

02/11/2019

**K. J. Somaiya College of Engineering, Mumbai-77
(Autonomous College Affiliated to University of Mumbai)**

Semester: July 2019 - November 2019

Max. Marks: 30

Class: SY

Branch:IT

Full Name of the Course: Digital Systems

Note: Assume suitable data wherever necessary

Duration: 1hr.15 min.

Semester: III

Test 2

Course Code:2UIC304

Q No.		Max. Marks
Q1	<p>Design a Combinational Logic circuit using any suitable MSI device to meet following conditions:</p> <p>In ABC private limited company, there are Two Entrance Gates to the two different departments namely, RnD department and Production Department.</p> <p>The RnD employees ID card ^{is} valid for opening entrance gate of both the departments, But Production Department employees are not allowed in RnD department; Hence Production Department ID card is restricted at RnD Department Entrance Gate.</p> <p>Any of the Entrance Gate must be opened only if any of the following condition is true.</p> <ol style="list-style-type: none"> 1. If the valid ID card is swiped at the scanning machine 2. If there is Fire Alarm activated in Premises. 3. If the CEO of Company turns ON the master control switch to deactivate locking system of all the doors in case of emergency. 	10
Q2	<p>Design a Synchronous Decade Counter using T Flip-flops. Explain its working with Timing Diagrams</p> <p style="text-align: center;">OR</p> <p>Design a 3 bit SIPO Shift register using suitable flipflops.</p>	10
Q3	<p>Design a 4 bit binary to gray code decoder.</p>	10

10:00 - 11:15 am
28/09/2019

K. J. Somaia College of Engineering, Mumbai-77
(Autonomous College Affiliated to University of Mumbai)

Semester: July 2019 - Nov 2019

Max. Marks: 30

Class: SY B.Tech.

Branch: IT

Course: Discrete and Applied Mathematics

Duration: 1 hr 15 min

Semester: III

Test1

Course code :2UIC301

Question No.	NOTE: 1. All questions are compulsory 2. Figures to the right indicate marks	Max. Marks
Q1	Attempt any Three of the following questions	
(a)	Find the inverse laplace transform of $\frac{s}{(s^2 + 1)(s^2 + 4)(s^2 + 9)}$	05
(b)	Find the laplace transform of $f(t) = \sin pt , t \geq 0$	05
(c)	Evaluate $\int_0^\infty e^{-3t} t J_0(4t) dt$ where $L[J_0(t)] = \frac{1}{\sqrt{s^2 + 1}}$	05
(d)	Find the laplace transform of $e^{-4t} \int_0^t u \sin 3u du$	05
Q2 (A)	Obtain Complex form of Fourier Series for $f(x) = e^{ax}$ in $(-l, l)$ where a is not an integer.	07
(B)	Attempt any One of the following questions	
(a)	Find the Fourier series for $f(x) = \frac{3x^2 - 6x\pi + 2\pi^2}{12}$ in $(0, 2\pi)$ Hence deduce that $\frac{\pi^2}{6} = \frac{1}{1^2} + \frac{1}{2^2} + \frac{1}{3^2} + \frac{1}{4^2} \dots$	08
(b)	Show that in the interval $0 < x < \pi$, $\sin x = \frac{2}{\pi} - \frac{4}{\pi} \left[\frac{\cos 2x}{2^2 - 1} + \frac{\cos 4x}{4^2 - 1} + \dots \right]$	08

21/09/2019

**K. J. Somaiya College of Engineering, Mumbai-77
 (Autonomous College Affiliated to University of Mumbai)
 Semester: July 2019 - November 2019**

Max. Marks: 30

Class: S.Y. B. Tech

Branch: I.T.

Full Name of the Course: Data Communication and Networking

Note: Assume suitable data wherever necessary

Draw neat diagrams

Duration: 1hr.15 min.

