Course Code: ITC304   Course Name: Database Management System

Time: 2 hour   Max. Marks: 80

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Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry equal marks
1.	While mapping the relationship sets, a separate relation is created for which type of cardinality?
Option A:	one to many
Option B:	many to many
Option C:	one to one
Option D:	many to one
2.	Which of the following statement is false regarding DBMS?
Option A:	Integrity constraints can be easily incorporated
Option B:	Security problems can be tackled effectively
Option C:	It is difficult to access the data using DBMS
Option D:	Concurrent access by multiple users is possible
3.	In Physical data independence one can_____
Option A:	modify the physical schema without changing logical schema
Option B:	modify the physical schema without changing view level schema
Option C:	modify the logical schema without changing physical schema
Option D:	modify the logical schema without changing view level schema
4.	Weak Entity set
Option A:	Do not have sufficient attributes
Option B:	Do not have partial key
Option C:	Do not have sufficient attributes to form primary key
Option D:	Do not have attributes at all
5.	In ER Model with three entities Person, Employee and Customer, a Person can be either Employee or Customer. This represents which constraint on Specialization?
Option A:	Disjoint
Option B:	Overlapping
Option C:	Total
Option D:	Partial
6.	Which of the following is benefit of using ER Model?
Option A:	Reduce data
Option B:	Increase number of attributes
Option C:	Exploring alternatives
Option D:	Exploring Product and process

7.	In ER Diagram, Derived Attributes are represented by
Option A:	Ellipse
Option B:	Double Ellipse
Option C:	Dashed Ellipse
Option D:	Dotted Ellipse
8.	Which of the following operation provides all possible combinations of the tuples from the left and right-side relations, as the output –
Option A:	Inner Join
Option B:	Cartesian Product
Option C:	Left Outer Join
Option D:	Set Difference (Minus)
9.	There are two relations named PG_Students and Instructors There are PG_Students who are Instructors as well as who are not Instructors. It is needed to find out PG_Students who are NOT Instructors, which is the most suitable operation to get this result –
Option A:	Set Difference or Minus
Option B:	Cartesian Product
Option C:	Union
Option D:	Intersection
10.	Which of the following statement is TRUE about the Normalization process –
Option A:	It considers common Tuples
Option B:	It's based on Functional Dependency/Primary Keys
Option C:	It increases the Anomalies
Option D:	It increases the Redundancy
11.	SQL command to remove data from table is _____
Option A:	drop table <tablename>
Option B:	delete table <tablename>
Option C:	drop from <tablename>
Option D:	delete from <tablename>
12.	If every non-key attribute is functionally dependent on the primary key, the relation will be in
Option A:	1NF
Option B:	2NF
Option C:	3NF
Option D:	BCNF
13.	Group by is used to group the tuples of a relation based on an attribute or group of attribute. It is always combined with _____
Option A:	where clause
Option B:	aggregation function
Option C:	in clause
Option D:	wild card operator
14.	Which of the following statement is TRUE, in respect of 3NF (Third Normal Form) and BCNF (Boyce-Codd Normal Form) –

Option A:	Both have identical constraints
Option B:	3NF is more stringent than BCNF
Option C:	BCNF is more stringent than 3NF
Option D:	3NF and BCNF are independent of each other
15.	The char datatype in SQL stores
Option A:	Fixed length string
Option B:	Variable length String
Option C:	Any length string
Option D:	Do not store string
16.	Which of the following statement is incorrect?
Option A:	The select clause is used to list the attributes desired in the result of a query.
Option B:	The from clause is a list of the relations to be accessed in the evaluation of the query.
Option C:	The select clause do not allow use of any special character
Option D:	The where clause is a predicate involving attributes of the relation in the
17.	Which of the following query is correct?
Option A:	Select avg(sal), company_name from works where company_name='SBI'
Option B:	Select avg(sal), company_name from works group by company_name
Option C:	Select avg(sal), company_name from works having company_name='SBI'
Option D:	Select avg(sal) from works having company_name='SBI'
18.	Hash Indices
Option A:	Are based on a sorted ordering of the values.
Option B:	Are based on numerical values only
Option C:	Are based on string type of values only
Option D:	Are based on a uniform distribution of values across a range of buckets.
19.	Sparce Index
Option A:	Impose more space for insertion and deletion
Option B:	Impose more overhead on insertions and deletions
Option C:	Requires Massive space
Option D:	Requires Less Space
20.	In hashing, overflow handling by providing overflow bucket is called as
Option A:	Overflow chaining
Option B:	Open Hashing
Option C:	Linear Probing
Option D:	Dynamic Hashing

