APPLIED INFORMATION AND COMMUNICATION TECHNOLOGY **9713/32**

Paper 3 Written B **May/June 2017**

MARK SCHEME

Maximum Mark: 80

Published

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This document consists of **7** printed pages.

Question	Answer	Marks
1	***Six*** *from:* Assist in bridging the gap between concept and actual design Because nuclear reactions can only be simulated not tested (by international agreements) So that simulations can be run at atomic level of reactions ...test results can be rerun at reduced speed of the reaction ...3D modelling of nuclear reactions cannot be done otherwise Allows modelling of the radiation shielding components (because use of simulations is) safer than performing the tests for real ....extreme conditions can be tested (because use of simulations is) cheaper than real testing/using <u>of nuclear materials/hardware</u> (because use of simulations allows) tests to be repeated more easily with differing variables.	6
2(a)	***Six*** *from:* *Benefits:* Have extremely/very high processing power/fast processing speed ...so that the simulation is completed in suitable time/without buffering Carry out very many tasks simultaneously Vast amount of data has to be processed ...which would take too long if carried out by human/non-super computer Large number of rules/parameters to be processed *Drawbacks:* Expensive to build/create/maintain ...supporting infrastructure is expensive to create/maintain/power costs are expensive Requires specialist support personnel ...specialists are expensive to pay/hire Maybe difficult to book/rent use of/time on super computer. *Max 5 for all benefits or all drawbacks.*	6
2(b)	***Two*** *from e.g. :* Use in weather forecasting Track space and ocean parameters Simulations of human brain/artificial intelligence Breaking of encryption by national security/intelligence agencies Calculating ballistic missile/space vehicle trajectories Use in online computer gaming Use in medical research for e.g. cancer research/DNA studies.	2

Question	Answer	Marks
3	*Five* from: Provides a visual representation that is easy to understand Shows an accurate timeline Breaks down the project structure Shows how each task relates to the others Shows sequential tasks Shows parallel tasks Shows what the various activities are Shows how long each activity is scheduled to last Show where activities overlap with other activities, and by how much Shows when each activity begins and ends Shows start and end dates of the whole project Shows schedule on day to day basis Shows the critical path Shows milestones Allows resource planning ...staff deployment ...materials allocations.	5
4(a)	*Two* from: Searches/queries can find the required records So letters will go to the right place/address Residents might not receive the (important) letters Residents might be angry if their names were spelled incorrectly An inaccurate demographic picture might be created if the details are inaccurate.	2
4(b)(i)	*Four* from: Only using the data for a single purpose/only for the letters Few people may live in the area therefore all the records are/can be stored in one file Database is easy to understand/maintain using standard office applications Simple sorting/filtering/queries can be carried out Data can easily be exported/extracted to e.g. spreadsheet/tables in word processed documents Do not need specialist staff to operate/maintain the database.	4

Question	Answer	Marks
4(b)(ii)	***Six*** *from e.g.:* Data is stored only once reduced/no data duplication so letters are only sent once/one per person/household Storage of data is more efficient because data can be entered/found/extracted faster/quicker Data can easily be modified/deleted Data structure is independent of the purpose Complex queries can be carried out so letters are sent to individuals living at same address Data can be extracted from many tables at once Greater security of data/details of recipients of letters Some tables can be restricted Database can be expanded more easily Tables can be added Many users can access the database at the same time.	**6**
5	***Eight*** *from e.g.:* Description of the use of one named sensor in monitoring the environment (Analogue) data sent to ADC/computer ...to convert data from analogue to digital ...so computers can read/understand the data Computers stores/records data/data logging Continual monitoring/continuous monitoring Data used to create reports Reports displayed on screen as live data/in real time ...in graphs/charts/tables automatically ...alerts if parameter exceeds pre-set values ...to try and ensure that parameter is within desired values ...reports in hardcopy ...extracted for analysis ...data sent to other institutions for research/action following an alert.	**8**
6(a)	***Two*** *from:* Use a software application/'soft' phone on a networked device/ smartphone/computer Using an adapter with a 'normal' analogue telephone to connect to an IP network.	**2**

