

N.B. :(1) Question No. 1 is compulsory.

(2) Attempt any four questions of remaining six questions.

(3) Assume suitable data if required.

(4) Figures at right indicate full marks.

1. (a) Explain object identity and type constructor. 5

(b) Suppose that we decompose the schema $R = \{ A, B, C, D, E \}$ into : 5

$$R_1 = \{ A, B, C \} \text{ and}$$

$$R_2 = \{ A, D, E \}$$

Show that this decomposition is lossless join decomposition if the following set, F, of functional dependencies holds.

$$A \rightarrow BC$$

$$CD \rightarrow E$$

$$B \rightarrow D$$

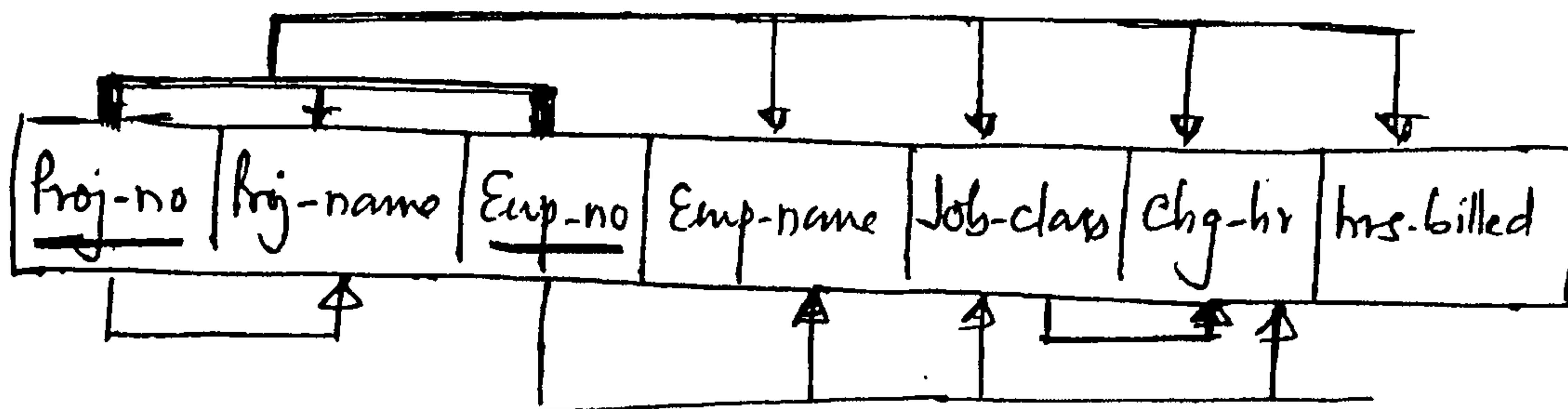
$$E \rightarrow A$$

(c) Explain factless fact table with example. 5

(d) Explain BCNF with suitable example. 5

2. (a) Describe the event-condition-action model for triggers. Why triggers are required ? 10

(b) Consider a dependency diagram of Relation R. 10



(i) The relation R is in which normal form ? Justify your answer.

(ii) Normalize relation R upto third normal form.

[TURN OVER

Con. 7342-GS-1006-13.

2

3. (a) Explain design and implementation issues in Mobile Database. **10**
 (b) Explain in detail the major steps in the ETL process. **10**
4. (a) Explain the concept of referential integrity with suitable example. **10**
 (b) Consider an Employee table with a multivalued dependents attribute Employee. **10**

Eid	Ename	Position	Dependents	
			Ename	Dage
E001	Sachin Tenduklar	Manager	Sara	14
			Arjun	12
E002	Dr. H. K. Patil	Professor	Vaidehi	10

- (i) Define Employee table using nasted relation in ORDBMS or OODBMS.
 (ii) Comment on the normalization rule violation if we define nested relation.

5. (a) Explain the architecture of Data-Warehouse in detail. **10**
 (b) Given the relation R with attributes A to J and the following set of functional dependencies : **10**

$$\begin{aligned}
 \text{FD} = \{ & \{A, B\} \rightarrow \{C\}, \\
 & \{B, D\} \rightarrow \{E, F\}, \\
 & \{A, D\} \rightarrow \{G, H\}, \\
 & \{A\} \rightarrow \{I\}, \\
 & \{H\} \rightarrow \{J\} \}
 \end{aligned}$$

- (i) What is the key of relation R.
 (ii) Decompose relation R into 2NF and 3NF.

