Sir Syed University of Engineering & Technology
Faculty of Basic & Applied Sciences
Department of ____Computer Science_____

End Semester Examinations (Spring 2020)

Course Title with Code	**CS-329: Database Systems**	**Program**	BS(CS)
Instructors	Mr. Shardha Nand Ms. Anam Siddiqui	**Semester**	5th
Start date & Time	June 23, 2020 at 11:30 AM	**Submission Deadline**	June 23, 2020 at 05:30 PM
Maximum Marks	50		

IMPORTANT INSTRUCTIONS:

Read the following Instructions carefully:

- Attempt All Questions on MS-Word. Font theme and size must be Times New Roman and 12 points respectively. Use line spacing 1.5. Convert file to PDF format before submitting.
- You may provide answers HANDWRITTEN. The scanned solution must be submitted in PDF file format (Use any suitable Mobile Application for Scanning)
- For Diagrams, you can use paper and share a clear visible snapshot in the same Answer Sheet.
- Arrange questions and their subsequent parts in sequence.
- Make sure that your answers are not plagiarized or copied from any other sources. In case of plagiarism, **ZERO** marks will be awarded.
- Provide relevant, original and conceptual answers, as this exam aims to test your ability to examine, explain, modify or develop concepts discussed during the course.
- Recheck your answer before the submission on **VLE**to correct any content or language related errors.
- You must upload your answers via the VLE platform ONLY.

You must follow general guideline for students before online examination and during online examination which had already been shared by email and WhatsApp.

This paper has a total of _04__ pages including this title page

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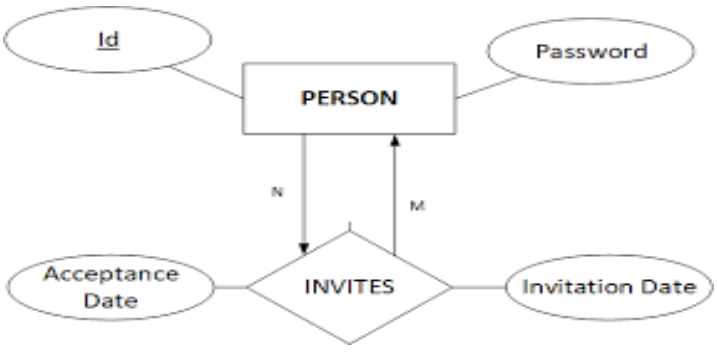
Q.1. (10)

Internet is the wide domain for implementing the Database application. Let's consider an online bookstore that allows you to browse and buy books, such as ABC.com. The bookstore allows you to browse books in different categories, such as computing or management, or it may allow you to browse books by author name. In either case, there is a database on the organization's Web server that consists of book details, availability, shipping information, stock levels, and on-order information. Book details include book titles, ISBNs, authors, prices, sales histories, publishers, reviews, and detailed descriptions. The database allows books to be cross-referenced: for example, a book may be listed under several categories, such as computing, programming languages, bestsellers, and recommended titles. The cross-referencing also allows Amazon to give you information on other books that are typically ordered along with the title you are interested in. For financial transactions you can provide your credit card details to purchase one or more books online. ABC.com personalizes its service for customers who return to its site by keeping a record of all previous transactions, including items purchased, shipping, and credit card details. When you return to the site, you can now be greeted by name and you can be presented with a list of recommended titles based on previous purchases.

Considering above relevant database application, explain how this application maintains data transaction according to **three level architecture of database**,
Hint: You need to mention the activities at every level (at internal level display schema of database, at Conceptual level construct ERD of above process, External level contains User Interface (show maximum two modes of data incoming))

Q.2. (A) (03)

Given below is the example of recursive relationship. Extend this Entity relationship by adding relevant entities (at least 4) along with attributes, make sure your design covers basic cardinalities (1:1, 1:M, N:M) along with total participation and a week entity.
Note: For instance, this relationship can be extended in a complete Event Management System. You have to use your designing approach and assumption for extending this case in any database application that involves Persons and invitations (other than Event Management System).



