

Cambridge Assessment International Education

Cambridge International Advanced Subsidiary and Advanced Level

COMPUTER SCIENCE 9608/42

Paper 4 Written Paper

October/November 2017

MARK SCHEME
Maximum Mark: 75

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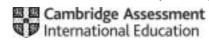
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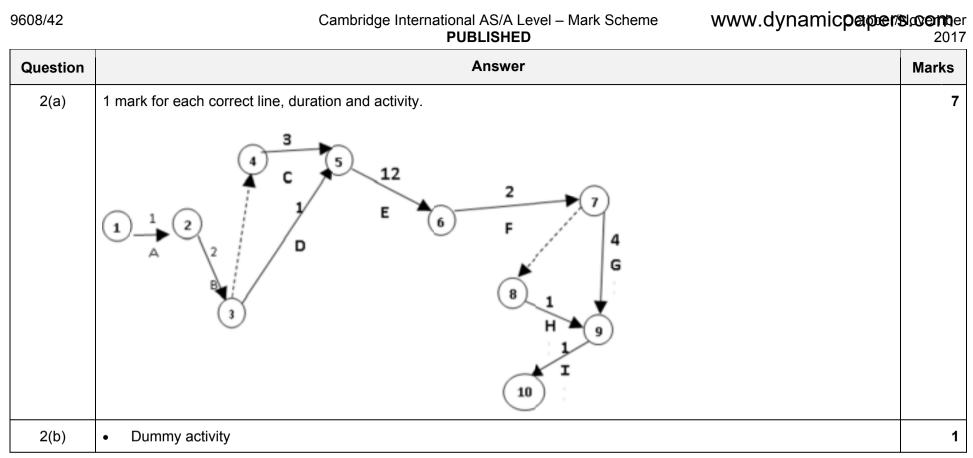


								JOITEL			
uestion							Α	nswer			
1(a)	1 mar	k per shaded group)								
						Co	lumn				
			1	2	3	4	5	6	7	8	
	suc	Grade C in Computer Science	Υ	Y	Y	Y	N	N	N	N	
	Conditions	Grade C in Maths	Υ	Υ	N	N	Υ	Υ	N	N	
	o 	Grade C in Science	Υ	N	Υ	N	Υ	N	Υ	N	
	g	Take Computer Science	Υ	Y	Υ	Υ	Υ	Υ			
	Actions	Take Maths	Υ	Υ			Υ	Υ			
	•	Take Physics	Υ				Υ				

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	ı	Answer										
Question							Α	nswer				Mar
1(b)	1 mar	k per column										
						Co	lumn					
			S	Т	U	V	W	Х	Υ	Z		
	suo	Grade C in Computer Science	Υ	_	_							
	Conditions	Grade C in Maths	_	Υ	Y							
	S	Grade C in Science	_	_	Y							
	S	Take Computer Science	Υ	Υ								
	Actions	Take Maths		Y								
		Take Physics			Y							
1(c)	• (0 • • (0 •	cample: Column S) combini . because they only Column T) combini . because CS does Column U) combinii .because CS does	y needing 1,2 s not not nog 1,5	d CS to 2,5,6 natter i	take C	N	aths and	d Scien	ce do r	ot matte	r	

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Question	Answer	Marks
3(a)	<pre>1 mark per clause room(corridor). furniture(table). furniture(lamp). located(table, corridor). located(lamp, corridor).</pre>	5
3(b)	master_bedroomspare_bedroom	2
3(c)(i)	 1 mark per bullet to max 2 The first clause <u>only</u> says the nursery is next to the master bedroom but not that the master bedroom is next to the nursery The second clause <u>only</u> says the master bedroom is next to the nursery but not that the nursery is next to the master bedroom Goal to find rooms adjacent to master bedroom would not return nursery Example. FindNextTo(X, master_bedroom) It is a two-way relationship 	2
3(c)(ii)	<pre>1 mark per bullet room(main_bathroom). nextTo(corridor, main_bathroom). nextTo(main_bathroom, corridor).</pre>	3