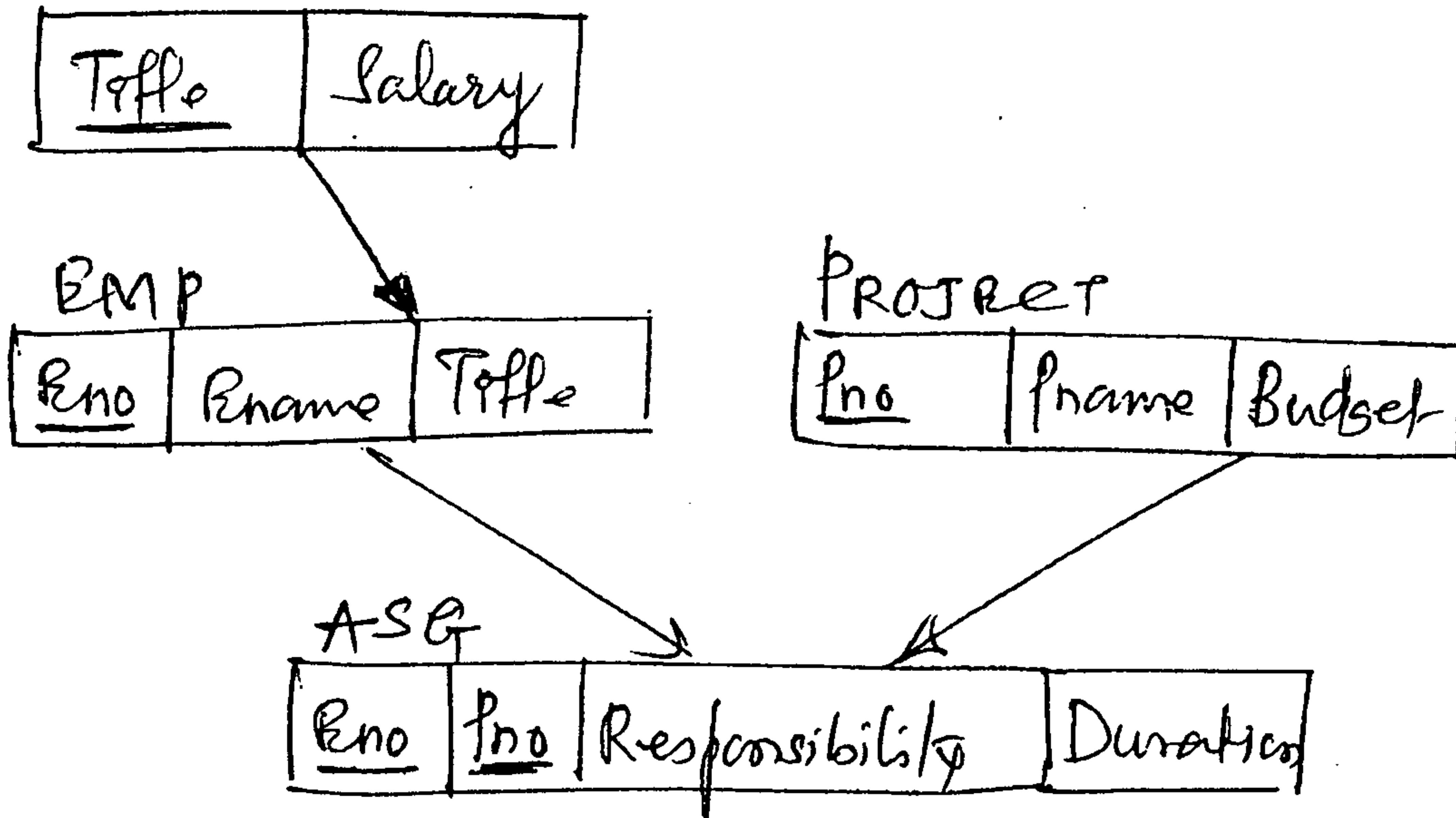
6. (a) Write short note on temporal Database.

10

(b) Consider following schema and PROJECT relation instance.

10

Pay



Project

P _{no}	P _{name}	Budget	Location
P ₁	Attendance System	1,50,000	Pune
P ₂	Payroll System	1,35,000	Mumbai
P ₃	Lux	3,10,000	Mumbai
P ₄	Maintenance	2,50,000	Delhi

- (i) Apply primary horizontal fragmentation (PHF) to PROJECT relation.
- (ii) Clearly state the different minterm predicates.
- (iii) State and derive the implications of minterm predicates.

7. (a) Explain Authorization in SQL.

5

(b) Compose primary key and object identity.

5

(c) Compose Data warehouse and Data marts.

5

(d) Write short note on parallel Database.

5
