

1.3.2

DATABASES

TOPIC WISE EXAM QUESTIONS

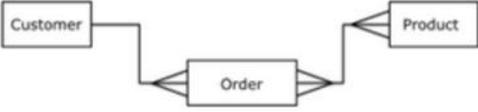
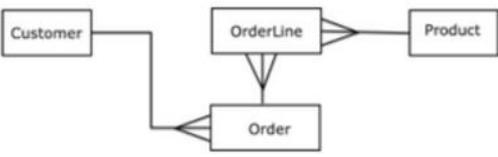
ANSWERS

A-LEVEL

OCR

4	(f)	(i)	<ul style="list-style-type: none"> DELETE FROM TblAccessLog WHERE UserType = "NotNeeded" 	2	<p>Do not accept DELETE * or inclusion of field names</p> <p>Need quotation on MP2</p> <p>For field and table names, case must match - only penalise once and FT</p> <p>Do not award MP2 if == is used instead of =</p>
4	(f)	(ii)	<ul style="list-style-type: none"> Each attribute name is unique Primary key identified No repeated attributes All data in attributes must be atomic (cannot be further split up) // by example 	2	<p>Do not accept repeated data / data redundancy (higher than 1NF) unless specified that this is within one field</p> <p>Allow fields/properties as alternative to attribute</p>
4	(f)	(iii)	<ul style="list-style-type: none"> DateAccessed... ...has non-atomic data // data can be split up (into separate dates) 	2	

AS - Level

4	(a)		<ul style="list-style-type: none"> Relational data allows for less redundancy of data/less repeated data Relational databases improve the consistency of data Relational databases allow for complex queries and/or searches to be performed 	A01.2 (2)	
4	(b)		<p>1 mark for each bullet point to max 2 marks:</p> <ul style="list-style-type: none"> One customer to many orders Many orders to many products // One order to many orderLines and many orderLines to one product <p>Solution 1:</p>  <p>Solution 2:</p> 	A03.1 (2)	<p>Ignore any relationship between customer and product.</p> <p>Accept any suitable alternative name for the OrderLine entity.</p> <p>Additional guidance: For MP2, candidates may have avoided the use of many-to-many relationships, due to the information in part c). Therefore, allow one product to many orders.</p>
4	(c)	(i)	<ul style="list-style-type: none"> A primary key will only appear once in a table/is a unique identifier A foreign key may appear multiple times a table/may not be unique 	A01.1 (2)	Accept entity for table
4	(c)	(ii)	<ul style="list-style-type: none"> <u>CustomerID</u> <u>ProductID</u> 	A02.2 (1)	Correct answer only
4	(c)	(iii)	<ul style="list-style-type: none"> There may be duplicate values. 	A02.2 (1)	

2	(a)	(i)	<ul style="list-style-type: none"> Field that is unique/does not repeat 	1	
		(ii)	<ul style="list-style-type: none"> Foreign Key: PackageType Table Name: Membership 	2	Must be spelled correctly
		(iii)	<ul style="list-style-type: none"> Float / Floating Point / Real 	1	Allow currency/double/single/decimal
	(b)		<ul style="list-style-type: none"> Username and FirstName fields (and no others) selected correctly using <code>SELECT</code> keyword Membership / both tables correctly selected using <code>FROM</code> keyword Tables joined using correct <code>JOIN / INNER JOIN</code> keywords // Tables joined using correct <code>WHERE</code> clause Fields use table identifiers before them <code>WHERE</code> clause used to correctly show only records where <code>Adverts = true</code> 	5	<p>For full marks, a fully correct working answer must be provided. Candidates can join tables in either of two valid ways (using <code>JOIN</code> or <code>WHERE</code>). Note that <code>JOIN</code> is given in the specification but <code>INNER JOIN</code> is also equally acceptable.</p> <p>BP1 is the same for either method For BP2, candidates can either choose just the Membership table or <u>both</u> the Membership and Packageable BP3 credited for correct <code>JOIN / INNER JOIN</code> or correct use of <code>WHERE</code> clause to join tables. <u>Do not credit if FROM clause incorrect for this method</u> BP4 credited if candidates have used table identifiers before the field name (i.e they have used <code>Membership.PackageType</code> and not just <code>PackageType</code>) BP5 will require use of <code>AND</code> if <code>WHERE</code> is used to join tables.</p> <p>Spellings of all field names, table names and keywords must be accurate but only penalise once.</p> <p><u>Example one using JOIN keyword</u> <pre>SELECT Username, Firstname FROM Membership JOIN Package on Membership.PackageType=Package.PackageType WHERE Adverts = true</pre> </p> <p><u>Example two using WHERE clause</u> <pre>SELECT Username, Firstname FROM Membership, Package WHERE Membership.PackageType = Package.PackageType AND Adverts = true</pre> </p>
	(c)	(i)	<ul style="list-style-type: none"> Form / web form Can use validation to check for common errors... Can check for duplicate values Data can be entered direct into the database / limited manual processing Can be done from remote locations 	3	<p>One mark maximum for identification of method Two marks for discussion of suitability</p> <p>Accept other valid methods of capturing data. Do NOT accept OCR/OMR/barcodes/QR codes</p> <p>If the method is incorrect, don't read on</p>
		(ii)	<p>e.g.</p> <ul style="list-style-type: none"> CSV JSON XML SQL APIs EDI RSS SOAP 	2	
	(d)	(i)	<ul style="list-style-type: none"> (Committed) data/transaction is not lost... ...in case of power / system failure 	2	
		(ii)	<ul style="list-style-type: none"> Completed transactions stored in secondary storage // data not stored long-term in RAM/cache 	1	
		(iii)	<ul style="list-style-type: none"> The outcome of concurrent transactions is the same as if transactions were completed sequentially. Record locking allows one user/process to access/modify record level data at any one time So data that is being used elsewhere cannot be modified // data that is being modified elsewhere cannot be used 	3	Allow reference to lost updates/dirty reads/phantom reads for BP3.
		(iv)	<ul style="list-style-type: none"> Can cause delays (as users wait for access) Can cause deadlock 	1	