Q2		
A	**Solve any Two**	**5 marks each**
i.	Explain levels of abstraction.	
ii.	Explain aggregate functions in SQL.	
iii.	Explain Sparce and Dense index with example.	
B	**Solve any One**	**10 marks each**
i.	Draw ER diagram for Hospital Management System	
ii.	Consider a relation as: CAR-SALE(Car #, Date-sold,salesman#,commission%,discount-amt) Assume that {Car#,salesman#} is the primary key. Additional dependencies are : Date-sold -> Discount-amt Salesman# ->commission% Based on the given primary key, is this relation in 1NF, 2NF or 3NF? Why or Why not? How would you successively normalize it completely?	

Q3		
A	**Solve any Two**	**5 marks each**
i.	Explain how various types of attributes are mapped while converting ER to relational schema.	
ii.	Explain 3NF and BCNF with example.	
iii.	Explain Specialization and generalization.	
B	**Solve any One**	**10 marks each**
i.	Explain any five relational algebra operators	
ii.	Consider a relation given below and answer the queries: Location (LocationId, RegionalGroup) Department (DeptId,Name, LocationId) Employee(EmpId, LastName, FirstName, MiddleName, JobId, ManagerId, HireDate, Salary, Commission, DeptId) Queries: 1. List out first name, last name, salary, commission for all employees 2. List out the employees who are working in department 'Sales' 3. Display the employee who got the maximum salary. 4. Give all employees of 'Sales' department 20% rise 5. Write a view on above relation.	

Course Code: ITC304   Course Name: Database Management System

Time: 2 hour   Max. Marks: 80

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Question Number	Correct Option (Enter either 'A' or 'B' or 'C' or 'D')
Q1.	B
Q2.	C
Q3.	A
Q4	C
Q5	A
Q6	C
Q7	C
Q8.	B
Q9.	A
Q10.	B
Q11.	D
Q12.	B
Q13.	B
Q14.	C
Q15.	A
Q16.	C
Q17.	B
Q18.	D
Q19.	D
Q20.	A

University of Mumbai
Examination June 2021
Program: **Information Technology**
Curriculum Scheme:2016
Examination: SE Semester III
Course Code:ITC303 and Course Name:Data structure Algorithm

Time: 2 hour   Max. Marks: 80

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Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry equal marks
1.	Which one of the following is the process of inserting an element in the stack?
Option A:	Insert
Option B:	Push
Option C:	Pop
Option D:	Delete
2.	When the user tries to delete the element from the empty stack then the condition is said to be a _____
Option A:	Underflow
Option B:	Overflow
Option C:	Garbage collection
Option D:	Full
3.	Which of the following is not the application of stack?
Option A:	A parentheses balancing program
Option B:	Tracking of local variables at run time
Option C:	Compiler Syntax Analyzer
Option D:	Data Transfer between two asynchronous process
4.	When we say an algorithm has a time complexity of O(n), what does it mean?
Option A:	The algorithm has 'n' nested loops.
Option B:	The computation time taken by the algorithm is proportional to n.
Option C:	The algorithm is 'n' times slower than a standard algorithm.
Option D:	There are 'n' number of statements in the algorithm.
5.	The amount of memory needs to run to completion is known as __.____
Option A:	Space complexity
Option B:	worst case
Option C:	Time complexity
Option D:	Best case
6.	___is the minimum number of steps that can be executed for the given parameters.
Option A:	Average case
Option B:	Worst case
Option C:	Time complexity
Option D:	Best case

