8.1.1 An entity is

(a) a collection of items in an application
(b) a distinct real world item in an application
(c) an inanimate object in an application
(d) a data structure

8.1.2 Pick entities from the following:

(i) vendor
(ii) student
(iii) attends
(iv) km/hour

(a) i, ii, iii (b) i, ii, iv
(c) i and ii (d) iii and iv

8.1.3 A relationship is

(a) an item in an application
(b) a meaningful dependency between entities
(c) a collection of related entities
(d) related data

8.1.4 Pick the relationship from the following:

(a) a classroom
(b) teacher
(c) attends
(d) cost per dozen

8.1.5 Pick the meaningful relationship between entities

(a) vendor supplies goods
(b) vendor talks with customers
(c) vendor complains to vendor
(d) vendor asks prices

8.1.6 The entity set is a

(a) set of entities
(b) collection of different entities
(c) collection of related entities
(d) collection of similar entities

8.1.7 Pick entity set from the following

(a) all vendors supplying to an organization
(b) vendors and organizations they supply
(c) vendors and transporters
(d) a vendor supplying to many organizations

8.1.8 Attributes are

(i) properties of relationship
(ii) attributed to entities
(iii) properties of members of an entity set

(a) i (b) i and ii
(c) i and iii (d) iii

8.1.9 The attributes of relationship teaches in teacher <u>teaches</u> course should be

(a) teacher code, teacher name, dept, phone no
(b) course no, course name, semester offered, credits
(c) teacher code, course no, semester no
(d) teacher code, course no, teacher name, dept, phone no

8.1.10 The expansion of E-R diagram is

(a) Entity-Relationship diagram
(b) Entity-Relative diagram
(c) Entity-Relation diagram
(d) Entity-Rationalized diagram

8.1.11In an E-R diagram entities are represented by

(a) circles
(b) rectangles
(c) diamond shaped box
(d) ellipse

8.1.12 In an E-R diagram relationship is represented by

(a) circles
(b) rectangles
(c) diamond shaped box
(d) ellipse

8.1.13 Entities are identified from the word statement of a problem by

(a) picking words which are adjectives
(b) picking words which are nouns
(c) picking words which are verbs
(d) picking words which are pronouns

8.1.14 Relationships are identified from the word statement of a problem by

(a) picking words which are adjectives
(b) picking words which are nouns
(c) picking words which are verbs
(d) picking words which are pronouns

8.1.15 One entity may be

(a) related to only one other entity
(b) related to itself
(c) related to only two other entities
(d) related to many other entities

8.2.1 By relation cardinality we mean

(a) number of items in a relationship
(b) number of relationships in which an entity can appear
(c) number of items in an entity
(d) number of entity sets which may be related to a given entity

8.2.2 If an entity appears in only one relationship then it is

(a) a 1:1 relationship
(b) a 1:N relationship
(c) a N:1 relationship
(d) a N:M relationship

8.2.3 If an entity appears in N relationships then it is

(a) a 1:1 relationship
(b) a 1:N relationship
(c) a N:1 relationship
(d) a N:M relationship

8.2.4 If an entity appears in not more than 5 relationships then it is a

(a) 1:1 relationship
(b) 1:5 relationship
(c) 5:1 relationship
(d) 5:5 relationship

8.2.5 A pilot can fly three types of planes and a plane can be piloted by any qualified pilot. The pilot-plane type relationship is

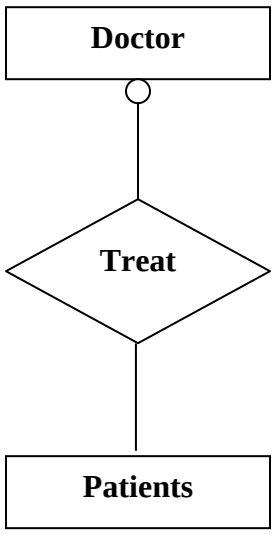
(a) N:3
(b) 3:N
(c) 1:3
(d) 3:1

8.2.6 A student can take not more than 5 subjects in a semester. The number of students allowed in a subject in a semester is not more than 40. The student – subject relationship is:

