K. J. Somaiya Institute of Engineering and Information Technology
Sion, Mumbai - 400022
NAAC Accredited Institute with 'A' Grade
NBA Accredited 3 Programs (Computer Engineering, Electronics & Telecommunication Engineering and Electronics Engineering) Permanently Affiliated to University of Mumbai

EXAMINATION TIME TABLE (JUNE 2021)

PROGRAMME - S.E. (Information Technology) (REV. -2016) (Choice Based)

SEMESTER - III

Days and Dates	Time	Course Code	Paper
15 June 2021	11:30 a.m. to 01:30 p.m.	ITC301	APPLIED MATHEMATICS –III
17 June 2021	11:30 a.m. to 01:30 p.m.	ITC302	LOGIC DESIGN
19 June 2021	11:30 a.m. to 01:30 p.m.	ITC303	DATA STRUCTURES & ANALYSIS
22 June 2021	11:30 a.m. to 01:30 p.m.	ITC304	DATA BASE MANAGEMENT SYSTEM
24 June 2021	11:30 a.m. to 01:30 p.m.	ITC305	PRINCIPLE OF COMMUNICATIONS

Important Note: ● Change if any, in the time table shall be communicated on the college web site.

Mumbai
20th May, 2021.

Principal

University of Mumbai

Examination 2021 under cluster __ (Lead College: _)

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.	$I = \int_0^\infty e^{-t} \frac{\sin sin\, t}{t} dt$ 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 $a \leq b$ 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.	$f : R \to R$ defined as $f(x) = 2x + 1$ for $x \in R$. 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:	e^t
Option B:	te^t
Option C:	$\sin sin\, t$
Option D:	te^{-t}
5.	$S = [0, 1]$ then S is
Option A:	countable set

Option B:	finite
Option C:	uncountable
Option D:	Both countable as well as uncountable
6.	$f : R \to R$ defined as $f(x) = x^2$ for $x \in R$ 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 $gof(x) =$
Option A:	$2x - 7$
Option B:	$2x + 7$
Option C:	$2x + 4$
Option D:	$3x + 4$
8.	$L\{t \sin sin\, t\} =$
Option A:	$\frac{2s}{(s^2+1)^2}$
Option B:	$\frac{-2s}{(s^2+1)^2}$
Option C:	$\frac{s}{(s^2+1)^2}$
Option D:	$\frac{1}{(s^2+1)^2}$
9.	Inverse Laplace transform of $\frac{1}{s(s+1)}$ is
Option A:	$1 - e^{-t}$
Option B:	$1 - e^{t}$
Option C:	$\cos cos\, ht$
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 $x = 0$
Option D:	$f(z)$ is analytic only at $x = 0$
11.	Fixed points of transformation $f(z) = \frac{z-1}{z+1}$ 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 $v = \frac{y}{x}$ is
Option A:	tan $tan\ z$
Option B:	log $log\ z$
Option C:	sin $sin\ z$
Option D:	cos $cos\ z$
14.	A relation R is defined on 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.	$L\{J_0(t)\} = \frac{1}{\sqrt{s^2+1}}$ then $L\{J_0(4t)\} =$
Option A:	$\frac{1}{\sqrt{s^2+16}}$
Option B:	$\frac{4}{\sqrt{s^2+16}}$
Option C:	$\frac{4}{\sqrt{s^2+4}}$
Option D:	$\frac{1}{4}\frac{1}{\sqrt{s^2+16}}$
16.	Image of $\|z\| = 1$ under $w = z + 2 + 3i$ 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:	$\frac{2}{3}$
Option B:	$\frac{1}{3}$
Option C:	$\frac{1}{6}$
Option D:	$\frac{5}{6}$
20.	Three students solve a problem in Mathematics independently.Their chances of solving problem are $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$ respectively.Probability that problem is solved is
Option A:	$\frac{1}{4}$
Option B:	$\frac{3}{4}$
Option C:	$\frac{1}{24}$
Option D:	$\frac{13}{12}$

Q2. **(20 Marks)**	**Solve any Four out of Six. (5 marks each)**
A	Determine constants a,b,c,d so that $f(z) = (x^2 + axy + by^2) + i(cx^2 + dxy + y^2)$ is analytic
B	$f: R \to R$ $g: R \to R$ $h: R \to R$ $f(x) = x + 4$, $g(x) = x - 4$, $h(x) = 4x$ $for\ x \in R$ Compute fog , gof , hoh
C	Find $L\{te^{3t} \sin sin\ 4t\}$
D	Find $L^{-1}\left\{\frac{s+2}{(s^2+4s+8)^2}\right\}$
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 $L^{-1}\left\{\log log\ (\frac{s+a}{s+b})\right\}$
B	Evaluate $\int_0^\infty e^{-t}\ \frac{sin^2 t}{t} dt$
C	$f: R - \left\{\frac{7}{3}\right\} \to R - \left\{\frac{4}{3}\right\}$ $f(x) = \frac{4x-5}{3x-7}$ 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 $f(z) = u + iv$ where $v = e^{x}(x \sin sin\, y + y \cos cos\, y)$
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

Examination 2021 under cluster __ (Lead College: _)

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

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 . 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 = ∑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
Examination June 2021

Examinations Commencing from ------ June 2021

Program: **Information Technology**

Curriculum Scheme:2016 (Keep the required)

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.

University of Mumbai
Examination June 2021
Examinations Commencing from -15th June 2021
Program: **Information Technology**
Curriculum Scheme:2016 (Keep the required)
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 2020 under cluster 7 (Lead College: SSJCOE)

Examinations Commencing from 15th June 2021

Program: **Information Technology**

Curriculum Scheme: Rev2016

Examination: SE Semester III

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.

