

UGANDA ADVANCED CERTIFICATE OF EDUCATION

S.5 & S.6 PRINCIPLES OF BUILDING CONSTRUCTION THEORY (PAPER 720/3)

HOLIDAY CONTINUOUS ASSESSMENT ASSIGNMENT

Item 1

Your brother recently acquired land along a sloping valley boundary on which he wants to construct a four-room commercial block but in three distinct phases starting strictly with the foundation. On knowing this, you approached him requesting for the job to carry out the first phase, and he allowed you on the condition that you provide him with a detailed written structural guide of how you will execute the preliminary site works and ground support layouts to ensure a strong house. Below is how the land looks like.



Task.

Provide your brother with a structured technical site manual detailing the chronological sequence of clearing operations, setting out methods for the structural line configurations, and the required physical site preparations necessary before excavation work begins.

Item 2

A local cooperative society has secured funding to put up a community health outpost clinic on a plot of land that possesses a uniform lateral gradient slope of 15 degrees. The local masonry foreman insists on casting a standard uniform horizontal concrete strip foundation without any vertical level changes, but you realize that this traditional approach will cause severe lateral sliding structural failures along the hillside boundary line over time. Below is a photograph showing the proposed foundation levels profile.



Task.

Draft a complete construction layout plan and a corresponding longitudinal section view that details how the vertical steps should overlap, change levels, and mechanically anchor into the sloping stratum to prevent lateral structural movement.

Item 3

A commercial property developer in town is erecting a large wholesale distribution outlet whose internal floor will be constantly subjected to heavy point loads from transport forklifts and industrial storage pallets. Additionally, the localized sub-soil water table is notably high, introducing a severe risk of capillary moisture bypassing the raw foundation wall lines and destroying the indoor stock. Below is a photograph indicating the sub-floor layer structural configuration.



Task.

Produce a fully labeled vertical cross-sectional working sketch of the solid ground floor structure showing the correct consecutive order of material layers from the compacted earth up to the final wearing surface to ensure load distribution and complete moisture control.

Item 4

An old commercial administrative complex is being reconfigured, and new internal partitioning masonry walls are being raised to divide the large open halls into separate workspace offices. The municipal structural inspector has suddenly halted the ongoing brickwork because the bricklayers are raising the new 115mm partition walls butt-straight against the old 230mm external load-bearing walls without any interlocking tooth bond or mechanical keying steel ties, creating a severe lateral buckling collapse risk. Below is a photograph showing the faulty unbonded straight structural intersection joint.



Task.

Draw the detailed bonding plans of two consecutive alternate courses (Course A and Course B) to show the masonry team how a structurally sound, interlocking T-junction bond is executed between the thin partition blockwork and the main perimeter wall.

Item 6

An estate developer is constructing an asymmetric L-shaped residential block. The site carpentry crew is having a hard time setting out the timber roof framing layout because the intersecting junction between the main structural wing and the projecting wing creates a complex changing pitch envelope, internal valley intersections, and hip lines that are difficult to visualize without a master framing plan overview map. Below is a photograph showing the structural layout of the building's outer wall lines.

Task.



Develop a comprehensive, structural line framing plan view of the entire roof layout, mapping out the precise positions, intersections, and alignment orientations for all principal rafters, hip rafters, valley jacks, and common ridge boards.

Item 7

Your building construction school workshop class has been tasked to fabricate a scaled structural prototype model of a traditional timber King-post roof truss framework to serve as a visual learning aid for incoming engineering students. To ensure accurate joint cutting and accurate matching of parts under load, a complete structural framework diagram must be produced for the reference board detailing how individual tension and compression nodes interface. Below is a photograph of the physical truss model.

Task.



Task.

Generate a complete, fully annotated engineering elevation layout schematic of the king-post timber framework assembly, clearly identifying each load-bearing component and adding technical joinery detail notes for the structural connection nodes.