(a) 5:40
(b) 40:5
(c) N:5
(d) 40:M

8.2.7 The following E-R diagram is interpreted as follows:

(a) A doctor treats upto N patients
(b) A doctor treats exactly N patients
(c) A doctor may treat upto N patients; Some doctors may not treat any patients
(d) A doctor will treat patients based on some conditions



8.2.8 A relation is

(a) an entity
(b) a relationship
(c) members of a relationship set
(d) members of an entity set or a relationship set

8.2.9 Rows of a relation are called

(a) tuples
(b) a relation row
(c) a data structure
(d) an entity

8.2.10 The rows of a relation

(a) must be in specified order
(b) may be in any order
(c) in ascending order of key
(d) in descending order of key

8.2.11 The columns of a relation

(a) must be in specified order
(b) may be in any order
(c) with key field in first column
(d) with largest width column last

8.2.12 Relations are used in logical database design because

(i) sound theory of relations facilitates systematic design of relational databases
(ii) they are very popular
(iii) they are flat files and easy to store and retrieve from computer's memory
(iv) E-R diagrams allow design of relations

(a) i and ii (b) i and iii
(c) ii and iii (d) iii and iv

8.3.1 Normalization is a process of restructuring a relation to

(a) minimize duplication of data in a database
(b) maximize duplication of data to ensure reliability
(c) make it of uniform size
(d) allow addition of data

8.3.2 Normalization of database is essential to

(i) avoid accidental deletion of required data when some data is deleted
(ii) eliminate inconsistencies when a data item is modified in the database
(iii) allows storage of data in a computer's disk
(iv) use a database management system

(a) i and iii (b) i and ii
(c) ii and iii (d) ii and iv

8.3.3 The process of normalization

(a) is automatic using a computer program
(b) requires one to understand dependency between attributes

(c) is manual and requires semantic information
(d) is finding the key of a relation

8.3.4 The following relation is not normalized because

Roll no	*Name*	*Courses taken*		
		Course No	*Dept*	*Sem*
4568	A.B Moni	CS 101	C.S.	1
		EE 545	E.E.	2
		Phy 325	Physics	1
4894	R. Chamnlal	Phy 101	Physics	1
		Chem202	Chemistry	2
		Math 103	Math.	1
		CS 101	C.S.	1
4954	R. Gupta	CS 101	C.S.	1

(a) It is difficult to store due to non–uniform size of the attributes
(b) Roll no. 4568 have 3 course line whereas Roll no. 4954 has only one course line
(c) The composite attribute (CS 101, C.S., 1) is repeated
(d) Some item lines have composite attributes

8.3.5 The relation given in Exercise 10.4.4 may be converted to 1 NF relation by

(a) eliminating composite attributes
(b) eliminating common attributes
(c) duplicating common attributes as many times as lines in corresponding attributes
(d) putting composite attributes in a separate table

8.3.6 A relation is said to be in 1NF if

(a) there is no duplication of data
(b) there are no composite attributes in the relation
(c) there are only a few composite attributes
(d) all attributes are of uniform type

8.3.7 The number of normal forms which has been proposed and discussed in the book are

(a) 3 (b) 4
(c) 5 (d) 6

8.3.8 A relation which is in a higher normal form

(a) implies that it also qualifies to be in lower normal form
(b) does not necessarily satisfy the conditions of lower normal form
(c) is included in the lower normal form
(d) is independent of lower normal forms

8.3.9 Given an attribute x, another attribute y is dependent on it, if for a given x

(a) there are many y values
(b) there is only one value of y
(c) there is one or more y values
(d) there is none or one y value

8.3.10 An attribute y may be functionally dependent on

(i) a composite attribute x,y
(ii) a single attribute x
(iii) no attribute

(a) i and ii (b) i and iii
(c) ii and iii (d) iii

8.3.11A second Normal Form (2 NF) relation should

(a) be in 1 NF
(b) not have a composite key
(c) not have attributes dependent on key attribute
(d) not have attributes dependent on one another

8.3.12 A relation is said to be in 2 NF if

(i) it is in 1 NF
(ii) non-key attributes dependent on key attribute
(iii) non-key attributes are independent of one another
(iv) if it has a composite key, no non-key attribute should be dependent on part of the composite key

