New Stion Specification



ADVANCED

General Certificate of Education
2018

Centre Number					
Can	didat	e Nu	mber		
			Centre Nu		

Software Systems Development

Unit A2 1:

Systems Approaches and Database Concepts



[ADV11] FRIDAY 1 JUNE, AFTERNOON

TIME

2 hours.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.

This paper is accompanied by a Pre-release Case Study. You must **not** use your own annotated copy of this Case Study. Write your answers in the spaces provided in this question paper.

Answer all ten questions.

 -1/4/5/4-1/4/1/3		
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The total mark for this paper is 100.

Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.

Quality of written communication will be assessed in **questions 2, 4 and 6**.

For Examiner's use only				
Question	Marks available	Marks	Remark	
1	10			
2	6			
3	6			
4	8			
5	10			
6	10			
7	8			
8	15			
9	6			
10	21			

Total	100	

lorizon Solutions intend to conduct a systems investigation in orde ully assess the current situation at Connected Works.	1 10	Examiner Or Marks Ren
a) Explain why a range of users of the system should participate investigation. Consider the input likely to come from Stephen, J and the office staff.	n this Iohn	
	[6]	

their inv	Solutions will clearly apply a range of fact-finding techniques to restigation. It has been suggested that observation could be used		Examin Marks	er Only Remark
	y to obtain relevant information.			
(b) (i)	Give one advantage and one disadvantage of using observation as a suitable fact-finding technique at Connected Works.	n		
(ii)	Describe an instance of how this technique could be applied at Connected Works.			
		[4]		

2	Although Connected Works is a very successful business, there are many problems relating to the administrative procedures. These can involve a wide range of people and could affect the continued success of the business.	Examin Marks	er Only Remark
	Discuss problems you have identified relating to the administrative procedures and their likely impact on the business. Illustrate your answer with examples from the case study.		
	[6]		

3	Horizon Solutions is keen to ensure that Stephen and John understand why the use of a methodology might be considered in the development process.	Examine Marks	er Only Remar
	Outline three benefits of using a systems development methodology at Connected Works.		
	1		
	2		
	3		
	[6]		

ystem at Connected Works. Your answer should explain how prototy ould be applied in the development process.	ping	
	[8]	

Thorough testing is critical to the success of any project. Complete the 5 Examiner Only Marks Remark paragraphs below relating to testing by selecting the correct words or phrases from the selection provided. Words or phrases may be used more than once. programmer white-box manager alpha users test-data system analyst black-box analysis design product prototype sub systems errors procedures program acceptance project test plan methods test beta methodology analysts corrective action integration description plan Testing is conducted in order to find errors in a software system. Testing takes place all through the development life cycle and commences at the stage. Finding errors at an early stage in the development is important as this can reduce time and save money. The product must be fit for purpose. Testing sections of code in isolation to ensure that they function correctly is known as testing. This type of testing is conducted by the _____ Where the whole system is treated like a black box and the internal working of the code is not checked the type of testing is called testing. This involves testing a complete _____ with all the _____ integrated together. Every systems specification should contain a test plan. This plan should contain a description of each test, , expected outcome, actual outcome and . . . Testing conducted by _____ at the end of the

[10]

development cycle is called testing.

Diagrams' and 'Sequence Diagrams' in the develor at Connected Works.		
	_	

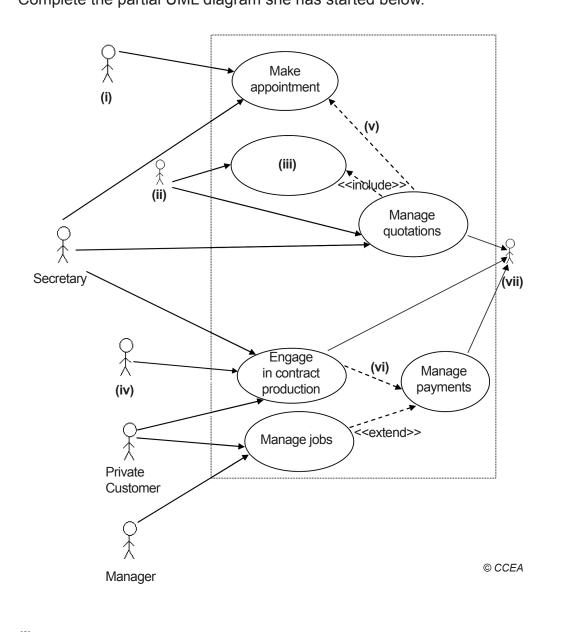
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(Questions continue overleaf)

7 Using UML, Anne the analyst has begun to develop a diagram to represent processes associated with private customers.Complete the partial UML diagram she has started below.