7.	In the worst case the time required to search an element in a linked list of length n is?
Option A:	O(n)
Option B:	O(log2 n)
Option C:	O(1)
Option D:	O(n2)
8.	The data structure linked list is?
Option A:	Random access structure
Option B:	Sequential access structure
Option C:	Random and sequential both type of structure
Option D:	Other type of data structure but neither random nor sequential type structure
9.	Which type of linked list contains a pointer to the next as well as the previous node in structure?
Option A:	Singly linked list
Option B:	Doubly Linked Lists
Option C:	Circular linked list
Option D:	Priority linked list
10.	A type of queue, where insertion is allowed from both ends and deletion is allowed from only one end is called as?
Option A:	Input restricted double ended queue
Option B:	Output restricted double ended queue
Option C:	Priority queue
Option D:	Circular queue
11.	In a normal queue, insertion is done at?
Option A:	Rear
Option B:	Front
Option C:	Back
Option D:	Top
12.	How many address pointer(s) do we need to change while deleting the last node of the queue implemented using a singly linked list?
Option A:	0
Option B:	1
Option C:	2
Option D:	3
13.	After creating max-heap of the given sequence which element will be at a[7] i.e. last position in array. 87,66,10,23,45,16,72,55
Option A:	16
Option B:	45
Option C:	10
Option D:	23
14.	Depth first traversal make use of which data structure
Option A:	Tree

Option B:	DQ
Option C:	queue
Option D:	Stack
15.	Which is important property Minimum cost spanning tree satisfies
Option A:	Cycle freeness.
Option B:	Closed loops
Option C:	Weighted closed loop
Option D:	Unweighted cycle
16.	What is a almost complete binary tree?.
Option A:	Each node has exactly zero or two children
Option B:	A binary tree, which is completely filled, with the possible exception of the bottom level, which is filled from right to left
Option C:	A tree In which all nodes have degree 2
Option D:	A binary tree, which is completely filled, with the possible exception of the bottom level, which is filled from left to right
17.	Which of the following statements is not true about breadth-first search (BFS) in an undirected graph starting at a vertex v?
Option A:	BFS identifies all vertices reachable from v.
Option B:	Using an adjacency list instead of an adjacency matrix can improves the worst case complexity to O(n + m
Option C:	BFS cannot be used to check for cycles in the graph
Option D:	BFS can be used to identify the furthest vertex from v in any graph, in terms of number of edges.

18.	An undirected graph G has 100 nodes and the minimum degree of any vertex is 3. Which of the following is the most precise statement we can make about m, the number of edges in G?
Option A:	m is at least 200
Option B:	m is at least 150
Option C:	m is at least 300
Option D:	m is at least 100
19.	What is necessary condition for binary search
Option A:	Input should be sorted
Option B:	Input can be random
Option C:	Input should be random
Option D:	Input can be sorted
20.	Let the keys 75,12,8,62,83,91,15 be hashed to a hash table of size 10 using a hash function h(x) = x mod 10. How many collisions shall occur during the hashing process
Option A:	2
Option B:	1

Option C:	3
Option D:	0

Q2. **(20 Marks)**	**Solve any Two Questions out of Three** **10 marks each**
A	What is stack ADT. Write an algorithm to implement a stack using an array.
B	Show with example what is collision and what are ways to handle collisions?
C	Explain the working of a double ended queue with its operations: insert, delete, display, empty, full. Proper diagrammatic representations of operations as mentioned above, are also expected.