Question	Answer	Marks
6(b)(i)	*Four* from: Calls are not charged based on distance Phone numbers remain the same wherever the representative is/virtual numbers possible Can use any computing device Phone conferencing/multiple callers in one conversation is possible Use of advanced call features such as call forwarding/ call waiting/voicemail/caller ID/block numbers Voicemail to email transcription Simultaneously sharing of images/emoticons.	4
6(b)(ii)	*Four* from e.g.: Cannot be used during power outages Must have a reliable internet/network connection Voice quality can vary/be poor ...delays in receiving data packets can make voices difficult to hear ...make conversations more difficult Security of call can be difficult/expensive to achieve Cannot be tracked reliably when making emergency calls Employees may need training.	4
7(a)	*Six* from: *Hardware:* Video camera/webcam to capture moving images/video for video input Microphones to capture sounds for audio input Computer monitor/television/projector for video output Loudspeakers/earphones/headphones for audio output Analogue/digital telephone network/LAN/internet for data transmission Computer/data processing unit to process the data Network interface cards/router/ to access the network/data transmission medium/internet *Software:* Operating system/application to provide user interface Codecs compressing and decompressing Network software to initiate/maintain the data linkage Software to transit/receive the data transmission. *Max 5 for all hardware or all software.*	6
7(b)	*Three* from: To prevent remote participant from hearing own voice ...after delay leading to confusion Voice channel can be susceptible to reverberation ...voices indistinguishable/unintelligible if reverberation too pronounced 'Howling' feedback if intrusive can prevent any conversation from occurring Improves clarity of call/sound of voices/audio.	3

Question	Answer	Marks
8(a)	***Six** from:* Easier to communicate visually with more than two participants Can see all participants simultaneously during conference rather during a phone call Participants may not be able/wish to physically meet as would have to in face-to-face conference More control over contributions from participants during conference 'Live' discussions may be required compared to emails/letters Restores visual communication clues that are absent from phone calls Non-verbal information can be transferred unlike an ordinary phone call.	**6**
8(b)	***Five** from e.g.:* Anxiety when in front of cameras Behaviour of participants may change when in front of cameras/can be seen Processing/interpreting information is more difficult than when-face-to-face/eliminates personal contact Technical problems with e.g. audio/lip sync may interfere with communications Equipment may be intrusive/non-intuitive to use/may need to be trained Conferences across (international) time zones may be difficult to arrange.	**5**
9(a)	***Four** from e.g.:* Room types e.g. Number of beds/facilities/views/accessibility Room rates e.g. Deposit required/cancellation options/maximum and minimum length of stay Check-in times and options e.g. late check in/out Room amenities available e.g. mini bar/air conditioning Hotel facilities/amenities e.g. gym/swimming pool/children's crèche Hotel information e.g. address/contact details/phone/fax numbers/email addresses/ratings Local amenities e.g. restaurants/theatre/travel Travel options to/from hotel/where to find hotel/'sat nav' details Geocode information such as postal address/zip/post code/description of location Available methods of payment.	**4**
9(b)	***Four** from e.g.:* Membership of hotel/hotel company/chain loyalty/discount schemes ...account number Employment/company details Billing address Disability/accessibility requirements Personal preferences e.g. room preferences/wake ups Credit card/payment details Stay statistics/dates stayed Number of rooms previously booked Number of bookings.	**4**

Question	Answer	Marks
9(c)	***Three** from e.g.:* Expected daily arrivals/check-in details showing which guests/type of guests/guest demographic Periodic/weekly/monthly/annual reservation numbers showing peak/quiet periods Summary of guest types e.g. leisure/business/nationality Room rate updates/variance/deals/special offers.	**3**
	Total:	**80**