



UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION  
SEMESTER II  
SESSION 2023/2024

- COURSE NAME : GEOGRAPHICAL INFORMATION SYSTEM FOR CIVIL ENGINEERING
- COURSE CODE : BFG 40803
- PROGRAMME CODE : BFF
- EXAMINATION DATE : JULY 2024
- DURATION : 3 HOURS
- INSTRUCTIONS :
1. ANSWER ALL QUESTIONS
  2. THIS FINAL EXAMINATION IS CONDUCTED VIA
    - Open book
    - Closed book
  3. STUDENTS ARE **PROHIBITED** TO CONSULT THEIR OWN MATERIAL OR ANY EXTERNAL RESOURCES DURING THE EXAMINATION CONDUCTED VIA CLOSED BOOK

THIS QUESTION PAPER CONSISTS OF **THREE (3)** PAGE

- Q1** The main objective in Geographical Information System analysis is the results. Understanding the characteristics and limitations of different data sources is crucial for ensuring the accuracy and reliability of GIS analysis results.
- (a) Define **FIVE (5)** primary considerations for selecting appropriate data sources in GIS analysis. (10 marks)
- (b) Evaluate the reliability, accuracy, and resolution of these sources impact decision-making in spatial analysis. (10 marks)
- Q2** (a) Describe the differences between vector and raster data models in GIS. Provide examples of when each model would be most appropriate for data analysis tasks in geographic information systems. (5 marks)
- (b) Explain the concept of raster data analysis in GIS. Discuss at least three common raster-based analytical techniques used in spatial analysis, such as interpolation, proximity analysis, and suitability modeling. Provide examples of real-world applications for each technique. (15 marks)
- Q3** In the housing development project, you need to assess the accessibility of the proposed site to various amenities and services such as schools, hospitals, and shopping centers.
- (a) Describe how you would use the "Network Analysis" tools in QGIS to calculate travel distances and times from the housing site to these amenities. (10 marks)
- (b) Discuss the significance of this analysis in determining the site's suitability for potential residents and propose possible improvements based on the results. (10 marks)

- Q4** Imagine you are tasked with analyzing the slope stability of a terrain for a road construction project using GIS.
- (a) Describe the steps you would take to perform slope analysis in GIS, including data preparation, analysis methods, and interpretation of results. (15 marks)
  - (b) Discuss how the findings from this analysis would influence the road design and construction process. (5 marks)
- Q5**
- (a) Using QGIS preference, describe the process in selecting best area to build a dam. How GIS technology is utilized in various stages of civil engineering such as site selection, planning, design, and infrastructure management. (10 marks)
  - (b) Design a workflow using GIS software to analyze the flood risk in a coastal area for urban planning purposes.
    - i. Outline the steps involved in data acquisition, processing, analysis, and visualization of flood hazard maps. (5 marks)
    - ii. Discuss how the results of this analysis can inform land-use planning and development regulations to mitigate flood risks in the area. (5 marks)

- END OF QUESTIONS -