Q3. **(20 Marks)**	**Solve any Two Questions out of Three** **10 marks each**
A	What is recursion? Explain it with an example. Also state the advantages and disadvantages of Recursion.
B	Write an algorithm for Quick sort . And comment on its complexity
C	Explain what is a circular linked list along with its operations: traversing, searching, insertion and deletion. Proper diagrammatic representations are also expected. Also, write two real world applications of it.

Program: **Information Technology**

Curriculum Scheme:2016

Examination: SE Semester III

Course Code:ITC303and Course Name: Data Structures & Algorithm

Time: 2 hour   Max. Marks: 80

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Question Number	Correct Option (Enter either 'A' or 'B' or 'C' or 'D')
Q1.	B
Q2.	A
Q3.	D
Q4	B
Q5	A
Q6	D
Q7	A
Q8.	B
Q9.	B
Q10.	B
Q11.	A
Q12.	C
Q13.	D
Q14.	D
Q15.	A
Q16.	D
Q17.	C
Q18.	B
Q19.	A
Q20.	A

University of Mumbai
Examination June 2021
Examinations Commencing from 15th June 2021
Program: **Information Technology**
Curriculum Scheme: Rev2016
Examination: SE Semester III

Course Code: ITC302   Course Name: Logic Design
Time: 2 hour   Max. Marks: 80

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Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry equal marks
Q1.	To work as an Amplifier transistor should operate in which region?
Option A:	Saturation region
Option B:	Cut-off region
Option C:	Active region
Option D:	Inverse-Active region
Q2.	A transistor has a β_{DC} of 240 and a base current, I_B, of 12 μ A. The collector current, I_C, equals:
Option A:	2.8A
Option B:	2.880mA
Option C:	2880mA
Option D:	28.8A
3.	To work as an OFF switch, transistor should operate in which region?
Option A:	Saturation region
Option B:	Cut-off region
Option C:	Active region
Option D:	Inverse-Active region
4.	The ASCII code is basically how many bits ?
Option A:	4 bits
Option B:	7 bits

Option C:	10 bits
Option D:	6 bits
5.	Which of the following are correct equation for half adder
Option A:	Sum= A+B, Carry= AB
Option B:	Sum = A xor B , Carry = AB
Option C:	Sum= A'B', Carry = A'B
Option D:	Sum = AB, Carry = A+B'
6.	Can a Multiplexer be used to implement logic of Encoder?
Option A:	Yes
Option B:	No
Option C:	Sometimes
Option D:	Depends on the number of inputs
7.	$(A + A \cdot B) = ?$
Option A:	0
Option B:	1
Option C:	A
Option D:	AB
8.	Which of the following could be used to implement given expression, Sum = $\sum m$ (1,2,4,7)
Option A:	Encoder
Option B:	Priority Encoder
Option C:	Decoder
Option D:	Subtractor
9.	7483 IC could be used to implement which of the following
Option A:	Multiplexer circuit
Option B:	Decimal to Octal converter

Option C:	4 bit parallel Adder
Option D:	XOR gate
10.	Hexadecimal of $(1287)_{10}$?
Option A:	$(4F7)_H$
Option B:	$(4F6)_H$
Option C:	$(4E9)_H$
Option D:	$(577)_H$
11.	If both the inputs are high(i.e. 1), what will be the output using NAND gate
Option A:	1
Option B:	0
Option C:	Could be 1 or 0
Option D:	Invalid output
12.	Which of the following is also known as Data selector.
Option A:	Dencoder
Option B:	Encoder
Option C:	DeMultiplexer
Option D:	Multiplexer
13.	**F(A,B,C,D)=∑(1,3,4,11,12,13,14,15) could be implemented using which of the following circuits**
Option A:	8X1 multiplexer
Option B:	16X1 multiplexer
Option C:	4 bit parallel adder
Option D:	1X4 demultiplxer
14.	Combinational circuit that establish the priority of competing inputs by outputting a binary code representing the highest-priority active input is called
Option A:	Select encoder
Option B:	Network Encoder

