X227/301

NATIONAL QUALIFICATIONS 2010

WEDNESDAY, 9 JUNE
1.00 PM – 3.00 PM

BUILDING CONSTRUCTION HIGHER

100 marks are allocated to this paper.

Attempt **all** questions in Section A (40 marks).

Attempt any **two** questions in Section B (30 marks each).

Worksheets are provided for Questions 10(*c*), 11(*a*) and 11(*c*). Hand these in with your answer book.

Marks

SECTION A

Attempt all the questions in this Section (total 40 marks)

1. State the main stages of a site investigation and the sequence in which they are carried out. **2**

2. (*a*) Briefly describe **two** types of construction site perimeter fence in common use today. **2**

(*b*) State **four** factors which should be considered when deciding where the temporary accommodation on a construction site could be located. **2**

3. Briefly describe how the following construction materials should be stored on a site.

- Plasterboard dry lining
- Gypsum plaster **4**

4. Prepare an annotated sketch to show a typical vertical cross-section through **each** of the following foundation types:

- traditional strip foundation;
- short bored pile foundation supporting a ground beam;
- raft foundation. **6**

5. (*a*) State the name given to the type of window shown in **Figure Q5** and name the parts of the window numbered 1 and 2. **3**

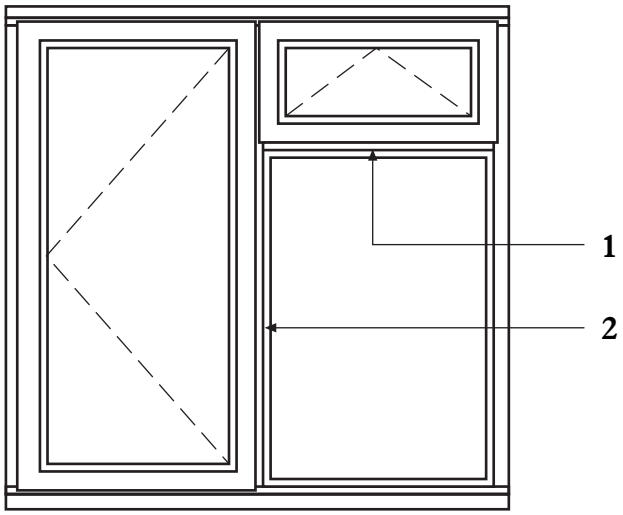

Figure Q5

(*b*) Prepare an annotated sketch to show a cross-section through an internal door jamb in a 75 mm × 50 mm timber stud partition with plasterboard both sides finished with taped and filled joints. **4**

Marks

6. A smooth surface finish is required for the plasterboard walls of a dwelling house ready to receive a wallpaper finish.

Briefly describe, with the aid of annotated sketches, **two** ways in which this smooth surface finish may be achieved and state which you would select for the proposed wallpaper finish. **5**

7. (*a*) **Figure Q7** shows a vertical cross-section through a ground bearing floor slab for a dwelling house.