(a) i, ii, iii (b) i and ii
(c) i, ii, iv (d) i, iv

8.3.13 Given the following relation

vendor order (vendor no, order no, vendor name, qty supplied, price/unit) it is not in 2 NF because

(a) it is not in 1 NF
(b) it has a composite key
(c) non-key attribute vendor name is dependent on vendor no. which is one part of the composite key
(d) Qty supplied and price/unit are dependent

8.3.14 Given the following relation

vendor order (vendor no, order no, vendor name, qty supplied , price/unit) the second normal form relations are

(a) vendor (vendor no, vendor name)
qty (qty supplied, price/unit)
order (order no, qty supplied)
(b) vendor (vendor no, vendor name)
order (order no, qty supplied, price/unit)
(c) vendor (vendor no, vendor name)
order (order no, qty supplied, price/unit)
vendor order (vendor no, order no)
(d) vendor (vendor no, vendor name, qty supplied, price/unit)
vendor order (order no, vendor no)

8.3.15A third Normal Form (3 NF) relation should

(a) be in 2 NF
(b) not have complete key
(c) not be 1 NF
(d) should not have non-key attributes depend on key attribute

8.3.16A relation is said to be in 3 NF if

(i) it is in 2 NF
(ii) non-key attributes are independent of one another
(iii) key attribute is not dependent on part of a composite key
(iv) has no multi-valued dependency

(a) i and iii (b) i and iv
(c) i and ii (d) ii and iv

8.3.17 Given the following relation it is not 3 NF because

Student (<u>roll no</u>, name, course no, course max. marks, year of study, address)

(a) it is not in 2 NF
(b) it does not have composite key
(c) non-key attributes course no and course max. marks are functionally dependent
(d) it has more than 3 non-key attributes

8.3.18Given the following relation

Student (<u>roll no</u>, name, course no, course max. marks, year of study, address)

The corresponding 3 NF relations are

(a) student (<u>roll no</u>, name, year of study, address)
course (<u>course no</u>, course max. marks)
(b) student (<u>roll no</u>, name, year of study, address)
student (<u>roll no</u>, <u>course no</u>)
course (<u>course no</u>, course max. marks)
(c) student (<u>roll no</u> , name, address)
year (<u>roll no</u>, year of study)
course (<u>course no</u>, course max. marks)
(d) student (<u>roll no</u>, name, address)
course (<u>course no</u>, course max. marks, year of study)

8.3.19 Boye Codd Normal Form (BCNF) is needed when

(a) two non-key attributes are dependent
(b) there is more then one possible composite key
(c) there are two or more possible composite overlapping keys and one attribute of a composite key is dependent on an attribute of another composite key
(d) there are two possible keys and they are dependent on one another

8.3.20 A relation is said to be in BCNF when

(a) it has overlapping composite keys
(b) it has no composite keys
(c) it has no multivalued dependencies
(d) it has no overlapping composite keys which have related attributes

8.3.21 A 3 NF relation is converted to BCNF by

(a) removing composite keys
(b) removing multivalued dependencies
(c) dependent attributes of overlapping composite keys are put in a separate relation

(d) dependent non-key attributes are put in a separate table

8.3.22 BCNF is needed because

(a) otherwise tuples may be duplicated
(b) when a data is deleted tuples may be lost
(c) updating is otherwise difficult
(d) when there is dependent attributes in two possible composite keys one of the attributes is unnecessarily duplicated in the tuples

8.3.23 Given the relation

Supplier(s_id, p_order, s_name, qty)

Given that there is a unique s_name for each s_id and that s_id, p_order is a composite key, find the correct statement among the following:

(i) this relation is a BCNF
(ii) this is 3 NF relation
(iii) this is a 2 NF relation
(iv) this is a 1 NF relation

(a) i and ii (b) ii and iii
(c) i and iv (d) i and iii

8.3.24 Given the relation of Exercise 10.7.5 it is reduced to the following BCNF relation

(a) Supplier (s_ids, s_name)
Purchase (s_id, p_order, qty)
(b) Supplier (s_id, s_name)
Purchase (p_order, qty)
(c) Purchase (s_id, p_order)
Supplier (s_name, qty)
(d) Supplier (s_id, s_name, qty)
Purchase (s_id, p_order)

