	B.M.S COLLEGE OF ENGINEERING, BANGALORE-19 (Autonomous Institute, Affiliated to VTU) **Computer Science & Engineering**
INTERNALS-2	
Course Code: 19CS4PCDBM	**Course Title: Database Management Systems**
Semester:4	**Maximum Marks: 40** **Date:18-06-2021**
Faculty Handling the Course:	Dr. KVN, Prof. VBM, Dr. SKS, Dr, KPM
Instructions: ***Internal choice is provided in Part C.***	

PART-A

Total 5 Marks (No Choice) [CO1-PO1]

No.	Question	Marks
1	Discuss anomalies which are caused by redundancy in the relational schema	**5**

PART-B

Total 15 Marks (No Choice) [CO2-PO2]

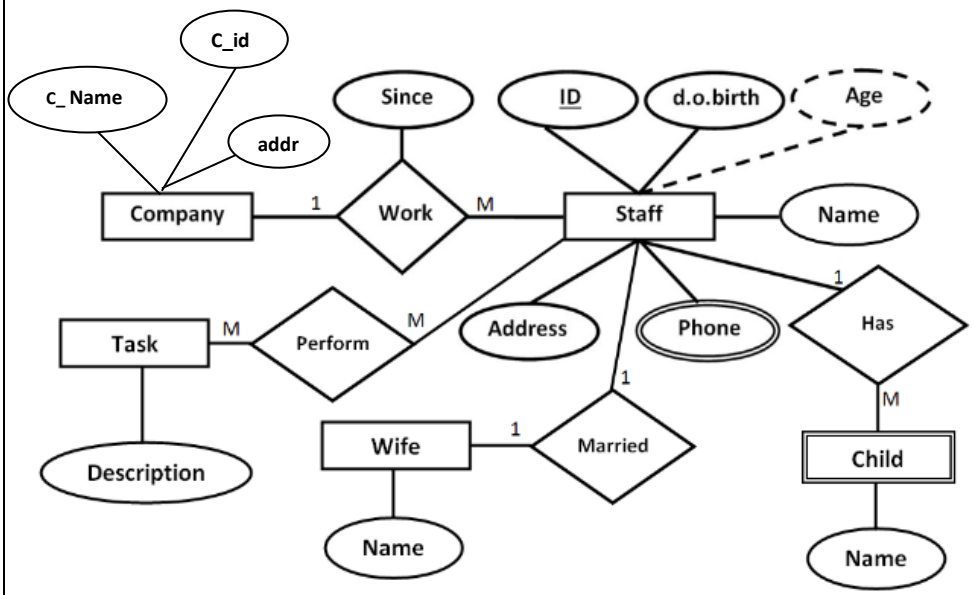
No.	Question	Marks
2a	Consider a relation R (A, B, C, D) with the following instance A B C D 1 1 2 3 1 2 2 3 1 3 2 3 2 4 5 6 5 6 7 8 Which of the following functional dependencies are satisfied by this relation? How? i. $A \rightarrow B$ ii. $AB \rightarrow CD$ iii. $C \rightarrow D$ iv. $BD \rightarrow AC$ v. $AD \rightarrow BC$	**5**

2b	Consider below tables R and S. Perform the following Relation algebra operations | Expression | |---| | $R \times S$ | | $R \bowtie S$ | | $R \rtimes S$ | | $R \ltimes S$ | | $R \bowtie_{A=D} S$ | **R** | A | B | |---|---| | 9 | a | | 3 | x | | 2 | z | | 2 | y | | 1 | x | **S** | B | C | D | |---|---|---| | y | 2 | 0 | | w | 3 | 0 | | y | 3 | 3 | | y | 2 | 1 | | x | 0 | 3 |	**5**
2c	If R={A,B,C,D,E,H} and FD‟s F={ A→ C, C->B, AC→ D, E→ AD, E→H} List all the candidate keys.	**5**

PART- C

Total 20 Marks (Choice between question 3a & 3b, choice between question 4a & 4b)[CO3-PO3]

No.	Question	Marks
3a	Consider the following Relational Database. Student (roll_no, name,city,marks,c_no) Course (c_no,cname,fees) Construct Queries into Relational algebra. i. List Student Details enrolled for ‘BA English’ Course. ii. List the Course having fees < 50000 iii. Display all students living in either ‘Bangalore’ or ‘Delhi’ city. iv. Display Course detail for student ‘Guru Nanma’. v. List the student details who have not registered for “BA Art” Course	**10**
	OR	

3b	Doctor (dno, dname,address,dcity) Hospital (hno,hname,street,hcity) Doc_Hospital (dno,hno,date) Construct Queries into Relational algebra. i. Find hospital names to which 'Dr.Srinivas J V' has visited. ii. List all the doctors who visited 'Aster hospital on '17-6-21'. iii. List the doctors name who are all not visiting 'Apollo Hospital' iv. List the doctors who visits all the hospitals	**10**
4a	Consider a relation R = {A, B, C, D, E} with the following functional dependencies F= {CE→D, D → B, C → A} a. Identify all the candidate keys and find the highest normal form of a Relation. If it violates any normal form then show each violation and its reason. b. If the relation is not in 3NF, decompose the relation until it reaches to 3NF form	**10**
	OR	
4b	Apply ER diagram to Relational schema algorithm and identify the tables required to implement the below given application  	**10**

ALL THE BEST