State the name of the component parts numbered 1 to 8. **4**

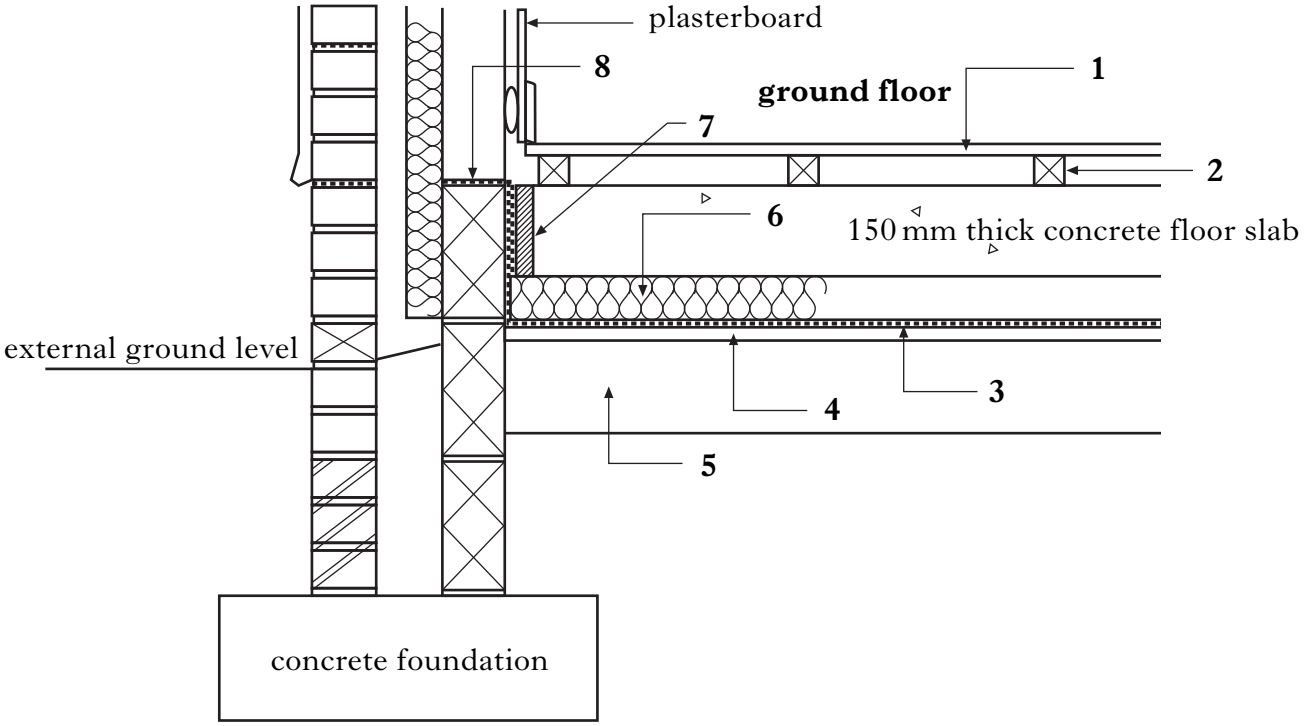

Figure Q7

(*b*) Select and describe an alternative solution to finishing the floor above the concrete floor slab. **2**

[Turn over

Marks

8. **Figure Q8** shows a cross-section through a stair within a dwelling between a kitchen and dining area.

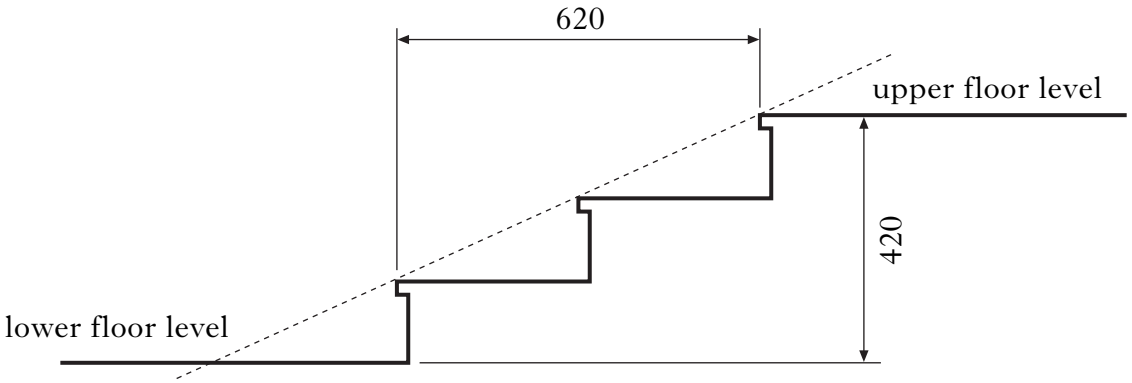

Figure Q8

Using the information given, state whether or not the stair complies with the recommendations made in current standards, giving the reasons for your answer. **6**

(40)

Marks

SECTION B

Attempt any TWO questions in this Section (total 60 marks)

9. (*a*) Five new detached houses are to be constructed on a site. Site investigation is to be carried out using *light percussion boring* (shell and auger).

(i) Briefly describe, with the aid of an annotated sketch, this exploration technique. **6**

(ii) Briefly explain the advantages and disadvantages of this exploration technique. **4**

(iii) Briefly describe, with the aid of an annotated sketch, the field test known as the *Standard Penetration Test* (SPT). **6**

(iv) State a laboratory test carried out on a soil sample. **2**

(*b*) The foundations for the houses are to be concrete deep strip, taken to a depth of 1 metre below ground level.

