



UNIVERSITY EXAMINATIONS
THIRD YEAR EXAMINATION FOR THE AWARD OF THE DEGREE OF
BACHELOR OF SCIENCE IN COMPUTER SCIENCE
FIRST SEMESTER 2022/2023
[SEPTEMBER-DECEMBER, 2022]

COMP 330: API DESIGN AND IMPLEMENTATION

STREAM: Y3S1

TIME: 2 HOURS

DAY: FRIDAY, 9:00 – 11:00 AM

DATE: 09/12/2022

INSTRUCTIONS

- 1. Do not write anything on this question paper.**
- 2. Answer question ONE and any other TWO questions.**

QUESTION ONE (30 MARKS)

- a. With help of diagram describe the architecture behind web streaming APIs. (4 marks)
- b. Describe the procedure that is followed in API testing. (3 marks)
- c. Discuss any four types of API testing. (4 marks)
- d. Discuss any five scaling best practices and tips that help ensure that API is future-proof. (5 marks)
- e. Highlight five constraints that must be present for any application to be considered RESTful. (5 marks)
- f. Compare and contrast any three structures that Companies that embrace API design use. In each give its strength and weakness. (5 marks)
- g. Discuss any two mechanisms employed by API in performing Searching, filtering, and sorting. (4 marks)

QUESTION TWO (20 MARKS)

- a. Write a code illustration to define an **Enum** in OpenAPI 2.0.
- b. Discuss any three data formats used in modern APIs (4 marks)
- c. Describe the structure behind Basic Authentication. (4 marks)
- d. Describe the procedure of token verification when applied to webhooks. (4 marks)

- e. With help of a diagram describe OAuth 2.0 access token grant flow. (4 marks)
- f. Describe the following http methods as used in API design
- i. GET (1 mark)
 - ii. POST (1 mark)
 - iii. PUT/PATCH (1 mark)
 - iv. DELETE (1 mark)

QUESTION THREE (20 MARKS)

- a. With help of code illustrations discuss any three types of request response paradigms that have been applied in API design. In each paradigm, cite applications that employ it. (10 marks)
- b. With help of code illustrations discuss any three types of event driven paradigms that have been applied in API design. In each paradigm, Cite applications that employ it. (10 marks)

QUESTION FOUR (20 MARKS)

- a. Explain the term JSON objects (2 marks)
- b. Explain the procedure used to transform JSON text to a JavaScript object (4 marks)
- c. By use of code illustration compare and contrast JSON and XML (4 marks)
- d. Explain how you can convert a string into a JSON Array (4marks)
- e. Explain the architecture behind NewtonSoft framework Net (6marks)

QUESTION FIVE (20 MARKS)

- a. Briefly discuss the basic steps involved in Implementing an API façade. (6 marks)
- b. By use of diagram illustration explain how the following approaches are used in API design
- i. The Build Up Approach (4 marks)
 - ii. The Standards Committee Approach (4 marks)
 - iii. The Copy Cat Approach (4 marks)
- c. Discuss any two REST principles (2 marks)