

Mark Scheme (Final)

January 2012

GCE Applied ICT (6959)  
Paper 1 Communications and  
Networks

## **Edexcel and BTEC Qualifications**

Edexcel and BTEC qualifications come from Pearson, the world's leading learning company. We provide a wide range of qualifications including academic, vocational, occupational and specific programmes for employers. For further information, please call our GCE line on 0844 576 0025, our GCSE team on 0844 576 0027, or visit our qualifications website at [www.edexcel.com](http://www.edexcel.com). For information about our BTEC qualifications, please call 0844 576 0026, or visit our website at [www.btec.co.uk](http://www.btec.co.uk).

If you have any subject specific questions about this specification that require the help of a subject specialist, you may find our Ask The Expert email service helpful.

Ask The Expert can be accessed online at the following link:

<http://www.edexcel.com/Aboutus/contact-us/>

Alternatively, you can speak directly to a subject specialist at Pearson about Edexcel qualifications on our dedicated ICT telephone line: **0844 372 2186**

### **Pearson: helping people progress, everywhere**

Our aim is to help everyone progress in their lives through education. We believe in every kind of learning, for all kinds of people, wherever they are in the world. We've been involved in education for over 150 years, and by working across 70 countries, in 100 languages, we have built an international reputation for raising achievement through innovation in education. Find out more about how we can help you and your students at: [www.pearson.com/uk](http://www.pearson.com/uk)

January 2012

Publications Code UA030135

All the material in this publication is copyright

© Pearson Education Ltd 2012

## General Marking Guidance

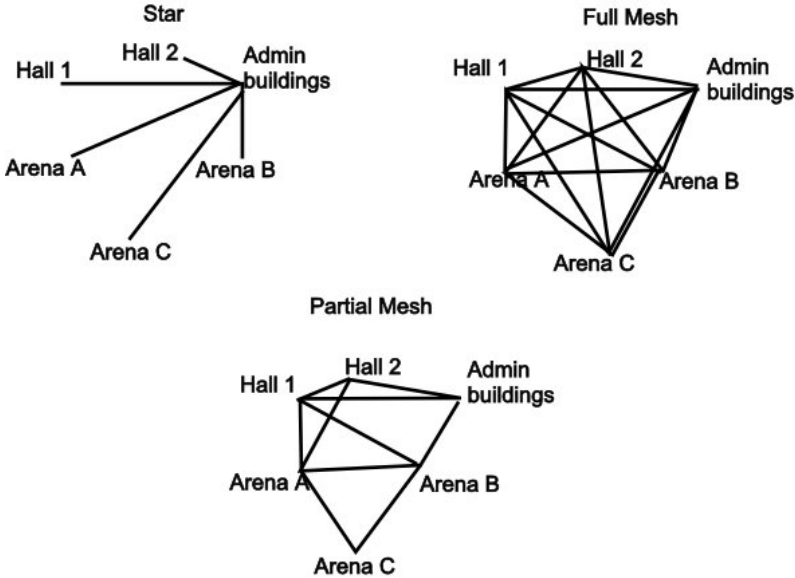
- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
- There is no ceiling on achievement. All marks on the mark scheme should be used appropriately.
- All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.
- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the team leader must be consulted.
- Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

## Activity 1 — Network management

| Question Number         | Indicative content  |
|-------------------------|---|
| <b>1</b><br><b>QWC*</b> | <p>A set of notes for Tristram about domains and trusts.</p> <p><b>Domain transfer from old admin (LYONESSE) LAN to the new one.</b></p> <p>Pre transfer:</p> <ul style="list-style-type: none"><li>• Check Active Directory on current server</li><li>• Backup the system</li><li>• Check Domain / Forest levels are the same for old and new servers, alter if needed</li><li>• Check / note what roles the old server is performing</li><li>• Load / connect new server to the LAN</li></ul> <p>During transfer:</p> <ul style="list-style-type: none"><li>• Add new server to old domain</li><li>• Make it an (additional) domain controller</li><li>• Replicate the Active Directory / transfer the control information</li><li>• Transfer any other required roles, e.g. DHCP, mail server</li><li>• Check / test the new server in its new roles</li></ul> <p>After transfer:</p> <ul style="list-style-type: none"><li>• Demote the old server so it is no longer a domain controller</li><li>• Check / test the system</li><li>• Check / raise domain / forest levels to Server 2008</li></ul> <p><b>Trust relationships.</b></p> <p>One way - A can access B but B cannot access A.<br/>Two way - A can access B and B can access A.</p> <p>Transitive - two way trusts between multiple domains. If A trusts B and B trusts C, A will trust C.<br/>Nontransitive - restricted to two domains. If A trusts B and B trusts C, A does not trust C without an extra trust being set up.</p> <p>Forest trust - A transitive trust between a forest root domain and a second forest root domain, normally two way by default. Only works with Server 2003 or higher.</p> <p><b>Recommendation.</b></p> <p>Good answer is a Forest (trust) OR transitive two way trusts.<br/>Other types would need a good, scenario-related reason.</p> <p><b>Reason.</b></p> <p>There are three domains, each running on Server 2008. A Forest makes best use of the Active Directory and security features of the operating system. It is also easier to administer with the built in admin tools.</p> |

