

Name:	
Enrolment No:	

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, December 2018

Course: Advanced Database Management System

Semester: III

Programme: B.Tech (All IBM+Cyber law)

Time: 03 hrs.

Max. Marks: 100

Instructions: In case of question having sub question then each sub question carry equal marks.

SECTION A

S. No.	Question	Marks	CO
Q 1	What is the difference between a candidate key and the primary key in a relation? What is a superkey?	4	CO1
Q2	Define the RAID technology for disk storage in detail.	4	CO2
Q 3	Differentiate between REDO and UNDO in log based recovery.	4	CO4
Q 4	Define ACID properties with example.	4	CO3
Q 5	Write a PLSQL code block to reverse the string.	4	CO1

SECTION B

Q 6	Consider a relation stored as a randomly ordered file for which the only index is an unclustered index on a field called sal. If you want to retrieve all records with sal > 20, is using the index always the best alternative? Explain.	10	CO2
Q 7	What is the difference between persistent and transient objects? How persistence is handled in typical OO database systems?	10	CO5
Q 8	Discuss what is meant by the following terms: a) Replication transparency b) Full Vs. Partial replication	10	CO5
Q 9	What is a cascadeless schedule? Why is cascadelessness of schedules desirable? Are there any circumstances under which it would be desirable to allow noncascadeless schedules? Explain your answer. <p style="text-align: center;">OR</p> What is the difference between ER and EER Diagram for DBMS? Draw the EER Diagram to show the concept of subclass and specialization.	10	CO4 CO1

SECTION-C

Q 10	(A) Consider the B+ tree index of order d=2 shown in Figure a) Show the tree that would result from inserting a data entry with key 9 into this tree. b) Show the B+ tree that would result from inserting a data entry with key 3 into the original tree. How many page reads and page writes does the insertion require? c) Show the B+ tree that would result from deleting the data entry with key 8 from the	20	CO2
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Draw a precedence graph to determine if this schedule is conflict serializable.

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SECTION A

S. No.	Question	Marks	CO
Q 1	List and draw the life cycle of a transaction.	4	CO3
Q 2	What is the difference between a candidate key and the primary key for a given relation? What is a superkey?	4	CO1
Q 3	Differentiate between strict Vs Rigorous two phase locking.	4	CO4
Q 4	Write a PL/SQL code block to check whether the given number is Armstrong number or not.	4	CO1
Q 5	Define the RAID technology for disk storage in detail.	4	CO2

SECTION B

Q 6	Explain what the buffer manager must do to process a read request for a page. What happens if the requested page is in the pool but not pinned?	10	CO2
Q 7	There are a number of applications, such as engineering design, for which Object oriented database systems are clearly superior to Relational systems. For a number of commercial applications, however, the advantage is perhaps less clear. Imagine you are starting up a company, which requires to keep data about customers, orders, products and sales. Discuss whether you would prefer to go for a Relational, Object-Relational or Object-oriented database solution	10	CO5
Q 8	Discuss the following terms a) Degree of homogeneity of a DDBMS (Distributed Database Management System) b) Federated DBMS, distribution transparency	10	CO5
Q 9	What is the difference between ER and EER Diagram for DBMS? Draw the EER Diagram to show the concept of subclass and specialization.	10	CO1
OR What is the significance of Data Fragmentation? Define Horizontal, Vertical and Hybrid Fragmentation with the suitable example.			CO5

SECTION-C

<p>Q 10</p>	<p>Answer the following questions about data on external storage in a DBMS.</p> <ol style="list-style-type: none"> a) Why does a DBMS store data on external storage? b) Why are I/O costs important in a DBMS? c) What is a record id? Given a record's id, how many I/O's are needed to fetch it into main memory? d) What is the role of the buffer manager in a DBMS? What is the role of the disk space manager? How do these layers interact with the file and access methods layer? <p style="text-align: center;">OR</p> <p>Suppose you have a file with 10,000 pages and you have three buffer pages. Answer the following questions for each of these scenarios, assuming that our most general external sorting algorithm is used:</p> <ol style="list-style-type: none"> (a) A file with 10,000 pages and three available buffer pages. (b) A file with 20,000 pages and five available buffer pages. (c) A file with 2,000,000 pages and 17 available buffer pages. <ol style="list-style-type: none"> 1. How many runs will you produce in the first pass? 2. How many passes will it take to sort the file completely? 3. What is the total I/O cost of sorting the file 4. How many buffer pages do you need to sort the file completely in just two passes? 	<p>20</p>	<p>CO2</p>
<p>Q 11</p>	<p style="text-align: center;">Consider a database with objects X and Y and assume that there are two transactions $T1$ and $T2$. Transaction $T1$ reads objects X and Y and then writes object X. Transaction $T2$ reads objects X and Y and then writes objects X and Y.</p> <ol style="list-style-type: none"> 1. Give an example schedule with actions of transactions $T1$ and $T2$ on objects X and Y that results in a write-read conflict. 2. Give an example schedule with actions of transactions $T1$ and $T2$ on objects X and Y that results in a read-write conflict. 3. Give an example schedule with actions of transactions $T1$ and $T2$ on objects X and Y that results in a write-write conflict. 4. For each of the three schedules, show that Strict 2PL disallows the schedule. 	<p>20</p>	<p>CO3 CO4</p>