INSTRUCTIONS

01. This paper consist **five (05)** questions.
02. Each question has **part A** and **Part B**.
03. Answer only one part of each question.

You are required to select the most appropriate foundation material for a foundation of a cottage. Random Rubble Masonry (RRM) and Grade 25 concrete were proposed as foundation materials.

Data & Outputs for a Cube of 14" thk. RRM in cement : Sand mortar 1:5.

6"-9" Rubble 1.30 cubes for the rate of Rs.6500.00 per 1 Cu.

5.25 Cement bags for the rate of Rs.950.00 per 1 Bag.

0.30 cubes of Sand for the rate of Rs. 13500.00 per 1 Cu.

100 gals of water for the rate of Rs.5.00 per 1 Gal.

4 days of Masons to construct the foundation for the rate of Rs.2000.00 per day

2 U/sk labourers to manual mixing of mortar for rate of Rs.2000.00 per day

2 U/sk labourers to supply mortar

2 U/sk labourers to transport rubble to the place.

Data & Outputs for a Cube of Gr.25 concrete.(1:1 ½: 3)

23 Cement bags for the rate of Rs.950.00 per 1 Bag.

0.42 Cubes Sand for the rate of Rs. 13500.00 per 1 Cu.

0.82 Cubes 3/4" Metal for the rate of Rs. 8500.00 per 1 Cu.

1/3 Day hire of mixer for the rate of Rs.6500.00 per day.

150 gals of water for the rate of Rs.5.00 per 1 Gal.

1/3 Semi skilled labour to operate poker vibrator for the rate of Rs.1800.00 per day

1/3 Skilled labour to operate concrete mixer for the rate of Rs.2000.00 per day

1/3 skilled labour to lay concrete for the rate of Rs.2000.00 per day.

1 U/sk labourers to transport concrete for rate of Rs.1500.00 per day

0.5 U/sk labourers for transport materials.

0.5 U/sk labourers for curing.

20 % of Overheads & profits

1.0 Part A

i. Select the most suitable material in cost aspects for the foundation using the given data. (12 Marks)

ii. Advice your client regarding your decision. (2 Marks)

iii. The super structure of this construction project decided to construct in Grade25 concrete. A part of the BOQ is mentioned below. Calculate total material, labour and plant cost for the item. (6 Marks)

Item No	Description	Unit	Qty	Rate	Amount
B.1	Mixing and placing in position concrete grade 25, nominal mix 1:1 1/2:3 (20mm) using a concrete mixer in columns.	m^3	15.00		

1.0 Part B

You are required to select the most appropriate wall material for a construction of a house. Engineering bricks and Concrete blocks were proposed as wall materials.

i. Select the most suitable material in cost aspects for the walls using the given data.

Data & Outputs for a Sqr. ($100ft^2$) 225mm Thick Brick wall in Cement & Sand 1:5

1090 bricks @ Rs.18. 00 per brick

Wastage of brick 5 %

3.00 Cement bags for the rate of Rs.1050.00 per 1 Bag.

0.20 Cubes Sand for the rate of Rs. 15500.00 per 1 Cu

115 gals of water for the rate of Rs.5.00 per 1 Gal.

2.25 days of Masons for the rate of Rs.2000.00 per day

3.75 U/sk labourers for rate of Rs.1700.00 per day

Small tools -3%

20 % of Overheads & profits

Data & Outputs for a Sqr. (100ft^2) of 200mm thick hollow block work in cement & sand mortar 1:5

112 Hollow Cement blocks @ Rs. 55.00 per block

Allow 5% for wastage

0.75 Cement bags for the rate of Rs.1050.00 per 1 Bag

0.06 cubes Sand for the rate of Rs. 15500.00 per 1 Cu

100 gals of water for the rate of Rs.5.00 per 1 Gal.

