

# THE BCS PROFESSIONAL EXAMINATIONS

## BCS level 5 Diploma in IT

March 2015

### IT PROJECT MANAGEMENT

#### EXAMINERS' REPORT

##### Section A

###### Question A1

You have been appointed IT manager to a company that sells and fits exhaust systems from a number of different manufacturers to a wide variety of motor vehicles. This is a very competitive market. The company must be able to answer immediately any telephone enquiry concerning its current stock and prices. In addition, good management information and the strict control of costs are essential.

The existing computer-based stock system, which was developed some time ago by the in-house IT section, is no longer adequate. A decision has been made by your senior management to adopt a new, more advanced stock recording and on-line enquiry system.

Some major exhaust system manufacturers offer such systems as an 'off-the-shelf' (OTS) package, but your management are concerned that these packages might be too restrictive and thus not suitable for the wide range of exhaust systems that your company sells. The alternative would be to design and develop a new in-house system. However, your current IT section has no experience of on-line or cost-control systems.

- a. Write a memorandum to your senior management setting out the advantages and disadvantages of acquiring an 'off-the-shelf' system as opposed to developing a new application in-house using your own staff, bearing in mind the scenario outlined above

**(15 marks)**

- b. A decision has been made to acquire an off-the-shelf package. Describe the activities that would now be needed to select and acquire the software and then to set up a fully operational stock system.

**(10 marks)**

###### Answer Pointers

- a) **2 marks** awarded for presenting the answer in a satisfactory memorandum format, with a clear distinction between advantages and disadvantages of the OTS approach.

OTS advantages in this question's context could include:

- Using an existing package means that there is no delay in deploying the new package (thus helping to maintain or perhaps improve the company's position in a competitive market)
- You can see the package in use at other users (site visits) and get a good idea of its quality

- Avoids potential problems due to the IT section's inexperience with on-line and cost-based systems
- There are likely to be fewer bugs initially (than with an in-house development) as the package will have been widely tested by the developers and other users
- Fewer internal resources are required, existing staff can concentrate on other (key) work
- Avoids other risks associated with software development e.g. cost overruns
- Cost is likely to be less as development costs are spread over many purchasers
- You do not have to employ new software staff with the required experience, who may then become surplus to requirements.
- Supplier can look after package maintenance and upgrades
- Full user documentation (and training) is usually supplied with an OTS system whereas this would all have to be undertaken internally with an in-house system

OTS disadvantages could include:

- A package might not be available that meets fully all your company's requirements (especially as they are developed and marketed by specific suppliers, this is a particular concern of your management)
- May be difficult to integrate such a standalone package with other applications belonging to the company
- Dependency on supplier for enhancements; upgrades might not suit your needs
- The package may contain features that you do not need but must be used to ensure that the package runs correctly, this might annoy some of your users
- The user interface might be less acceptable to your users than if the system was developed in-house
- The supplier's response to operational system problems might be slower than with an in-house system
- No source code: so can't enhance it yourself
- Supplier may go out of business
- The fact that competitors could acquire the same system means that there is less competitive advantage in having the system
- Such packages are often leased on an annual licence so if the supplier increases the licence fee you may be forced to pay it

Up to 2 marks awarded per clear and valid advantage/disadvantage discussed explained in the memo and relevant to this scenario (up to **12 marks**), plus 1 for quality. **Total 13 marks**

b) The activities required to select, acquire and then install a suitable package might include:

- Drawing up requirements
- Issuing invitation to tender
- Evaluation process, including visits to reference sites
- Contract negotiation and award
- Possible acquisition of hardware platform
- Amendment of OTS software, if necessary, to meet your company's requirements more fully (e.g. extending the range of exhaust systems and providing specific management information, etc)
- Acceptance testing
- Training
- Plan and implement changes to office procedures
- Data transfer

1 or 2 marks awarded for each valid activity depending on the quality of the description provided and the scope of activities in this scenario.

Up to a total of **10 marks**

## Examiners' Guidance Notes

Overall this question was answered well. Most answers displayed a good understanding of the implications of acquiring an OTS system rather than developing such a system in-house. However, some answers tended to be far too generic and did not mention any of the specific issues raised in this scenario (such as the competitive market, the management's concerns and, importantly, the lack of specific experience in the current IT section).

