9.4 TCP IP part 2 Mark Scheme

Mark schemes

Q1.

(a)   bbc.co.uk; www.bbc.co.uk;

                                                                                    1

(b)   (i)   (hypertext transfer) protocol / protocol used / set of rules used;
                R http format

       (ii)   www means it is a web site/web page/is on the web; **R** Internet
                on a web server/the machine name;
                world wide web on its own n.e.

       (iii)   (bbc is the)) organisation's/company's name/keyword/identifier/ site
                name/site owner;

       (iv)   (co means it is a) company; **A** corporation; the type of organisation;

       (v)   uk means the country of origin is the UK/based in UK/**A** site in the UK;
                where it is based/located;

       (vi)   History is the folder name/subdirectory
                (which contains a file with default name of index.html);
                OR **A** history is the page/filename of the web site/part of the site;
                A (specific) topic;

                                                                                      6

(c)   (i)   Domain name has a single IP address;
                Computer looks up domain name on a (domain) name server
                Which tells the computer the IP address;
                Domain name is user-friendly representation of IP number;
                IP number/address is numerical representation of domain name;
                Domain name maps onto IP address; one-to-one;

                                                                                  1

       (ii)   0.0.0.0 / 0;
                To 255.255.255.255 / $2^{32}-1$ / 256^4-1; 4294967295;
                Each group of digits is in the range 0-255;;

                                                                                    2

                                                                                     [10]

Q2.

LAN;
Justification:
Computers in health centre are in close proximity to each
other/geographically close/in same building/on same site;
R Computers within health centre on its own

                                                                                                           [2]

Q3.

(a)   (i)   Too much traffic//Congestion//slow to respond//too many (packet/frame)
                collisions; (Candidate may answer reduces traffic, etc.   This is OK)
                A Performance degrades

(ii) Bridge "learns" which desktop PCs connected to each port//bridge stores
Ethernet addresses of desktop PCs connected to port **A** and port B;
Bridge blocks packets destined for a desktop PC on same segment from
being passed to other segment// Bridge only passes packets destined
for a desktop PC on other segment; Packets between machines on
same segment are ignored by bridge/blocked by bridge;
Packets between machines(using machine identifiers is OK, e.g.
PC1) on different segments transferred by bridge;
A Messages for packets

(iii)
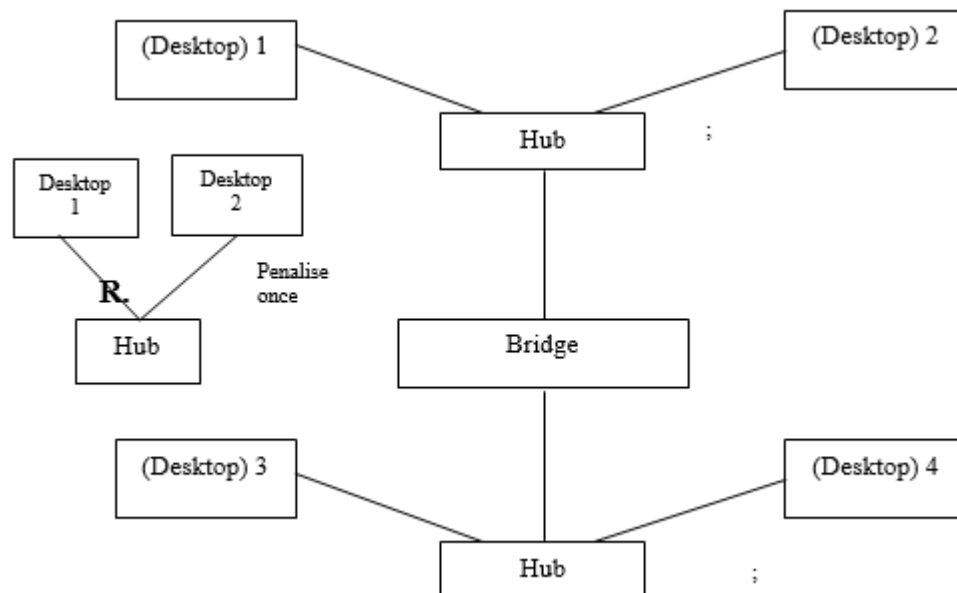
1 for first segment hub connected to bridge + desktops 1 & 2
1 for second segment hub connected to bridge + desktops 3 & 4
R Missing bridge correct hubs – penalise once
No hubs – scores zero

