

**Data transmission – 2021 O Level 2210**

1. Nov/2021//Paper\_12/No.3

(a) Six statements are given about methods of data transmission.

Tick (✓) to show if each statement applies to serial simplex, parallel simplex, parallel half-duplex or serial duplex data transmission. Some statements may apply to more than **one** data transmission method.

Statement	Serial simplex (✓)	Parallel simplex (✓)	Parallel half-duplex (✓)	Serial duplex (✓)
bits are transmitted along a single wire				
data is transmitted in both directions				
it is only suitable for distances less than 5 metres				
bits from the same byte are transmitted one after the other				
data may <b>not</b> arrive in the correct sequence				
data is transmitted in both directions, but only <b>one</b> direction at a time				

[6]

(b) A Universal Serial Bus (USB) connection can be used to transmit data from a mobile device to a computer.

Give **three** benefits of using a USB connection for this purpose.

Benefit 1 .....

.....

Benefit 2 .....

.....

Benefit 3 .....

.....

[3]

2.

Four 7-bit binary values are transmitted from one computer to another. A parity bit is added to each binary value creating 8-bit binary values. All the binary values are transmitted and received correctly.

(a) Identify whether each 8-bit binary value has been sent using odd or even parity by writing odd or even in the type of parity column.

8-bit binary value	Type of parity
01100100	
10010001	
00000011	
10110010	

[4]

(b) An error may **not** be detected when using a parity check.

Identify why an error may **not** be detected.

.....  
 ..... [1]

(c) The data is sent using parallel half-duplex data transmission.

(i) Describe how data is sent using parallel half-duplex data transmission.

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 .....  
 .....  
 .....  
 .....  
 .....  
 .....  
 .....  
 ..... [4]

(ii) State **two** drawbacks of using parallel data transmission.

Drawback 1 .....

.....

Drawback 2 .....

.....

[2]