8.3.25 Fourth normal form (4 NF) relations are needed when

(a) there are multivalued dependencies between attributes in composite key
(b) there are more than one composite key
(c) there are two or more overlapping composite keys
(d) there are multivalued dependency between non-key attributes

8.3.26 A 3 NF relation is split into 4 NF

(a) by removing overlapping composite keys
(b) by splitting into relations which do not have more than one independent multivalued dependency
(c) removing multivalued dependency
(d) by putting dependent non-key attribute in a separate table

8.3.27 A relation project guidance

Project Guidance(<u>professor, project</u>, <u>student no</u>. st-name, dept)

A professor can give many projects to many students
A project will have many students
A project may be guided by many professors

The 4 NF relation corresponding to this are

(a) Prof_Project (professor, st_name, dept)
Proj_stud (project, student no.)
(b) Prof_stud (professor, student no)
Proj_stud (project, student no)
Student (student no, st_name, dept)
(c) Student (student no, st_name, dept)
Professor(professor, project)
(d) Professor(professor, project, dept)
Student (student no, st_name, dept)

8.3.28 The project guidance relation of Exercise 10.8.3 needs further normalization to 5 NF because

(a) There are too many multivalued dependencies
(b) Multivalued dependency and simple dependency are mixed in the 4 NF relation
(c) Spurious tuples got introduced when the 4 NF relations are combined due to the fact that a professor can guide only specified projects
(d) 4 NF relations have composite keys

8.3.29 5 NF relations equivalent to the relation of Exercise 10.8.3 are

(a) Prof_stud (professor, student_no)
Proj_stud (project, student_no)
Prof_proj (professor, project)
Student (student_no, st_name, dept)
(b) Professor (professor, professor details)
Student (student_no, st_name, dept)
Project (project no, project details)
(c) Prof_stud (professor, student_no)
Prof_proj (professor, project)
(d) Prof_stud (professor, student_no)
Stud_proj (student_no, project)
Student (student_no, st_name, dept)

8.4.1 The ORDER PLACED FOR relation in Mini-case example 1 has the composite key order no, item code because

(a) item code has a multivalued dependency with order no.
(b) the non-key attributes are dependent on the composite key order no, item code
(c) if order no is the only key we cannot find qty. ordered, price/unit, delivery time
(d) if item code is the only key we cannot find order no. uniquely

8.4.2 The relation SUPPLIES in Mini-case example 1 of Section 10.10 requires normalization because

(a) it has a composite key with three attributes
(b) the non-key attributes are dependent on part of composite key
(c) the attributes item code and order no of the composite key have multivalued dependency
(d) vendor code and order no have a multivalued dependency

8.4.3 TEACHES-COURSES relation in Mini-case example 2 is in

(a) 3 NF. Does not need any further normalization
(b) BCNF
(c) 4 NF
(d) unnormalized form

8.4.4 TEACHER-STUDENT relation in Mini-case example 2 is required because

(a) it is in 3 NF
(b) it has a multivalued key
(c) it has a composite key with multivalued dependency relation
(d) Without this relation database is incomplete and some queries cannot be answered

8.5.1 By redundancy in a file based system we mean that

(a) unnecessary data is stored
(b) same data is duplicated in many files
(c) data is unavailable
(d) files have redundant data

8.5.2 Data integrity in a file based system may be lost because

(a) the same variable may have different values in different files
(b) files are duplicated
(c) unnecessary data is stored in files
(d) redundant data is stored in files

8.5.3 Data availability is often difficult in file based system

(a) as files are duplicated
(b) as unnecessary data are stored in files
(c) as one has to search different files and these files may be in different update states
(d) redundant data are stored in files

8.5.4 Management policy changes are difficult to implement in a file based system because

(a) relating data in different files is difficult
(b) files are duplicated
(c) redundant data are stored
(d) unnecessary data is stored

8.5.5 Some of the objectives of a database management system are to

(i) minimize duplication of data
(ii) ensure centralized management control of data
(iii) ease retrieval of data
(iv) maintain a data dictionary