|          |      | <p>One way.<br/>B trusts A<br/>DOMAIN A<br/>↓<br/>DOMAIN B</p> <p>Two way.<br/>A and B trust each other<br/>DOMAIN A<br/>↓   ↑<br/>DOMAIN B</p> <p>Transitive<br/>A trusts B<br/>B trusts C<br/>So A automatically trusts C<br/>DOMAIN A<br/>↑   ..<br/>DOMAIN B   DOMAIN C</p> <p>Intransitive<br/>A trusts B<br/>B trusts C<br/>No automatic trust A - C<br/>DOMAIN A<br/>↑   *<br/>DOMAIN B   DOMAIN C</p> <p>Forest trust within a forest<br/>Forest A Root<br/>↙   ↘<br/>Domain A   Domain B</p>  |
|----------|------|--|
| Level    | Mark | Descriptor   |
|          | 0    | No rewardable material.  |
| <b>1</b> | 1-4  | <p>Notes have simple diagrams with little or no text. Or have text but no diagrams.</p> <p>There is an outline description of a domain transfer method, some simple statements about the sequence of events for the actual transfer.</p> <p>Notes only address one or two trust relationships.</p> <p>There is a recommendation but no reason.</p> <p>The candidate uses everyday language and the response lacks clarity and organisation. Spelling, punctuation and the rules of grammar are used with limited accuracy.</p>   |
| <b>2</b> | 5-8  | <p>Notes have diagrams for the trust relationships. The text refers to the difference between them.</p> <p>There is a description of a domain transfer method, an attempt to describe the sequence of events needed during the transfer and either prior to or after the transfer.</p> <p>There are at least three trust relationships described.</p> <p>There is a recommendation with a sensible reason.</p> <p>The candidate uses some terms and shows some focus and organisation. Spelling, punctuation and the rules of grammar are used with some accuracy.</p>   |
| <b>3</b> | 9-12 | <p>Notes have a diagram / flowchart for the domain transfer.</p> <p>There is a good description of a domain transfer method, covering events prior to, during, and after the transfer</p> <p>Notes have diagrams for the trust relationships. The text makes clear the difference between them.</p> <p>Trust relationships should include: one way, two way, transitive, nontransitive, forest</p> <p>NOTE, shortcut, realm, and external trusts are not appropriate for the scenario.</p> <p>There is a recommendation with a sensible reason that relates to the scenario. This likely to be along the lines of making best use of Server 2008 features.</p> <p>The candidate uses a range of appropriate terms and shows good focus and organisation. Spelling, punctuation and the rules of grammar used with considerable accuracy.</p> |

**Activity 2 - Network connectivity.**

| Question Number | Answer   | Mark     |
|-----------------|--|----------|
| 2 (a) (i)       | <p>Describe, with the aid of diagrams, the two network topologies.<br/>The diagrams must be based on the layout of the showground.</p>  <p><b>Star.</b> Diagram, in context. 1 mark<br/>Description 1 mark e.g. all connections run from single / central switch</p> <p><b>Mesh.</b> Diagram, in context. 1 mark<br/>Description 1 mark e.g. each node / switch connects to two or more other nodes / switches.</p> | <b>4</b> |

| Question Number | Answer   | Mark     |
|-----------------|--|----------|
| 2 (a) (ii)      | <p>State, with reasons, which topology you recommend<br/>Chosen topology, 0 marks<br/>Reasons, 1 mark each to a maximum of 2.<br/>Reasons may include:</p> <p>Star.</p> <ul style="list-style-type: none"> <li>• Easier control / admin</li> <li>• Cheaper because less cable</li> <li>• Cheaper because less / smaller switch /other relevant device needed</li> </ul> <p>Mesh.</p> <ul style="list-style-type: none"> <li>• More robust / will keep working if one cable is broken</li> <li>• Easier to expand to distant parts of showground, just connect from nearest node.</li> <li>• Cheaper to expand to distant parts of showground, less cable needed</li> </ul> | <b>2</b> |

| Question Number | Answer  | Mark     |
|-----------------|---|----------|
| 2 (a) (iii)     | <p>Explain which type(s) of cable would be suitable for which links</p> <p>Detail will depend on chosen topology. Look for:</p> <ul style="list-style-type: none"> <li>• Copper cable for links of &lt;100m</li> <li>• Specified copper links e.g. admin - hall 1 / 2, arena A - arena B, hall 1 - hall 2, hall1 / 2 - arena A, admin - arena B, hall 2 - arena B</li> <li>• Fibre for any links because max distance on site is approx 200m / much less than max allowable distance for fibre.</li> </ul> <p>1 mark each</p> | <b>3</b> |

| Question Number | Answer   | Mark     |
|-----------------|--|----------|
| 2 (a) (iv)      | <p>State, with reasons, which type of cable you recommend for each link</p> <p>Detail will depend on chosen topology.</p> <p>Look for:</p> <ul style="list-style-type: none"> <li>• Copper for short / &lt;100m link because of cheaper cable cost</li> <li>• Copper because needs cheaper switch / other relevant device / can connect with existing hall switches / other relevant device</li> <li>• Fibre optic for long / &gt;100m link</li> <li>• fibre optic because cables run next to mains electric in ducts, therefore interference problems with copper</li> </ul> <p>Any other reasonable and justified idea.</p> <p>Allow 2(a)(iii) answer on specified links if not awarded in (iii)</p> | <b>3</b> |