Semester: III

Test 1

Course Code: 2UIC305

Q No.		Max. Marks
Q1(a)	Define Topology. Explain Star and Bus topologies with their disadvantages?	05
Q1(b)	Differentiate between ISO and TCP model ?(any 5 points)	05
Q2(a)	Describe Client server paradigm with neat diagram.	05
Q2(b)	Draw and explain the header structure of HTTP, FTP, DNS, SMTP, IMAP4. (any one)	05
Q3(a)	Draw UDP header and explain all the fields in brief? OR Draw and explain TCP state transition diagram.	05
Q3(b)	TCP is a reliable protocol. Justify the statement?	05

2.00 - 3.15 pm
21/09/19

**K. J. Somaiya College of Engineering, Mumbai-77
(Autonomous College Affiliated to University of Mumbai)**

Semester: July 2019 - November 2019

Max. Marks: 30

Class: SYIT-A,B

Branch: IT

Full Name of the Course: Digital Systems

2UIC304

Note: Assume suitable data wherever necessary

Duration: 1hr.15 min.

Semester: III

Test 1

Course Code:

Q No.		Max. Marks
Q1A	Perform the following number conversions as indicated:- (a) Decimal 175.175 to binary (b) Octal 12121 to decimal (c) Hexadecimal FFFF to decimal	06
Q1B	Explain with an example the rules for BCD addition ---- OR ---- Explain with examples one's complement and two's complement subtraction.	04
Q2	Express the following Boolean expression in Canonical POS form: $F(a,b,c,d) = (a+b)(c+d)(a'+b+d)$ ---OR--- Find the complement of $F = x +yz$; Then show that $F \cdot F' = 0$ and $F + F' = 1$	10
Q3	Reduce the following expression using table method (Quine-McKluskey method): $F(a,b,c,d) = \sum m(0,2,8,10) + \sum d(1,3,5,7)$. Also identify the Essential Prime Implicants.	10

K. J. Somaiya College of Engineering, Mumbai-77
(Autonomous College Affiliated to University of Mumbai)
Semester: July 2019 – Nov 2019

Max. Marks: 30

Class: SYBTECH

Branch: IT

Full Name of the Course: Database Management System

Duration: 1hr.15 min.

Semester: III

Test 1

Course Code: 2UIC303

Note: Assume suitable data wherever necessary

Q No.		Max. Marks	Bloom taxonomy
Q1	<p>Design a database for an automobile company to provide to its dealers to assist them in manufacturing customer records and dealer inventory and to assist sales staff in ordering cars.</p> <p>Each vehicle is identified by Vehicle Identification Number(VIN) . Each individual vehicle is a particular model of a particular brand offered by the company. For example the XF is a model of the car brand JAGUAR of TATA Motors.</p> <p>Each model can be offered with a variety of options but an individual car may have only one(or none) of the available options . The database needs to store information about models, brands and options as well as information about individual dealers, customers and cars.</p> <p>Your design should include an ER diagram depicting appropriate constraints.</p>	10	
Q2	<p>Explain following relational algebra operations with suitable example.</p> <p>OUTER JOIN</p> <ul style="list-style-type: none"> • Left Outer Join($A \bowtie B$) • Right Outer Join: ($A \bowtie B$) • Full Outer Join: ($A \bowtie B$) 	05	
Q3	<p>Consider given relational schema and write following SQL queries.</p> <p>Employee(<u>emp_name</u>, street, city) Works(<u>emp_name</u>, <u>Company_name</u>, Salary) Company(<u>Company_name</u>, city) Manages(<u>emp_name</u>, Manager_name)</p> <ol style="list-style-type: none"> 1. Find all the employees in the database who do not work for “TOYO tech” 2. List names of employee who reside in the city name of which starts with letter ‘p’ 3. Find name and address(street) of the employees who works 	05	

10.00 - 11:15 am

14/04/19

K. J. Somaiya College of Engineering, Mumbai-77
(Autonomous College Affiliated to University of Mumbai)

Semester: July 2019 - November 2019

Max. Marks: 30

Class: SY BTech

Branch: IT

Full Name of the Course: Data Structures

Note: Assume suitable data wherever necessary

Duration: 1hr.15 min.

