Version 1.0 0711

General Certificate of Education (A-level)
June 2011

Computing COMP3

(Specification 2510)

Unit 3: Problem Solving, Programming, Operating Systems, Databases and Networking

Final

Mark Scheme

Mark schemes are prepared by the Principal Examiner and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation events which all examiners participate in and is the scheme which was used by them in this examination. The standardisation process ensures that the mark scheme covers the candidates' responses to questions and that every examiner understands and applies it in the same correct way. As preparation for standardisation each examiner analyses a number of candidates' scripts: alternative answers not already covered by the mark scheme are discussed and legislated for. If, after the standardisation process, examiners encounter unusual answers which have not been raised they are required to refer these to the Principal Examiner.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of candidates' reactions to a particular paper. Assumptions about future mark schemes on the basis of one year's document should be avoided; whilst the guiding principles of assessment remain constant, details will change, depending on the content of a particular examination paper.

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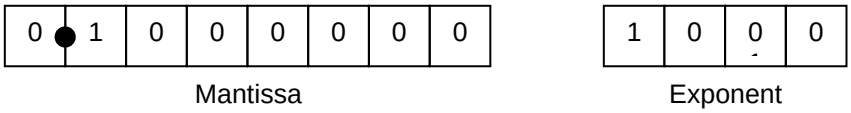
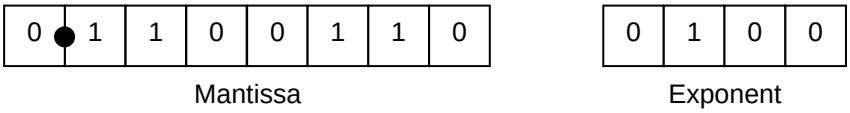
The following annotation is used in the mark scheme:

; - means a single mark
// - means alternative response
/ - means an alternative word or sub-phrase
A - means acceptable creditworthy answer
R - means reject answer as not creditworthy
NE - means not enough
I - means ignore
DPT - in some questions a specific error made by a candidate, if repeated, could result in the loss of more than one mark. The **DPT** label indicates that this mistake should only result in a candidate losing one mark, on the first occasion that the error is made. Provided that the answer remains understandable, subsequent marks should be awarded as if the error was not being repeated.

<table>
<tr><td>1</td><td>(a)</td><td></td><td>
<table>
<tr><th>Position</th><th>Value</th><th>Order Examined In</th></tr>
<tr><td>8</td><td>Philip</td><td>1</td></tr>
<tr><td>10</td><td>Ravi</td><td>3</td></tr>
<tr><td>11</td><td>Richard</td><td>4</td></tr>
<tr><td>12</td><td>Timothy</td><td>2</td></tr>
</table>
; ; ;
1 mark for row 8 correct
1 mark for row 11 correct
1 mark for both rows 10 and 12 correct
Do not award mark for a particular number if same number is written more than once
</td><td>3</td></tr>
<tr><td>1</td><td>(b)</td><td></td><td>8</td><td>1</td></tr>
<tr><td>1</td><td>(c)</td><td></td><td>
<table>
<tr><th>Order of complexity</th><th>Tick one box</th></tr>
<tr><td>$O(\log_2 n)$</td><td>✓</td></tr>
<tr><td>$O(n)$</td><td></td></tr>
<tr><td>$O(n^2)$</td><td></td></tr>
</table>
Do not award mark if more than one box ticked
</td><td>1</td></tr>
</table>

2	**(a)**		*Interactive OS:* User and computer in direct/two-way communication // User makes input to computer then waits for output before making next input; **A** system, software, program, OS for computer *Network OS:* (Layer of software that) redirects requests to remote resources; (**A** examples) in a way that is transparent to user; **Must make one point about interactive and one point about network**	**Max 2**
2	**(b)**		Flow of program/execution sequence determined by events // program executes relevant code-handling block/procedure/sub-routine in response to events; Example of event such as clicking a button; Message sent to program when event occurs; System loop executes until application closes; this receives and processes messages // use of event-listener/handler; If several events occur they are queued;	**Max 2**