| Question Number                      | Answer  | Mark   |                       |        |      |                 |           |  |             |                   |            |                                      |          |           |        |  |     |                   |        |  |                       |                      |             |  |                 |                      |            |             |                  |                                     |  |   |  |                                      |  |   |  |   |
|--------------------------------------|---|--|-----------------------|--------|------|-----------------|-----------|--|-------------|-------------------|------------|--------------------------------------|----------|-----------|--------|--|-----|-------------------|--------|--|-----------------------|----------------------|-------------|--|-----------------|----------------------|------------|-------------|------------------|-------------------------------------|--|---|--|--------------------------------------|--|---|--|---|
| 2 (b)                                | <p>A budget for the recommended solution<br/> 1 mark per component to a maximum of 6 marks<br/> Detail will depend on chosen topology. Look for:</p> <table border="1"> <thead> <tr> <th>Component</th> <th>Quantity</th> <th>Reason</th> <th>Cost</th> </tr> </thead> <tbody> <tr> <td>Cat 5 / 6 cable</td> <td>300-600 m</td> <td>1 or 2 x 305m box depending on topology and links made</td> <td>£75 per box</td> </tr> <tr> <td>Cable fibre optic</td> <td>300-1500 m</td> <td>depending on topology and links made</td> <td>£1 per m</td> </tr> <tr> <td>RJ45 ends</td> <td>10 -30</td> <td>probably pack of 50, cheaper than 3 x 10</td> <td>£20</td> </tr> <tr> <td>fibre end adaptor</td> <td>4 - 40</td> <td>depending on number of fibre links, need for adaptors / connectors to switches. Cost depends on type chosen.</td> <td>typical £5 - £10 each</td> </tr> <tr> <td>fibre capable switch</td> <td>3 x 16+port</td> <td>1 per LAN, could be assumed as existing device</td> <td>£200 - 300 each</td> </tr> <tr> <td>fibre capable switch</td> <td>3 x 8 port</td> <td>1 per arena</td> <td>£100 - £150 each</td> </tr> <tr> <td>Other sensible fibre network device</td> <td></td> <td>e.g. fibre patch panels, fibre patch leads, cabinets, racks</td> <td></td> </tr> <tr> <td>Other sensible copper network device</td> <td></td> <td>e.g. RJ45 patch panels, copper patch leads, cabinets, racks</td> <td></td> </tr> </tbody> </table> | Component  | Quantity              | Reason | Cost | Cat 5 / 6 cable | 300-600 m | 1 or 2 x 305m box depending on topology and links made | £75 per box | Cable fibre optic | 300-1500 m | depending on topology and links made | £1 per m | RJ45 ends | 10 -30 | probably pack of 50, cheaper than 3 x 10 | £20 | fibre end adaptor | 4 - 40 | depending on number of fibre links, need for adaptors / connectors to switches. Cost depends on type chosen. | typical £5 - £10 each | fibre capable switch | 3 x 16+port | 1 per LAN, could be assumed as existing device | £200 - 300 each | fibre capable switch | 3 x 8 port | 1 per arena | £100 - £150 each | Other sensible fibre network device |  | e.g. fibre patch panels, fibre patch leads, cabinets, racks |  | Other sensible copper network device |  | e.g. RJ45 patch panels, copper patch leads, cabinets, racks |  | 6 |
| Component                            | Quantity  | Reason   | Cost                  |        |      |                 |           |  |             |                   |            |                                      |          |           |        |  |     |                   |        |  |                       |                      |             |  |                 |                      |            |             |                  |                                     |  |   |  |                                      |  |   |  |   |
| Cat 5 / 6 cable                      | 300-600 m   | 1 or 2 x 305m box depending on topology and links made   | £75 per box           |        |      |                 |           |  |             |                   |            |                                      |          |           |        |  |     |                   |        |  |                       |                      |             |  |                 |                      |            |             |                  |                                     |  |   |  |                                      |  |   |  |   |
| Cable fibre optic                    | 300-1500 m  | depending on topology and links made   | £1 per m              |        |      |                 |           |  |             |                   |            |                                      |          |           |        |  |     |                   |        |  |                       |                      |             |  |                 |                      |            |             |                  |                                     |  |   |  |                                      |  |   |  |   |
| RJ45 ends                            | 10 -30  | probably pack of 50, cheaper than 3 x 10   | £20                   |        |      |                 |           |  |             |                   |            |                                      |          |           |        |  |     |                   |        |  |                       |                      |             |  |                 |                      |            |             |                  |                                     |  |   |  |                                      |  |   |  |   |
| fibre end adaptor                    | 4 - 40  | depending on number of fibre links, need for adaptors / connectors to switches. Cost depends on type chosen. | typical £5 - £10 each |        |      |                 |           |  |             |                   |            |                                      |          |           |        |  |     |                   |        |  |                       |                      |             |  |                 |                      |            |             |                  |                                     |  |   |  |                                      |  |   |  |   |
| fibre capable switch                 | 3 x 16+port   | 1 per LAN, could be assumed as existing device   | £200 - 300 each       |        |      |                 |           |  |             |                   |            |                                      |          |           |        |  |     |                   |        |  |                       |                      |             |  |                 |                      |            |             |                  |                                     |  |   |  |                                      |  |   |  |   |
| fibre capable switch                 | 3 x 8 port  | 1 per arena  | £100 - £150 each      |        |      |                 |           |  |             |                   |            |                                      |          |           |        |  |     |                   |        |  |                       |                      |             |  |                 |                      |            |             |                  |                                     |  |   |  |                                      |  |   |  |   |
| Other sensible fibre network device  |   | e.g. fibre patch panels, fibre patch leads, cabinets, racks  |                       |        |      |                 |           |  |             |                   |            |                                      |          |           |        |  |     |                   |        |  |                       |                      |             |  |                 |                      |            |             |                  |                                     |  |   |  |                                      |  |   |  |   |
| Other sensible copper network device |   | e.g. RJ45 patch panels, copper patch leads, cabinets, racks  |                       |        |      |                 |           |  |             |                   |            |                                      |          |           |        |  |     |                   |        |  |                       |                      |             |  |                 |                      |            |             |                  |                                     |  |   |  |                                      |  |   |  |   |
|                                      | <b>TOTAL FOR ACTIVITY 2</b>   | <b>18</b>  |                       |        |      |                 |           |  |             |                   |            |                                      |          |           |        |  |     |                   |        |  |                       |                      |             |  |                 |                      |            |             |                  |                                     |  |   |  |                                      |  |   |  |   |



