Qualification title: Level 3 Advanced Technical Extended Diploma in Digital Technologies (5220-32)

Exam name: 5220-036/536 Level 3 Digital Technologies (System Infrastructure) – Theory exam (2)

Exam date: 01 March 2018

Exam start time: 9:30

Exam finish time: 12.00

Base mark: 80

Q	Acceptable answer(s)	Guidance	Max mks	Ref
1	1 mark for **each** stage in the correct order, maximum of 4 marks. • Feasibility or Preliminary analysis (1) • Analysis or Requirements definition (1) • Design or Systems design (1) • Prototyping or Development (1)	Any of the following or any other reasonable answer	**4**	**320-1.3 A01**
2	2 marks for **each** explanation, maximum of 6 marks. • Business Requirements (1) where the information regarding the specific needs of the business or organisation is documented (1). • User Requirements (1) where the specific needs of the user(s) of the proposed system are documented (1). • Time Frames (1) where the agreed timeframes for the system development are documented (1). • Resource Constraints (1) where all currently identified (known) issues affecting the availability of resources are documented (1). • Team Members (1) where the initial roles and responsibilities of personnel in the team are documented (1).	Any **three** of the following or any other reasonable answer	**6**	**320-2.1, 2.2 A02**
3	2 marks for a correct explanation, maximum of 2 marks. To allow for a system to be built, tested, then adjusted (1) or re-worked until all requirements are met (1).	Any of the following or any other reasonable answer	**2**	**320-1.3 A02**

4	1 mark for **each** benefit stated, maximum of 2 marks. • 24/7 access (1) • Scalability (1)	Any of the following or any other reasonable answer	**2**	**321-1.1, 1.2** **A01**
5	2 marks for **each** explanation, maximum of 4 marks. • Software-as-a-Service [SaaS] (1) – Business subscribes to an application that it regularly accesses over the Internet (1) removing the need for the Business to install and run applications on their own computers or in their own data centres. • Platform-as-a-Service [PaaS] (1) – Cloud service provider delivers hardware and software tools to a Business (1) - usually those needed for application development. • Infrastructure-as-a-Service [IaaS] (1) – Large ISP or Internet search engine company's host's hardware, software, servers, storage and other infrastructure components on behalf of its users (1). IaaS providers also host users' applications and handle tasks including system maintenance, backup. • Solution-as-a-Service [So-aa-S] (1) provides a Business with the complete solution – hardware / software / skills / resource management, to complete a specific project (1).	Any of the following or any other reasonable answer	**4**	**321-2.1, 2.2** **A02**
6	2 marks for **each** explanation, maximum of 6 marks. • Predicted costs savings (1) – compared to current expenditure or predicted expenditure without the transition to cloud-based (1). • Improvements to productivity (1) – forecast increase in productivity (1) if cloud-based services adopted. • Decreased administration (1) – one of a number of business 'overheads' that may be reduced (1) in a transition to cloud-based services. • Reduced wage costs (1) – reduced wage costs involved in the management and maintenance of business IT infrastructure (1). • Security of data storage (1) – data stored in a secure off-site facility (1), maintained by a specialist 3rd party.	Any of the following or any other reasonable answer	**6**	**321-3.2** **A02**
7	1 mark for **each** connector stated, maximum of 2 marks. • Twisted pair – RJ45 (1) • Coaxial – BNC (1)	Any of the following or any other reasonable answer	**2**	**322-1.2** **A01**

8	2 marks for **each** explanation, maximum of 6 marks. • Physical (or Installation) (1) - identifying the hardware, software and network devices (1) that comprise the network. • Logical (or configuration) (1) - identifying the (IP) addressing scheme and subnets (1) in the network. • Testing (1) - identifying the testing conducted across the network to ensure device connectivity and appropriate access (1).	Any of the following or any other reasonable answer	**6**	**322-3.2 A02**
9	1 mark for **each** factor stated, maximum of 2 marks. • Reliability (1) • Availability (1) • Latency (1) • Throughput (1)	Any of the following or any other reasonable answer	**2**	**323-1.2 A01**
10	2 marks for **each** explanation, maximum of 6 marks. • Malware - Malicious software that is intended to cause harm (1), loss of data (1) by accessing a device without the user's knowledge. • Spyware - software that is put in someone's computer to secretly gather information about the user (1) and relay it to advertisers or other interested parties without permission (1). • Trap Door - bits of code embedded in programs by the programmer(s) to quickly gain access at a later time (1), allowing unauthorised access to the system (1).	Any of the following or any other reasonable answer	**6**	**323-2.2 A02**
11	1 mark for **each** stated purpose, maximum of 2 marks. • To maintain system functionality (1). • To keep a business running (1). • To access technical advice (1). • To provide systems development (1).	Any of the following or any other reasonable answer	**2**	**324-1.1 A01**
12	2 marks for **each** explanation, maximum of 4 marks. • Observation (1) - is the information gathered, supported by any observations made by the technician (1). • Cross referencing (1) - is the information gathered supported by information from different sources (1).	Any of the following or any other reasonable answer	**4**	**324-2.3**