3	**(a)**		 **1 mark** for correct mantissa **1 mark** for correct exponent	**2**
3	**(b)**		**1 method mark** for either: • showing correct value of both mantissa and exponent in denary • showing binary point shifted 2 places to right in binary number • indicating that final answer calculated using answer = mantissa x $2^{exponent}$ **1 mark** for correct answer [Mantissa = -0.625 // -5/8 Exponent = 2 Answer = -2.5 // -2½	**2**
3	**(c)**		 **1 mark** for correct mantissa **1 mark** for correct exponent	**2**
3	**(d)**		Maximises precision/accuracy for given number of bits; Note: Must have concept of given number of bits or an example of this e.g. word length. Unique representation of each number // simpler to test for equality of numbers;	**2**
3	**(e)**		Reduced precision; Increased range; **A** can represent larger/smaller numbers No effect on amount of memory required to represent a number;	**Max 2**

4 (a)

Current State	S_1	S_1	S_2	S_2	S_3	S_3	S_4	S_4	S_5	S_5
Input Symbol	0	1	0	1	0	1	***0***	***1***	***0***	***1***
Next State	S_2	S_3	S_2	S_4	S_3	S_3	***S_4***	***S_5***	***S_5***	***S_4***

1 mark for all four bolded columns correct
A the two columns for S_4 either way round and similar for S_5 **1**

4 (b)

Accept/Accepting/Accepted (state) // Input (string) is accepted
A if the FSA finishes in this state output is Yes
R Stop state **1**

4 (c)

Input String	**String Accepted? (Yes/No)**
101	***No***
000	***No***
010001101	***No***
0100011011	***Yes***

1 mark for any two correct answers
2 marks for all four answers correct **2**

4 (d)

Strings that start with a 0;
A does not start with 1
R starts with 00, 01, any statement of a specific second digit being required

Followed by any sequence containing an odd number of 1s and zero or more 0s;
A String with an odd number of 1s in it.
A Numbers or bit patterns in place of 0s and 1s. **2**

5 (a)

Reverse Polish Notation	**Equivalent Infix Expression**
45 6 +	*45 + 6* ***R*** *6 + 45*
12 19 + 8 *	*(12 + 19) * 8* ***R*** *12+19*8, (19+12)*8* ***A*** *x for **

1 mark per correct expression
A extra brackets around complete expressions **2**

5 (b)

Simpler for a machine/computer to evaluate // simpler to code algorithm **A** easier **R** to understand
Do not need brackets (to show correct order of evaluation/calculation);
Operators appear in the order required for computation;
No need for order of precedence of operators;
No need to backtrack when evaluating;
A RPN expressions cannot be ambiguous as **BOD** **1**

5 **(c)**

String Pos	Token	Integer Val	Op1	Op2	Result	Stack
0	-	-	-	-	-	
1	6	6				6
2	4	4				4 6
3	+		**6**	**4**	10	10
4	3	3				3 10
5	2	2				2 3 10
6	+		**3**	**2**	5	5 10
7	*		**10**	**5**	50	50

Output : **50**

1 mark for each of rows 1-3
1 mark for rows 4 and 5 together
1 mark for rows 6 and 7 together
1 mark for correct final output

Values of Op1 and Op2 MUST be assigned in rows 3, 6 and 7 to award the marks for these rows. They cannot be inferred from incorrectly entered previous values.

I values in empty cells, even if they are incorrect.

6

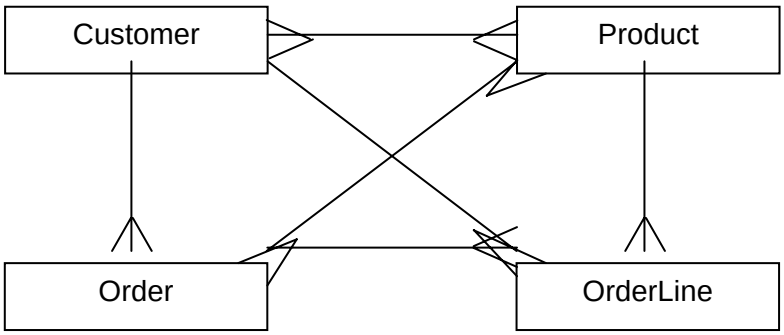
5 **(d)**

```
If StackArray is full
  Then Stack Full Error
  Else
    Increment TopOfStackPointer
    StackArray [TopOfStackPointer] ←
        ANumber
EndIf
```

