

Sample Question Paper – 1

COMPUTER SCIENCE (Code: 083)

Maximum Marks: 35

Time: 2 hours

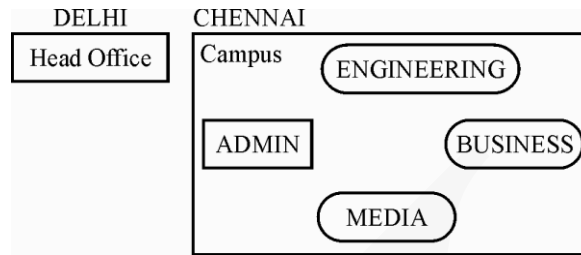
General Instructions

- The question paper is divided into 3 sections – A, B and C
- Section A, consists of 7 questions (1-7). Each question carries 2 marks.
- Section B, consists of 3 questions (8-10). Each question carries 3 marks.
- Section C, consists of 3 questions (11-13). Each question carries 4 marks.
- Internal choices have been given for question numbers 7, 8 and 12.

Section -A			
Each question carries 2 marks			
1.		Expand the term LIFO. Which data structure facilitates LIFO operations?	(2)
2.	(i)	Expand the following: HTML, HTTP	(1)
	(ii)	Name the wireless medium which travels in all the directions from the point of origin.	(1)
3.		Write one advantage and one disadvantage of using char datatype over varchar datatype to store variable length strings in a column of a table.	(2)
4.		Suppose a cursor object, named crsr, has been already created in a script. Write a statement to extract all the records from a table "Teacher" using this cursor object. What will happen if the table is empty?	(2)
5.		<p>Write the output of the queries (a) to (d), based on the table "Teacher" given below:</p> <pre> +-----+-----+-----+-----+-----+-----+-----+ T_ID Name Age Department Date_of_join Salary Gender +-----+-----+-----+-----+-----+-----+-----+ 1 Jugal 34 Computer Sc 2017-01-18 12000 M 2 Sharmila 31 History 2008-03-24 20000 F 3 Sandeep 32 Mathematics 2016-12-12 30000 M 4 Sangeeta 35 History 2015-07-01 40000 F 5 Rakesh 42 Mathematics 2007-09-05 25000 M 6 Shyam 50 History 2008-06-27 30000 M 7 Shiv Om 44 Computer Sc 2017-02-25 21000 M 8 Shalakra 33 Mathematics 2018-07-31 20000 F +-----+-----+-----+-----+-----+-----+-----+ </pre> <p>(a) select distinct department from teacher;</p> <p>(b) select name, age from teacher where name not like '%a';</p> <p>(c) select name, age from teacher where name not like '%a%';</p> <p>(d) select T_ID, name, gender from teacher where age between 30 and 35;</p>	(2)
6.	(i)	Which command is used to view the list of databases?	(1)
	(ii)	If a table Alpha has degree 5 and cardinality 3, and another table Beta has degree 3 and cardinality 5, what will be the degree and cardinality of the Cartesian product of Alpha and Beta?	(1)
7.		Consider the table CABHUB given below:	(2)

		<table><tr><th colspan="6">CABHUB</th></tr><tr><th>Vcode</th><th>VehicleName</th><th>Make</th><th>Color</th><th>Capacity</th><th>Charges</th></tr><tr><td>100</td><td>Innova</td><td>Toyota</td><td>WHITE</td><td>7</td><td>15</td></tr><tr><td>102</td><td>SX4</td><td>Suzuki</td><td>BLUE</td><td>4</td><td>14</td></tr><tr><td>104</td><td>C Class</td><td>Mercedes</td><td>RED</td><td>4</td><td>35</td></tr><tr><td>105</td><td>A-Star</td><td>Suzuki</td><td>WHITE</td><td>3</td><td>14</td></tr><tr><td>108</td><td>Indigo</td><td>Tata</td><td>SILVER</td><td>3</td><td>12</td></tr></table> <p>(a) Identify the degree and cardinality of the table.</p> <p>(b) Which field should be made the primary key? Justify your answer.</p> <p style="text-align: center;">OR</p> <p>Consider the table CUSTOMER given below:</p> <table><tr><th colspan="3">CUSTOMER</th></tr><tr><th>CCode</th><th>CName</th><th>VCode</th></tr><tr><td>1</td><td>Hemant Sahu</td><td>101</td></tr><tr><td>2</td><td>Raj Lal</td><td>108</td></tr><tr><td>3</td><td>Feroza Shah</td><td>105</td></tr><tr><td>4</td><td>Ketan Dhal</td><td>104</td></tr></table> <p>(a) How many rows will be there in the natural join of tables CUSTOMER and CABHUB (given in first part of this question)?</p> <p>(b) If the tables CABHUB and CUSTOMER are related in a database, which key of which table should be made the foreign key?</p>	CABHUB						Vcode	VehicleName	Make	Color	Capacity	Charges	100	Innova	Toyota	WHITE	7	15	102	SX4	Suzuki	BLUE	4	14	104	C Class	Mercedes	RED	4	35	105	A-Star	Suzuki	WHITE	3	14	108	Indigo	Tata	SILVER	3	12	CUSTOMER			CCode	CName	VCode	1	Hemant Sahu	101	2	Raj Lal	108	3	Feroza Shah	105	4	Ketan Dhal	104	
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8.		<p>Jomia has created the following dictionary containing Indian names of some herbs and their corresponding names in English:</p> <pre>Herbs={'Adrak':'Ginger', 'Amla': 'Gooseberry', 'Babool': 'Indian Gum', 'Dhania': 'Coriander', 'Lahsun':'Garlic', 'Tulsi': 'Basil'}</pre> <p>Write a program, with separate user defined functions to perform the following operations:</p> <ul style="list-style-type: none">Push the item (key, value pair) of the dictionary into a stack, where the corresponding value (English name) starts with 'G'.Pop and display the content of the stack. <p style="text-align: center;">OR</p> <p>Write a program to input an integer and display all its prime factors in descending order, using a stack. For example, if the input number is 2100, the output should be: 7 5 5 3 2 2 (because prime factorization of 2100 is 7x5x5x3x2x2)</p> <p>Hint: Smallest factor of any integer is guaranteed to be prime.</p>	(3)																																																												
9.	(i)	<p>A table BOTTLES has been created in a database with the following fields:</p> <p style="text-align: center;">B_ID, Shape, Volume, Color, Price</p> <p>Write an SQL command to make B_ID the Primary key of this table.</p>	(1)																																																												
		<p>Differentiate between DDL and DML commands. Give examples of two commands in each category.</p>	(2)																																																												

