

**UNIVERSITY COLLEGE TATI (UC TATI)****FINAL EXAMINATION QUESTION BOOKLET**

COURSE CODE	: BNS 3103
COURSE	: NETWORK PROGRAMMING
SEMESTER/SESSION	: 1-2023/2024
DURATION	: 3 HOURS

Instructions:

1. This booklet contains 5 questions. Answer ALL questions.
3. All answers should be written in answer booklet.
4. Write legibly and draw sketches wherever required.
5. If in doubt, raise your hands and ask the invigilator.

DO NOT OPEN THIS BOOKLET UNTIL YOU ARE TOLD TO DO SO**THIS BOOKLET CONTAINS 6 PRINTED PAGES INCLUDING COVER PAGE**

QUESTION 1

- a) Draw and label all **FOUR (4)** layers in TCP/IP model. (4 marks)
- b) State which OSI layer(s) and protocol(s) involved directly related to network programming. (5 marks)
- c) List **TWO (2)** types of Uniform Resource Identifier (URI). (2 marks)
- d) Interpret data transmission occurred in TCP/IP layers related to low level networking interface. (5 marks)

QUESTION 2

- a) State **TWO (2)** IANA IPv4 Special-Purpose Address Registry and provide an example for each. (4 marks)
- b) Define relationship between IP address, URL and hostname. (6 marks)
- c) State **THREE (3)** methods in InetAddress class, that connect to a DNS server to resolve a hostname (3 marks)
- d) Describe execution of thread application. (2 marks)
- e) According to Figure 1, shows Java Stream class hierarchy for input and output data transmission. Give: (6 marks)
- i. **TWO (2)** types of Java Stream Classes;
 - ii. **TWO (2)** superclass(s) from each type and;
 - iii. **TWO (2)** subclass(s) from each superclass.

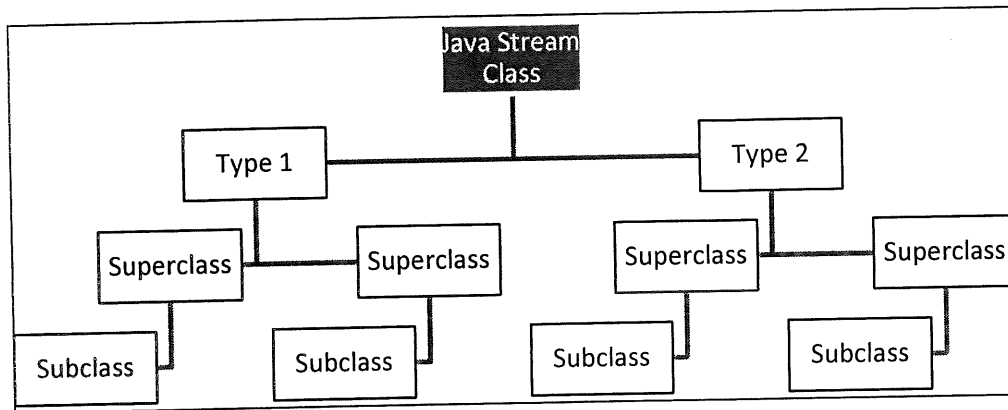
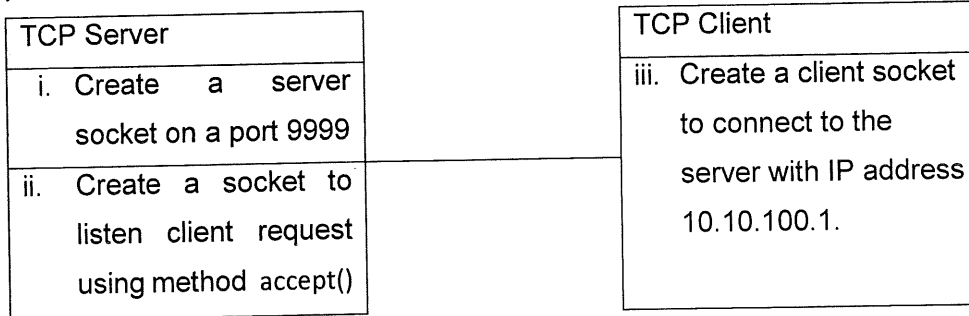