(iv) **A** user logged in at one peer computer is able to use resources on any
other peer computer;
In a peer-to-peer network, there are no dedicated servers;
In a peer-to-peer network all computers are equal/have equal status;
Each computer functions as both a client and a server;
User at each computer acts as both a user and an administrator
(determining what data, disk space and peripherals on their computer
get shared on the network)//User at each controls what is shared with
other computers;
A Network with no central control;
R Each computer is directly connected to each other and so can send to
each other without a server
R All computers have same rights

(b) (i) To provide access/interface to the Internet/World Wide Web (to
individuals/organisations/businesses);
To act as hosts for Web pages (that individuals/organisations/

businesses wish to publish on the Internet);
To provide electronic mail boxes;
To provide services related to Internet access;

1

(ii)   **A** router is a device that receives datagrams or packets from
one   computer and uses the <u>IP addresses</u> that they contain to pass on
these packets, correctly formatted, to another computer;
Device which uses <u>IP addresses</u> to route packets;

1

(iii)   192.168.1.1;

1

[9]

Q4.

(a)   *Client –server system*
A server provides services required by client workstations/applications (1)
Such as file storage/communications/web access; *(dependant on first point)*
(1)
OR
Server distributes data to client system requesting it(1)
Clients process data (1)

2

(b)   *3 benefits*
Client workstations can have lower processing speeds/hard disc capacity –
and so cheaper;
A print server will manage the printing on behalf of the clients;
All client workstations can share 1 copy of an application;
All client workstations can share data/backups easier;
Enables greater security such as access rights/control over
Internet access/firewall/one Internet access point;
Upgrades easily managed because only one copy of software;
Licensing managed because use can be monitored.

3

[5]

Examiner reports

Q1.

Candidates must be aware that one word answers are not usually sufficient. Just spelling out the full word from the abbreviation in the URL is enough to explain what the different parts can tell us. Particularly vague were the answers to the history part of the URL, which is a folder name of the web site. Some candidates wrongly thought it was a link. Some candidates suggested, wrongly, that each part of the URL is coded into a set of digits and this is how the IP address is arrived at. Each web site has a unique IP address. The more user-friendly domain name is resolved to its IP address through a Domain Name Server. A creditworthy response was that each domain name maps onto one IP address. (Although it should be noted that several domain names may map onto the same IP address.) Very few candidates correctly stated the range of possible IP addresses. Many did not appear to see the significance of each group of digits being stored in one byte and therefore the possible range was 0.0.0.0 – 255.255.255.255. Some candidates were on the right track but failed to see that the largest possible integer that can be stored in a byte is 255 and stated a variety of other values. This is an important concept to understand the pending change to longer IP addresses as the world runs out of the currently available addresses.

Q2.

Candidates performed well on this question.

Q3.

Most candidates made a reasonably successful attempt at this question but **router** was not well understood. Very few candidates knew that routers use the IP addresses of packets to route a packet across the Internet. They forward data packets if the destination is not on the current network. Routers are at the core of the Internet. Without routers we would not have an Internet. The specification states: "define this term and consider when and why routers are used. In particular, consider how routing is achieved across the Internet". Understanding what is a router and routing is as fundamental to internet working as an understanding of what a nucleus is, and that splitting the nucleus produces a vast amount of energy, is to nuclear physics.

Q4.

Few candidates could really define a client server system for this question, or give benefits for one. What was lacking here was the notion that the server provides services to the client workstations, such as managing the printer queue, or internet access. Many answers were in a general network context, or were too vague to be worthy of credit. Others confused the system with terminals, keyboards and monitors, which used the main computer's processing power.