(a) i and ii (b) i, ii and iv
(c) i and iii (d) i, ii and iii

8.5.6 A database is a

(a) collection of files
(b) collection of inputs and outputs of application
(c) collection of related data necessary to manage an organization
(d) data resource of an organization

8.5.7 A database models data so that it is

(a) appropriate for application
(b) independent of application program
(c) optimized for most frequent applications
(d) optimized for all applications

8.5.8 A database should be designed to allow providing

(a) different views of portions of data requested by an application
(b) data only to selected applications as decided by an organization
(c) a uniform view of data to all applications
(d) data to all applications

8.5.9 The abbreviation DBMS stands for

(a) Data Base Manipulation System
(b) Data Bank Manipulating System
(c) Data Base Management System
(d) Data Bank Management System

8.5.10 A DBMS is

(a) another name for database system
(b) independent of a database
(c) dependent on application programs
(d) is a set of procedures which manage a database

8.5.11 A DBMS

(a) is a set of procedures
(b) manages a database
(c) is a set of procedures to manage a database to provide data as required by applications
(d) provides data to applications

8.5.12 One of the main objectives of a DBMS is to

(a) Create a database for an organization
(b) Facilitate sharing of a database by current and future applications
(c) Allow sharing application programs
(d) Replace file based systems

8.5.13 Database is

(a) an important resource of an organization
(b) not relevant to existing programs
(c) not relevant for future programs
(d) not as good as files as there is redundancy

8.5.14 By data independence we mean application programs

(a) do not need data
(b) may be developed independent of data
(c) may be developed without knowing the organization of data
(d) may be developed with independent data

8.5.15 Data independence allows

(i) no changes in application programs
(ii) change in database without affecting application programs

(iii) hardware to be changed without affecting application programs
(iv) system software to be changed without affecting application programs

(a) i, ii (b) ii, iii
(c) ii, iii, iv (d) i, ii, iv

8.5.16 Data independence allows

(a) sharing the same database by several applications
(b) extensive modification of applications
(c) no data sharing between applications
(d) elimination of several application programs

8.5.17 Among objectives of DBMS are ensuring

(i) data integrity
(ii) data redundancy
(iii) data security
(iv) easy data retrieval

(a) i, ii (b) i, iii
(c) i, iii, iv (d) i, ii, iii

8.5.18 DBMS

(a) does not allow replication of data
(b) allows controlled replication of data if it improves performance
(c) does not allow common data to be duplicated
(d) does not allow replication as it adversely affects reliability

8.5.19 By data integrity we mean

(a) maintaining consistent data values
(b) integrated data values
(c) banning improper access to data
(d) not leaking data values

8.5.20 Data integrity is ensured by

(a) good data editing
(b) propagating data changes to all data items
(c) preventing unauthorized access
(d) preventing data duplication

8.5.21 By data security in DBMS we mean

(a) preventing access to data
(b) allowing access to data only to authorized users
(c) preventing changing data
(d) introducing integrity constraints

8.5.22 DBMS must implement management controls to

(i) control access rights to users
(ii) implement audit trail when changes are made
(iii) allow data to be used extensively in the organization
(iv) duplicate databases

(a) i, ii (b) ii, iii
(c) iii, iv (d) i, iv

8.6.1An E-R modelling for given application leads to

(a) conceptual data model
(b) logical data model
(c) external data model
(d) internal data model

8.6.2A conceptual data model is converted using a Relational Data Base Management System to a

(a) logical data model
(b) external data model
(c) internal data model
(d) an entity-relation data model

8.6.3A subset of logical data model accessed by programmers is called a

(a) conceptual data model
(b) external data model
(c) internal data model
(d) an entity-relation data model

8.6.4When a logical model is mapped into a physical storage such as a disk store the resultant data model is known as

(a) conceptual data model
(b) external data model
(c) internal data model
(d) disk data model

8.6.5A DBMS has the following components

(i) a data definition language
(ii) a query language
(iii) a security system
(iv) audit trail