Figure 1

QUESTION 3

- a) List **SIX(6)** basic socket operations for TCP and UDP connection. (6 marks)
- b) Create an object instances according to the following client server TCP connection phase. (6 marks)



c) Interpret the following sockets call for TCP communications in Figure 2. (9 marks)

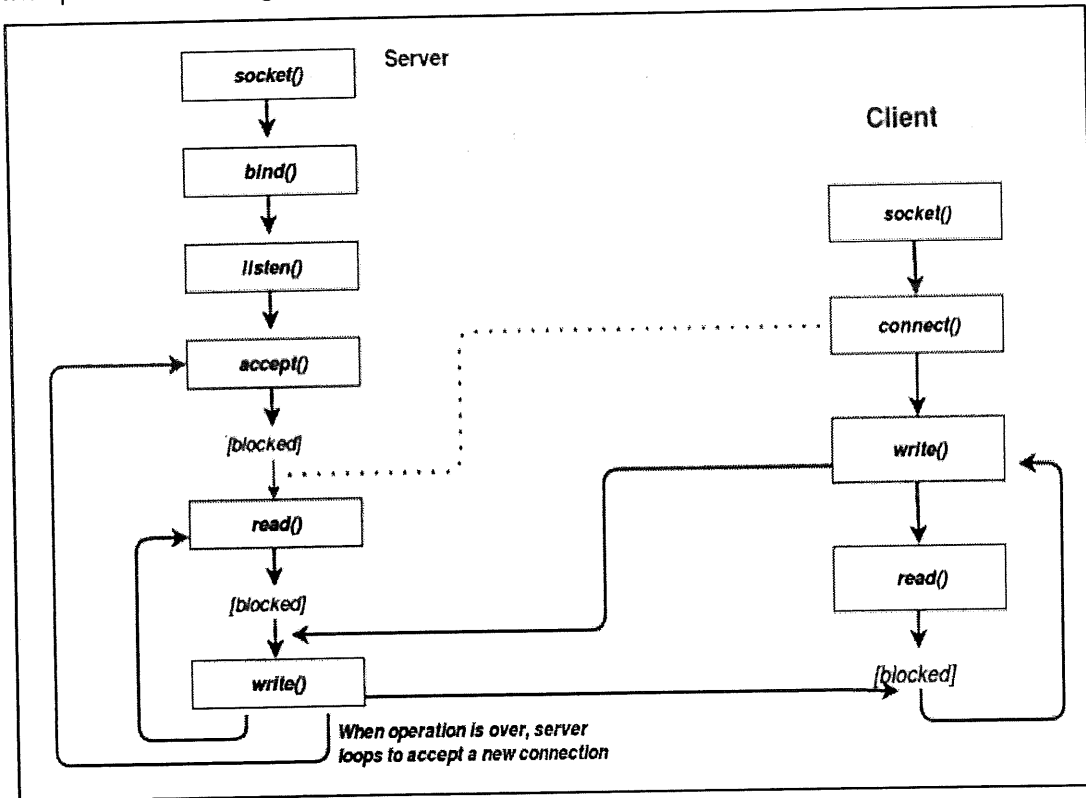
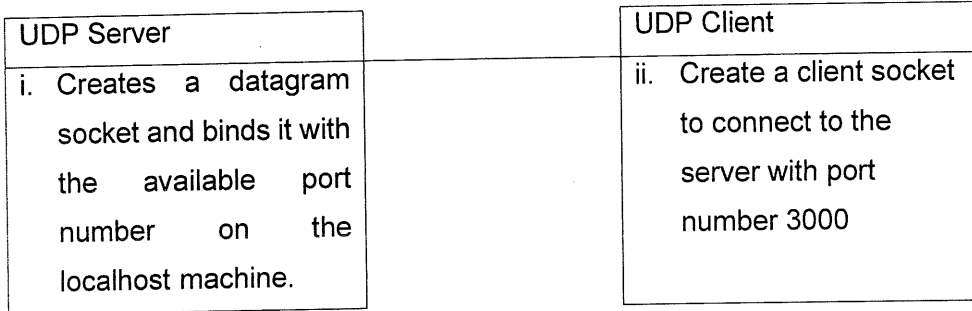