(d)	i	<ul style="list-style-type: none"> Field with a unique value CustomerID 	2	
	ii	<ul style="list-style-type: none"> SELECT CustomerID, Surname FROM Customer WHERE Title="Miss" OR Title = "Mrs" 	4	1 mark per bullet point. Data in fields must be in speech marks/apostrophes Allow speech mark/apostrophe FT for BP 2 and 4 Ignore colons/semicolons
	iii	<ul style="list-style-type: none"> Only one customer entry allowed (because of key field) ...so would not be able to add second entry Customer data already present/would be repeated ...resulting in redundant data/wasted space ...resulting in inconsistencies should changes be made 	2	Mark in pairs.
	iv	<ul style="list-style-type: none"> Add in second table ...for the cars // splitting up cars/customers The primary key of customer is used as a field in the car/vehicle table ... as a foreign key of cars Create one to many relationship. <i>Accept many to one.</i> 	5	

(d)	i	<ul style="list-style-type: none"> -Customer, Room and Booking entities, must be singular -Customer joined to Booking and Room joined to booking and no other links -Customer to Booking relationship indicated as one-many -Room to Booking relationship indicated as one-many 	4		<pre> graph TD Customer[Customer] --- Booking[Booking] Room[Room] --- Booking[Booking] style Customer fill:none,stroke:none style Room fill:none,stroke:none style Booking fill:none,stroke:none </pre>
	ii	<ul style="list-style-type: none"> A field that links to a (primary) key in a second table Example : Customer ID // RoomID... ... in Booking table 	3		
(e)		<ul style="list-style-type: none"> Database/relationships are consistent // each foreign key links to an existing/valid primary key Suitable example of being broken (e.g. if primary key is deleted/updated, foreign keys are no longer valid / changes should be cascaded) 	2		Accept example that is not related to the database given (as this is an AO1 question)

7	a	<ul style="list-style-type: none">- Ensuring that changes are consistent across a database- if a record is removed all references to it are removed- A foreign key value must have a corresponding Primary key value in another table.- In this case, a user being removed will result in their reviews being removed/ a restaurant being removed will result in its reviews being removed. <p>(1 mark per -, max 2 marks for explanation)</p>	3 AO1.1 (2) AO2.1 (1)
	c	<ul style="list-style-type: none">- A transaction/review can only fully complete or not complete / cannot partially complete- In this case, it should not be possible for the review to be added without the (average) rating being updated. <p>(1 mark per -, max 2)</p>	2 AO1.1 (1) AO2.1 (1)
	d	<ul style="list-style-type: none">- Consistency- Isolation- Durability <p>(1 mark per -, max 3)</p>	3 AO1.1