- a) This required a good memorandum format (heading, addressee, addressor, date, short introduction and clear conclusion) and then a clear distinction between advantages and disadvantages.

Some candidates discussed each possible approach separately, which often became confusing and led to the duplication of points. Others became too conversational. Some key advantages, such as the much quicker time to implementation and the probability of an almost immediate fully-working system (without the need for extensive in-house testing) were overlooked, as were important potential disadvantages (such as the management's concerns and how these might be met)

- b) This part was often not answered as well as part a, with some candidates producing lists of activities with very limited explanation. The question mentioned three distinct phases -select, acquire, and then set up the working system – but frequently one of these (either the selection or the implementation) was not covered. The question also expected the activities to be presented in a logical order. Site visits were almost never mentioned, not was any integration with existing systems. Very few considered the probable need to modify and test the amended package to meet the specific company requirements. Some included unnecessary standard system development activities (such as unit testing) or discussed in detail the choice of standard implementation methods (without considering this scenario)

## Question A2

You work for a small software house which has won a contract with a new client to design, develop and implement a replacement database system. The client is a medical research organisation and has a very small IT section. Your company has little experience in this business area. Your company has decided to use a new rapid development method for this project, and you have been appointed project manager.

- a) Explain the difference between project and business risk. Give THREE examples of EACH of these two categories of risk that might affect your company when undertaking the IT project described above.

**(8 marks)**

- b) List and explain the TWO factors used in evaluating risk exposure. Explain how each of these factors might be assessed quantitatively.

**(6 marks)**

- c) Risks can be assessed both quantitatively, as above, and qualitatively. Discuss the way in which risks could be assessed qualitatively and how these qualitative assessments could then be used to prioritise risks. **(6 marks)**
- d) Draw up a table illustrating the qualitative assessment of risk exposure for the THREE project risks that you have identified in part (a) above. **(5 marks)**

### Answer Pointers

- a) Business-related risks are **external** to the project and its activities  
 Project related risks **relate directly to (i.e. are internal to)** the project and its activities  
**1 mark each = 2 marks**

Examples of possible business risks could include (note that the “business” in this respect is usually the client, not the software house)  
 Reduced funding for medical research may cause the client to cancel the project  
 The client may discover a suitable off-the-shelf package  
 There might be sudden changes in the type of research that the client is required to undertake  
**Up to 3 marks**

Possible project risks could include:  
 Staff departure (perhaps key client staff, but mainly your staff)  
 The rapid development method is more complicated to use than anticipated  
 Key requirements misunderstood by your staff, due to their inexperience in this market sector.  
**Up to 3 marks**

All these risks should be clearly related to the client, the client’s business and the project described in this question.

**Total: 2 + 3 + 3 = 8 marks**

- b) The two main standard risk evaluation criteria are:  
 probability, and impact **1 mark each**

Quantitative probability measurement:  
 This can be assigned a percentage as the likelihood of the risk occurring. For simplicity, ranges of percentages could be drawn up and then assigned values from 4 (greater than 50%) down to 1 (less than 10%).  
**2 marks**

Quantitative impact measurement:  
 Consider the cost, scope and the time of the likely impact and assess the likelihood overall cost of the impact of the risk. In some instances this overall cost could then also be assigned similar values on a scale from 4 down to 1.  
**2 marks**

- c) **Qualitative** assessment of Probability. This likelihood can be assessed against a scale of (say) high, significant, moderate, low **2 marks**

**Qualitative** assessment of Impact. Again, consider cost, scope and the effect on project time of the overall impact and, again, assess each risk against a scale of high, significant, moderate and low. **3 marks**

These two assessments can then be used together to prioritise each risk, using a simple table or, more graphically, by drawing up a probability/impact grid. **1 mark**

- d) The key columns in a table would be the risk, the 2 assessments, followed by a third column giving some measure of priority (from low to high) based on the combination of the two assessments. If a grid is used this prioritisation can be displayed through the use of a tolerance line.

Up to 5 marks for a clear table (or grid) identifying the 3 stated risks with each of their assessments

### Examiners' Guidance Notes

#### General

This was by far the least popular question in Section A and generally not answered at all well, showing very limited knowledge and understanding of the key elements of risk, assessment, evaluation and prioritisation.