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Question	Answer	Marks
3(d)	<pre>1 mark per bullet • canBeMovedTo(B,A) • Furniture(B) • Room(A) • AND /, • AND NOT /, NOT • Located(B,A) Example: canBeMovedTo(B,A) If furniture(B) AND room(A) AND NOT(located(B,A)).</pre>	6

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	A	2017					
Question	Answer	Marks					
4(a)	1 mark per item in bold	4					
	FOR Pointer ← 1 TO (Max - 1)						
	<pre>ItemToInsert ← Numbers[Pointer]</pre>						
	CurrentItem ← Pointer						
	WHILE (CurrentItem > 0) AND (Numbers[CurrentItem - 1] > ItemToInsert)						
	Numbers[CurrentItem] ← Numbers[CurrentItem - 1]						
	CurrentItem ← CurrentItem - 1						
	ENDWHILE						
	Numbers[CurrentItem] ← ItemToInsert						
	ENDFOR						
4(b)	 The size of the array // value of Max How ordered the items already are 	2					

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Question				Answer		Mark				
5(a)	Max 10									
	Label	Op code	Operand	Comment	Marks					
	START:	LDR	#0	// initialise Index Register						
	LOOP:	LDX	LETTERS	// load LETTERS	1					
		CMP	LETTERTOFIND	// is LETTERS = LETTERTOFIND ?	1					
		JPN	NOTFOUND	// if not, go to NOTFOUND	1					
		LDD	FOUND		1					
		INC	ACC	// increment FOUND	1					
		STO	FOUND		1					
	NOTFOUND:	LDD	COUNT							
		INC	ACC	//increment COUNT	1					
		STO	COUNT							
		CMP	#6	// is COUNT = 6 ?	1					
		JPE	ENDP	// if yes, end	1					
		INC	IX	// increment Index Register	1					
		JMP	LOOP	// go back to beginning of loop	1					
	ENDP:	END		// end program						
	LETTERTOFIND:		'x'							
	LETTERS:		'd'							
			'u'							
			'p'							
			'1'							
			'e'							
			'x'							
	COUNT:		0							
	FOUND:		0							

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Question	Answer									
5(b)	Label	Op Code	Operand		Comment	10				
	START:	LDR	#0	// initialise the Index Register	1					
	LOOP:	LDX	VALUES	// load the value from VALUES	1(loop) + 1(LDX Values)					
		LSR	#3	// divide by 8	1 (LSR) + 1 (#3)					
		STX	VALUES	// store the new value in VALUES	1					
		INC	IX	// increment the Index Register	1					
		LDD	REPS							
		INC	ACC	// increment REPS	1					
		STO	REPS							
		СМР	#6	// is REPS = 6 ?	1					
		JPN	LOOP	// repeat for next value	1					
		END								
	REPS:		0							
	VALUES:	2	22							
		1	.3							
			5							
		4	16							
		1	.2							
		3	33							

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Question		Answer	Mark
6(a)		CurrentAccount and SavingsAccount to Account set functions in CurrentAccount ctor in SavingsAccount	
	AccountNumb Balance: CU	er: STRING	
	GetAccountN GetBalance(SetAccountN SetBalance((umber()	
	Level: STRING Cost: CURRENCY	PaymentInterval : INTEGER Amount : CURRENCY	
	Constructor() GetLevel() GetCost() SetLevel() SetCost()	Constructor() GetAmount() SetAmount() GetPaymentInterval() SetPaymentInverval()	

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	PUBLISHED	2017
Question	Answer	Marks
C(h)	4 manufa man haallat ta mana E	_
6(b)	1 mark per bullet to max 5	5
	 Class heading and ending Identifying inheritance 	
	Identifying inheritance Declaring AccountNumber, Balance	
	Use of private/protected for AccountNumber and Balance Secret Section 1. Market	
	One Correct Get Method	
	One Correct Set Method	
	Second correct Get and Set Methods	
	Example VB	
	MustInherit Class Account	
	Private AccountNumber As String	
	Private Balance As Decimal	
	Sub SetAccountNumber(AccNumP As String)	
	AccountNumber = AccNumP	
	End Sub	
	Function GetAccountNumber() As String	
	return AccountNumber	
	End Function	
	Sub SetBalance (BalanceP As Decimal)	
	Balance = BalanceP	
	End Sub	
	Function GetBalance() As Decimal	
	return Balance	
	End Function	
	End Class	
	or	
	MustInherit Class Account	
	Private AccountNumber As String	