Option C:	Linear encoder
Option D:	Priority encoder
15.	The states of output in sequential circuits depends on
Option A:	Past output states
Option B:	Present input states
Option C:	Present input as well as past output
Option D:	Past output and past inputs
16.	Following flip flop is used to eliminate race around condition
Option A:	S R Flip flop
Option B:	Master Slave J K Flip flop
Option C:	J K Flip flop
Option D:	T Flip flop
17.	What is the preset condition for a ring shift counter?
Option A:	All FFs set to 1
Option B:	All FFs cleared to 0
Option C:	A single 0, the rest 1
Option D:	A single 1, the rest 0
18.	A decade counter skips which states
Option A:	binary states 1000 to 1111
Option B:	binary states 0000 to 0011
Option C:	binary states 1010 to 1111
Option D:	binary state 1111
19.	A package in VHDL consists of
Option A:	Commonly used architectures
Option B:	Commonly used tools
Option C:	Commonly used syntax and variables

Option D:	Commonly used data types and subroutines
20.	Which expression correctly represents architectural data flow of half subtractor
Option A:	DIFF <= A xor B; Borrow <= (not A) and B;
Option B:	DIFF <= A or B; Borrow <= (not A) and B;
Option C:	DIFF <= A xnor B; Borrow <= (not A) and B;
Option D:	DIFF <= A and B; Borrow <= (not A) and B;

Q2. **(20 Marks)**	**Solve any Two Questions out of Three** **10 marks each**
A	Explain Input & output characteristics of BJT.
B	Convert SR Flip flop to JK and T Flip Flop
C	Solve the given equation using K-maps. $f(w,x,y,z) = \sum m\ (0,2,5,7,8,10,13,15) + d(4)$ Realize the solved equation using logic gates.

Q3. **(20 Marks)**	**Solve any Two Questions out of Three** **10 marks each**
A	Explain the working of 4 bit bidirectional shift register
B	Convert $(2AB.7)_H$ into Decimal, Binary, Octal number, BCD, Gray and Excess-3 Code.
C	Explain with diagram, how can we implement a full adder using 2 half adders.

University of Mumbai
Examination June 2021
Examinations Commencing from 15th June 2021
Program: **Information Technology**
Curriculum Scheme: Rev2016
Examination: SE Semester III
Course Code: ITC302 and Course Name: Logic Design

Time: 2 hour   Max. Marks: 80

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Question Number	Correct Option (Enter either 'A' or 'B' or 'C' or 'D')
Q1.	C
Q2.	B
Q3.	B
Q4	B
Q5	B
Q6	A
Q7	C
Q8.	C
Q9.	C
Q10.	A
Q11.	B
Q12.	D
Q13.	A
Q14.	D
Q15.	C
Q16.	B
Q17.	D

Q18.	C
Q19.	D
Q20.	A

University of Mumbai

Examinations Commencing from 15ᵗʰ June 2021 to 24ᵗʰ June 2021
Program: BE (Information Technology)
Curriculum Scheme: Rev 2016 (CBCGS)
Examination: SE Semester III
Course Code: ITC301 and Course Name: Applied Mathematics III