Semester: III

Test 1

Course Code:2UIC302

Q. No.		Max. Marks
Q1 A	<p>Consider the following code/fuction that takes Queue as an argument and uses Stack for processing</p> <pre>void fun(Queue *Q) { Stack S; while (!isEmpty(Q)) { push(&S, deQueue(Q)); } while (!isEmpty(&S)) { enQueue(Q, pop(&S)); } }</pre> <p>Interpret the above function.</p>	03
Q1 B	Write the ADT specification of Queue.	03
Q2 A	<p>Write the pseudo code for the following</p> <ol style="list-style-type: none">Delete the given element from a singly linked listInsert an element at the end of doubly linked list <p style="text-align: center;">OR</p> <p>Write the pseudo code for the following</p> <ol style="list-style-type: none">Enqueue an element from linear queueDequeue an element from linear Queue	06
Q2 B	Show the contents of the stack in the conversion of given Infix expression into postfix form $A+(((B-C)*(D-E)+F)/G)^{(H-J)}$	08
Q3	<p>Design a solution by identifying an appropriate data structure for implementing Undo and Redo feature for the text editor.</p> <p>Give the following</p> <ol style="list-style-type: none">Identify the data structure and explain the approach.Write the pseudo code for the Undo and Redo operationsIllustrate with an example.	10 (2+5+3)

for a company situated in Mumbai city and takes salary more than 20K

Q.4

What is normalization? What is need for normalization? Explain 1NF, 2NF and 3 NF with suitable examples.

10

2/2



Maximum Marks: 30		Semester: July 2023-October 2023 Examination: In-Semester Examination	Duration: 1hr. 15 min.
Programme code: 04 Programme: B. Tech Information Technology		Class: SY	Semester: III (SVU 2020)
Name of the Constituent College: K. J. Somaiya College of Engineering		Name of the department: IT	
Course Code: 116U04C301		Name of the Course: Discrete and Applied Mathematics	

Question No.		Max. Marks
Q.1	Attempt any THREE of the following	
(a)	Find the Laplace transform of $f(t) = t e^t \sin 2t \cos t$	06
(b)	Evaluate $\int_0^\infty \frac{\cos 6t - \cos 4t}{t} dt$ using Laplace transforms.	06
(c)	Find the inverse Laplace transforms of $\left(\frac{1}{(s-2)(s+2)^2}\right)$	06
(d)	Find the inverse Laplace transforms of $\log\left(1 + \frac{1}{s^2}\right)$	06
Q.2	Attempt any ONE of the questions set (a) or (b)	
(a)	(i) Write the Fourier series of $f(x)$ in the interval $0 \leq x \leq 2\pi$ and formula for Fourier constants a_0 , a_n and b_n . (ii) For $f(x) = \left(\frac{\pi-x}{2}\right)^2$, $0 \leq x \leq 2\pi$ obtain Fourier constants a_0 , a_n and b_n (iii) Write the Fourier series of $f(x) = \left(\frac{\pi-x}{2}\right)^2$ in the interval $0 \leq x \leq 2\pi$	01 05 01
	(iv) Deduce $\frac{\pi^2}{6} = \frac{1}{1^2} + \frac{1}{2^2} + \frac{1}{3^2} + \frac{1}{4^2} + \dots$ from Fourier series	01
	(v) Deduce $\frac{\pi^2}{12} = \frac{1}{1^2} - \frac{1}{2^2} + \frac{1}{3^2} - \frac{1}{4^2} + \dots$ from Fourier series	01
	(vi) Deduce $\frac{\pi^2}{8} = \frac{1}{1^2} + \frac{1}{3^2} + \frac{1}{5^2} + \frac{1}{7^2} + \dots$	01
	(vii) By using Parseval's identity prove that $\frac{\pi^4}{90} = \frac{1}{1^4} + \frac{1}{2^4} + \frac{1}{3^4} + \frac{1}{4^4} + \dots$	02

