $a > 0$	CO2
3) Using Fourier integral representation $\int_0^\infty \frac{\omega \sin x \omega}{1+\omega^2} d\omega = \frac{\pi}{2} e^{-x}, x > 0$	CO2
4) Solve the differential equation $y''-3y'+2y=4t+e^{3t}$, where $y(0)=1$ and $y'(0)=-1$	CO2
5) Using Laplace transform $(D^2+2D+5)y=e^{-t}\sin t$, where $y(0)=0$ and $y'(0)=1$	CO2

Note:-

Course Outcomes-1 (CO-1): Remember the concept of Laplace transform and apply in solving real life problems.



Eshan College of Engineering

31/8
150

Paper Code:-KAS102T
Time:1:30 Hours

B-Tech -I Semester

Subject-Engg Chemistry
Total Marks: 30

Section-A

Note: Attempt all parts of the following

2x5=10

1) Arrange the following molecules or ions in increasing order of bond length. O_2 , O_2^+ & O_2^-	CO1
2) Explain impurity defects.	CO1
3) Why O_2 is paramagnetic and N_2 is diamagnetic?	CO1
4) Define Schotky defect. Give example.	CO1
5) Explain why N_2 is diamagnetic while O_2 is paramagnetic	CO1

Section-B

Note: Attempt all parts of the following

4x5=20

1) Write the criteria for a molecule to show Raman, IR, Rotational and UV Spectra.	CO1
2) (i) Explain types of Non stoichiometric defects with examples. (ii) Calculate bond order, magnetic behavior and order of stability of NO , NO^- , NO^+	CO1
3) Explain the applications of Graphite and comment upon the electrical and lubrication property of Graphite?	CO1
4) With the help of molecular orbital diagram, explain the paramagnetic character of O_2 and diamagnetic character N_2 .	CO1
5) What is Fullerene? Indicating the method of preparations, properties and their application?	CO1

Corse outcomes

CO 1: Use of different analytical instruments