1 mark for appropriate `If` structure including condition (does not need both `Then` and `Else`) – Do not award this mark if `ANumber` is put into `StackArray` outside the `If`.
1 mark for reporting error in correct place
1 mark* for incrementing `TopOfStackPointer`
1 mark* for storing value in `ANumber` into correct position in array

			***** = if the store instruction is given before the increment instruction OR the `If` structure then award **MAX 1** of these two marks UNLESS the item is inserted at position `TopOfStackPointer+1` so the code would work. **I** initialisation of `TopOfStackPointer` to `0` **A** `TopOfStackPointer=20` / `>=20` for Stack is full **A** Logic of If structure reversed i.e. If stack is not full / `TopOfStackPointer<20` / `<>20` / `!=20` and `Then`, `Else` swapped **A** Any type of brackets or reasonable notation for the array index **DPT** If candidate has used a different name any variable then do not award first mark but award subsequent marks as if correct name used. Refer answers where candidate has used a loop to find position to insert item into stack to team leaders.	**4**

6	**(a)**		An abstraction / leaving out non-essential details // A mathematical representation of reality;	**1**
6	**(b)**	**(i)**	**1 mark** for naming or describing **two** pointers from this list: • Front/start/head pointer • Next node pointer • Previous node pointer • Rear/end/tail pointer **R** Next free space pointer **1 mark** for stating the purpose of **one** of the pointers that have been named: • (Front/start/head pointer) to indicate where to remove items from // who should be served next // who is currently being served; **NE** to points to start of list • (Next node pointer) to link items in list together // to show order of list // so items can be inserted into middle of list // to traverse list; • (Previous node pointer) to link items in list together // to show order of list // so items can be inserted into middle of list // to traverse list backwards; • (Read/end/tail pointer) to indicate where to add new items to // so new people can be added to queue **NE** to point to end of list **A** Contextualised answers which refer to queue instead of list or adding people to a queue. **R** Answers which clearly relate to the use of a fixed-size array	**2**
6	**(b)**	**(ii)**	Priority (queue);	**1**
6	**(c)**		Allow any reasonable example that would require randomness e.g. time next person joins queue, inter-person arrival time, time to be served, choice of meal, type (student/teacher) of next person to arrive; **R** number of students/teachers/people in queue	**1**

7	**(a)**		Only one (type of) product per order // Must make new order for each (type of) product; as ProductNumber / product details stored in relation that has OrderNumber as primary key / product relation directly related to order relation // as relations not (fully) normalised; Difficult to query // requires (unnecessarily) complex queries; as contains repeating groups (of attributes); **A** either way round **A** table for relation	**Max 2**
7	**(b)**		 **1 mark** for each correct relationship, up to **MAX 3** **MAX 2** if more than three relationships drawn.	**Max 3**
7	**(c)**		ProductNumber INTEGER PRIMARY KEY // ProductNumber INTEGER PRIMARY KEY(ProductNumber) ProductPrice SMALLMONEY ProductDescription VARCHAR(50) QuantityInStock INTEGER **1 mark** for ProductNumber correct with appropriate type and identified as primary key **1 mark** for two other fields correct with appropriate types OR **2 marks** for all three other fields correct with appropriate types **A** any sensible types / field lengths. eg: For *ProductNumber*: integer, numeric, char, varchar, text, nchar, nvarchar, ntext, longvarchar, varchar2, nvarchar2 For *ProductPrice*: smallmoney, money, currency, float, real, decimal, dec, double, double precision, numeric For *ProductDescription*: varchar, char, varchar, text, nchar, nvarchar, ntext, longvarchar, varchar2, nvarchar2 For *QuantityInStock*: integer, numeric, float, real, decimal, dec, double, double precision, numeric **A** insertion of other unnecessary but valid SQL commands e.g. AUTO INCREMENT, NOT NULL **I** Spaces inserted into fieldnames e.g. Product Number **MAX 2** if additional fields added	**3**

