FINAL VERSION

CONFIDENTIAL

GCSE MARK SCHEME

January 2015

INFORMATION & COMMUNICATION TECHNOLOGY
UNIT 3: ICT IN ORGANISATIONS
4333/01

Date of Examination:	**Tuesday, 20 January 2015 (a.m.)**
Date of Examiners' Conference:	**N/A**
Final Date for Return of Scripts:	**Monday, 16 February 2015**

WJEC GCSE ICT
4333 Unit 3: ICT in Organisations
January 2015 Mark Scheme

1	Speakers (1) – Output (1) Webcam (1) – Input (1)		2 2	4
2a	(i) A **notator** is software that converts music entered into the computer using a **MIDI** device into traditional musical notation. (ii) A music file stored in **WAV** format would take longer to download than the same file stored in **MP3** format.		2 2	4
2b	An image stored as a bitmap graphic takes up less memory than the same image stored as a vector graphic. – **False (2)** Vector images use points, lines, curves, and shapes stored as mathematical equations – **True (3)** When a bitmap image is enlarged it loses quality – **True (5)**		1 1 1	3
2c	Any **two** of: • Zoom • Selection • Transforming • Sizing • Scaling • Copying • Moving • Cloning • Brush • Toggling between layers • Crop	• Layering • Red-eye <u>removal</u> • Spot clearing • Skew • Rotate • Distortion • Colour palette • Contrast • Brightness • Text • Blur *Accept any reasonable answer*	1 1	2
3	Advantages (any **one** of:) • Faster uploads/downloads • Saves memory/storage (space) / saves hard disc space (Not 'saves space') • Ability to email some compressed files • File size smaller Disadvantages (any **one** of:) • Loss in quality / reduction in number of colours / becomes blurry • Slower access of compressed data / decompression needed when opening file • More resources intense when accessing compressed files		1 1	2
4ai	Any **one** of: • Device which **stores the addresses** of computers on the network. • Transfers / directs data between devices / destinations on a network. • Router allows <u>computers/devices on a network</u> to share an Internet <u>connection</u> **NOT** connect to a WAN **NOT** allow users to connect to the internet		1	1
4aii	Any **one** of: • Joins together two networks that use different base protocols, • Links different types of networks • Links LAN to WAN • Allows a LAN to connect to the internet.		1	1

4aiii	Any **one** of: • Joins together two networks that use the same base protocols, • Links similar types of networks • Links LAN to LAN	1	1
4b	Any **three** of: • Data is broken into packets • Packets are sent/transferred (one-by-one) over a network • Packets contain source address / destination address / re-assembly information / packet number / checksum • Packets can take different routes to get to destination • Data is reassembled at the destination • Data collisions occur when two packets are detected simultaneously • Both data collision packets are discarded • Computers wait a random amount of time before attempting to resend the discarded packets	1 1 1	3
5ai	Tweening / Motion tween	1	1
5aii	Onion skinning	1	1
5aiii	**One mark for each of:** • Tracing around/over an image/over images/movies • Gives a cartoon like appearance / creating a life like motion	 1 1	2
5b	The human eye / retina / brain continues to see an image for a short period after the image has disappeared **or** The process by which the eye is fooled into thinking that still pictures are moving	1	1
5c	A story board is a plan. Any **one** of: • Frame-by-frame • Comic book • Scene-by-scene • Detailing key elements • Sequence/order of events *Accept similar wording.*	1 1	2
6a	URL (2) Hosting (4)	1 1	2
6b	HTML	1	1
6c	• Bookmark – Stores the address of a file/data used to enable quick access by a user / link to another page on the internet • Homepage – First / main page of a website • Leader board – A **banner** (used for advertising) or scrolling/animated marquee. *Accept different wording if answer shows clear understanding*	1 1 1	3
6d	• The area/location which the eye focuses on first / user looks at first • on a webpage of search results / after a search	1 1	2

6e	Any **three** of: • Reviews / blogs / forums • Location maps • Email/enquiries form • Search engines / Search box • Login/ customer accounts • Shopping basket / Online shopping / e- commerce • Audio descriptions • Video • Drop down lists to select options • Hyperlinks • Hotspots • Web icons • Animations • Banner **NOT** Bookmark, Homepage, Leaderboard Any reasonable answer	 1 1 1	 3
6f	Any **two** of: • Mobile phone / Smart phone **NOT** phone • Tablet – no brand names • Laptop • Smart TV • Games console **NOT** Network Any reasonable answer		 2
7a	Software/program That controls/runs the computer system	1 1	 2
7b	• An operating system is responsible for booting (starting) up a computer. **– True (1)** • An operating system manages input and output devices **– True (3)** • An operating system ensures that data is written to the backing store **– True (5)**	1 1 1	 3
7c	(i) Batch processing (ii) Real-time transaction processing (iii) Real-time processing Accept answers without the word 'processing' at the end, e.g. batch on its own.	1 1 1	 3
8	C - D - A - E - B	5	5
9ai	Check data is sensible / reasonable / within stated ranges	1	1
9aii	Any **one** of: • Check that **data** is consistent / has been <u>entered</u> correctly (as intended by the user) • Data exactly matches the original source	1	 1
9bi	Any **one** of: • Ensures that the data sent is the same as the data received (when data is transmitted from one computer to another). • Ensures data has not been corrupted in transit. • An <u>extra bit (parity bit) is added</u> to transmitted data to give <u>odd or</u>	1	 1