(b)	(i) Define Even function. Examine for $f(x) = x^2, -\pi \leq x \leq \pi$	01
	(ii) Write the Fourier series of even function $f(x)$ in the interval $-\pi \leq x \leq \pi$ and formula for Fourier constants a_0 and a_n	01
	(iii) For $f(x) = x^2, -\pi \leq x \leq \pi$ obtain Fourier constants a_0 and a_n	04
	(iv) Write the Fourier series of $f(x) = x^2$ in the interval $-\pi \leq x \leq \pi$	01
	(v) Deduce $\frac{\pi^2}{6} = \frac{1}{1^2} + \frac{1}{2^2} + \frac{1}{3^2} + \frac{1}{4^2} + \dots$ from Fourier series	01
	(vi) Deduce $\frac{\pi^2}{12} = \frac{1}{1^2} - \frac{1}{2^2} + \frac{1}{3^2} - \frac{1}{4^2} + \dots$ from Fourier series	01
	(vii) Deduce $\frac{\pi^2}{8} = \frac{1}{1^2} + \frac{1}{3^2} + \frac{1}{5^2} + \frac{1}{7^2} + \dots$	01
	(viii) By using Parseval's identity prove that $\frac{\pi^4}{90} = \frac{1}{1^4} + \frac{1}{2^4} + \frac{1}{3^4} + \frac{1}{4^4} + \dots$	02



12/09/2023



Semester: July 2023-October 2023

Examination: In-Semester Examination

Duration :1Hr:15 Min

Maximum Marks: 30

Programme code: 04

Programme: B. Tech. IT

Class: SY

Semester: III (SVU 2020)

Name of the Constituent College:

K. J. Somaiya College of Engineering

Name of the department: COMP/IT

Course Code: 116U04C302

Name of the Course: Data Structures

Question No.		Max. Marks
Q1	A. Define ADT. Discuss any two advantages of ADT. B. Suggest and justify appropriate data structures for following :- a. 'Continue watching' list in OTT app platform b. Entry and exit from a stadium having two gates both permitting entry and exit	5+5
Q2	Convert the expression given below into its corresponding postfix expression and then evaluate it using stack operation. $10^3 + (2+6) * (12-6) / ((7 - 5) + 10)$	10
Q3	Discuss & Write the algorithms/pseudocode to implement following operations on circular singly linked list (CLL). a. Insertion at beginning b. Deletion after a given node OR Write Algorithm/Pseudo code for Priority Queue Insertion Operation and Deletion operation. (List must be sorted on priority of element with the highest priority element at the front)	10

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13/09/2023



SOMAIYA
VIDYAVIHAR UNIVERSITY

Maximum Marks:	30	Semester: July 2023-October 2023	Examination: In-Semester Examination	Duration: 1.15hr
Programme code:	04			
Programme:	BTech. IT		Class: SY	Semester: III (SVU 2020)
Name of the Constituent College:	K. J. Somaiya College of Engineering		Name of the department:	
Course Code:	116U04C303	Name of the Course: Database Management Systems		

Q1	<p>For the relational schema given below</p> <p>Suppliers(<u>sid</u>, sname, address)</p> <p>Parts(<u>pid</u>, pname, color)</p> <p>supplies(<u>sid</u>, <u>pid</u>, cost)</p> <p>1. Draw ER diagram and show primary key, cardinality and participation constraints (4M)</p> <p>2. Answer the following questions (6M)</p> <ol style="list-style-type: none"> 1. Write create table queries for these 3 relations and specify desire constraints (at least 2). 2. Find the names of suppliers who reside in Mumbai. 3. Give details of supplier name, address, part name for green color part supplier. 	10
2	Explain logical and physical independence with proper example	5
3	Differentiate simple and complex views OR Write SQL queries using different aggregate functions (2 queries)	5
4	Define primary key, super key, check constraint, unique constraint, and domain constraints	5
	Explain different types of Database System users with example. OR Draw neat diagram for Database System structure.	5

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14/09/2023



Semester: July 2023-October 2023

Examination: In-Semester Examination

Duration :1hr15mins

Maximum Marks: 30

Programme code: 04

Programme: BTech-IT

Class: SY

Semester:III (SVU2020)

Name of the Constituent College:

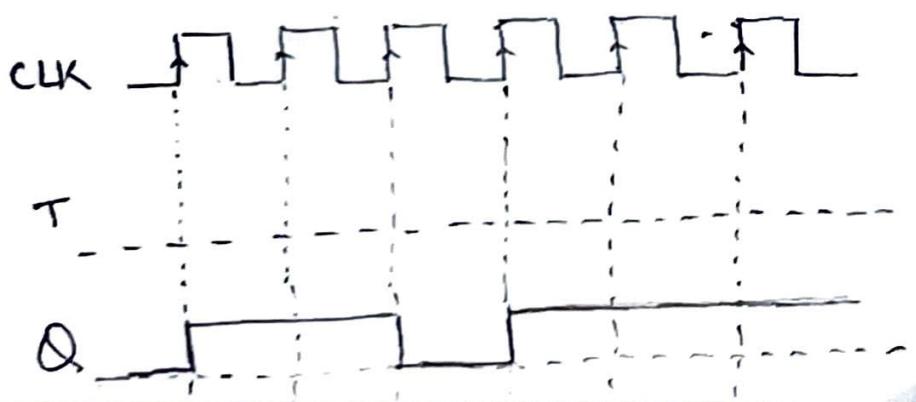
K. J. Somaiya College of Engineering

Name of the department: IT

Course Code: 116U03C304

Name of the Course: Digital Systems

Quest ion No.		Max. Marks
Q1A	<ul style="list-style-type: none"> (i) Write the binary number $(1110010)_2$ in octal and hexadecimal form. (02) (ii) Add the two BCD numbers 55 and 45 and show all steps clearly. (02) (iii) Add the numbers (+1) and (-1) using 1's complement and two's complement arithmetic. (02) 	
Q1B	<p>Answer ANY TWO:</p> <ul style="list-style-type: none"> (i) Using Boolean properties simplify the expression $F(x, y, z) = x'y + (xyz)'$ (02) (ii) Write the expression $E(p, q, r) = p.q + q.r$ in NOR form. (02) (iii) Write the expression $Y = (ab)' + (b+c)'$ in standard SOP form. (02) 	(02x2)
Q2	<ul style="list-style-type: none"> (i) Implement the expression $F(p, q, r) = (p+q)' + (q+r)' + (p+r)'$ using an 8:1 multiplexer. (05) (ii) Use the K-map method to minimize the following Boolean expression: $S(a, b, c, d) = \pi M(1, 2, 3, 9, 10, 11)$ --- OR --- (10) 	(05) ---OR--- (10)
Q3	<ul style="list-style-type: none"> (i) Write the expression $Y(a, b) = (a \oplus b)$ in NAND form and draw the circuit. (04) (ii) Draw the circuit diagram of a T flip flop. (06) See the timing diagram below. Assume the clock is active on the positive edge (i.e. positive edge triggered). To achieve the output waveform Q shown below, what changes are required at the input T? Draw the completed diagram. 	



15/09/2023



Semester: July 2023-October 2023

Maximum Marks: 30	Examination: In-Semester Examination	Duration : 1.15 hours
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Programme code: 04	Class: SY	Semester: III (SVU 2020)
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Name of the Constituent College: K. J. Somaiya College of Engineering	Name of the department: IT
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Course Code: 116U04C305	Name of the Course: Data Communication and Networking
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Question No.		Max. Marks
Q1 (a)	<p>Define Topology. Explain Star and Ring topologies with their disadvantages?</p> <p>OR</p> <p>Explain any five factors that determine whether a communication system is LAN or MAN.</p>	05
Q1 (b)	Explain any five networking devices and also write the name of layer where they are useful.	05
Q2	<p>Alice and Bob are connected to their organization mail server via LAN or WAN. Alice wants to send a mail to Bob over the internet. Draw neat diagram for Email architecture showing one way email exchange with proper labelling.</p> <p>Explain the architecture, specifically the application programs/protocol used at various stages.</p> <p>OR</p> <p>i) Differentiate between Client Server V/S Peer to Peer model based on stability, server, service, performance and security?</p> <p>ii) Explain the purpose of DNS protocol with the help of diagram? Explain any two domains of the DNS in brief?</p>	10
Q3	<p>The following is a dump of a UDP header in the hexadecimal format.</p> <p>06 32 00 0D 00 1C E2 17</p> <p>(i) What is the source port number? (ii) What is the destination port number? (iii) What is the length of the data? (iv) Is the packet directed from a client to server or vice versa? Justify the answer. (v) List any two fields in the TCP header that are missing in UDP header.</p>	10