### Activity 3 - Components of a network

| Question Number | Answer   | Mark  |       |             |   |   |  |   |   |   |   |  |  |   |                                     |                                   |   |   |  |   |   |                                   |          |
|-----------------|--|---|-------|-------------|---|---|--|---|---|---|---|--|--|---|-------------------------------------|-----------------------------------|---|---|--|---|---|-----------------------------------|----------|
| 3 (a)           | <p>Required evidence for 3a<br/>           A diagram showing the recommended layout of the admin and IT centre<br/>           Award 1 mark for each item. Up to a maximum of 8 marks,</p> <table border="1"> <thead> <tr> <th></th> <th>Point</th> <th>Explanation</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>just enough power sockets and network points: 20, sales 4, secretaries 4, directors 1 each, network staff 4</td> <td>Counted from personnel/devices given in the scenario</td> </tr> <tr> <td>B</td> <td>attempt to put extra sockets in all areas / space extra sockets around the building</td> <td>Allowance for expansion/more personnel/changing the location of devices</td> </tr> <tr> <td>C</td> <td>sockets on outside walls / in floor / hanging from ceiling / etc, NOT on moveable partitions</td> <td>Partitions may be moved OR walls are fixed / will not be moved</td> </tr> <tr> <td>D</td> <td>cable runs reach all defined spaces</td> <td>Allowance for changing the layout</td> </tr> <tr> <td>E</td> <td>cable runs on outside walls / in floor / hanging from ceiling / etc, NOT on moveable partitions</td> <td>Partitions may be moved / OR walls are fixed / will not be moved</td> </tr> <tr> <td>F</td> <td>cable runs laid out for easy reconfiguration of the space. e.g. in a grid, central trunk with regular spurs, ring with regular spurs.</td> <td>Allowance for changing the layout</td> </tr> </tbody> </table> |   | Point | Explanation | A | just enough power sockets and network points: 20, sales 4, secretaries 4, directors 1 each, network staff 4 | Counted from personnel/devices given in the scenario | B | attempt to put extra sockets in all areas / space extra sockets around the building | Allowance for expansion/more personnel/changing the location of devices | C | sockets on outside walls / in floor / hanging from ceiling / etc, NOT on moveable partitions | Partitions may be moved OR walls are fixed / will not be moved | D | cable runs reach all defined spaces | Allowance for changing the layout | E | cable runs on outside walls / in floor / hanging from ceiling / etc, NOT on moveable partitions | Partitions may be moved / OR walls are fixed / will not be moved | F | cable runs laid out for easy reconfiguration of the space. e.g. in a grid, central trunk with regular spurs, ring with regular spurs. | Allowance for changing the layout | <b>8</b> |
|                 | Point  | Explanation   |       |             |   |   |  |   |   |   |   |  |  |   |                                     |                                   |   |   |  |   |   |                                   |          |
| A               | just enough power sockets and network points: 20, sales 4, secretaries 4, directors 1 each, network staff 4  | Counted from personnel/devices given in the scenario                    |       |             |   |   |  |   |   |   |   |  |  |   |                                     |                                   |   |   |  |   |   |                                   |          |
| B               | attempt to put extra sockets in all areas / space extra sockets around the building  | Allowance for expansion/more personnel/changing the location of devices |       |             |   |   |  |   |   |   |   |  |  |   |                                     |                                   |   |   |  |   |   |                                   |          |
| C               | sockets on outside walls / in floor / hanging from ceiling / etc, NOT on moveable partitions   | Partitions may be moved OR walls are fixed / will not be moved          |       |             |   |   |  |   |   |   |   |  |  |   |                                     |                                   |   |   |  |   |   |                                   |          |
| D               | cable runs reach all defined spaces  | Allowance for changing the layout                                       |       |             |   |   |  |   |   |   |   |  |  |   |                                     |                                   |   |   |  |   |   |                                   |          |
| E               | cable runs on outside walls / in floor / hanging from ceiling / etc, NOT on moveable partitions  | Partitions may be moved / OR walls are fixed / will not be moved        |       |             |   |   |  |   |   |   |   |  |  |   |                                     |                                   |   |   |  |   |   |                                   |          |
| F               | cable runs laid out for easy reconfiguration of the space. e.g. in a grid, central trunk with regular spurs, ring with regular spurs.  | Allowance for changing the layout                                       |       |             |   |   |  |   |   |   |   |  |  |   |                                     |                                   |   |   |  |   |   |                                   |          |