(i) Describe the plant you would select to excavate the foundation trenches. **2**

(ii) List the materials required to make up a suitable concrete mix for the foundations. **2**

(iii) Briefly explain how a contractor may obtain a supply of concrete for the foundations and state **one** reason why he may do so. **3**

(iv) State **two** ways in which a concrete mix may be specified. **2**

(v) Compaction is an important process in achieving the design strength of finished concrete.

Briefly describe how successful compaction may be achieved in the foundation concrete. **3**

(30)

[Turn over

Marks

10. (*a*) Select and describe **one** common method of forming a temporary road into a construction site where the ground conditions are known to be soft. **4**

(*b*) A new sewer passing below a roadway will require excavation to a depth in excess of 2 metres at some points along its length.

(i) Briefly explain why it would be important to carry out a safety "risk assessment" prior to commencing a trench excavation and describe the factors which would be taken into consideration. **3**

(ii) Briefly describe, with the aid of an annotated sketch, **one** method of supporting the trench during the excavation and placing of the new sewer. **3**

(*c*) **Worksheet Q10(*c*)** shows an incomplete detail drawing for a foundation and a suspended timber ground floor to a dwelling house.

On the **Worksheet**, complete the drawing to an approximate scale to show the following:

- support for the suspended floor;
- how moisture is prevented from entering the building;
- solum treatment;
- insulation;
- ventilation;
- floor finish;
- two critical dimensions. **10**

(*d*) Briefly describe, with the aid of annotated sketches, how the following finishes would be applied to the structure:

- external render with a dry dash finish;
- ceramic wall tiles to bathroom.

Details of the background materials should be included together with any preparation which may be required. **10**

(30)

Marks

11. (*a*) **Worksheet Q11(*a*)** shows an incomplete detail drawing of an external door jamb.

On the **Worksheet**, complete the drawing in proportion with notes to show the following:

- timber door;
- timber door frame;
- fixings;
- internal finishes;
- facings;
- sealant.

Ensure compliance with current standards and traditional Scottish practice. **6**

(*b*) Prepare annotated sketches to illustrate the following terms relating to a stair:

(i) tapered tread;

(ii) half landing. **2**

(*c*) **Worksheet Q11(*c*)** shows details of a new timber private stair which rises to an attic conversion comprising two bedrooms and a bathroom.

(i) On **Worksheet Q11(*c*)**, state the names of the component parts of the stair lettered A to F. **6**

(ii) State on the **Worksheet**, the **minimum** permitted dimension for **each** of the following:

- going at points **X**;
- headroom at point **Y**;
- height of the handrail;
- effective width of the stair. **4**

(iii) Using the dimensions given on the **Worksheet**, calculate the rise, and select a suitable going and pitch of the stair to comply with the recommendations made in current standards.

On the **Worksheet** at point **Z** mark the overall *going* of your stair. **6**

(*d*) Briefly describe, with the aid of an annotated sketch, how **one** of the following roof finishes is applied and fixed to the structure of the building.

- single lap concrete roof tiles
- PVC single ply membrane **6**

(30)

[*END OF QUESTION PAPER*]

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FOR OFFICIAL USE

X227/302

NATIONAL QUALIFICATIONS 2010

WEDNESDAY, 9 JUNE
1.00 PM – 3.00 PM

BUILDING CONSTRUCTION HIGHER

Worksheets for Questions 10(*c*), 11(*a*) and 11(*c*)

Fill in these boxes and read what is printed below.

Full name of centre

Town

Forename(s)