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```
Question
                                                   Answer
                                                                                                      Marks
  6(b)
             Protected AccountNumber As String
                Get
                  return AccountNumber
                End Get
                Set (ByValue AccountNumberV As String)
                   AccountNumber = AccountNumberV
                End Set
             Private Balance As Decimal
             Protected Balance As Decimal
                Get
                  return Balance
                End Get
                Set (ByValue BalanceV As Integer)
                   Balance = BalanceV
                End Set
          End Class
         Example Python
         class Account:
             def init (self, accountNumber, balance):
                   self. accountNumber = accountNumber
                   self. balance = balance
             def getAccountNumber(self):
                   return self. accountNumber:
             def setAccountNumber(self, AccountNumber):
                 self. AccountNumber = AcountNumber
             def getBalance(self):
                  return self. balance:
             def setBalance(self, Balance):
                  self. Balance = Balance
```

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```
Question
                                                    Answer
                                                                                                       Marks
  6(b)
         Example Pascal
         type
             Account := class
             private
                 AccountNumber, Balance,;
             public
                 constructor Create(AccountNumber, Balance);
                 procedure setAccountNumber(AccountN: String);
                 function getAccountNumber() : String;
                 procedure setBalance(BalanceV: Real);
                 function getBalance() : Real;
           constructor Account.init(Account, Bal);
           begin
               AccountNumber := Account;
               Balance := Bal;
           end:
           procedure SetAccountNumber(AccountN: String);
           begin
               AccountNumber := AccountN;
           end:
           procedure GetAccountNumber() : String;
           begin
               GetAccountNumber := AccountNumber
           end;
           procedure SetBalance(Bal: String);
           begin
               Balance := Bal;
           end;
           procedure GetBalance() : String;
           begin
```

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Question	Answer	Marks
6(b)	<pre>GetBalance := Balance end; end;</pre>	
6(c)	 1 mark per bullet to max 5 Class declaration and end Declaration of inheritance Amount and PaymentInterval as Private/protected with appropriate data types Constructor: Override / Overriding in constructor Constructor heading and end taking values as parameters Constructor setting all values using base class Initialisations of new attributes in the constructor all set to the parameters 	5
	Example VB Class SavingsAccount Inherits Account Private Amount As Decimal Private PaymentInterval As Integer Public Overrides Sub New(ByVal AccountNumberValue As	
	End Class	

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```
Question
                                                    Answer
                                                                                                       Marks
  6(c)
         or
         Class SavingsAccount
             Inherits Account
             Private Amount As Decimal
             Private PaymentInterval As Integer
             Public Sub New (AccountNumberValue As String, BalanceValue As Decimal, PayInterval As
         Integer, payAmount As Decimal)
                 MyBase.New(AccountNumberValue, BalanceValue)
                 AccountNumber = AccountNumberValue
                 Balance = BalanceValue
                 Amount = payAmount
                 PaymentInterval = PayInterval
             End Sub
         etc.
         Example Python
         class SavingsAccount(Account):
             def init (self, AccountNumber, Balance, PayInt, AmountP):
                 super(). init (AccountNumber, Balance)
                 self. PaymentInterval = PayInt
                 self. Amount = AmountP
         Example Pascal
         type
           SavingsAccount = class(Account);
             private
                PaymentInterval : integer;
                Amount : currency;
             public
                constructor Create(AcountNum : String, Bal : Currency, PayInt : Integer, AmountP :
         Currency);
         end;
         constructor SavingsAccount.Create(); override;
```

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Question	Answer	Marks
6(c)	<pre>begin inherited Create(AccountNum, Bal) PaymentInterval := PayInt; Amount := AmountP; end;</pre>	

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