| Question Number                         | Answer   | Mark                                  |   |        |       |                              |      |         |   |        |    |                |                               |          |    |              |   |                     |   |              |                     |                      |   |              |                              |   |     |                                       |   |                |    |              |   |  |
|---|--|---------------------------------------|---|--------|-------|------------------------------|------|---------|---|--------|----|----------------|-------------------------------|----------|----|--------------|---|---------------------|---|--------------|---------------------|----------------------|---|--------------|------------------------------|---|-----|---------------------------------------|---|----------------|----|--------------|---|--|
| 3(b)                                    | <p>Required evidence for 3b<br/>           A table for submission to Tristram which identifies the hardware and cabling components to be used in the admin LAN and I.T. Centre, giving a reason for each component.<br/> <b>1 mark per component, with sensible reason.</b><br/> <b>Max 12</b><br/> <b>Needs to be in context. Allow different numbers if reason justifies.</b></p> <table border="1"> <thead> <tr> <th>Component</th> <th>Number</th> <th>Reason</th> <th>Notes</th> </tr> </thead> <tbody> <tr> <td>PC (+screen, keyboard, etc.)</td> <td>13 +</td> <td>counted</td> <td>13 specified, may give PCs to network staff or others</td> </tr> <tr> <td>Server</td> <td>1+</td> <td>to run the LAN</td> <td>Probably a server plus backup</td> </tr> <tr> <td>Netbooks</td> <td>8+</td> <td>as specified</td> <td>8 for event office, could have a spare or two for contingency</td> </tr> <tr> <td>B &amp; W laser printer</td> <td>2</td> <td>as specified</td> <td>sales and reception</td> </tr> <tr> <td>Colour laser printer</td> <td>2</td> <td>as specified</td> <td>event office and secretaries</td> </tr> <tr> <td>Switch with fibre optic link capability</td> <td>1 +</td> <td>for centre of LAN + fibre optic links</td> <td>Min of 24 ports. May be multiple switches</td> </tr> <tr> <td>Internet phone</td> <td>4+</td> <td>as specified</td> <td>sales and reception but could use elsewhere. MUST be VoIP capable</td> </tr> </tbody> </table> | Component                             | Number  | Reason | Notes | PC (+screen, keyboard, etc.) | 13 + | counted | 13 specified, may give PCs to network staff or others | Server | 1+ | to run the LAN | Probably a server plus backup | Netbooks | 8+ | as specified | 8 for event office, could have a spare or two for contingency | B & W laser printer | 2 | as specified | sales and reception | Colour laser printer | 2 | as specified | event office and secretaries | Switch with fibre optic link capability | 1 + | for centre of LAN + fibre optic links | Min of 24 ports. May be multiple switches | Internet phone | 4+ | as specified | sales and reception but could use elsewhere. MUST be VoIP capable |  |
| Component                               | Number   | Reason                                | Notes   |        |       |                              |      |         |   |        |    |                |                               |          |    |              |   |                     |   |              |                     |                      |   |              |                              |   |     |                                       |   |                |    |              |   |  |
| PC (+screen, keyboard, etc.)            | 13 +   | counted                               | 13 specified, may give PCs to network staff or others             |        |       |                              |      |         |   |        |    |                |                               |          |    |              |   |                     |   |              |                     |                      |   |              |                              |   |     |                                       |   |                |    |              |   |  |
| Server                                  | 1+   | to run the LAN                        | Probably a server plus backup                                     |        |       |                              |      |         |   |        |    |                |                               |          |    |              |   |                     |   |              |                     |                      |   |              |                              |   |     |                                       |   |                |    |              |   |  |
| Netbooks                                | 8+   | as specified                          | 8 for event office, could have a spare or two for contingency     |        |       |                              |      |         |   |        |    |                |                               |          |    |              |   |                     |   |              |                     |                      |   |              |                              |   |     |                                       |   |                |    |              |   |  |
| B & W laser printer                     | 2  | as specified                          | sales and reception   |        |       |                              |      |         |   |        |    |                |                               |          |    |              |   |                     |   |              |                     |                      |   |              |                              |   |     |                                       |   |                |    |              |   |  |
| Colour laser printer                    | 2  | as specified                          | event office and secretaries                                      |        |       |                              |      |         |   |        |    |                |                               |          |    |              |   |                     |   |              |                     |                      |   |              |                              |   |     |                                       |   |                |    |              |   |  |
| Switch with fibre optic link capability | 1 +  | for centre of LAN + fibre optic links | Min of 24 ports. May be multiple switches                         |        |       |                              |      |         |   |        |    |                |                               |          |    |              |   |                     |   |              |                     |                      |   |              |                              |   |     |                                       |   |                |    |              |   |  |
| Internet phone                          | 4+   | as specified                          | sales and reception but could use elsewhere. MUST be VoIP capable |        |       |                              |      |         |   |        |    |                |                               |          |    |              |   |                     |   |              |                     |                      |   |              |                              |   |     |                                       |   |                |    |              |   |  |

