Sir Syed University of Engineering & Technology
Faculty of Computing & Applied Sciences
Department of Computer Science & Information Technology

Online End Semester Examinations (Spring 2021)

Course Code with Title	**CS-329 Database Systems**		**Program**	BS (CS)
Instructor	**Mr. Shardha Nand** **Ms. Anam Siddiqui**		**Semester**	5th
Start date & Time	June 9, 2021 at 11:30 AM	**Submission Deadline**	June 9, 2021 at 04:30 PM	
Maximum Marks	50			
Students must meet their submission deadline as there is no re-take or re-attempt after the deadline.				

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.
- 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 shared by email and WhatsApp.

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

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Note: Please attach scanned copy of your CNIC

Q.1. (10)

The University ERP or University Management Software is a comprehensive and robust system designed to provide automation solutions to digitize administrative operations. You have to design ERD of a complete University Management System for SSUET that covers given modules. Select your task from the given processes by taking Average (Round figure) of your CNIC number.
Note: You all have to attach the scanned copy of your CNIC.
Hint: (4+2+1+0+1+5+9+6+9+7+2+3+0 /13) = 3.76 = 4

1. Admission process
2. Class management module
3. Semester management module
4. Attendance management system
5. Fees module
6. Finance Management
7. Overall Examination management system
8. Sessional result management system
9. Scholarship management module
10. Library Management
11. GPA and CGPA Calculator

Q.2. (10)

Consider relation R = (A, B, C, D, E) with the following Functional Dependencies:
A, B → C
C, B → D
E→D
Where A = NIC, B = RollNo. , C= Name, D= City, E = ZipCode

1. Insert your record in R using SQL query
2. List all super keys and candidate keys of R
3. Implement all possible Armstrong Axioms in R and identify remaining FDs
4. Compute closure of A (A+)

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Q.3. (10)

You were given project for Database Lab. Consider the following schema and insert appropriate record according to your current database project

Student (*SID, Sname, SRollNo, SAddress, SContactNo*)
Project (*PID, PTitle, PMembers, PStatus*)
Supervisor (*SupID, SupName, SupEmail , SupDesignation,SupContactNo*)

1. Insert record of your Database Project by using SQL query

Resolve the given statements by using Relational Algebra:

2. Select all students with at least two members in group
3. Select contact number from Supervisor where Supervisor name is your lab teacher
4. Identify all the projects where Project Title contains 'Management'
5. Rename your project title by adding Database CS-329

Q.4. (10)

What are the issues, deficiencies and anomalies in below mentioned schema ***"StudentInfo"***. How would you improve the design? Step by step solution with proper justification is required for normalization process.

StudentInfo

StudentId	Name	Address	Phone	Course	CreditHr	GPA
S01	Ahmed Ali	A1	222,443	C++	3+1	2.5
S02	Saleem Khan	A2	111,234	Java	3+1	2.8
S03	Asad Muitaba	A3	333,335	NA	3+0	3.5
S01	Ahmed Ali	A1	222,443	NA	3+0	3.6
S02	Saleem Khan	A2	111,234	C++	3+1	2.9
S03	Asad Muitaba	A3	333,335	Java	3+1	3.2

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Q.5.A. (06)

Check whether the given schedule S1 is conflict serializable or not by using precedence graph. If no, then suggest all the possible serialized schedules:

Schedule S1

T1	**T2**	**T3**
R(A)		
	R(A)	
		R(B)
W(A)		
	R(C)	
	R(B)	
	W(B)	
		W(C)

Q.5.B. (04)

How 2PL (2 Phase Locking Protocol) can ensure a conflict-serializable schedule for the same transactions above i.e. Q.5.A.Apply 2PL.