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16/09/2023



Semester: July 2023 – Oct 2023
Examination: In-Semester Examination Duration :1Hr 30Min

Maximum Marks: 30**Programme code: 04****Programme: Btech IT****Class: SY****Semester: III
(SVU 2020)****Name of the Constituent College:****K. J. Somaiya College of Engineering****Name of the department: IT****Course Code: 116h65C301****Name of the Course:Cyber Law-Honor**

Question No.		Max. Marks
Q1	Explain any 5 offences of IT Act 2000 and its punishments.	10
Q2	Explain the classification of cybercrime with proper examples OR Differentiate between Copy right and patent with its definition, process, clauses and benefits.	10
Q3	Categories following in to patent, copyright and trade mark with justification. 1. A prototype model to measure pollution in particular area. 2. A song composed by particular music director. 3. Logo of Amazon shopping site. 4. A technical paper published with new Machine learning algorithm. 5. Painting of particular artist	10

1/1

16/9/23



Semester: July 2023-October 2023

Examination: In-Semester Examination

Duration :1Hr.15Min

Maximum Marks:30

Programme code: 04

Programme: B.Tech IT with Honour in AI

Class: SY

Semester: III (SVU 2020)

Name of the Constituent College:

K. J. Somaiya College of Engineering

Name of the department: IT

Course Code: 116h66C301

Name of the Course: Fundamental of Data Science(FDS)

Que stio n No.	NOTE: <ol style="list-style-type: none">All Questions are compulsory.Choose suitable options and mention it on answer sheetAssume suitable data wherever required and mention it .	Max. Mark s	CO	BT														
Q1	<p>Answer the following Questions (Any two)</p> <p>A. State different kinds of attributes available in Data Science? What are the major differences among them? Give suitable example for each kind.</p> <p>B. What are the data science applications in healthcare and disaster management domain?</p> <p>C. Find Mean Mode, Median, range and Standard Deviation for given height data?</p> <table border="1"> <thead> <tr> <th>Height (cm)</th><th>Frequency</th></tr> </thead> <tbody> <tr> <td>90 < h ≤ 100</td><td>5</td></tr> <tr> <td>100 < h ≤ 110</td><td>22</td></tr> <tr> <td>110 < h ≤ 120</td><td>30</td></tr> <tr> <td>120 < h ≤ 130</td><td>31</td></tr> <tr> <td>130 < h ≤ 140</td><td>18</td></tr> <tr> <td>140 < h ≤ 150</td><td>6</td></tr> </tbody> </table>	Height (cm)	Frequency	90 < h ≤ 100	5	100 < h ≤ 110	22	110 < h ≤ 120	30	120 < h ≤ 130	31	130 < h ≤ 140	18	140 < h ≤ 150	6	05	CO1	UN
Height (cm)	Frequency																	
90 < h ≤ 100	5																	
100 < h ≤ 110	22																	
110 < h ≤ 120	30																	
120 < h ≤ 130	31																	
130 < h ≤ 140	18																	
140 < h ≤ 150	6																	
Q2	<p>The goal scored by Argentina's Football Team in a IVY league of 12 matches –</p> <p>10,12,11,15,11,14,13,17,12,22,14,11</p> <p>Draw whisker plot(Box Plot) for given data? What is outlier for given data? What do you interpret from the obtained Whisker plot?</p>	10	CO2	AN														

What is ANOVA? How ANOVA is superior to its descendent approaches? Calculate the ANOVA coefficient for the following data:

Plant	Number	Average span	Std. deviation
Hibiscus	5	12	2
Marigold	5	16	1
Rose	5	20	4

OR

What is skewness? Observe the following data :

The following table gives the 100 number of student obtained there marks are as follows:

No. of student	10	20	30	40	50	60	70	80
	-	-	-	-	-	-	-	-
	20	30	40	50	60	70	80	90
Marks Obtained	15	13	12	18	12	13	9	8

Find Bowley's coefficient of skewness for above given data? What you interpret from the obtained skew?

10 CO2 AN

10 CO2 AN