(a) i, ii (b) i, ii, iii
(c) i, ii, iii, iv (d) i, ii, iv

8.6.6A check pointing system is needed

(a) to ensure system security
(b) to recover from transient faults
(c) to ensure system privacy
(d) to ensure system integrity

8.6.7 A database administrator

(a) administers data in an organization
(b) controls all inputs and all outputs of programs
(c) is controller of data resources of an organization
(d) controls all data entry operators

8.6.8 The responsibilities of a database administrator includes

(i) maintenance of data dictionary
(ii) ensuring security of database
(iii) ensuring privacy and integrity of data
(iv) obtain an E-R model

(a) i, ii (b) i, ii, iii

(c) i, ii, iii, iv (d) ii, iii, iv

8.6.9 Access right to a database is controlled by

(a) top management
(b) system designer
(c) system analyst
(d) database administrator

8.6.10 The sequence followed in designing a DBMS are

(a) physical model conceptual model logical model
(b) logical model physical model conceptual model
(c) conceptual model logical model physical model
(d) conceptual model physical model logical model

8.6.11 Designing physical model of DBMS requires information on

(i) data volume
(ii) frequency of access to data
(iii) programming language used
(iv) secondary memory characteristics

(a) i, ii (b) i, ii, iii
(c) i, ii, iii, iv (d) i, ii, iv

8.6.12A good database design

(i) caters primarily to current needs
(ii) caters to current and future needs as organizations grow
(iii) has to be modified when hardware is upgraded
(iv) ensures data security

(a) i, ii (b) i, ii, iii
(c) ii, iv (d) iii, iv

8.6.13 A good database design

(i) is expandable with growth and changes in organization
(ii) easy to change when software changes
(iii) ensures data integrity
(iv) allows access to only authorized users

(a) i, ii (b) ii, iii
(c) i, ii, iii, iv (d) i, ii, iii

Key To Objective Questions

8.1.1 b	**8.1.2 c**	**8.1.3 b**	**8.1.4 c**	**8.1.5 a**	**8.1.6 d**
8.1.7 a	**8.1.8 c**	**8.1.9 c**	**8.1.10 a**	**8.1.11 b**	**8.1.12 c**
8.1.13 b	**8.1.14 c**	**8.1.15 d**	**8.2.1 b**	**8.2.2 a**	**8.2.3 b**
8.2.4 b	**8.2.5 a**	**8.2.6 b**	**8.2.7 c**	**8.2.8 d**	**8.2.9 a**
8.2.10 b	**8.2.11 b**	**8.2.12 b**	**8.3.1 a**	**8.3.2 b**	**8.3.3 b**
8.3.4 d	**8.3.5 c**	**8.3.6 b**	**8.3.7 d**	**8.3.8 a**	**8.3.9 b**
8.3.10 a	**8.3.11 a**	**8.3.12 c**	**8.3.13 c**	**8.3.14 c**	**8.3.15 a**
8.3.16 c	**8.3.17 c**	**8.3.18 b**	**8.3.19 c**	**8.3.20 d**	**8.3.21 c**
8.3.22 d	**8.3.23 d**	**8.3.24 a**	**8.3.25 a**	**8.3.26 b**	**8.3.27 b**
8.3.28 c	**8.3.29 a**	**8.4.1 a**	**8.4.2 c**	**8.4.3 a**	**8.4.4 d**
8.5.1 b	**8.5.2 a**	**8.5.3 c**	**8.5.4 a**	**8.5.5 d**	**8.5.6 c**
8.5.7 b	**8.5.8 a**	**8.5.9 c**	**8.5.10 d**	**8.5.11 c**	**8.5.12 b**
8.5.13 a	**8.5.14 c**	**8.5.15 c**	**8.5.16 a**	**8.5.17 c**	**8.5.18 b**
8.5.19 a	**8.5.20 b**	**8.5.21 b**	**8.5.22 a**	**8.6.1 a**	**8.6.2 a**
8.6.3 b	**8.6.4 c**	**8.6.5 c**	**8.6.6 b**	**8.6.7 c**	**8.6.8 b**
8.6.9 d	**8.6.10 c**	**8.6.11 d**	**8.6.12 c**	**8.6.13 c**	