|  |                                      |                         |   |  |
|--|--------------------------------------|-------------------------|---|--|
|  | Ethernet cable<br>Cat 5 or better    | min 1<br>box /<br>300 m | joining<br>sockets etc.<br>to switch            | May give lots of<br>individual cable<br>lengths                            |
|  | RJ 45 ends                           | pack of<br>50           | need 2 per<br>cable /<br>patch lead             | = 40 + for the<br>PCs, printers,<br>server etc. if<br>making own<br>cables |
|  | Patch leads                          | depends<br>on set<br>up | joining PCs<br>etc to<br>sockets                | 1 per device<br>connected  |
|  | WiFi Access<br>Point                 | 3 +                     | To cover<br>event office<br>and admin<br>centre | 1 for event office,<br>2 + to cover all of<br>admin centre                 |
|  | Patch panel                          | 1 +                     | to organise<br>cabling at<br>the<br>switch(es)  | not a<br>requirement,<br>allow with a<br>sensible reason                   |
|  | Trolley or<br>similar                | 4                       | For the<br>events<br>office                     | PCs must be<br>easily movable,<br>accept any<br>sensible solution          |
|  | Up to 3 other<br>sensible<br>devices |                         | with a good<br>reason                           | e.g. UPS,<br>cabinets, back-up<br>device.                                  |
|  | <b>TOTAL FOR ACTIVITY 3</b>          |                         |   | <b>20</b>  |