Surname

Date of birth

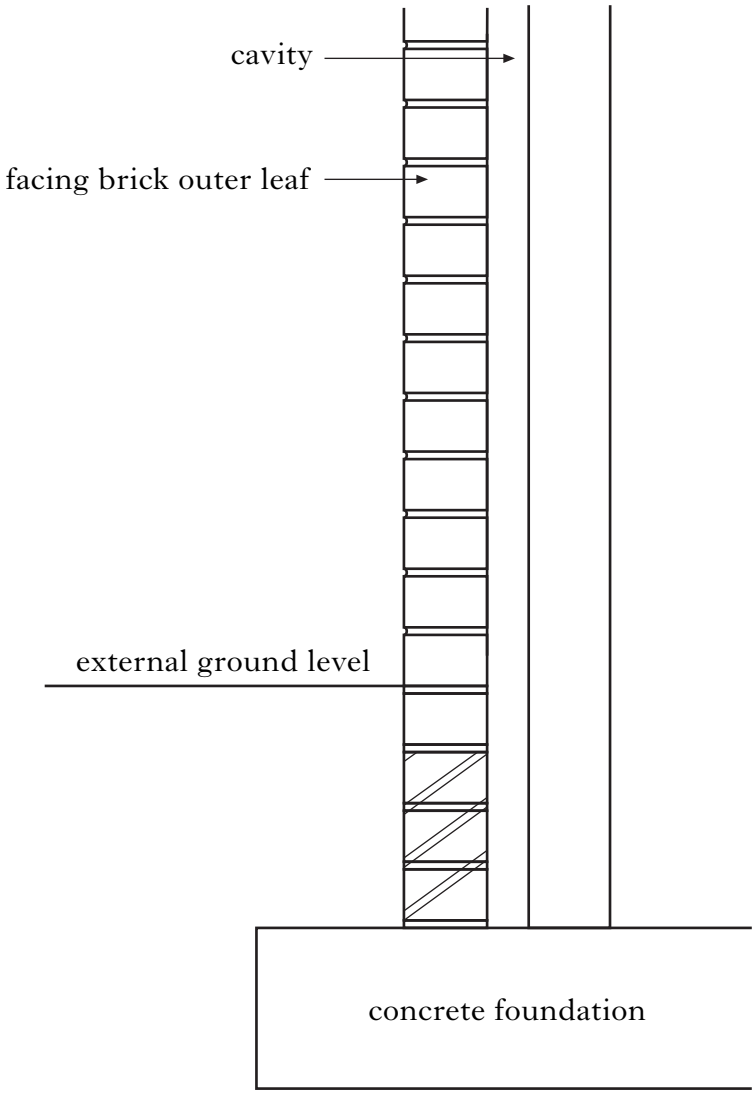
Day Month Year

Scottish candidate number

Number of seat

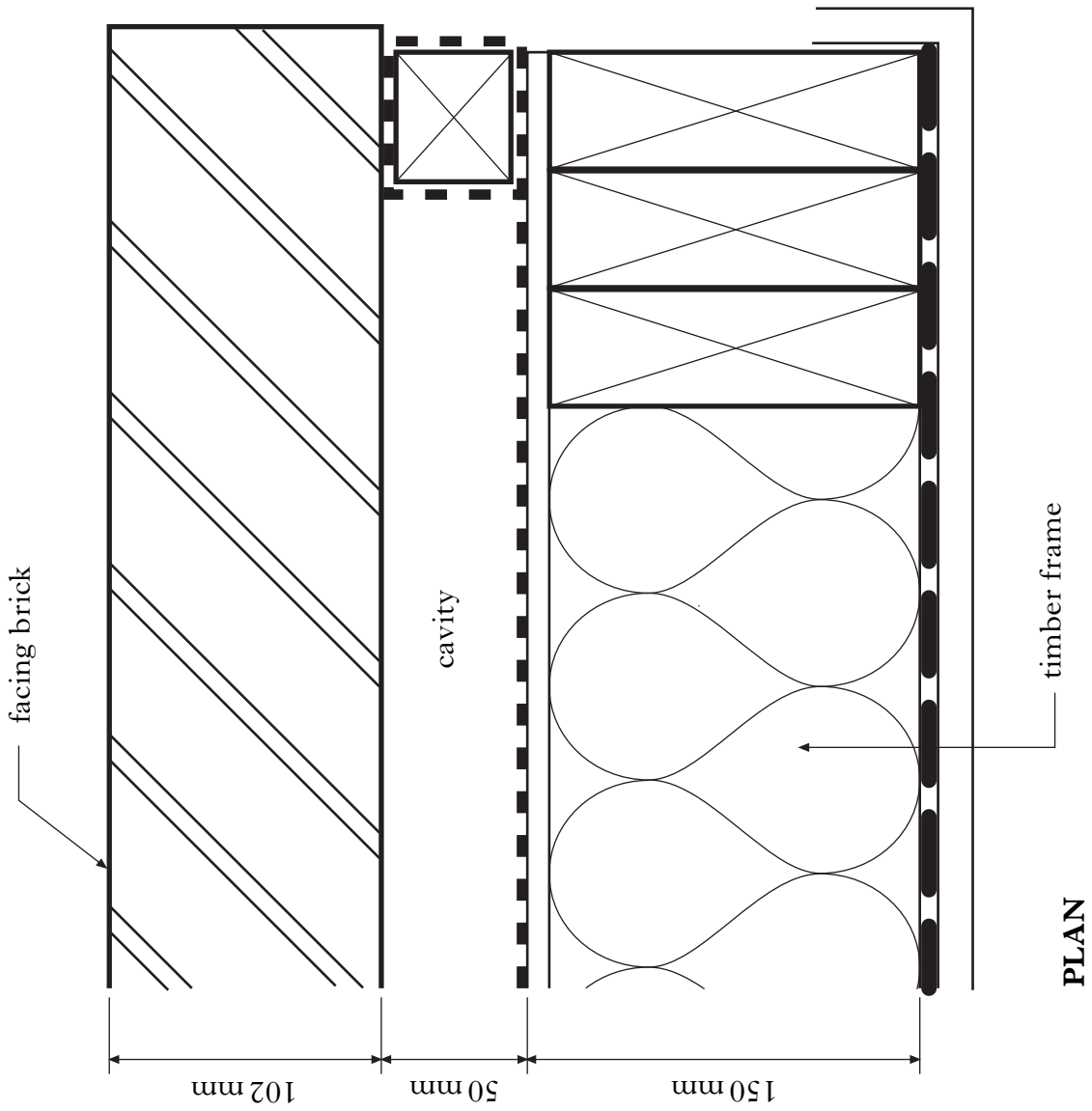
To be inserted inside the front cover of the candidate's answer book and returned with it.