As in the previous Section A question some candidates' answers were quite generalised and not related at all to the scenario set out in the question. Several answers concentrated more on risk management, rather than assessment and prioritisation, in particularly in parts c and d.

- a) The distinction and difference between these two risk types was rarely explained well, with poor examples which (very often) confused the two types. Candidates needed to distinguish between those risks that:
- affect the client and the client's business and the client's business sector (with a brief explanation of their effect)
  - and those that: are related directly to the project, the project staff and team, and its development.

Some stated business risks were often too generalised – such as 'currency exchange fluctuations'

Candidates often did not provide three different examples of each risk type. Some assigned the same risk (wrongly) to both risk types.

- b) This section is based almost entirely on the numerical measurement of risk, but very few candidates quoted, say, the use of %-ages as a numerical measurement (particularly of probability) or the use of some form of numerical scale. Several answers strayed into discussion of the methods that might be used to establish these assessments (or indeed deriving the list of risks in the first place)

- c) This part of the question required a clear understanding of the difference between qualitative assessment and numerical measurement (as covered in part b). Few candidates were able to provide this. Some confused this concept with (product) “quality”, and the various quality measures that might be taken, or with risk management (and the handling of different risk types)
- d) This part was not often answered, but again some candidates strayed into consideration of risk management activities rather than risk assessment and prioritisation.

**Question A3**

A small accounting company needs to update and extend its existing time recording system. You are the project manager and have drawn up an outline project plan for the main project activities, as follows:

Activity	Duration (weeks)	Dependent on
A Draw up and agree requirements	4	none
B Select and order additional hardware	4	A
C Develop and unit test new software	12	A
D Install and test additional hardware	4	B
E Test hardware backup and security procedures	4	D
F Document new software	4	C
G Install new software and system test	6	C, D
H Go Live	2	E, F, G

- a) Draw a fully analysed activity-on-node network diagram for this project, using a standard node convention, to display the duration, the earliest and latest start and end dates and the float for each activity. Supply a node key. Name, and display on the network diagram, the critical path and state the minimum duration, in weeks.

**(10 marks)**

- b) As the project proceeds, activity A was completed on time but problems occurred with both activity B and activity C. At the end of week 16 activity B is only just completed and activity C is only 75% complete (with another 3 weeks’ work required, meaning that it will finish at the end of week 19). You are satisfied that all these problems are now resolved and the remaining project activities can progress at the originally planned rate.

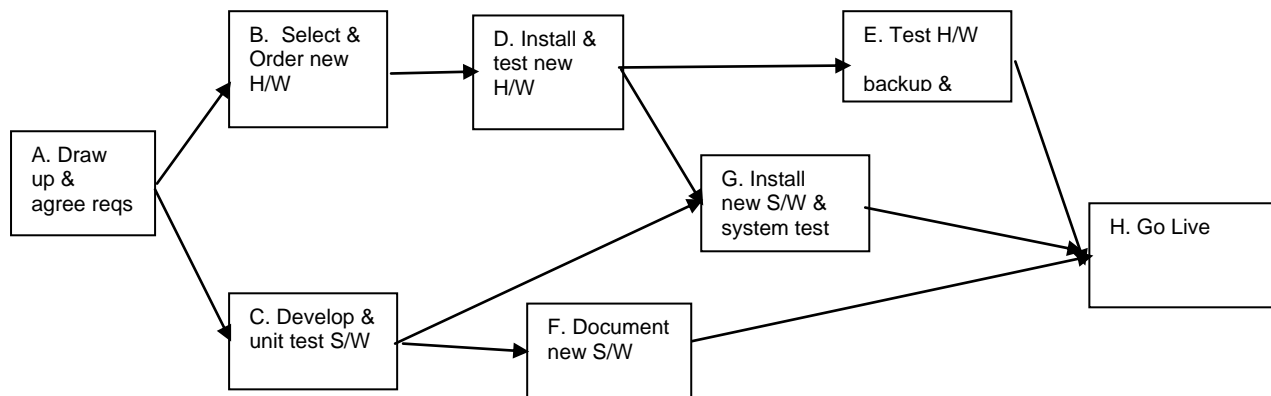
Draw a Gantt chart for the project to show clearly the progress to date (up to the end of week 16) and the revised schedule for the remaining project activities. Mark clearly, and name, the critical path for these remaining activities.

What is the new end date for the project?

