

# National Exams May 2019

04-BS-15, Engineering Graphics and Design Process

3-Hours Duration

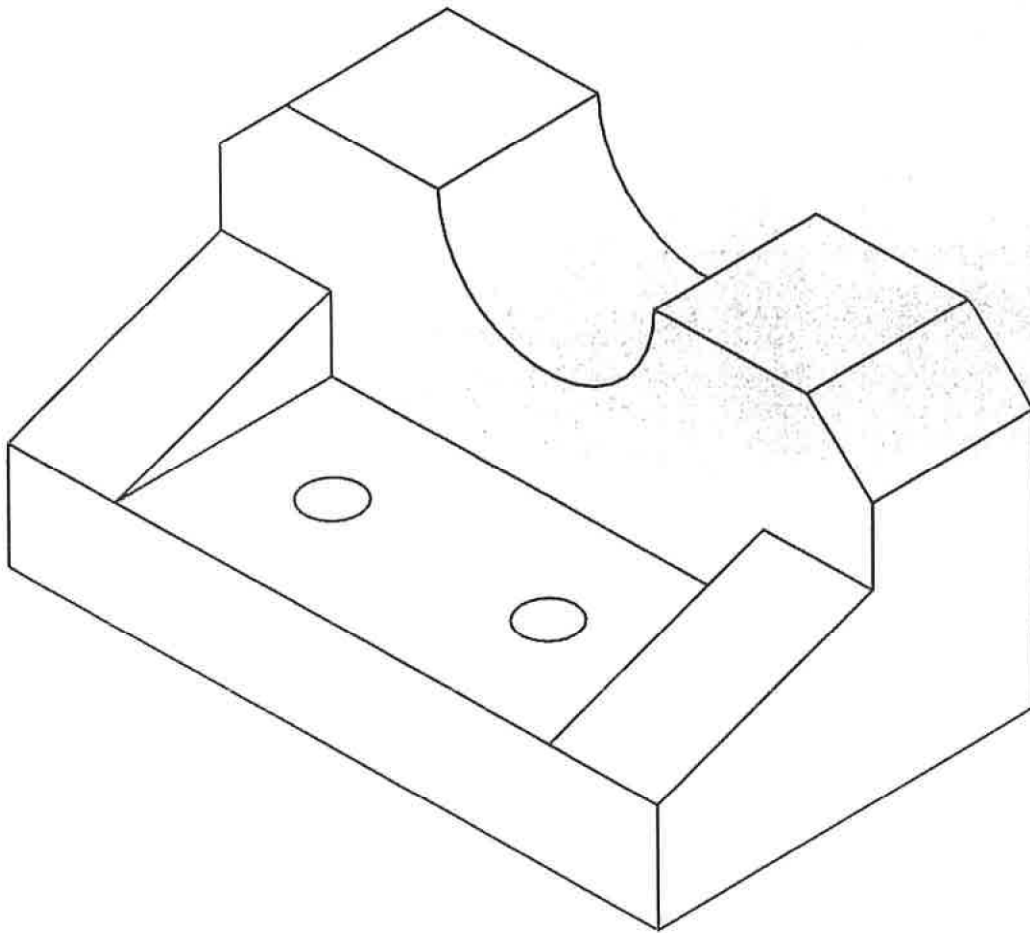
## NOTES

1. If doubt exists as to the interpretation of any question, the candidate is urged to submit with the answer paper, a clear statement of any assumptions made.
2. This is a closed book examination. No calculator is permitted.
3. Five (5) questions constitute a complete exam paper. Clearly label the answers in the answer book.
4. All sketches must be made freehand and must be easy to read and neat. Straightedges may not be used.
5. The exam is out of 100 marks.

