

(Free) Sample 6

Taken from:

Question Bank 1: Database Fundamentals

Knowledge River Ltd



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The full *Question Bank 1* comprises 23 extended questions and detailed answers covering all aspects of database fundamentals.

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Below are three examples...

Question: Given this conceptual schema for a student database:

First Name, Surname, Student ID, Date of Birth, Home Address, Term Address, Home Telephone, Term Telephone, Course Code, Course Title, Department, Start Year, End Year, Average Grade, Project Title, Supervisor.

Which of the following are valid views (sub-schemas) and which are not – and state why:

View 1: First Name, Surname, Project Title, Supervisor

View 2: Student ID, Home Address, Home Telephone, Term Address, Term Telephone

View 3: First Name, Surname, Student ID, Date of Birth, Home Address, Term Address, Home Telephone, Term Telephone, Course Code, Course Title, Department, Start Year, End Year, Average Grade, Project Title, Supervisor.

View 4: First Name, Surname, Student ID, Project Title, Supervisor, Supervisor ID, Supervisor Room Number, Supervisor Telephone.

View 5: First Name, Surname, Student ID, Date of Birth, Home Address, Term Address, Home Telephone, Term Telephone, Mobile, Email.

View 6: Student ID

Solution: Given this conceptual schema for a student database:

First Name, Surname, Student ID, Date of Birth, Home Address, Term Address, Home Telephone, Term Telephone, Course Code, Course Title, Department, Start Year, End Year, Average Grade, Project Title, Supervisor.
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Which of the following are valid views (sub-schemas) and which are not – and state why:

View 1: First Name, Surname, Project Title, Supervisor

View 2: Student ID, Home Address, Home Telephone, Term Address, Term Telephone

View 3: First Name, Surname, Student ID, Date of Birth, Home Address, Term Address, Home Telephone, Term Telephone, Course Code, Course Title, Department, Start Year, End Year, Average Grade, Project Title, Supervisor.

View 4: First Name, Surname, Student ID, Project Title, Supervisor, *Supervisor ID*, *Supervisor Room Number*, *Supervisor Telephone*.

View 5: First Name, Surname, Student ID, Date of Birth, Home Address, Term Address, Home Telephone, Term Telephone, *Mobile*, *Email*.

View 6: Student ID

[Views 1, 2, 3 and 6 are fine. Views 4 and 5 are invalid – they have additional data items that are not listed in the original conceptual/logical model (these are in italics) – this is not allowed]

Question: Complete the following statement by filling in the blanks:

The _____ architecture has three levels. The highest level is known as the _____ level and comprises one or more user views (often called _____). Each view contains a sub-set of the (single) _____ or logical schema – which is the middle level. Both the external and conceptual/logical levels describe _____ data is held in the database, not _____ it is stored – which is covered by the lowest of the three levels – the _____ (storage) schema – which describes the physical structure of the data. Below this final level lies two distinct components – the _____ which holds the actual data and the _____ (or _____) which holds meta-data.

Solution: Complete the following statement by filling in the blanks:

The **ANSI-SPARC** architecture has three levels. The highest level is known as the **external** level and comprises one or more user views (often called **sub-schemas**). Each view contains a sub-set of the (single) **conceptual** or logical schema – which is the middle level. Both the external and conceptual/logical levels describe **what** data is held in the database, not **how** it is stored – which is covered by the lowest of the three levels – the **internal** (storage) schema – which describes the physical structure of the data. Below this final level lies two distinct components – the **database** which holds the actual data and the **system catalogue** (or **data dictionary**) which holds meta-data.

Question: If the Universe of Discourse is a *legal firm's customer billing operation*, for each of the following data items note whether or not you would expect it to be within the system boundary? (Write **IN** or **OUT** for each item).

Customer name		Legal regulations or Acts of Parliament	
Customer date of birth		Law Society staff membership details	
Customer address		The number of staff at the firm	
Customer identifier (at firm)		The legal specialities of the firm	
Customer sex		The address of the firm	
Customer marital status		The telephone number of the firm	
Customer occupation		The invoice number	
Customer car details		The type of work undertaken	
Solicitor sex		The payment dates & terms of settlement	
Solicitor private address		The review dates for salaries	
Solicitor age		Solicitor academic background	
Solicitor name		Solicitor start date at firm	
Solicitor hourly rate		Solicitor hours worked for this client	
Solicitor salary		Solicitor annual leave entitlement	

Solution: If the Universe of Discourse is a *legal firm's customer billing operation*, for each of the following data items note whether or not you would expect it to be within the system boundary? (Write IN or OUT for each item).

Customer name	IN	Legal regulations or Acts of Parliament	OUT
Customer date of birth	OUT	Law Society staff membership details	OUT
Customer address	IN	The number of staff at the firm	OUT
Customer identifier (at firm)	IN	The legal specialities of the firm	OUT
Customer sex	OUT	The address of the firm	IN
Customer marital status	OUT	The telephone number of the firm	IN
Customer occupation	OUT	The invoice number	IN
Customer car details	OUT	The type of work undertaken	IN
Solicitor sex	OUT	The payment dates & terms of settlement	IN
Solicitor private address	OUT	The review dates for salaries	OUT
Solicitor age	OUT	Solicitor academic background	OUT
Solicitor name	IN	Solicitor start date at firm	OUT
Solicitor hourly rate	IN	Solicitor hours worked for this client	IN
Solicitor salary	OUT	Solicitor annual leave entitlement	OUT