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Q.2. (B) (07)

Course {CourseId, Title, CreditHour}
Section {SecID,Semester, Year}
Department {DeptID,DeptName,HOD}
Instructor {InstructorID,Name,Designation}

Basic schema of College Management System is given above. You are required to update and refine the given Relational Schema according to the instructions provided later by the management. Change the given schema and add/modify tables as per following requirement:

i. Each student can opt one or many courses
ii. In each course many students are enrolled
iii. It is pertinent to mention the Department of every student.
iv. Each course has 0, 1 or more prerequisite course(s).
v. Every student is issued grade report
vi. An Instructor can teach many courses. If instructor is busy in some administrative work, he may take at least one course.
vii. It is worthwhile to mention the section of every student.

Q.3. (A) (05)

Find out functional dependencies in the given table considering all attributes like Roll No → Name, Marks and you have to check every possibility. Give proper justification of your answers with part of table.

Roll No.	Name	Marks	Department	Course
001	Ahmed	58	BM	C1
002	Rasheed	65	CS	C1
003	Ahmed	58	BM	C2
004	Rasheed	65	CS	C3
005	Abdul Qadir	90	EE	C3
006	Saleem-Ul-Ullah	91	IT	C2

Q.3. (B) (05)

Bad designs of a relational database may provide erroneous results. Why below mentioned design is not efficient. Find out the issues and anomalies in the given details and refine the schema.

StudentID	Name	Address	Course
S-001	Ahmad	Sukkur	C++
S-002	Saleem	Hyderabad	Algorithm
S-003	Shivam	Karachi	C++
S-004	Khalid	Lahore	Algorithm
S-002	Saleem	Hyderabad	Data Communication
S-001	Ahmad	Sukkur	Null

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Q.4. (10)

Normalization is the process of decomposing unsatisfactory relations by breaking up their attributes into smaller relations. Discuss your normalization choice(s) with proper justification by applying Normalization forms (1NF, 2NF, 3NF) to below mentioned Sales Records in order to remove anomalies, redundancy and improve data integrity.

Sales Records

CustName	Product	ShippingAddrss	NewsLetter	Supplier	SuppPhone	Price
Riaz Hussain	TV	Mall Road Lahore	Sony News	Sony	04245678	50000
Rashid Khan	Refrigerator	Electronic Market Karachi	Dawlance News	Dawlance	033324556	45000
Saleem Ahmed	TV, Audio Device	Mall Road Lahore	Sony News	Sony	04245678	50000, 10000
Salma Ali	Haier Dryer, hair straightener	Hussain Agahi Market Multan	Panasonic Weekly Report	Panasonic	03216543	4000, 6300

Q.5. (10)

You all were assigned a class project for database course. Considering your database project and your current details, help your course teachers to extract data for projects by resolving some SQL queries.

Student {**SId**, SName, SRollno, SDob, SContactno,SGender,**SemId**,**PId**}
Semester {**SemId**, Stitle,SBatch,SSection}
Project {**PId**,PTitle,PNoM,PFET,PBET,PStatus}

Where
PNoM = Project Number of Members
PFET= Project Front End Tool
PBET= Project Back End Tool
PStatus (Submitted, Ready, In Progress)

i. Write a query to create above tables
ii. Insert appropriate and relevant record in each table as per your current details and your assigned project.
iii. Select the Names and Roll Numbers of all students whose Project Title contains “Management System”
iv. Find total count of students in your section group by Gender.
v. Find name and contact numbers of student who uses VS2012 for Front End and SQL Server 2019 for Back End.
vi. Update Project Status to “Submitted” for the students who has submitted their Project Report.
vii. List the details of student whose project title is same as the Roll no **(Your Roll No)**
viii. Find the average number of members in project group by sections.