

NSBM Green University Town

Data Communication and Networks CN101.3

Model Paper

Answer all questions.

Total 100 Marks.

Time: 3 hours

01. (a) Mention *two* reasons for layering as used in protocol architectures.
- (b) How many layers are there in TCP/IP protocol architecture model?
- (c) How many layers are there in ISO OSI protocol architecture model?
- (d) Show the two models in (b) and (c) by sketching a diagram showing the layers of each model side-by-side. You should label (name) the layers in your diagram.
- (e) Write *two* similarities you can see between the two models in (b) and (c).
- (f) Write *two* differences you can see between the two models in (b) and (c).
- (g) Out of the two models in (b) and (c), *which one* is widely used today?
- (h) Mention *two* reasons for your answer in (g).

[Total 20 marks]

02. (a). Transmission media can be categorized into two types. What are the two types?
- (b). Mention two examples each for above mention types.
- (c). Mention two types of twisted pair cables.
- (d). Write three advantages available in using optical fiber in data communication
- (e). Mention two reasons for use of parabolic dish type antennas in microwave transmission.

(f). Write two advantages and disadvantages in using microwaves for data communication.

(g) Explain point to point and broadcast link satellite network configurations.

[Total 20 marks]

03. (a). Explain what is meant by an error in data communication.

(b). Explain single bit error and burst error using an appropriate diagram.

(c). Explain odd parity and even parity.

(d). A data transmission system uses an **even parity** error detection scheme. The transmitter transmits the following bit stream:

01011100

Due to noise in the transmission channel, the following bit stream was received by the receiver:

01011000

(i) Identify which bit(s) is(are) in error.

(ii) Will this error be detected by the receiver? Explain.

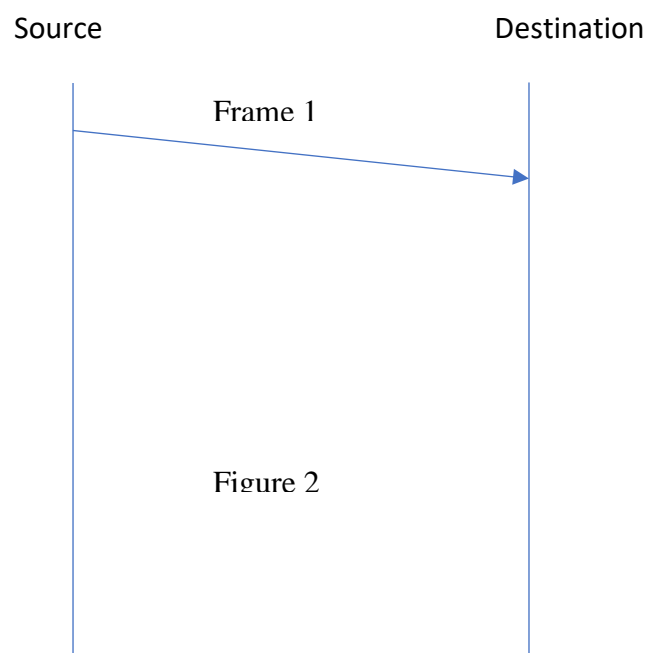
(iii) If detected, can this error be corrected by the receiver? Explain.

(iv). Explain how the Selective Reject ARQ operates by sketching three separate timing diagrams (Similar to fig 02) under the following three scenarios Buffer size = 3

a. Five data frames transferred without any errors

b. Frame 3 is lost in transit

c. Acknowledgement from frame 5 is lost



[Total 20 marks]

04. (a). Name two transmission impairments in data communication.
(b). Explain what is mean by Attenuation and Noise
(c). What is mean by Simplex, Half duplex and Full duplex in transmission.
provide one example for each.
(c). Name two periodic wave forms.
(d). What is mean by Peek amplitude and frequency in sine waves.
(e). A radio wave has a frequency of 1,500,000 Hz and a wavelength of
0.2 km. What is its speed?
(f). A sound wave has a time period of 0.002 seconds.
What is its frequency?

[Total 20 marks]

05. (a). Explain what is meant by Multiplexing and Demultiplexing.
(b). Mention one application which use multiplexing in networking. Explain your answer.
(c). Explain FDM and TDM using relevant diagrams
(d). Explain Circuit Switching and Packet switching.
(e). Explain why packet switching is more suitable for data transmission than circuit switching

[Total 20 marks]