**(15 marks)**

## Answer Pointers

a). This expected an A-on-N diagram similar to:



with the nodes showing clearly the following calculated values:

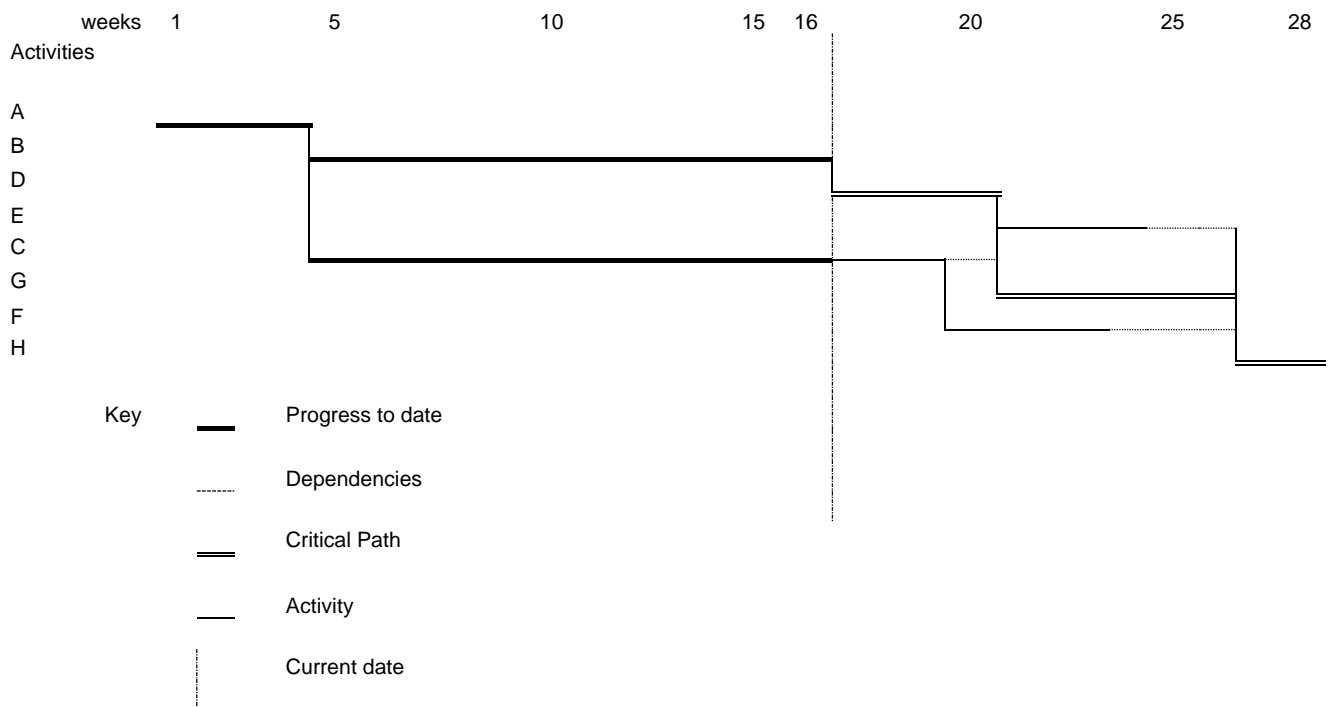
Activity	Duration	EST	LST	EFT	LFT	Float
A	4	0	0	4	4	0
B	4	4	8	8	12	4
C	12	4	4	16	16	0
D	4	8	12	12	16	4
E	4	12	18	16	22	6
F	4	16	18	20	22	2
G	6	16	16	22	22	0
H	2	22	22	24	24	0

Up to **3 marks** were awarded for a valid, correct A-on-N diagram (including 1 mark for **displaying** the critical path) with a further **4 marks** for the correct calculated values (displayed on the diagram).

**1 mark** for a valid, sensible node key, preferably BS 4335, 1 for naming the correct critical path (tasks A, C, G, H) and 1 for naming the correct minimum duration (24 weeks).

**3 + 4 +1 +1 +1 = 10 marks.**

b) This expected a Gantt chart similar to:



Marks

Gantt chart:	Overall chart	7 marks
	Progress to date marked	2 marks
	Dependencies	2 marks
	Critical path named/highlighted	1 mark each
	New end date - week 28	2 marks

Progress-to-date can be show very easily by marking the completed tasks (or part tasks) in bold (as above, or colour - irrespective of whether they were on the critical path. This, of course should be different from the mark-up type used to highlight the tasks on the critical path.