University of Mumbai

Examination 2020 under cluster 7 (Lead College: SSJCOE)

Examinations Commencing from 15th June 2021

Program: **Information Technology**

Curriculum Scheme: Rev2016

Examination: SE Semester III

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

Examinations Commencing from 15th June 2021

Program: **Information Technology**

Curriculum Scheme: R2016

Examination: SE IT Semester III

Course Code: ITC305 Course Name: _Principles of Ccommunication

Time: 2 hour Max. Marks: 80

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QP3

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Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	The range of microwave frequency more easily passed by the atmosphere than the others is called as
Option A:	gyro frequency range
Option B:	Critical frequency
Option C:	Window
Option D:	Resonance in the atmosphere
2.	Distances near skip distance should be used for sky wave propagation
Option A:	to avoid tilting
Option B:	to prevent sky wave and upper ray interference
Option C:	to avoid faraday effect
Option D:	so as to exceed the critical frequency
3.	If the bit rate is 1200 bps and there are 4 bits for signal element then baud rate is
Option A:	4800
Option B:	1200
Option C:	400
Option D:	300
4.	Most modern MODEMs use _____for digital to analog modulation.
Option A:	ASK
Option B:	FSK

Option C:	PSK
Option D:	QAM
5.	The biggest disadvantage of PCM is
Option A:	its inability to handle analog signals
Option B:	the high error rate which its quantizing noise introduces
Option C:	its incompatibility with TDM
Option D:	the large bandwidths that are required for it
6.	Companding is used
Option A:	to overcome quarantining noise in PCM
Option B:	in PCM transmitters, to allow amplitude limited in the receivers
Option C:	to protect small signals in PCM from quantizing distortion
Option D:	in PCM receivers, to overcome impulse noise
7.	The modulation system inherently most noise-resistant is
Option A:	SSB, suppressed-carrier
Option B:	Frequency modulation
Option C:	pulse-position modulation
Option D:	pulse-code modulation
8.	Quantizing noise occurs in
Option A:	time-division multiplex
Option B:	frequency division multiplex
Option C:	pulse-code modulation
Option D:	pulse-width modulation
9.	In pulse width modulation,
Option A:	Synchronization is not required between transmitter and receiver
Option B:	Amplitude of the carrier pulse is varied
Option C:	Instantaneous power at the transmitter is constant
Option D:	Width of the carrier remains constant

10.	Calculate the minimum sampling rate to avoid aliasing when a continuous time signal is given by $x(t) = 5 \cos 400\pi t$
Option A:	100 Hz
Option B:	200 Hz
Option C:	400 Hz
Option D:	250 Hz
11.	The spectrum of the sampled signal may be obtained without overlapping only if
Option A:	$fs \geq 2fm$
Option B:	$fs < 2fm$
Option C:	$fs > fm$
Option D:	$fs < fm$
12.	One of the following is an indirect way of generating FM. This is the
Option A:	Reactance FET modulator
Option B:	Varactor diode modulator
Option C:	Armstrong modulator
Option D:	Reactance bipolar transistor modulator
13.	A carrier is simultaneously modulated by 2 sine waves with modulation indices of 0.3 and 0.4 . The total modulation index is
Option A:	1
Option B:	1.2
Option C:	0.5
Option D:	0.7
14.	The difference between phase and frequency modulation
Option A:	is purely theoretical because they are the same in practice
Option B:	is too great to make the two system compatible
Option C:	lies in the poorer audio response of phase modulation
Option D:	lies in the different definitions of the modulation index
15.	AM is used for broadcasting because

Option A:	It is more noise immune than other
Option B:	It requires less transmitting power
Option C:	It avoids receiver complexity
Option D:	It is less costly
16.	The modulation index of AM is changed from 0 to 1. The transmitted power is
Option A:	unchanged
Option B:	halved
Option C:	doubled
Option D:	increase by 50 percent
17.	If the carrier of 100 percent modulated AM is suppressed . the percentage power saving is
Option A:	50
Option B:	150
Option C:	100
Option D:	66.66
18.	If the plate supply voltage for the plate modulated class C amplifier is V.The max plate cathode voltage could be as high as
Option A:	4V
Option B:	3V
Option C:	2V
Option D:	1V
19.	One of the advantages of the base modulation over collector modulation of a transistor class C amplifier is
Option A:	the lower modulating power required
Option B:	higher power output per transistor
Option C:	better efficiency
Option D:	better linearity
20.	Indicate the false statement. the square of the thermal noise voltage generated by the resistor is proportional to its

Option A:	its temperature
Option B:	its resistance
Option C:	Boltzmann's constant
Option D:	Bandwidth over which is is measured

Q2	**Solve any Two Questions out of Three 10 marks each**
A	*Draw the block diagram of analog communication system and explain each block in brief.*
B	*What are sources of noises ? classify and explain various noises that affect communication.*
C	*Draw the block diagram of superhetrodyne receiver and explain each block in brief.*

Q3	**Solve any Two Questions out of Three 10 marks each**
A	*Differentiate between PAM,PWM & PPM (Atleast 5 proper points).*
B	*Explain adaptive delta modulation with suitable figures*
C	*Explain ground wave and sky wave propagation in detail ?*

University of Mumbai
Examination June 2021
Examinations Commencing from 15th June 2021

Program: **Information Technology**

Curriculum Scheme: R2016

Examination: SE Semester III

Course Code: _ITC 305 Course Name: Principles of Communication

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.	D
Q4	D
Q5	D
Q6	C
Q7	D
Q8.	C
Q9.	A
Q10.	C
Q11.	A
Q12.	C
Q13.	C
Q14.	D
Q15.	C
Q16.	D
Q17.	D
Q18.	A
Q19.	A
Q20.	C