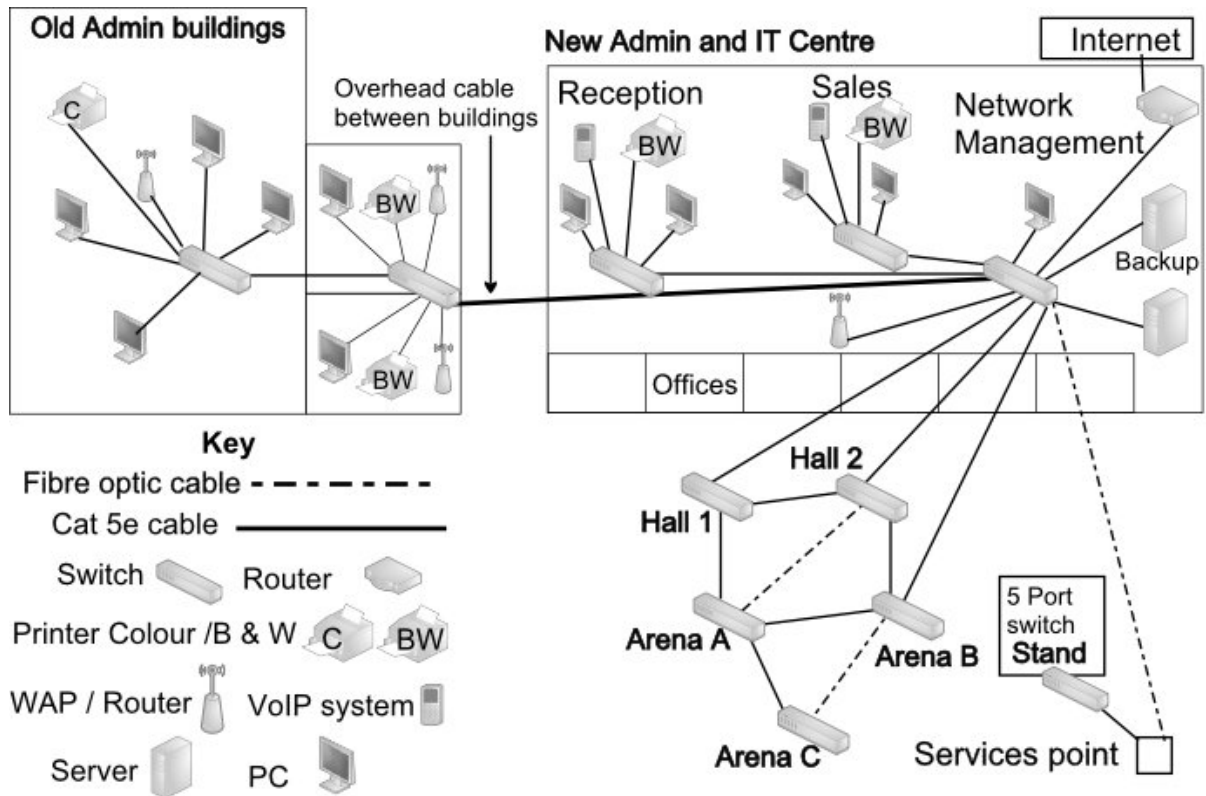
#### Activity 4 – Network Design

| Question Number | Answer  | Mark      |
|-----------------|---|-----------|
| 4 (a)           | <p>Required evidence for 4a:<br/> <b>a network design for the complete project</b></p> <ul style="list-style-type: none"> <li>a) Diagram shows; old admin buildings, new admin and IT centre, Hall1, Hall2, 3 arenas, example exhibition stand</li> <li>b) Cable types identified, must include copper and fibre optic.</li> <li>c) Hall1 and Hall2, switch / router plus link</li> <li>d) Arenas 1, 2, 3, switch / router plus link</li> <li>e) Exhibition stand, switch / data socket</li> <li>f) Exhibition stand, Services Access Point with cable to stand</li> <li>g) 2 x Works dept buildings. PC and network printer in each</li> <li>h) 2 x Works dept buildings. WAP in each / 1 WAP in the middle</li> <li>i) Events Office. 4 x PC and network colour laser printer</li> <li>j) Events Office. WAP and switch</li> <li>k) Reception area, 2 x PC and network B&amp;W laser printer</li> <li>l) Reception area, VoIP telephone</li> <li>m) Sales area, 2 x PC and network B&amp;W laser printer</li> <li>n) Sales area, VoIP telephone</li> <li>o) Secretarial area, 3 x PC and network colour laser printer</li> <li>p) 6 x office with WAP coverage</li> <li>q) Network management area. Server</li> <li>r) Network management area. Backup server or backup device</li> <li>s) Network management area. PC</li> <li>t) Network management area. Switch</li> <li>u) Network management area. Router</li> <li>v) Sensible routes from server to router &amp; switch</li> <li>w) Protected / overhead link from Admin and I.T. to old admin</li> <li>x) Admin buildings have Internet connection</li> </ul> <p style="text-align: right;">Max 20 marks</p> | <b>20</b> |

| Question Number | Answer  | Mark      |
|-----------------|---|-----------|
| 4 (b)           | <p>Required evidence for 4b:<br/>An explanation of decisions made regarding the <b>positioning</b> of network devices and equipment.<br/>There are no marks for descriptions of what is on the diagram.</p> <p>1 mark per explanation which justifies a decision, to a maximum of 6.<br/>Allow a maximum of 2 non-position explanations. e.g.</p> <ul style="list-style-type: none"> <li>• The Event Office has a WAP = 0</li> <li>• The Event Office has a WAP in the centre of the room to give coverage wherever the PCs are placed = 1</li> </ul> <p>Answers may include explanation of:</p> <ul style="list-style-type: none"> <li>• server position</li> <li>• router position</li> <li>• switch positions</li> <li>• WAP positions</li> <li>• network printers positions</li> <li>• location of Internet access point</li> <li>• expansion provision</li> <li>• Max 6 marks</li> </ul> | 6         |
|                 | <b>TOTAL FOR ACTIVITY 4</b>   | <b>26</b> |

**Network Diagram. NOTE. This diagram:**

- is drawn to illustrate all of the marking points
- is **not** the only answer
- is **probably not the best answer**



### Activity 5 – Network addressing and protocols

| Question Number  | Answer  | Mark           |             |   |                     |  |  |  |  |  |   |                |                           |  |   |          |
|--|---|----------------|-------------|---|---------------------|--|--|--|--|--|---|----------------|---------------------------|--|---|----------|
| 5 (a)  | <p>Required evidence for 5a:<br/>A set of recommendations that will save money.<br/>Answers may include:</p> <table border="1"> <thead> <tr> <th>Recommendation</th> <th>Explanation</th> </tr> </thead> <tbody> <tr> <td>Joint / remote administration of the 3 LANs</td> <td>Save on staff costs</td> </tr> <tr> <td>Centralised / joint backup of the 3 LANs</td> <td>Save on backup equipment / staff costs</td> </tr> <tr> <td>Use LANs for communications to arenas / stands</td> <td>Save on radio kit / mobile telephone costs</td> </tr> <tr> <td>More efficient use of peripherals / printers</td> <td>Networked printers allow fewer machines / allow heavy duty machines with lower page costs</td> </tr> <tr> <td>Better control</td> <td>Print control saves waste</td> </tr> <tr> <td>File / information sharing / collaboration possibilities</td> <td>Management can be more efficient, saving time / money</td> </tr> </tbody> </table> <p>1 mark for a sensible recommendation set in context.<br/>1 mark for a plausible explanation.<br/>To a maximum of 8 marks</p> | Recommendation | Explanation | Joint / remote administration of the 3 LANs | Save on staff costs | Centralised / joint backup of the 3 LANs | Save on backup equipment / staff costs | Use LANs for communications to arenas / stands | Save on radio kit / mobile telephone costs | More efficient use of peripherals / printers | Networked printers allow fewer machines / allow heavy duty machines with lower page costs | Better control | Print control saves waste | File / information sharing / collaboration possibilities | Management can be more efficient, saving time / money | <b>8</b> |
| Recommendation   | Explanation   |                |             |   |                     |  |  |  |  |  |   |                |                           |  |   |          |
| Joint / remote administration of the 3 LANs              | Save on staff costs   |                |             |   |                     |  |  |  |  |  |   |                |                           |  |   |          |
| Centralised / joint backup of the 3 LANs                 | Save on backup equipment / staff costs  |                |             |   |                     |  |  |  |  |  |   |                |                           |  |   |          |
| Use LANs for communications to arenas / stands           | Save on radio kit / mobile telephone costs  |                |             |   |                     |  |  |  |  |  |   |                |                           |  |   |          |
| More efficient use of peripherals / printers             | Networked printers allow fewer machines / allow heavy duty machines with lower page costs   |                |             |   |                     |  |  |  |  |  |   |                |                           |  |   |          |
| Better control   | Print control saves waste   |                |             |   |                     |  |  |  |  |  |   |                |                           |  |   |          |
| File / information sharing / collaboration possibilities | Management can be more efficient, saving time / money   |                |             |   |                     |  |  |  |  |  |   |                |                           |  |   |          |