7	**(d)**		Sequence of instructions / program / code; **NE** programming language **Note:** Do not award mark for program if candidate clearly means HTML which is executed/run/interpreted on the server (instead of the client); executed/run/interpreted when a web page is requested; to generate a web page (and its contents) which the server returns to the client // generating of dynamic web pages;	**Max 2**
7	**(e)**	**(i)**	**MAX 1** point from this list: Retrieve ProductNumber and Quantity // retrieve values input by user; stores values in variables; **R** responses that suggest these two commands are making the user input the values **MAX 1** point from this list: from the web page/web site/form/web serve/bowser; using POST/GET methods;	**Max 2**
7	**(e)**	**(ii)**	Query/retrieve data from the products table; to retrieve the price of product being ordered/selected on form/product that has correct product number/product number in ProdNum; Store the set of records/data/price returned in ProdDetails;	**Max 2**
7	**(e)**	**(iii)**	To send/output the Total Price back to the web server/web browser/client; **A** display price on web page **R** sent to user/customer	**1**
7	**(f)**		---EITHER--- SELECT ProductNumber, ProductDescription, ProductPrice, Quantity FROM Product, OrderLine WHERE OrderNumber = 4013 AND Product.ProductNumber = OrderLine.ProductNumber ORDER BY ProductNumber ASC **1 mark** for SELECT clause with correct four fields **1 mark** for FROM clause with correct two tables **1 mark** for OrderNumber = 4013 **1 mark** for clause linking tables on the common field with no additional unnecessary clauses added **1 mark** for ORDER BY ProductNumber, ASC is optional --- OR --- SELECT ProductNumber, ProductDescription, ProductPrice, Quantity FROM Product INNERJOIN OrderLine ON Product.ProductNumber = OrderLine.ProductNumber WHERE OrderNumber = 4013 ORDER BY ProductNumber ASC **1 mark** for SELECT clause with correct four fields **1 mark** for correct two tables in FROM clause **1 mark** for INNERJOIN together with ON Product.ProductNumber = OrderLine.ProductNumber and no other joins **1 mark** for OrderNumber = 4013	

			1 mark for ORDER BY ProductNumber, ASC is optional **In both solutions:** Do not award mark for SELECT clause if extra attributes listed. Do not award mark for FROM clause if extra tables listed. Do not award mark for ORDER BY clause if order descending. Only award two marks for conditions if they are connected by AND. Otherwise just award one of the marks. If candidate appears to have written two queries e.g. there are two SELECT commands then mark the first query. **A** table names before fieldnames. i.e. TableName.FieldName **A** " or ' as delimiters for 4013 **A** ascending, (ASC) for ASC **R** if ASC written before ProductNumber in ORDER BY **I** Spaces inserted into fieldnames e.g. Product Number Accept answers that candidates have surrounded by "ExecuteSQL()". If any of the errors listed below are made, they should result in at most one mark being lost. If the mistake is made more than once then on subsequent occasions, providing that the meaning is clear, the mistake should be ignored: • the addition of unnecessary punctuation such as semicolons the fieldname being written before the tablename	**5**

8	**(a)**	**(i)**	192.168.0.x where x is not 0 or 255;	**1**
8	**(a)**	**(ii)**	192.168.2.x where x is not 0 or 255;	**1**
8	**(b)**		255.255.255.0;	**1**
8	**(c)**		**Reason:** To reduce (network) congestion//improve throughput//*to cut the number of collisions**; **A** faster operation/transmission; **Explanation:** *by cutting the number of collisions**//by reducing the number of stations/computers connected to each section of cabling// because two computers in one segment can communicate at the same time as two computers in another segment; **Note:** * = Do not award two marks for cutting the number of collisions – only award one for either reason or explanation. **Reason:** To improve security; **Explanation:** by localising packet transmission to one segment; **Reason:** To improve reliability; **Explanation:** By limiting effect of cable failure to one segment; **Award marks for either:** • **one reason + explanation** • **two reasons** • **two explanations**	**Max 2**
8	**(d)**	**(i)**	Less expensive as reduced cabling requirement; No reliance on central node as data does not all travel through one node; **A** less cabling required without reference to reduced cost if candidate has explained why less cables are needed **A** computer/station for node **Must have explanation as well as advantage for mark**	**Max 1**

<table>
<tr><td>8</td><td>(d)</td><td>(ii)</td><td>Improved security as: data only travels down one link // is not sent throughout network // is not sent to all nodes;
Improved reliability as if one link fails the other links/nodes are not affected;
Speed of link remains constant // speed not affected by number of connections/collisions // faster connection as: no collisions/links not shared;
A cable for link
R responses about terminal/computer failure
Must have explanation as well as advantage for mark</td><td>Max 1</td></tr>
<tr><td>8</td><td>(e)</td><td></td><td>Below are some example security threats and measures, but they are only examples. Award marks for all reasonable security threats and appropriate measures.