	• Problem replication (1) - can the problem be re-created under similar circumstances (1) to confirm the diagnosis. • Log file analysis (1) - is the information gathered supported by a detailed study of any 'log files' (1) that have recorded information about the issue. • Reliability of information source (1) - is the information source considered to be reputable and reliable: i.e. manufacturer's information vs article comment (1). • Previous experience (1) - does the information gathered equate with the previous experience of the individual or someone else within the team (1).			
13	2 marks for **each** explanation, maximum of 4 marks. • Language (1) – the technical language used must be appropriate for the level of subject understanding held by the user (1). • Organisation Policy (1) – the amount of information allowed to be divulged to the user (1) regardless of their questions. • Method (1) – the method of the feedback (i.e. face to face / email / telephone call / memo) used (1) to provide the results. • Technician's ability (1) – feedback provided within the limits of one's own technical knowledge / ability (1).	Any of the following or any other reasonable answer	**4**	**324-4.1** **A02**
14	1 mark for **each** role stated, maximum of 2 marks. • Network Manager (1) • Database Administrator (1) • Website Analyst (1)	Any of the following or any other reasonable answer	**2**	**325-1.1** **A01**
15	2 marks for **each** feature, maximum of 4 marks. • Mainframe computers – dependability - critical applications (1) constantly operating with absolutely minimal downtime – often for decades at a time: extensive input and output facilities to handle extremely large quantities of data often, data processing involves workload sharing (1). • Distributed systems (1) – Large networks of autonomous devices that communicate via messages (1) and cooperate by coordinating their activities (1) to further (solve) a common goal.	Any of the following or any other reasonable answer	**4**	**325-3.1** **A02**
16a	1 mark for **each** way stated, maximum of 2 marks.	Any of the following or any other reasonable answer	**2**	**325-2.2**

	• Organisation's own Server Provision (1) • Paid-for hosting (1) • Cloud-based services (1) • Outsourced (managed) services (1)			**A01**
16b	2 marks for each explanation, maximum of 4 marks. • Conventional Credential Database (1) – a credential database maintained by the organisation containing usernames and passwords (1) - for matching authenticated users. • Third Party Authentication Services (1) – where a user logs into a 3rd party (eg Google / Microsoft / Facebook) and is subsequently authenticated by this service (1) when accessing other locations.	Any of the following or any other reasonable answer	**4**	**325-2.3** **A02**
17	**Band 1:** **1 – 3 marks** There is little consideration given to the appropriate System Methodologies such as the Analysis, Design and Implementation of an Information System. The considerations of Cloud Technologies and Services is weak with little understanding of Metrics demonstrated. There is little discussion of technical support and backup strategies necessary to manage a network. **Band 2:** **4 – 6 marks** There is some consideration given to the appropriate Analysis, Design and Implementation of an Information System. The discussions of Cloud Technologies and Services is effective and Metrics have been included. Management of the Network has included technical support and backup strategies. **Band 3:** **7 – 9 marks** Appropriate consideration given to the Analysis, Design and Implementation of an Information System. The discussions of Cloud Technologies and Services is highly effective. Realistic deliberation of Network Management strategies, including Technical Support and Backup and testing is evidenced.	**Indicative content** • System Methodologies, Analysis, Design and Implementation • Cloud Technologies and Services, use of Metrics • Managing Networks, Technical Support and Backup Strategies ***For no awardable content, award 0 marks.***	**9**	**320: 2.1, 2.2, 3.1, 3.2, 4.3** **321: 1.1, 1.2, 2.1, 3.1, 3.2** **322: 2.1** **323: 1.1, 1.3, 2.1, 2.2, 3.3** **324: 1.1, 3.1** **325: 3.1, 4.1, 4.2, 5.1** **A04**
18	**Band 1:** **1 – 3 marks** There is little consideration given to the appropriate scope, analysis and design of the organisation's information system requirements. The considerations of cloud technologies and services is sparse with little relationships drawn between services provided and	**Indicative content** • Scope, analysis and design of an information system • Investigation and justification of cloud technologies and services	**9**	**320: 1.3, 2.1, 2.2, 3.1, 3.2** **321: 1.1, 1.2, 2.1, 3.1**

	required. There is little discussion of the requirement to manage infrastructure and user authentication. **Band 2:** **4 – 6 marks** There is some consideration given to the scope, analysis and design, of the organisation's information system requirements The discussions of cloud technologies and services is realistic and is related to the organisation's business need. Strategies for managing infrastructure and user authentication are discussed. **Band 3:** **7 – 9 marks** Appropriate consideration is given to the scope, analysis and design of the organisation's information system requirements. The discussions of cloud technologies and services is highly effective and is matched to the organisation's business need. Strategies for managing infrastructure and user authentication are fully explored.	• Infrastructure management and user authentication ***For no awardable content, award 0 marks.***		**323: 1.1, 1.2, 1.3, 2.1, 2.2, 3.3** **324: 1.1** **325: 1.3, 2.1, 2.2, 2.3, 3.1, 3.2, 3.3, 4.1, 4.3, 4.4, 5.1** **A04**