3	a		<ul style="list-style-type: none"> - Gets/selects/outputs the flight numbers from the 'Flight' table - Of flights with the destination JFK - It returns OC0089 and OC7750 <p>(1 Mark per -, Max 2)</p>	2 (AO2.2)	
	b		<ul style="list-style-type: none"> - SELECT * changed to DELETE - Halifax changed to Heathrow DestinationName='Heathrow' / DestinationCode='LHR' - Added AND DepartureDate=4/7/18 <p>(1 Mark per -, Max 3)</p>	3 (AO3.2)	<p>DELETE FROM Flight WHERE DestinationName='Heathrow' AND DepartureDate=4/7/18</p> <p>Accept quotation marks or #s around the date.</p> <p>Do not give first mark if asterisk is kept (i.e. DELETE *)</p> <p>The Departure Date condition could be placed before the Destination Name.</p>
	c	i	It is not unique/ the same value can appear in multiple records	1 (AO2.1)	
		ii	It is likely to be used to search for / index / sorted on	1 (AO2.1)	
	d	i	<ul style="list-style-type: none"> -No Repeating fields/data -Data is atomic -Has a primary Key <p>(1 Mark per -, max 2)</p>	2 (AO2.1)	
		ii	<ul style="list-style-type: none"> -Is in First Normal Form -Every field is dependent on the primary key. <p>(1 Mark per -, max 2)</p>	2 (AO2.1)	
		iii	<ul style="list-style-type: none"> - Has a transitive relationship/ A non-key field depends on another non-key field. - DestinationName depends on DestinationCode <p>(1 Mark per -, max 2)</p>	2 (AO1.2)	
	e		<ul style="list-style-type: none"> - CSV/Comma Separated Value (file)... - A (text) file/format with values separated by commas (or some other delimiter) - XML/eXtensible Markup Language... - ...A markup language that uses tags to denote data. - SQL/Structured Query Language... - ...A language for creating/querying databases <p>Accept any reasonable answer. 1 mark for naming method, 1 mark for valid description.</p>	2 (AO2.1)	<p>Other examples include:</p> <ul style="list-style-type: none"> - RSS/Really Simple Syndication/Rich Site Summary... -A URL is given which points to an XML file which is periodically checked by a browser/program. - API/Application Programming Interface... - ...A prewritten set of subroutines/interfaces that provide access to the company's data. - JSON/JavaScript Object Notation... - ...text format that can easily be changed to and from JavaScript Objects. <p>Candidates may provide other valid answers (e.g. REST, SOAP etc.).</p> <p>Descriptions may differ from those given. Accept any valid description.</p>

7	a	A field which has a unique value for every record/A unique identifier. (1)	2 (AO1.1 –	
	c	SELECT passwordHash, locked (1) FROM Users (1) WHERE username='Apollo' (1)	3 (AO 3.2)	Do not award first mark for SELECT *
	d	UPDATE Users (1) SET locked=1(1) WHERE username='Hades' (1)	3 (AO 3.2)	Allow other updating method e.g. a DELETE statement followed by an INSERT statement, for full marks e.g. DELETE FROM Users WHERE username = 'Hades' (1 mark) INSERT INTO Users (1 mark) VALUES (<userID value>,'Hades',<passwordHash value>,1) (1 mark)

6	a	<ul style="list-style-type: none"> Data might be inconsistent...(A01.1) ...For example the amount of LP-7XB toner cartridges might be reduced in one record but not in other records. (A02.2) Space is wasted through redundant data... (A01.1) ...For example the Re-order URL for each toner cartridge is stored multiple times. (A02.2) 	4 AO1.1 (2) AO2.2 (2)	
	b	<ul style="list-style-type: none"> Entities and relationships drawn using standard notation. (AO1.1) Cartridge linked to PrinterModel, PrinterModel linked to PrinterInstance with no other links. (AO 2.1) 1:M relationship from Cartridge to Printer Model (AO 2.1) 1:M relationship from PrinterModel to PrinterInstance. (AO 2.1) 	4 AO1.1 (1) AO2.1 (3)	<pre> classDiagram Cartridge --> PrinterModel PrinterModel --> PrinterInstance </pre>

b	i	<ul style="list-style-type: none"> Many to Many relationships are not allowed / in 3NF (1). 	1	For 1 mark.
	ii	<ul style="list-style-type: none"> Table added between student and video (1). Student to middle table 1:M relationship (1). Middle table to video M:1 relationship (1). 	3	For 3 marks.
2	a	<ul style="list-style-type: none"> A primary key must have a unique value for every record The values for all these fields could repeat. (1 per -) 	2	
	b	<ul style="list-style-type: none"> Advantage: Searches of Artist can be performed more quickly. Disadvantage: The index takes up extra space in the database. (1 per -) 	2	
3	a	<p><i>e.g.</i></p> <ul style="list-style-type: none"> NoInStock... ...to check stock levels / allow re-ordering Location (in warehouse)... ...to find item when needed 	2	<p>Marks for single example with reason only</p> <p>Accept other relevant examples</p> <p>Examiner's Comments</p> <p>A very open ended question that was designed to test candidates' ability to hypothesise about what should be in a database, most candidates achieved a creditable answer.</p>
	b	<ul style="list-style-type: none"> Only one product can be on an order Customer would have to make a separate order for each product required 	2	<p>Examiner's Comments</p> <p>A few candidates showed a lack of understanding of the E-R Diagram and said that customers would not be able to see the products, but most were able to correctly analyse what was asked for</p>
4	a	Branch name depends on Sort Code (i.e. there is a transitive relationship).	1	
	b	<p>Create another table for Branches which should include sort-code and branch name. (1) Make sort code the primary key of the BRANCH table/ Add a primary key to BRANCH. (1) Remove Branch name from Customers, leave sortcode as primary key/ Remove sort-code and branch name from customers and add the primary key values from BRANCS as the foreign key (1)</p> <p>ALTERNATIVE ANSWER (ER-DIAGRAM) Two tables CUSTOMER and BRANCH (or similar names) (1) Link from CUSTOMER to BRANCHES is Many (1) to One (1)</p>	3	

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useful, drop a follow
to help me out!**

THANK YOU!

GCST