Threats:

<table>
<tr><td>Virus</td><td>Malicious self-replicating programs which attach to other programs</td></tr>
<tr><td>Spam</td><td>Unsolicited junk email</td></tr>
<tr><td>Worm</td><td>Malicious self-replicating programs which replicate across networks using security vulnerabilities</td></tr>
<tr><td>Remote Login</td><td>Ability to login to a computer via Internet A “hacking” if explained</td></tr>
<tr><td>Trojan</td><td>A malicious program hidden inside another program // masquerading as another program</td></tr>
<tr><td>Phishing</td><td>Attempts to get users to divulge personal information</td></tr>
<tr><td>Pharming</td><td>Misdirecting users to a fake website by changing DNS entries</td></tr>
<tr><td>Spyware</td><td>Program that collects information from a user's computer without user knowing</td></tr>
<tr><td>Denial of Service Attack</td><td>Repeated requests/pings from the Internet could overwhelm (parts of) the network.</td></tr>
</table>

Threats must be described not simply named.

Measures:

Use a secure operating system
Regularly install security patches/upgrades for software
Use virus checking software + some explanation of what this will do
Keep virus definitions up to date
Use anti-spyware software + some explanation of what this will do
Use of firewall to control traffic between private network and Internet // explanation of how firewall might work
Use of spam filter in email package
Enable web browser features to detect Pharming
Restrictions on which websites users can visit
White lists/black lists
Enforce strong passwords
Encryption of data during transmission
Authentication of user/computer attempting remote login using digital certificate//smart card//security code generating device
Log files
Network manager keeps informed about latest threats // network manager trains users about threats

Measures must be appropriate to security issues described.

More than one measure can be used for the same threat.</td><td></td></tr>
</table>

How to award marks:

Mark Bands and Description	
5-6	*To achieve a mark in this band, candidates must meet the subject criterion (SUB) and all 5 of the quality of language criteria (QLx).* *SUB* Candidate has described 2 security threats and 3 appropriate measures OR 3 security threats and 2 appropriate measures. To get 6 marks answer must include 3 threats and 3 appropriate measures. *QL1* Text is legible. *QL2* There are few, if any, errors of spelling, punctuation and grammar. Meaning is clear. *QL3* The candidate has selected and used a form and style of writing appropriate to the purpose and has expressed ideas clearly and fluently. *QL4* Sentences and paragraphs follow on from one another clearly and coherently. *QL5* Appropriate specialist vocabulary has been used.
3-4	*To achieve a mark in this band, candidates must meet the subject criterion (SUB) and 4 of the 5 quality of language criteria (QLx).* *SUB* Candidate has described at least 2 security threats and described 1 or more appropriate security measures OR candidate has named (but not described) some security threats and has described 3 or more security measures *QL1* Text is legible. *QL2* There may be occasional errors of spelling, punctuation and grammar. Meaning is clear. *QL3* The candidate has, in the main, used a form and style of writing appropriate to the purpose, with occasional lapses. The candidate has expressed ideas clearly and reasonably fluently. *QL4* The candidate has used well-linked sentences and paragraphs. *QL5* Appropriate specialist vocabulary has been used.
1-2	*To achieve a mark in this band, candidates must meet the subject criterion (SUB). The quality of language should be typified by the QLx statements.* *SUB* Candidate has described at least 1 security threat and may or may not have described some appropriate security measures OR candidate has named at least one security threat and has described 1 or 2 security measures. *QL1* Most of the text is legible. *QL2* There may be some errors of spelling, punctuation and grammar but it should still be possible to understand most of the response. *QL3* The candidate has used a form and style of writing which has many deficiencies. Ideas are not always clearly expressed. *QL4* Sentences and paragraphs may not always be well-connected or bullet points may have been used. *QL5* Specialist vocabulary has been used inappropriately or not at all.
0	Candidate has made no relevant points.