**Examiners' Guidance Notes**

As ever, this was by far the most popular question in Section A and also the most well-answered. However many candidates found difficulty in adjusting the corresponding Gantt chart in part b to reflect correctly the mid-project changes to the originally-planned task durations and very few attempted to indicate progress-to-date, which is an important advantage of the use of Gantt charts – often used in project progress meetings

a) Most candidates produced a reasonably accurate and well laid-out A-on-N diagram. Arrowheads were often omitted but this was not penalised unless any of the main dependencies were drawn flowing from right to left or bottom to top. There were a wide variety of node layouts, very few of which seemed to be to any recognised standard. A disappointing number of candidates produced only an outline diagram



with the node values shown in a separate table (i.e. not in the diagram). This was penalised. In several answers the stated minimum duration was less than that of the named critical path, which implies a worrying lack of understanding of the concept of critical path – there were also several instances where the float of tasks on the critical path were not all 0 duration.

- b) The standard of drawing here was not good and many diagrams failed to show key features such as most/all dependencies and float. Some candidates used a bar chart format with no gap between the bars, which makes it very difficult to show dependencies clearly. Some seemed to confuse the concept of dependency with float.

Most answers reflected correctly the second of the mid-project changes and showed task C finishing at the end of week 19 – with all dependent tasks then starting in the next week.

However many answers having correctly changed task C, did not then display correctly the completion of task B at the end of week 16, which means that task D and all its dependent tasks must start after week 16. This changes both the critical path and the end date for the project.

## Section B

### Question B4

- a) Explain the difference between quality control and quality assurance. **(5 marks)**
- b) Describe up to SIX different types of testing that might be carried out during a software development project. Explain how each type of testing contributes to the overall quality of the project's deliverables. **(12 marks)**
- c) Identify and briefly explain the FOUR, apart from testing, that could be used to ensure the quality of the intermediate and deliverable products of a software development project. **(8 marks)**

### Answer Pointers

- a) Quality control describes those procedures that check that the outputs of a process conform to the standards and qualities specified for them. For example, the software created by a software development process would be checked to see if it conforms to the software specification by means of testing. **(2 marks).**

Quality assurance describes the processes which ensure that quality control is in place and has been conducted properly. Quality auditors might check that those who are responsible for testing have documented their faults found, their correction and eventual successful completion of the testing process.

Quality control tends to be internal to the process while quality assurance tends to be external. Control tends to focus on product quality while assurance focuses more on the quality of processes.

**(1 mark)**

b) Types of testing could include:-

- Unit testing – usually carried out by developers to check that individual software modules work as specified by low level software designs.
- System testing – tests that individual software components work correctly in conjunction with other units in the overall system.
- Usability testing – checks that human operators can use the system effectively to carry out their tasks. The focus is on the interface design.
- Acceptance testing – tests by the clients/users which ensure the system is delivered meets their expectations and allows them to carry out business processes effectively.
- Volume/stress testing – checks that the delivered IT system does not affect the performance of the unchanged elements of that system.
- Regression testing – checks that a change to a part of an existing system does not affect the performance of the unchanged elements of that system.

**(1 mark for each valid type of testing + 1 mark for explanation of purpose for up to 6 types of testing).**

c) Four activities apart from testing could include:-

- Documents review – the document is read by someone other than the author to check for errors and ambiguous terms or technical expressions.
- Peer Review – could be carried out on a document or code. Done by peers to establish if the design is sound, it will fit with rest of infrastructure/organisation, adheres to policy, covers requirements.
- Inspection – a more formal approach which has a set of structures covering preparation, meeting, recording, follow-up. There are also set roles for participants.
- Walkthrough – this can be used in conjunction with other techniques or on its own. It is likely to involve people from operations and the user community.
- Pair Programming – contemporaneous peer review used in Agile.
- Static testing – looks at the actual lines of code rather than the operation, looks for unnecessary complexity or loops.

**1 mark for each heading + 1 mark for a brief description of up to 4 valid activities.**

### **Examiner's Comments**

The first question in Part B and was answered by 85% of candidates. The question comprised three parts, each of which referred to a different aspect of quality.

