



***"Investing in Africa's Future"***

**COLLEGE OF ENGINEERING AND APPLIED SCIENCES (CEAS)**

**NCIS307 DATA COMMUNICATIONS AND COMPUTER NETWORKS**

**END OF FIRST SEMESTER EXAMINATIONS**

**NOVEMBER 2025**

**LECTURER: DR. TENDAI ZENGENI**

**TIME: 3 HOURS**

***INSTRUCTIONS***

You are required to answer questions as instructed in each section

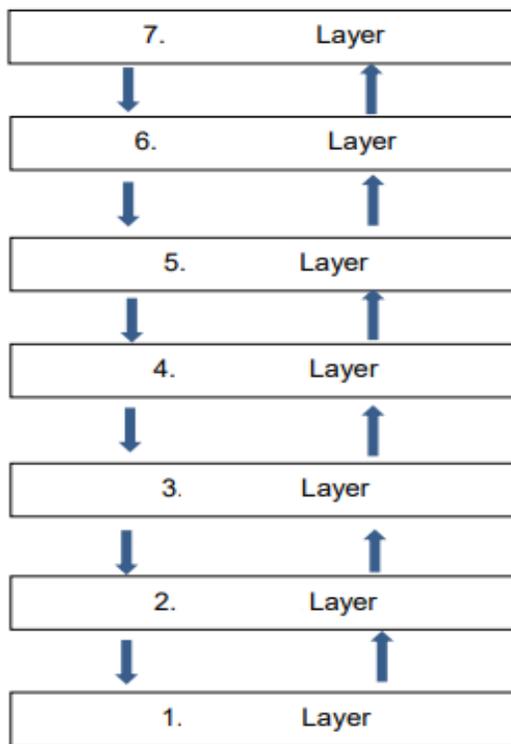
Start each question on a new page in your answer booklet

Answer 4 Questions **ONLY**

1. Draw and explain the functions, advantages and disadvantages of the following network topologies:

- a) Bus Topology (5 marks)
- b) Star Topology (5 marks)
- c) Ring Topology (5 marks)
- d) Mesh Topology (5 marks)
- e) Tree Topology (5 marks)

2. Fill in the blanks to complete the 7 layers of the OSI model in the correct order. Explain the functions of each layer and what processes are involved. (25 marks)



- 3. a) Why do we connect or network computers? Give 5 reasons. (5 marks)
- b) What are the 3 advantages and 3 disadvantages of cables in data transmission and communication? (12 marks)
- c) Explain the functions of these devices and how they act as end nodes (8 marks)



4. Draw and explain the Ecosystem of components that are involved for two devices to communicate from Australia to China. Show all the components of hardware and software and communication mechanisms and signals in that system. **(25 marks)**
5. a) What is the difference between half-duplex and full-duplex transmission modes **(4 marks)**  
b) Draw and describe how the Token ring topology works. **(10 marks)**  
c) What is an internet? What is The Internet? **(2 marks)**  
d) Cloud computing, Internet of Things, 5G and Artificial intelligence are all emerging technologies, explain them in terms of data communications and computer networks **(8 marks)**  
e) The 802.11 is a standard suite for which networking scheme? **(1 mark)**
6. 5G technology, Internet of Things, Cloud Computing, Artificial Intelligence, Generative AI, Robotics, Blockchain. Describe and explain only 5 of these emerging technologies. **(25 marks)**
7. Hub, Switch, Router, Bridge, Firewall Draw and explain all their functions in computer networks. **(25 marks)**

**END OF EXAMINATION**