10.		<p>Neha has to create a database named RESTAURANT in MySQL, and a table MENU in it. The table MENU has the following structure:</p> <table><tr><th>Field</th><th>Data Type</th><th>Remarks</th></tr><tr><td>Code</td><td>Char(5)</td><td>Primary Key</td></tr><tr><td>Name</td><td>Varchar(20)</td><td>Not Null</td></tr><tr><td>Category</td><td>Varchar(10)</td><td></td></tr><tr><td>Price_full</td><td>Float</td><td></td></tr><tr><td>Price_half</td><td>Float</td><td></td></tr></table> <p>As her good friend, write SQL commands to complete the task.</p>	Field	Data Type	Remarks	Code	Char(5)	Primary Key	Name	Varchar(20)	Not Null	Category	Varchar(10)		Price_full	Float		Price_half	Float		(3)																											
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		<p style="text-align: center;">Section C</p> <p style="text-align: center;">Each question carries 4 marks</p>																																														
11.		<p>Write queries (a) to (d) based on the tables BOOK and MEMBER whose structures are given below:</p> <table><tr><th colspan="3">Table: BOOK</th></tr><tr><th>Field</th><th>Data Type</th><th>Remarks</th></tr><tr><td>AccNo</td><td>Char(5)</td><td>Primary Key</td></tr><tr><td>Title</td><td>Varchar(20)</td><td>Not Null</td></tr><tr><td>Edition</td><td>Integer</td><td>Edition year of the book</td></tr><tr><td>Cost</td><td>Float</td><td></td></tr><tr><td>Mem_ID</td><td>Integer</td><td>Foreign Key. References Mem_ID of MEMBER table</td></tr></table> <table><tr><th colspan="3">Table: MEMBER</th></tr><tr><th>Field</th><th>Data Type</th><th>Remarks</th></tr><tr><td>Mem_ID</td><td>Integer</td><td>Primary Key</td></tr><tr><td>Name</td><td>Varchar(20)</td><td>Not Null</td></tr><tr><td>DOB</td><td>Date</td><td></td></tr><tr><td>DOJ</td><td>Date</td><td></td></tr><tr><td>Address</td><td>Varchar(20)</td><td></td></tr><tr><td>Phone</td><td>Varchar(14)</td><td></td></tr></table> <p>(a) Display the number of books edition wise. (b) Display titles of books which have not been issued (Mem_ID should be null) (c) For each book which has been issued (Mem_ID is not null), display the AccNo, Title, Mem_ID, and Name of the member to whom it is issued. (d) Display the information of all the members in the descending order of their names.</p>	Table: BOOK			Field	Data Type	Remarks	AccNo	Char(5)	Primary Key	Title	Varchar(20)	Not Null	Edition	Integer	Edition year of the book	Cost	Float		Mem_ID	Integer	Foreign Key. References Mem_ID of MEMBER table	Table: MEMBER			Field	Data Type	Remarks	Mem_ID	Integer	Primary Key	Name	Varchar(20)	Not Null	DOB	Date		DOJ	Date		Address	Varchar(20)		Phone	Varchar(14)		(4)
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12.	(i)	<p>Give two advantages and two disadvantages of Bus topology.</p> <p style="text-align: center;">OR</p> <p>Define the terms: SMTP, VoIP</p>	(2)																																													
	(ii)	<p>Write any two differences (other than the term expansion) between LAN and MAN.</p>	(2)																																													
13.		<p>Meticulous EduServe is an educational organization. It is planning to setup its India campus at Chennai with its head office at Delhi. The Chennai campus has 4 main buildings – ADMIN, ENGINEERING, BUSINESS and MEDIA</p>	(4)																																													



Shortest distances between various buildings:

ADMIN to ENGINEERING	55 m
ADMIN to BUSINESS	90 m
ADMIN to MEDIA	50 m
ENGINEERING to BUSINESS	55 m
ENGINEERING to MEDIA	50 m
BUSINESS to MEDIA	45 m
DELHI Head Office to CHENNAI Campus	2175 km

Number of Computers installed at various buildings are as follows:

ADMIN	110
ENGINEERING	75
BUSINESS	40
MEDIA	12
DELHI Head Office	20

- Suggest and draw the cable layout to efficiently connect various blocks of buildings within the CHENNAI campus for connecting the digital devices.
- Suggest the placement of the following devices with justification:
 - Hub/Switch
 - Firewall
- Which kind of network (PAN/LAN/WAN) will be formed within each block of the CHENNAI campus?
- Which fast and very effective wireless transmission medium should preferably be used to connect the head office at DELHI with the campus in CHENNAI?