Time: 2-hours   Max. Marks: 80

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Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry equal marks
1.	$I = \int_0^\infty e^{-t} \frac{\sin t}{\Box} dt$ then value of I is
Option A:	$\pi/2$
Option B:	$\pi/4$
Option C:	$-\pi/4$
Option D:	π
2.	On set of integers , a relation R is defined as aRb iff a ≤ b then which of the following is true ?
Option A:	R is equivalence
Option B:	R is symmetric
Option C:	R is not transitive
Option D:	R is reflexive
3.	$f : \mathbb{R} \to \mathbb{R}$ defined as $f(x) = 2x + 1$ for $x \in \mathbb{R}$. Find rule for $f^{-1}(x)$
Option A:	$f^{-1}(x) = \frac{x+1}{2}$
Option B:	$f^{-1}(x) = \frac{x-1}{2}$
Option C:	$f^{-1}(x) = 2x - 1$
Option D:	f^{-1} doesn't exist
4.	Inverse Laplace transform of $\frac{1}{s^2-2s+1}$ is
Option A:	$\Box^\Box$
Option B:	$\Box^{\Box}$
Option C:	$\sin \Box$
Option D:	te^{-t}
5.	$\Box = [0,1]$ then $\Box$ is
Option A:	countable set
Option B:	finite
Option C:	uncountable
Option D:	Both countable as well as uncountable

6.	$f : \mathbb{R} \to \mathbb{R}$ defined as $f(x) = x^2$ for $x \in \mathbb{R}$ then f is
Option A:	injective
Option B:	surjective
Option C:	bijective
Option D:	not bijective
7.	$f(x) = x + 3 \quad g(x) = 2x + 1$ then $g \circ f(x) =$
Option A:	$2x - 7$
Option B:	$2x + 7$
Option C:	$2x + 4$
Option D:	$3x + 4$
8.	$L\{t \sin t\} =$
Option A:	$\dfrac{2s}{(s^2 + 1)^2}$
Option B:	$\dfrac{-2s}{(s^2 + 1)^2}$
Option C:	$\dfrac{s}{(s^2 + 1)^2}$
Option D:	$\dfrac{1}{(s^2 + 1)^2}$
9.	Inverse Laplace transform of $\dfrac{1}{s(s+1)}$ is
Option A:	$1 - e^{-t}$
Option B:	$1 - e^{t}$
Option C:	$\cos ht$
Option D:	e^{-t}
10.	If $f(z) = \bar{z}$ where $z = x + iy$ then which of the following is true ?
Option A:	$f(z)$ is everywhere analytic
Option B:	Cauchy-Riemann equations are satisfied
Option C:	$f(z)$ is not analytic at $z = 0$
Option D:	$f(z)$ is analytic only at $z = 0$
11.	Fixed points of transformation $f(z) = \dfrac{z-1}{z+1}$ are
Option A:	± 1
Option B:	$\pm i$
Option C:	$\pm 2i$
Option D:	± 2
12.	How many friends you must have to gurantee that at least two of them have birthday in same month
Option A:	8
Option B:	13
Option C:	12
Option D:	10
13.	Analytic function $f(z) = u + iv$ whose imaginary part $v = \tan^{-1} \dfrac{y}{x}$ is

Option A:	tan □
Option B:	log □
Option C:	sin □
Option D:	cos □

14.	A relation R is defined on $\mathbb{Z}$ such that aRb if $a - b$ is divisible by 5. How many distinct equivalence classes are there corresponding to R?
Option A:	1
Option B:	3
Option C:	4
Option D:	5

15.	$\{ \mathcal{L}_0(\square)\} = \frac{1}{\sqrt{s^2+1}}$ then $\{ \mathcal{L}_0(4\square)\} =$
Option A:	$\dfrac{1}{\sqrt{s^2+16}}$
Option B:	$\dfrac{4}{\sqrt{s^2+16}}$
Option C:	$\dfrac{4}{\sqrt{s^2+4}}$
Option D:	$\dfrac{1}{4}\dfrac{1}{\sqrt{s^2+16}}$

16.	Image of $|\square| = 1$ under $\square = \square + 2 + 3\square$ is
Option A:	straight line
Option B:	line segment
Option C:	circle
Option D:	ellipse

17.	If repetitions are not permitted , How many 4-digited numbers can be formed using digits 1,2,3,5,7,8
Option A:	360
Option B:	720
Option C:	180
Option D:	1296

18.	From integers 1 to 100 , any one integer is chosen at random. Determine probability that it divisible by 3 or 5.
Option A:	0.47
Option B:	0.53
Option C:	0.59
Option D:	0.48