**QUESTION 1 (50 MARKS)**

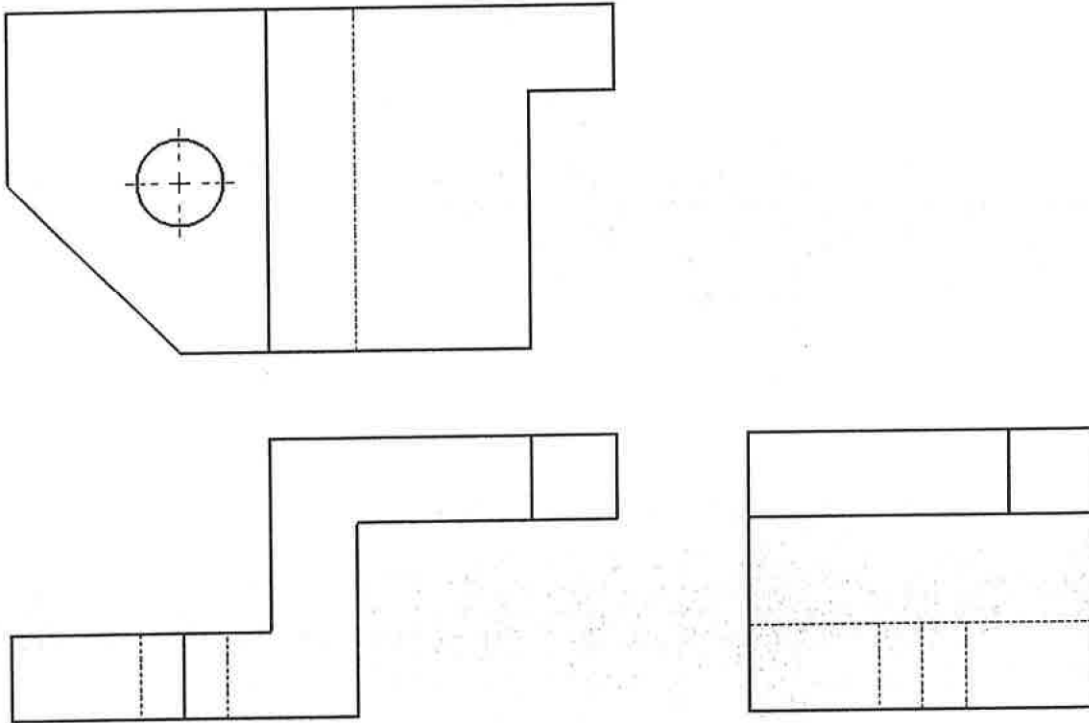
For the part shown below,

- Sketch an appropriate set of orthographic views, using third-angle projection. (10 marks)
- Fully dimension the sketch in part a) using professional standards. Use "xx" in place of numerical values in the dimensions. (10 marks)
- Describe and sketch an appropriate sequence of feature-based solid modelling operations that could be used to create this geometry using parametric, feature-based solid modelling CAD software. (15 marks)
- Describe and discuss appropriate manufacturing methods for this part, and any issues that might arise. (15 marks)



**QUESTION 2 (10 MARKS)**

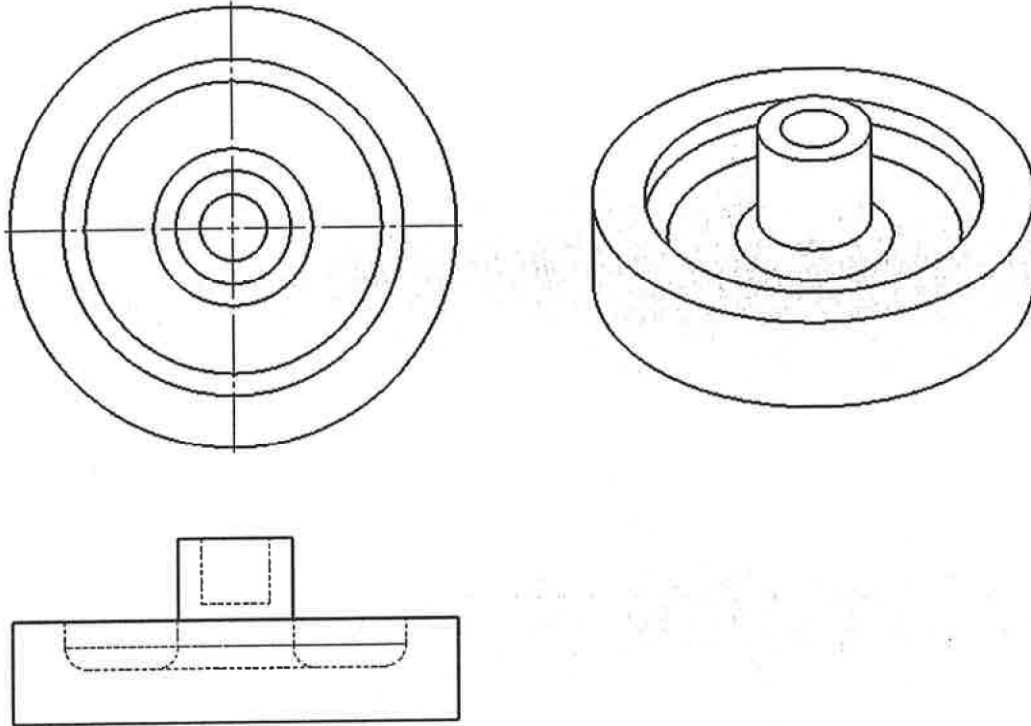
The multiview drawing below uses 3<sup>rd</sup>-angle projection. Sketch an isometric view.

**QUESTION 3 (10 MARKS)**

Two standard systems are used in the definition of shaft and hole fits: basic hole system, and basic shaft system. Define these terms, and explain when each would be used. Use sketches as necessary.

**QUESTION 4 (10 MARKS)**

Sketch an appropriate section view for the part shown below.

**QUESTION 5 (20 MARKS)**

Describe the engineering design process in terms of a series of steps or stages, and explain the purpose of each step. Use diagrams as needed.