	even parity. The destination device checks if the parity has been maintained/kept/matches data sent.		
9bii	Enter data twice to check for a match.	1	1
9ci	Hash total	1	1
9cii	Batch total	1	1
10a	Banking at an ATM: (Any **one** of) • Card number • Composite Keyfield of sort code and account number • **Condone** account number **NOT** PIN number Payroll (Any **one** of) • Payroll No. • Employee number	1 1	2
10b	Banking at an ATM: • Touch screen • Card reader (magnetic strip reader or chip and pin reader) • Biometric recognition devices (voice recognition / fingerprint scanner / microphone) • Keypad **NOT** Camera Payroll • Clock cards • Swipe cards • Biometrics (**NOT** twice) • OMR / OCR	1 1	2
10c	Any **two** of: • Date • Payroll number • Cost centre number / department • NI Number • Address • Month number • Tax code • Management messages • Gross pay to date • Net pay to date • Tax to date • NI to date • Superannuation/Pension contributions to date • Gross pay • Net pay • Tax • NI • Superannuation / Pension contributions • Processed payment (EFT) • Updated master file • Management statistics / summaries • Total hours worked	2	2

11	• Backups to store data safely off-site • Firewall to prevent access to data • Biometric scans to allow access to data to correct user • Description of use of suitable sensor (e.g. PIR sensor linked to alarm) • Security guards to restrict access to buildings • Locks to restrict access to buildings to keyholders • Keypads unlock doors to authorised personnel • Card scanners to unlock doors to card holders **NOT** 'burglar alarm' on its own	3	3
12	**9-11 marks** Candidates give a clear, coherent answer fully and accurately describing the uses, advantages and disadvantages of robotics and expert systems. They use appropriate terminology and accurate spelling, punctuation and grammar. **5-8 marks** Candidates describe some uses, advantages and disadvantages of robotics or expert systems, but responses lack clarity. There are a few errors in spelling, punctuation and grammar **1-4 marks** Candidates simply give a few uses advantages and disadvantages of robotics or expert systems. The response lacks clarity and there are significant errors in spelling, punctuation and grammar. **0 marks** No valid response. **Guidance** 1 mark for each use, 1 mark for each advantage and 1 mark for each disadvantage. To gain full marks, candidates must have a use, an advantage and a disadvantage for each application. Additional marks (up to a maximum of 5) may be awarded for additional suitable advantages and disadvantages. **Only award credit once for the same advantages / disadvantages for robotics and expert systems.** **Robotics** **<u>Specific Uses</u>** Car production • Spot welding • Assembling parts e.g. fitting windscreens • Paint spraying • Testing engine timing and emissions using sensors • Carrying parts around the factory • Telebots e.g. Deep sea exploration, Bomb disposal, • Bionics e.g. robotic legs and arms controlled by the human brain • Space probes • Domestic robots such as vacuum cleaners, disability robots **<u>Advantages</u>**	11	11

- Repetitive tedious jobs are done to the same consistent standard
- Can work 24 hours a day 365 days a year
- Can work in dangerous places
- Can work in unhealthy places
- Can be quickly taught new skills by changing the program or a human taking them through the motions of a new skill
- Do not need to have a heated or lit environment saving on utility costs
- Saves on employment costs

Disadvantages

- Initial expensive development costs
- Unemployment due to many assembly line jobs now being done by robots / loss of human jobs
- Possible need for extra space / new technology to accommodate robots
- Cost of maintenance/running costs
- Staff training to set up or use robots
- Limited functionality
- Lack of common sense. Robots do not react quickly to situations they have not been programmed to deal with.

NB Award marks for any sensible advantage or disadvantage to a sensible unexpected example of robotic use.

Expert Systems

Specific Uses

Medical Expert Systems

- Mycin - This expert system was designed to identify bacteria causing severe infections, such as bacteria and meningitis, and to recommend antibiotics
- Medical screening for cancer and brain tumours

Any other example e.g. Matching people to jobs, Diagnosing faults in car engines, Legal advisory systems, Training on oil rigs, Mineral prospecting, Oil exploration

Advantages

- The computer can store far more information than a human. It can draw on a wide variety of sources such as stored knowledge from books case studies to help in diagnosis and advice
- The computer does not 'forget' or make mistakes
- Data can be kept up-to-date
- The expert system is always available 24 hours a day and will never 'retire'
- The system can be used at a distance over a network / rural areas or even poorer third world countries have access to experts
- Provides accurate predictions with probabilities of all possible problems with more accurate advice
- Some people prefer the privacy of talking to a computer
- Gives the security of a second opinion

Where medical analogy is used can replace with similar

	• Gives the doctor/expert more time to deal with other patients / saves overloading doctors in epidemic/pandemic / more time to deal with serious cases • Can provide a second opinion • It can help train young doctors/workers in unfamiliar diseases/events • People can do an initial diagnosis from home saving them travel and time costs especially if in a rural area or have long waiting lists to see a GP, e.g. if you suspect your child has a rash you could quickly check the symptoms for meningitis. • Cheaper to update than to train doctors • Training using simulators • Using NHS Direct allows self-diagnosis **<u>Disadvantages</u>** • Over reliance upon software • Initial expensive development costs • Some employees could be de-skilled by over dependence upon computer advice • Fewer staff could be needed • Lacks the 'human touch' – lack of personal contact/empathy/ No human available if do not know what to do • Lacks human senses e.g. see a rash, hear a cough, smell a wound in medical examples • GIGO/ dependent upon the correct information being given. If data or rules wrong the wrong advice could be given / not 100% accurate/ lack of common sense. **Do not award contradictory answers** *NB Award marks for any sensible advantage or disadvantage to a sensible unexpected example of expert system*		
	TOTAL	80	80