



Undergraduate Programme
Department of Computer Science & Information Technology
Semester 2 Year 2017

FINAL EXAMINATION PAPER

ITC334 CLOUD COMPUTING

Important Instructions to Students:

1. Read the questions, instructions carefully and answer the questions.
2. You are allowed an **extra 10 minutes reading time** (during this time, you are not allowed to write with pen) and **180 minutes (3 Hours) to complete this paper**.
3. Silent, non-programmable calculators are allowed, but not supplied.
4. Write all your answers in the answer booklet provided. If you need extra sheets, please ask from the supervisor. Write your name, course code and student identification number in the answer booklet and in the attendance sheet.
5. **This Final Course Examination Paper is worth 100 marks contributes 50% of the total course assessments.**
6. This paper contains two (2) sections A and B. Answer all thirty-four (34) questions in Section A and answer the one (1) question in Section B.
7. Write all your answers legibly. The marker has the right to award zero for answers that are not legible.
8. This is a **Closed Book Examination**. The University views plagiarism, cheating and dishonest practice as serious offences and if found, offenders are penalized.

Examination Paper Content (Format):

<u>Section</u>	<u>Question</u>	<u>Content</u>	<u>Marks</u>	<u>Suggested Time</u>
A	1-34	Open-Ended Questions	90	135 minutes
B	1	Essay	10	45 minutes
		TOTAL	100	180 Minutes

Section A – Open-Ended Questions [90 Marks]

There are 34 questions in this section.

All questions are compulsory

1. Briefly explain at least three common characteristics that all cloud computing solutions have, regardless of their form. [3 marks]
2. Which fundamental technology provides cloud computing with its ability to split up processes across multiple resource pools? [1 mark]
3. What is the term used in system virtualization to reflect more than one operating system or instance running on a single host server? [1 mark]
4. Briefly explain at least three models for cloud deployment documented in NIST Special Publication 800-145. [3 marks]
5. Which type of cloud allows an organization to share its local cloud services with its partners? [1 mark]
6. What type of cloud deployment is used by an organization that blends Google Docs forms and Microsoft's Azure services for data collection and management? [1 mark]
7. Traditional software application management follows a predictable process as below:
 1. Identify software meeting requirements.
 2. Perform capital acquisition for identified software.
 3. Install software to client computers.
 4. Patch software in maintenance cycle.
 5. Perform acquisition for software update.
 6. Install software update to client computers.
 7. Return to maintenance cycle until next software update.In contrast, list the steps that SaaS application management requires for the consuming organisation. [2 marks]
8. Briefly explain the term **vendor lock-in**, with a local example. [3 marks]
9. Briefly explain at least three advantages of SaaS in the enterprise? [3 marks]
10. Which level of the cloud service model pyramid allows the greatest flexibility for application development? [1 mark]
11. What type of client system relies on server-based applications and services to take the place of locally stored resources? [1 mark]
12. Briefly explain three benefits that cloud computing provide through economies of scale? [3 marks]
13. Briefly explain direct costs and indirect costs in cloud computing services with examples. [4 marks]
14. Briefly explain three appropriate business reasons for choosing a private cloud solution over a public cloud solution. [3 marks]
15. Briefly explain at least three features that cloud networks are architected to provide. [3 marks]

16. Briefly explain at least three benefits that **cloud service automation** has over the traditional data center resource allocation process? [3 marks]
17. What is a service-level agreement (SLA)? [2 marks]
18. List at least four non-cloud specific components in a SLA. [4 marks]
19. List at least four cloud-specific components in a SLA. [4 marks]
20. Based on elasticity, briefly explain at least two main patterns that can be recognized for cloud-ready applications. [2 marks]
21. Fill in the table below to compare Pros and Cons of migration to cloud applications. [6 marks]

Migration to	Pros	Cons
SaaS		
PaaS		
IaaS		

22. Briefly explain at least four risks associated with cloud computing. [4 marks]
23. Briefly explain at least three best practices for negotiating a cloud service contract. [3 marks]
24. Independent of technology and type of cloud services in use, explain three considerations that must always be taken into account when transitioning to a live environment. [3 marks]
25. How do you calculate the overall availability of a service composed of two tiers, where each tier is 99.99% available? [2 marks]
26. Explain each process in the **continual process improvement** in ITIL 2011. [4 marks]
27. Briefly explain the components of the CIA triad. [3 marks]
28. Briefly explain the concept of **defense in depth**, with an example. [3 marks]
29. What risks are posed by application programming interface (APIs)? [2 marks]
30. How can the API risks be mitigated? [2 marks]
31. Regarding information security management systems, in what phase of the **Plan-Do-Check-Act** cycle does metrics analysis occurs? [1 mark]
32. Briefly explain the three software licensing models. [3marks]
33. Briefly explain three main elements of **AAA** used to manage identity and access control in the cloud? [3 marks]
34. Briefly explain the concept of **single sign-on** (SSO), with an example. [3 marks]

Section B – Essay [10 Marks]

There is only one question in this section, worth 10 marks.

Write an essay of 200- 300 words for question 35.

35. Critically discuss the evolution of the traditional data center infrastructure to the increasingly virtualised IT infrastructures in the cloud.

The End