1.5 Days Mason for the rate of Rs.2000.00 per day

2.5 Days U/sk labourers for rate of Rs.1700.00 per day

Small tools -3%

20 % of Overheads & profits (12 marks)

ii. Advice your client regarding your decision. (2 Marks)

iii. There is a part of the BOQ is mentioned below. Calculate the cost of materials for the given item separately. (6 Marks)

Item No	Description	Unit	Qty	Rate	Amount
M.1	225mm thick Brick walls in Cement & Sand 1:5 in First floor	m^2	125.00		

2.0 Part A

RIBA plan of work provides a logical and systematic way to identify the essential steps that necessary for the successful completion of a project. Feasibility, Outline proposals and scheme design are three main stages in RIBA plan of work.

i. Explain the major activities that have to be carried out by the quantity surveyor in each of the three stages. (14 Marks)

There is a close collaboration between pre contract cost planning and RIBA plan of work.

ii. Mention the phases of pre contract cost planning process. (6 Marks)

2.0 Part B

Bills of Quantities (BOQ) are a document which provides the project specified measured quantities of the items of work identified by the drawings and specifications.

i. State three uses of bills of quantities. (3 Marks)
ii. What are the main sections of a BOQ? (5 Marks)
iii. Explain two of them briefly. (4 Marks)
iv. Distinguish between prime cost and provisional sums. (4 Marks)
v. Compare the advantages and disadvantages of the use of computers for traditional bill preparation. (4 Marks)

3.0 Part A

Aggregates are those chemically inert materials, which when bonded by cement paste from concrete.

i. Write down the short note for the fine aggregate and coarse aggregate. (4 Marks)
ii. What is the test done for the aggregate to measure good quality characteristic? And write down brief note for Concrete Admixtures. (4 Marks)
iii. Write down advantages and disadvantages of concrete. (6 Marks)
iv. You are the responsible person for concrete work at the site. According to work program you have to concrete work at ground floor. What are the basic procedures to success your concrete work at ground floor? (6 Marks)

3.0 Part B

i. What are the tests used in cement and concrete? (4 Marks)
ii. Explain how to find initial setting time and final setting time of cement (2 Marks)
iii. What is the minimum initial setting time of cement according to BS 12 standard? (2 Marks)
iv. Sketch the stress-strain curve of concrete in compression test. (2 Marks)
v. Is concrete strong in tension and compression? (2 Marks)
vi. How the weakness in tension capacity of concrete beam is improved? (2 Marks)
vii. What is the workability of concrete and how to measure it in the field? (2 Marks)
viii. What is C25 concrete? (2 Marks)

ix. Why we use 28 days cube strength to define concrete strength and what are the size of concrete test cube & cylinder? (2 Marks)

4.0 Part A

You are the procurement specialist in Ad Value Consultants Private Limited. One of your clients wants to construct 18 floors shopping complex in Polonnaruwa area. Design is not much complex and has a typical floor plan in 12 number of floors.

i. As the first step, you have to select the most appropriate procurement method for the construction. What is the most suitable procurement method for the project? Justify your answer giving reasons/assumptions for your opinion. (10 Marks)

ii. After the procurement selection a suitable contractor has to be selected to carry out the project. Explain the tendering process that has to be followed. (10 Marks)

4.0 Part B

i. What is a tender? (5 marks)

ii. Is an Invitation to Tender published in a newspaper can be considered as an offer? explain (5 marks)

iii. List out content of bidding documents and explain any document out of them. (10 marks)

5.0 Part A

i. Develop detail check lists to monitor following two processes;

a) Preparation of bidding documents (10 Marks)
b) Preparation of Bills of Quantities (10 Marks)

5.0 Part B

As a contractor's Quantity Surveyor, you have to perform a presentation at a meeting with your client regarding new construction of five storied building based on Design & Build contract type. You are required to draw power point slides assuming necessary details. The following details should be included in the presentation.

a) Details of the project
b) Construction programme
c) Main cost elements of the projects
d) Variations can be occurred & what actions can be taken to minimize it
e) Method of payments (20 Marks)