WORKSHEET Q10(*c*)



VERTICAL SECTION THROUGH FOUNDATION

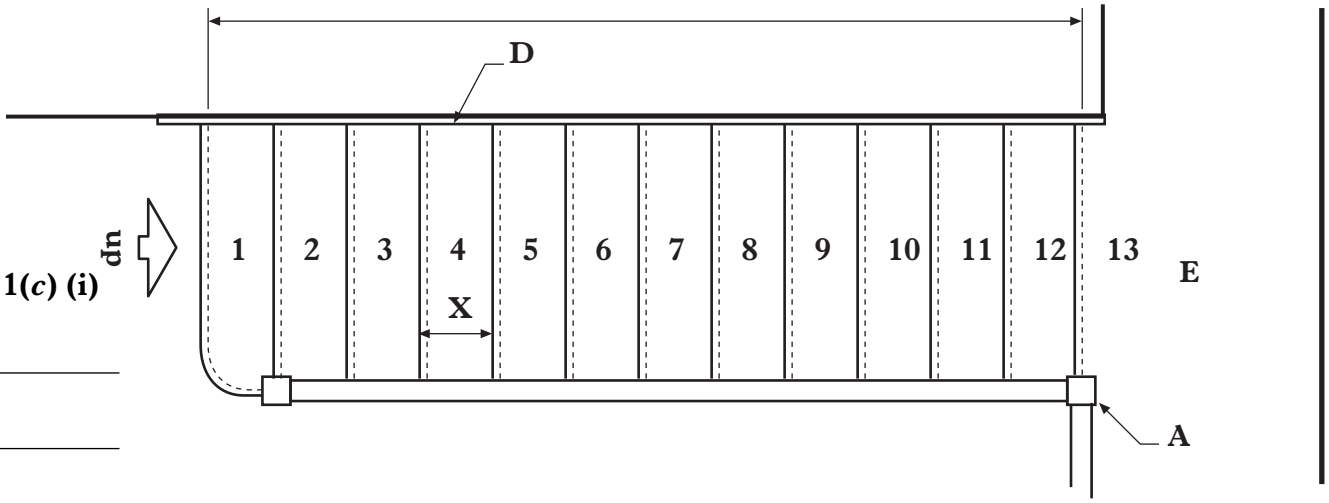
WORKSHEET Q11(*a*)



WORKSHEET Q11(*c*)

Question 11(*c*) (iii)