- a) Most candidates gave good, complete answers although there were a few who confused 'quality assurance' and 'quality control'.
- b) Answers ranged from "no attempt" to a comprehensive description of six different types of testing.

- c) Few candidates gave four relevant activities. Some provided a description of a generic Systems Development Life Cycle. Others repeated testing procedures given in their answer to Part b) or failed to make any serious attempt at an answer.

### Question B5

- a) One key characteristic of a successful project is that it is completed on time. Identify THREE other key characteristics of project success, explaining why they are important. **(6 marks).**
- b) Identify THREE important reports needed to monitor and control a project. For each report, identify who would produce the report, to whom would it go and its purpose. **(12 marks)**
- c) Describe the process of dealing with change requests. **(7 marks)**

### Answer Pointers

- a) The three other elements are 'scope', 'quality' and 'cost'.  
One mark each for naming the above plus one mark for each valid explanation.
- b) Candidates had the opportunity to name three important reports their authors, their recipients and the purpose of each of them from a wide variety depending of their knowledge and experience in IT projects.  
**One mark each for naming each of four valid reports + up to three marks for each description (i.e. author, recipient and purpose).**
- c) The question asked for a description of the process of handling Requests for Change. Each organisation will have their own variation of the generally accepted standard process of :-
- Submit and receive Request for Change.
  - Review and log.
  - Determine feasibility.
  - Scope impact and cost.
  - Decide on outcome (i.e. approve, reject or defer)
  - Implement change (if approved).
  - Update configuration management system.
  - Evaluate change.

**Up to seven marks for the above or similar.**

### Examiner's Comments

80% of candidates attempted this question with an average of 12.24 out of a maximum of 25 marks. The question comprised three parts.

- a) A significant number of candidates attempting this part of the question gained full marks. Very few appeared to encounter significant difficulties.

- b) Most candidates had little problem in identifying relevant reports although not all were able to their purpose, author and recipient.
- c) In general, this part of the question was not well answered. Many candidates assumed that a change request was a mandatory instruction to make a change without question. Few indicated the potential technical impact of making the change nor the effect that it would have on the project's business case. The level of authority required to approve, reject or defer the change was also absent from most answers.  
**1 mark for the label + two further marks for each attribute to a maximum of six marks ( 2 X 3 marks).**

**Question B6**

- a) Describe what happens in each of the FIVE stages of team formation. **(10 marks)**
- b) Name and describe briefly THREE management styles **(9 marks)**
- c) You have been appointed project manager of a new project team that is going to develop a finance system which **MUST** be implemented before the end of the tax year. This team is made up of four experienced analysts who have worked on projects like this many times before in other companies and six very intelligent programmers who have recently graduated from university. The team will meet for the first time tomorrow and you want to decide on the most appropriate management style for this project.  
  
How will the factors in this scenario influence your choice of management style and why will they influence it? **(6 marks)**

**Answer Points**

- a) The five stages are: Forming, Storming, Norming, Performing and Adjourning.  
**Up to two marks available for each of the above to a maximum of 10 marks.**
- b) There are various ways of tackling this question including :  
Autocratic/Democratic/Consultative,  
Directive Autocratic/Permissive Autocratic/Directive Democratic/Permissive Autocratic.  
Task-oriented versus Relationship-oriented.  
Etc.
- c) Again, various ways of approaching this question but taking into account the newness of the graduates might suggest an autocratic style and the experience of the analysts may call for a consultative approach. However the fixed deadline means that consultative is unsuitable and possibly democratic is better.  
**Up to three marks for taking the constraints/opportunities into consideration + up to two marks for a valid argument leading to a decision.**

### **Examiner's Comments**

42% of candidates attempted this question making it by far the least popular question in Section B. This was reflected in the average mark of 10.34 out of a maximum of 25.

- a) No problem with this part of the question. Almost all candidates attempting it were able to provide at least four of the five stages (i.e. Forming, Storming, Norming, Performing and Adjourning) but some had the stages out of sequence.
- b) While some candidates gave good answers, other appeared to be confused mainly through confusing management styles with management organisation. A significant number skipped this part of the question.
- c) Many candidates lost marks through writing rambling/unstructured answers that failed to reach any conclusion. A significant number skipped this question. It is possible that the reason for this may be that it is the last question in the paper.