Note: Even if English is perfect, candidates can only get marks for the

			points made at the top of the mark scheme for this question. If a candidate meets the subject criterion in a band but does not meet the quality of language criteria then drop mark by one band, providing that at least 3 of the quality of language criteria are met in the lower band. If 3 criteria are not met then drop by two bands.	**6**

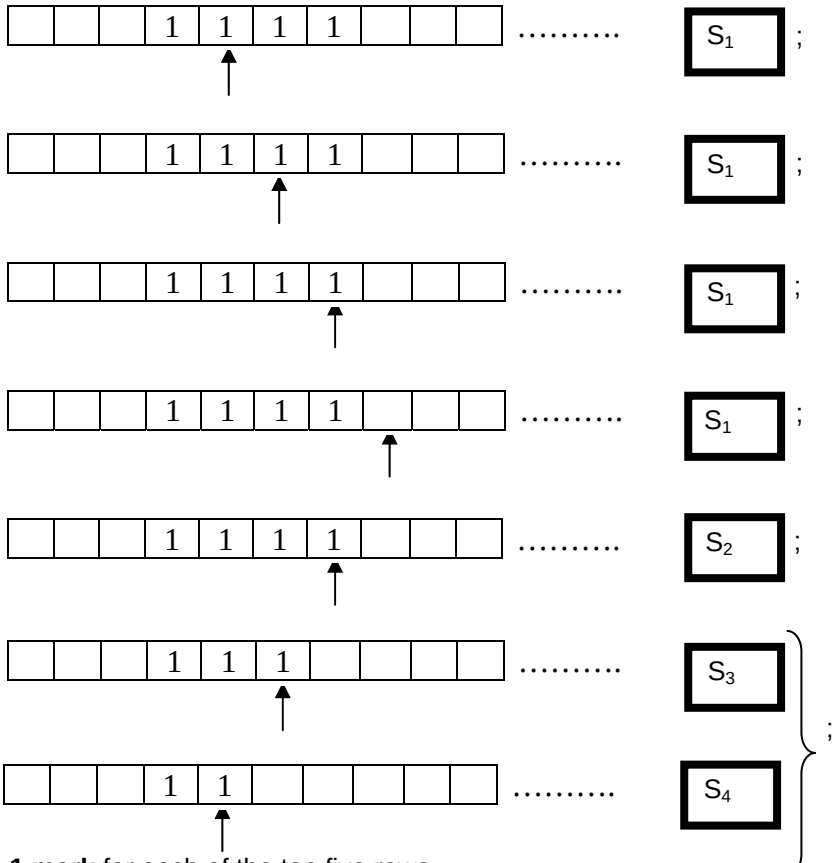
9	**(a)**	**(i)**	One or more a's followed by (a/one) b; **A** answers by example but must be at least ab, aab, aaab and show that the sequence continues.	**1**
9	**(a)**	**(ii)**	The strings ab or b // zero or one a's followed by (a/one) b	**1**
9	**(a)**	**(iii)**	A sequence of 0 or more occurrences of ab. **A** answers by example but must be at least the empty string, ab, abab, abababab and show that the sequence continues.	**1**
9	**(b)**	**(i)**	Clai?re // Clare|Claire **A** other valid possibilities e.g. Cla(ir|r)e, Cl(air|ar)e **A** use of different types of brackets	**1**
9	**(b)**	**(ii)**	10(0|1)*01 **1 mark** for the 10 at the start and 01 at the end **1 mark** for (0|1)* in the middle to produce a correct expression **A** use of different types of brackets Award **2 marks** for any other expression that would work	**2**

10	**(a)**		Number of signal changes per second // rate at which signals can change; **A** voltage changes for signal changes as BOD	**1**
10	**(b)**	**(i)**	Each signal level/signal change represents two bits (of data)/more than one bit (of data) // channel supports four/more than two different signal levels/voltages // use of modulation/coding technique e.g. phase modulation **NE** Send more than one bit at a time **Must be clear that there are more than two signal levels**	**1**
10	**(b)**	**(ii)**	**Step** / **Data/Request Sent** 2 – Printer indicates ready; **A** Yes, Ack 3 – [Computer sends] data; 6 – Printer indicates ready to receive further data; **R** job complete **NE** data received **1 mark** per correct step	**3**
10	**(c)**		Baseband – whole bandwidth of medium dedicated to one channel at a time // only one computer can send data at a time // sends signals with frequencies from 0Hz to a maximum highest frequency. Suitable for LAN – lower cost electronic components (accept examples) // simpler hardware // good performance at low cost	