| Question Number                                     | Answer  | Mark           |             |                                       |  |                                    |  |  |                                  |                                 |   |   |                                     |          |
|---|---|----------------|-------------|---------------------------------------|--|------------------------------------|--|--|----------------------------------|---------------------------------|---|---|-------------------------------------|----------|
| 5 (b)   | <p>Required evidence for 5b:<br/>A set of recommendations that will help secure the network.<br/>Answers may include:</p> <table border="1"> <thead> <tr> <th>Recommendation</th> <th>Explanation</th> </tr> </thead> <tbody> <tr> <td>Firewall between network and Internet</td> <td>Hides network / controls / blocks unauthorised ex access</td> </tr> <tr> <td>Anti-malware / anti-virus software</td> <td>prevents malware / troja sending information out</td> </tr> <tr> <td>Anti-malware / anti-virus software kept up to date</td> <td>Because of rapidly chang malware</td> </tr> <tr> <td>Secure WAPs with WPA2 or better</td> <td>prevents intrusion via th WAPs / wardriving attac</td> </tr> <tr> <td>Ensure lockable covers of service points are locked</td> <td>Prevents easy 'hard' acc the system</td> </tr> </tbody> </table> <p>1 mark for a sensible recommendation set in context.<br/>1 mark for a plausible explanation.<br/>To a maximum of 4 marks</p> | Recommendation | Explanation | Firewall between network and Internet | Hides network / controls / blocks unauthorised ex access | Anti-malware / anti-virus software | prevents malware / troja sending information out | Anti-malware / anti-virus software kept up to date | Because of rapidly chang malware | Secure WAPs with WPA2 or better | prevents intrusion via th WAPs / wardriving attac | Ensure lockable covers of service points are locked | Prevents easy 'hard' acc the system | <b>4</b> |
| Recommendation                                      | Explanation   |                |             |                                       |  |                                    |  |  |                                  |                                 |   |   |                                     |          |
| Firewall between network and Internet               | Hides network / controls / blocks unauthorised ex access  |                |             |                                       |  |                                    |  |  |                                  |                                 |   |   |                                     |          |
| Anti-malware / anti-virus software                  | prevents malware / troja sending information out  |                |             |                                       |  |                                    |  |  |                                  |                                 |   |   |                                     |          |
| Anti-malware / anti-virus software kept up to date  | Because of rapidly chang malware  |                |             |                                       |  |                                    |  |  |                                  |                                 |   |   |                                     |          |
| Secure WAPs with WPA2 or better                     | prevents intrusion via th WAPs / wardriving attac   |                |             |                                       |  |                                    |  |  |                                  |                                 |   |   |                                     |          |
| Ensure lockable covers of service points are locked | Prevents easy 'hard' acc the system   |                |             |                                       |  |                                    |  |  |                                  |                                 |   |   |                                     |          |
|   | <b>TOTAL FOR ACTIVITY 5</b>   | <b>12</b>      |             |                                       |  |                                    |  |  |                                  |                                 |   |   |                                     |          |

|                             |   |          |
|-----------------------------|---|----------|
| <b>SWW</b><br><br><b>EE</b> | <p>All printouts must have a header and a footer. The header must contain the activity number. The footer must contain your name, candidate number and centre number.</p> <p>Minimum font size of 10 should be used for all word processed documents.<br/>Submitted work must meet the page limitations given in each activity.</p> | <p>2</p> |
|-----------------------------|---|----------|

|  |                        |           |
|--|------------------------|-----------|
|  | <b>TOTAL FOR PAPER</b> | <b>90</b> |
|--|------------------------|-----------|



Further copies of this publication are available from  
Edexcel Publications, Adamsway, Mansfield, Notts, NG18 4FN

Telephone 01623 467467

Fax 01623 450481

Email [publication.orders@edexcel.com](mailto:publication.orders@edexcel.com)

Order Code UA030135

January 2012

For more information on Edexcel qualifications, please visit  
[www.edexcel.com/quals](http://www.edexcel.com/quals)

Pearson Education Limited. Registered company number 872828  
with its registered office at Edinburgh Gate, Harlow, Essex CM20 2JE

Ofqual  




Llywodraeth Cynulliad Cymru  
Welsh Assembly Government



Rewarding Learning