

## Principles and Application of BIM

### 22CVP320

Semester 1 2022-23

Online Short-window Exam paper

This is an online short-window examination, meaning you have a total of **3 hours plus an additional 30 minutes** to complete and submit this paper. The additional 30 minutes are for downloading the paper and uploading your answers when you have finished. If you have extra time or rest breaks as part of a Reasonable Adjustment, you will have further additional time as indicated on your exam timetable.

**It is your responsibility to submit your work by the deadline for this examination. You must make sure you leave yourself enough time to do so.**

**It is also your responsibility to check that you have submitted the correct file.**

#### Exam Help

If you are experiencing difficulties in accessing or uploading files during the exam period, you should contact the Exam Helpline. For urgent queries please call **01509 222900**.

For other queries email [examhelp@lboro.ac.uk](mailto:examhelp@lboro.ac.uk)

You may handwrite and/or word process your answers, as you see fit.

Answer **THREE** questions.

All questions carry equal marks.

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1. (a) Define a “**trigger**” and using an illustration critically explain how triggers could affect an Asset Information Model. [19 marks]  
(b) Citing literature to support your viewpoints, critically examine the **barriers** faced by organisations in attempting to implement BIM on projects. Discuss potential solutions to address these barriers. [14 marks]
2. (a) With the help of an example, explain briefly what an **information container** is. Within the context of a CDE (Common Data Environment). Illustrate the various states of an information container workflow. [13 marks]  
(b) As a BIM Lead on a multinational construction project located in the United Kingdom, you have been tasked with developing a BIM Execution Plan (**BEP**). Start by explaining the purpose of the BEP document, then outline the contents of the BEP and critically explain your reasons for including the contents in the BEP. [20 marks]
3. (a) Provide a detailed description of IDEF0. Illustrate the building blocks of IDEF0 diagrams and provide an example of an **IDEF0** diagram. [12 marks]  
(b) Giving examples, explain what is meant by an entity, an attribute and a relationship. [12 marks]  
(c) You are required to gather the data about purchasing doors from a supplier and are required to familiarise yourself with the purchasing process. Construct an **Entity Relationship Diagram** based on the following facts:  
  
Door Supplier provides a product catalogue  
A product catalogue is provided by Door Supplier  
That product catalogue lists many Door types  
Many Door types are listed in one product catalogue  
The sub-contractor issues a purchase order  
The purchase order is issued by the sub-contractor  
Door Supplier issues an invoice to the sub-contractor  
The invoice is sent to the sub-contractor  
The sub-contractor receives the invoice and pays the Door Supplier  
Door Supplier receives payment from the sub-contractor  
  
[9 marks]

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4. (a) Firstly, define **construction collaboration technologies**, and then citing literature sources, explain what has driven the UK construction industry to use construction collaboration technologies on projects. [15 marks]
- (b) Industry stakeholders in the AEC (Architecture, Engineering and Construction) sector are primarily driven to adopt new technologies because of the opportunity for direct gains and benefits in their operation. These are often in the form of tangible and intangible benefits. Explain what is meant by tangible and intangible benefits and then critically examine the tangible and intangible benefits of using construction collaboration technologies on projects. [18 marks]

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