NE cheaper
Broadband – bandwidth of medium shared so multiple channels can be carried simultaneously // many computers can send data simultaneously // frequency bands assigned to different communications. **TO** multiple wires
Suitable for WAN – expensive to install/maintain communications media over long distance // many more devices/people needs to communicate // more cost effective to share medium.

How to award marks:

Mark Bands and Description	
3-4	*To achieve a mark in this band, candidates must meet the subject criterion (SUB) and 5 of the 5 quality of language criteria (QLx).* *SUB* Candidate has described both baseband and broadband and has explained accurately why at least one of these is appropriate to the context. *QL1* Text is legible. *QL2* There are few, if any, errors of spelling, punctuation and grammar. Meaning is clear. *QL3* The candidate has selected and used a form and style of writing appropriate to the purpose and has expressed ideas clearly and fluently. *QL4* Sentences and paragraphs follow on from one another clearly and coherently. *QL5* Appropriate specialist vocabulary has been used.
2	*To achieve a mark in this band, candidates must meet the subject criterion (SUB) and 4 of the 5 quality of language criteria (QLx).* *SUB* Candidate has described both broadband and baseband but may not have explained why they are suitable. *QL1* Text is legible. *QL2* There may be occasional errors of spelling, punctuation and grammar. Meaning is clear. *QL3* The candidate has, in the main, used a form and style of writing appropriate to the purpose, with occasional lapses. The candidate has expressed ideas clearly and reasonably fluently. *QL4* The candidate has used well-linked sentences and paragraphs. *QL5* Appropriate specialist vocabulary has been used.
1	*To achieve a mark in this band, candidates must meet the subject criterion (SUB). The quality of language should be typified by the QLx statements.* *SUB* Candidate has only described one of baseband or broadband. *QL1* Most of the text is legible. *QL2* There may be some errors of spelling, punctuation and grammar but it should still be

			possible to understand most of the response. *QL3* The candidate has used a form and style of writing which has many deficiencies. Ideas are not always clearly expressed. *QL4* Sentences and paragraphs may not always be well-connected or bullet points may have been used. *QL5* Specialist vocabulary has been used inappropriately or not at all. 0 Candidate has made no relevant points. Note: Even if English is perfect, candidates can only get marks for the points made at the top of the mark scheme for this question. If a candidate meets the subject criterion in a band but does not meet the quality of language criteria then drop mark by one band, providing that at least 3 of the quality of language criteria are met in the lower band. If 3 criteria are not met then drop by two bands.	**4**
11	**(a)**		 **1 mark** for each of the top five rows **1 mark** for sixth and seventh row together **Must have correct tape contents and state for each mark** **A** the blank cell symbol ☐ in blank cells **A** answers in which the initial situation of the TM is repeated **A** If the read/write head is not drawn on some rows, this should result in the loss of the mark on the first occasion that it is missing only. Marks should be awarded for subsequent rows, even if the read/write head is not drawn.	**6**

11	**(b)**		Deletes two ones from the (right hand) end of the string // Subtracts two from a (unary) number; **A** bits for ones **R** end of tape for end of string **NE** deletes two ones	**1**
11	**(c)**		A Turing machine that can execute/simulate the behaviour of any other Turing machine // can compute any computable sequence; Faithfully executes operations on the data precisely as the simulated TM does; (Note: Must have idea of same process) Description of/Instructions for TM (and the TM's input) are stored on the (Universal Turing machine's) tape // The UTM acts as an interpreter; **A** take any other TM and data as input *Alternative definition:* A UTM, U, is an interpreter that reads the description <M> of any arbitrary Turing machine M; and faithfully executes operations on data D precisely as M does.; The description <M> is written at the beginning of the tape, followed by D.;	**Max 2**

UMS conversion calculator www.aqa.org.uk/umsconversion