Figure 2

QUESTION 4

- a) Define client/server infrastructure in network and provide an example application. (3 marks)
- b) Define the **THREE (3)** key features of UDP in comparison to other transport protocols. Provide an example of a situation where UDP would be a suitable choice. (4 marks)
- c) Create an object instance(s) according to the following UDP datagram socket creation. (4 marks)



- d) Interpret the following sockets call for UDP communications in Figure 3. (10 marks)

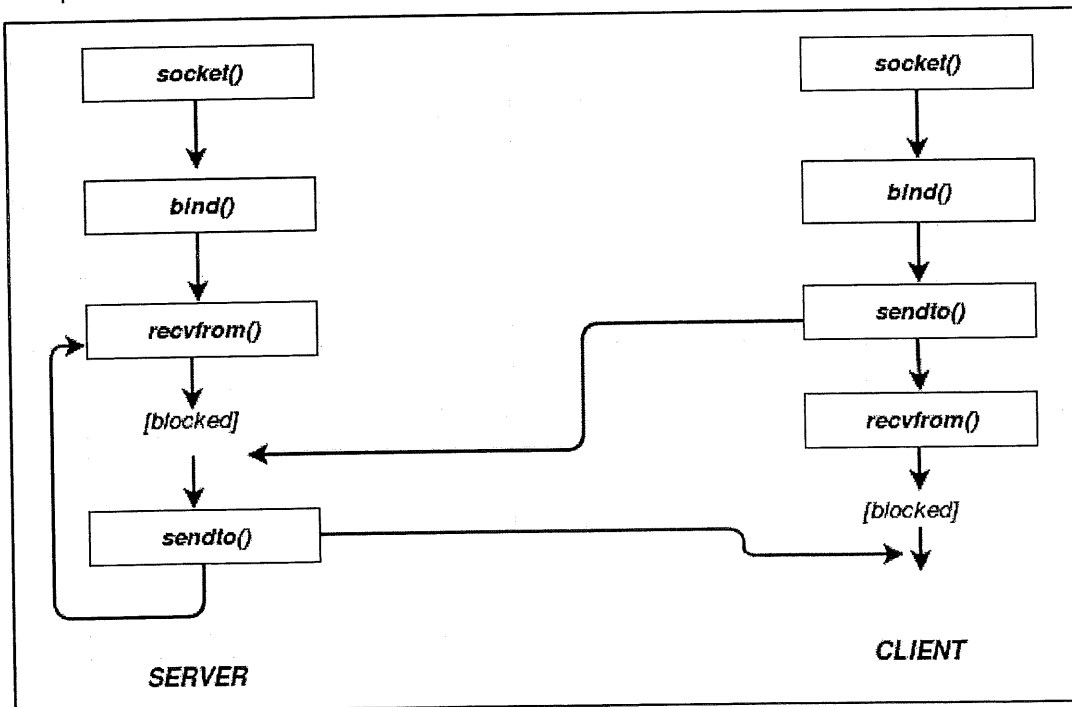


Figure 3

QUESTION 5

- a) Define Secure Socket Layer (SSL) and provide an example application. (3 marks)
- b) Describe **THREE (3)** important security factors in SSL. (6 marks)
- c) State **TWO (2)** types of cryptography applied in SSL. (2 marks)
- d) Illustrate and describe Hypertext Transfer Protocol Secure (HTTPS) establishment between browser and web server. (10 marks)

-----End of question-----