Examiner Only

Marks Remark



(i)	
(ii)	
()	
(iii)	
` '	
(iv)	
(v)	
(vi)	
` ,	
(vii)	
. ,	
Iden	tify Type of UML diagram
	• • •

__ [8]

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(viii)_

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(Questions continue overleaf)

Robert, one of the software development team, is designing the database structure for the new system at Connected Works. He uses a variety of documents gathered from the current system for the normalisation process.					
Using the sample quotation document given in the case study Robert has identified the derived fields and the non-atomic data.					
(a)	 a) (i) Give an example of a derived field that does not need to be included in the normalisation process. 				
		[1]			
	(ii)	Give an example of a non -atomic field indicating the breakdown required.			
		[2]			
nam	es r	nas also noted the repeating groups (nested) and devised the table required for 1NF. The un-normalised data identified by Robert is below.			
Cust	tom tom Гуре	onNo, QuotationDate, StaffNo, StaffSurname, StaffForename, erNo, CustomerSurname, CustomerForename, erAddress1, CustomerAddress2, Customer TelNo, {JobNo, e, Duration, {MaterialNo, Material, QtyRequired, Price,}}			

(b)	Complete the transformation of the data into third normal form showing:	Examin Marks	er Only Remark
	• 1st Normal Form (Attribute names may be abbreviated)		
	QUOTATION		
	QUOTATIONJOB		
	QUOTATIONJOBMATERIAL		

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2nd Normal Form		ner Only
	Marks	Remark

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3rd Normal Form		Examir Marks	ner Only Remark
	[12]		

Examiner Only

Marks Remark

9 The tables below form part of the proposed database system.

CONTRACT		
field	Data Type	
ContractNo	int	
StartDate	Date	
EndDate	Date	
CustomerNo*	int	
FeeNo*	int	

CONTRACTJOB		
field	Data Type	
ContractNo*	int	
JobNo*	int	
Frequency	char	
DateLastCarriedOut	date	

JOB	
field	Data Type
<u>JobNo</u>	int
JobType	Varchar(30)
SkillNo*	int

STAFF	
field	Data Type
<u>StaffNo</u>	int
StaffSurname	varchar(20)
StaffForename	varchar(20)
Salary	Decimal(8,2)
SkillNo*	int

SKILL	
field	Data Type
SkillNo	int
Skill	Varchar(25)
Cost_hr	Decimal(5,2)

The team must ensure that one or more suitably skilled staff members are allocated to a contracted job.

Clearly identifying the primary key and foreign keys, complete the table CONTRACTJOBSTAFF given below to support this requirement.

CONTRACTJOBSTAFF		
field	Data Type	
ContractNo	int	

[6]

10		ng the CUSTOMER and FEE tables exist with primary keys nerNo and FeeNo.		Examin Marks	er Only Remark
	(a)	ite SQL scripts to complete the creation of the table CONTRACT h constraints where: ForeignKey is CustomerNo in the CUSTOMER table; ForeignKey is FeeNo in the FEE table; StartDate is current or in the future; EndDate is later than the StartDate.	-		
		CREATE TABLE CONTRACT (ContractNo int, StartDate DATE, EndDate DATE, CustomerNo int, FeeNo int,			
		constraint PKContract PRIMARY KEY (ContractNo),			
			[5]		

(b) (i)	Stephen requires a list of all non-urgent contract jobs to be carried out in the coming week and has indicated some of the criteria for the coder: • DateLastCarriedOut is null; or • Frequency is weekly denoted by W; or • Frequency is monthly denoted by M and DateLastCarriedOut is 23 or more days ago. Write the SQL scripts to create a list of jobs. The list should include the customer's name and address, job type and skill required. It should be ordered by JobNo.	Exat Mark	Remark
(ii)	[11] Name one other criterion that should be implemented.		
	[1]		

(c)	Write the SQL script to count the number of new contracts for each number. A new contract has a start date in the future.	h fee	Examine Marks	r Only Remark
		_ [4]		
-	THIS IS THE END OF THE QUESTION PAPER			
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