19.	$P(A) = \frac{1}{2}$, $P(B) = \frac{1}{3}$ where $A \ and \ B$ are independent events then $P(A\cup B) =$
Option A:	$\dfrac{2}{3}$
Option B:	$\dfrac{1}{3}$
Option C:	$\dfrac{1}{6}$

Option D:	$\dfrac{5}{6}$
20.	Three students solve a problem in Mathematics independently.Their chances of solving problem are $\dfrac{1}{2}, \dfrac{1}{3}, \dfrac{1}{4}$ respectively.Probability that problem is solved is
Option A:	$\dfrac{1}{4}$
Option B:	$\dfrac{3}{4}$
Option C:	$\dfrac{1}{24}$
Option D:	$\dfrac{13}{12}$

Q2. **(20 Marks)**	**Solve any Four out of Six. (5 marks each)**
A	Determine constants a,b,c,d so that $f(z) = (x^2 + \square + \square^2) + i(\square^2 + \square + \square^2)$ is analytic
B	$f: \mathbb{R} \to \mathbb{R}\ \ g: \mathbb{R} \to \mathbb{R}\ \ h: \mathbb{R} \to \mathbb{R}\ \ f(x) = x + 4\,, g(x) = x - 4\,, h(x) = 4x$ $for\ x\ \in \mathbb{R}$ Compute $fog\,, gof\,, hoh$
C	Find $\ \ L\{\square^{3\square} \sin 4\square\}$
D	Find $\ \ L^{-1}\{\dfrac{s+2}{\frac{1}{2}(\square^2+4\square+8)}\}$
E	In a bolt factory , machines A , B , C manufacture respectively 25% , 35% and 40% of total production. Of this output ,Defective bolts produced by machine A , B , C are 5% , 4% and 3% respectively.A bolt is drawn at random from total production and is found to be defective.What is the probability that it is manufactured by machine A?
F	If four points are drawn inside an equilateral triangle of side 1 unit then prove that there are two among them whose distance apart is less than ½ units.

Q3. **(20 Marks)**	**Solve any Four out of Six .(5 marks each)**
A	Find $\ \ L^{-1}\{\log(\dfrac{\square+\square}{\square+\square})\}$
B	Evaluate $\ \int_0^\infty e^{-t}\dfrac{sin\ t}{\square}\,dt$
C	$f: \mathbb{R} - \{\frac{1}{3}\} \to \mathbb{R} - \{\frac{1}{3}\}\ \ f(x) = \dfrac{\cdots}{3x-7}$ Prove that f is bijective . Hence find f^{-1}
D	Find bilinear transformation which maps points $2\,, i\,, -2$ in Z-plane onto points $1\,, i\,, -1$ in W-plane.
E	Construct analytic function $f(z) = \square + \square$ where $\square = \square^{\square}(\square\sin \square + \square\cos \square)$
F	A student giving true false test answers a question correctly if he knows the answer and if he does not know the answer then he answers a question on basis of tossing a coin.If probability that student knows the answer is 1/5 then what is the probability that students knows the answer to a correctly

	marked question ?

University of Mumbai

Examinations Commencing from 15th June 2021 to 24th June 2021
Program: BE (Information Technology)
Curriculum Scheme: Rev 2016 (CBCGS)
Examination: SE Semester III
Course Code: ITC301 and Course Name: Applied Mathematics III

Time: 2-hours   Max. Marks: 80
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Question Number	Correct Option (Enter either 'A' or 'B' or 'C' or 'D')
Q1.	B
Q2.	D
Q3.	B
Q4	B
Q5	C
Q6	D
Q7	B
Q8.	B
Q9.	A
Q10.	C
Q11.	B
Q12.	B
Q13.	B
Q14.	D
Q15.	A
Q16.	C
Q17.	A
Q18.	A
Q19.	A
Q20.	B