Z _____



PLAN

Question 11(*c*) (i)

A _____

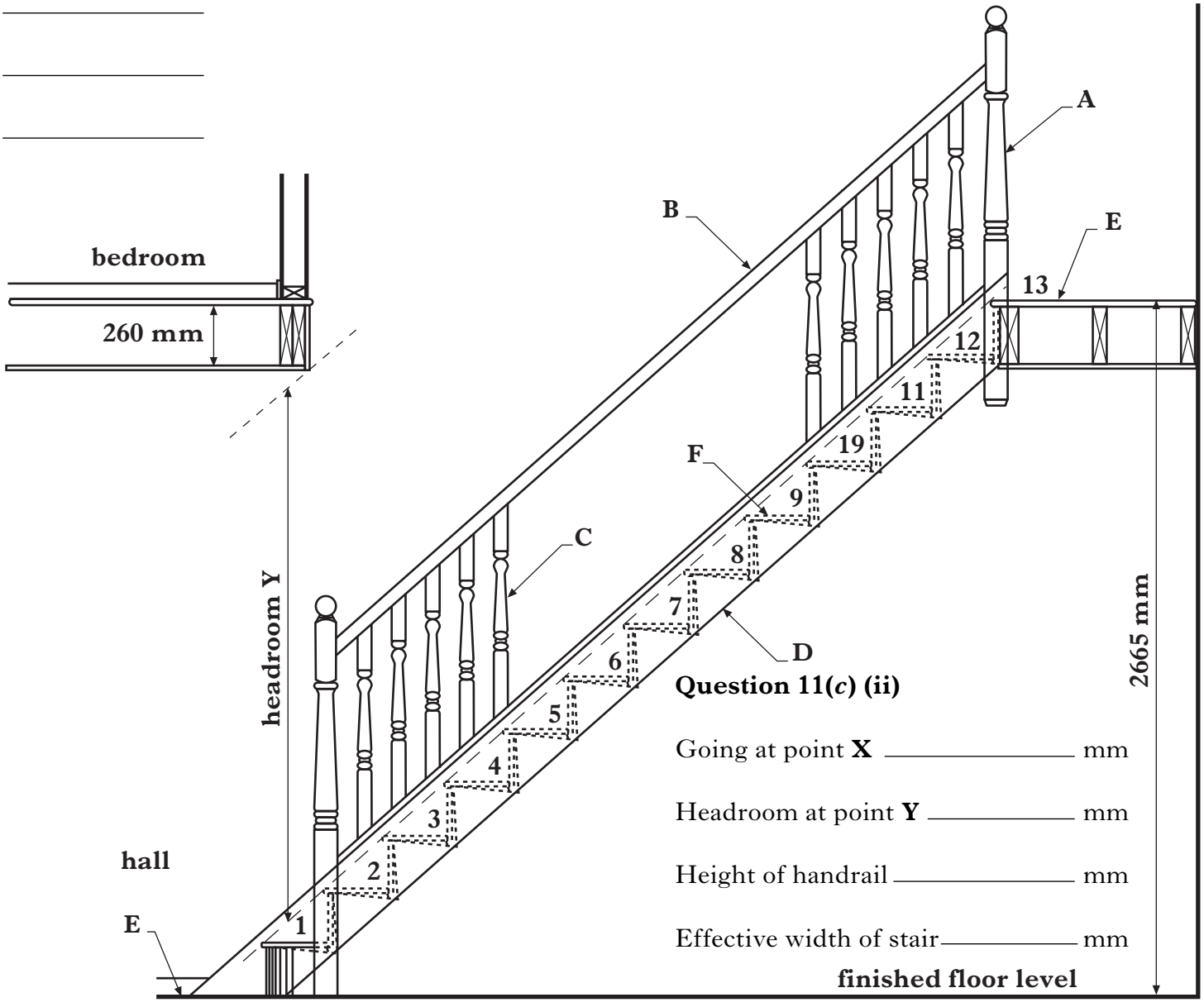
B _____

C _____

D _____

E _____

F _____



Question 11(*c*) (ii)

Going at point **X** _____ mm

Headroom at point **Y** _____ mm

Height of handrail _____ mm

Effective width of stair _____ mm

ELEVATION

[*END OF WORKSHEETS*]