THE INSTITUTE OF CARPENTERS

Member Examination

15th June 1999

Associated Vocational Technology Paper Section B

Total Time Allowed For Papers A and B

THREE HOURS

The following instructions should be read by all CANDIDATES before they commence work.

Section B: Consists of **8** questions only **FOUR** of which are to be answered. All questions carry equal marks.

Each answer **MUST** be submitted on a separate sheet of paper, and your candidate number **MUST** be written in the top right hand corner of **EACH** answer sheet in the box provided.

Member Examination

Associated Vocational Technology (Section B)

(Answer FOUR questions only)

1. The external elevation of the main entrance to an office building is shown in Figure 1. The pair of 58 thick Oak framed doors with raised and fielded panels are hung to a 120 x 70 rebated and moulded frame having a 58 thick fixed fanlight above a 120 x 70 transom. The door panels are finished with bolection moulding on the outside, and planted bead moulds on the inside.

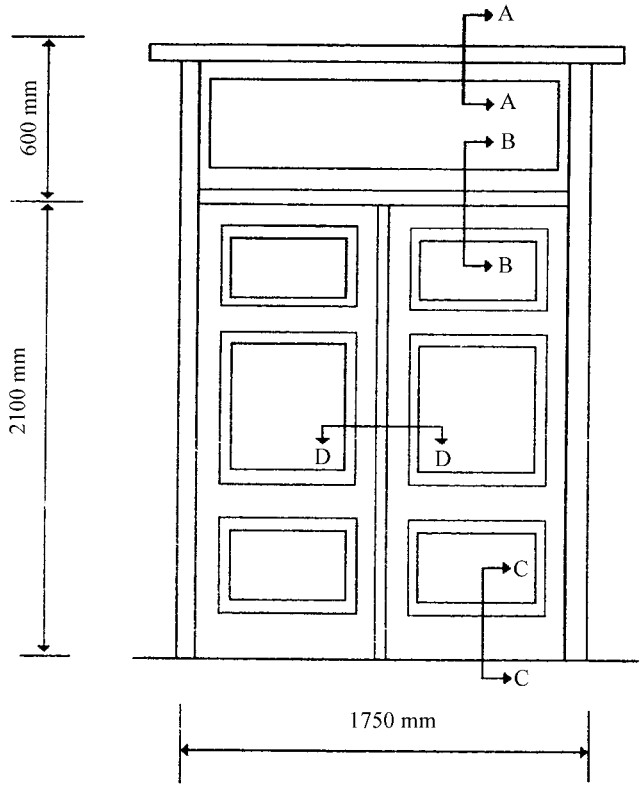

Fig. 1

Draw to a scale of 1 : 2

a.) a broken vertical section through :-

A-A head of the frame and top rail of fanlight;

B-B fanlight bottom rail, transom and top rail of door

C-C door bottom rail and part of the panel and mouldings

b.) D-D horizontal section through the door meeting stiles.

2. Six concrete columns 300 x 300 on plan and 2300 high are to be cast in-situ. The formwork is to be plywood with timber framing held by metal column cramps. Plywood is available in 1220 x 2400 sheets.

(a) Draw to a scale of 1: 5 a horizontal section of the formwork. State names and dimensions of materials.

(b) Calculate the number of sheets of plywood and column cramps if all six columns are to be cast at the same time.

(c) Describe three aids to the striking of formwork.

3. Figure 2 shows the outline of a stormproof casement window.

a) Draw, full size, fully dimensioned vertical sections through :-

i) the cill of the frame and bottom rail of the casement;

ii) the transom and bottom rail of the vent light.

b) Describe, with aid of sketches, a method of setting up a single ended tenoning machine to produce the combed joint between the rails and stiles of the opening casement.

c) Name a type of hinge commonly used when hanging stormproof casements.

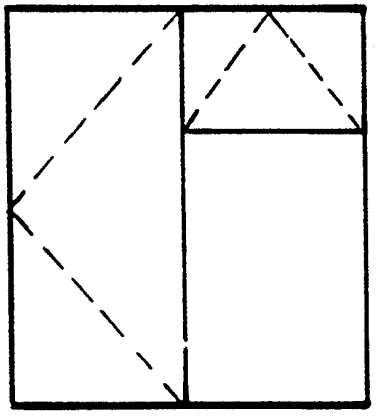

Fig. 2

4. Describe with the aid of sketches where necessary **THREE** of the following :-

(a) the method of marking and cutting herringbone strutting;

(b) setting out the shape of a hole on a roof sheet to receive a 100 mm pipe on a roof of half pitch;

(c) dividing a 21.000 length into equal spacings for 19, 100 x 100 posts to receive ranch stile fence;

(d) assembly, necessary bracing and fixing of internal door linings.

5. Figure 3 shows the plan of a roof pitched at 30° which is to be constructed using trussed rafters. The roof is to have one splayed gable end and one splayed hipped end which is to be erected using "hip" and "jack" rafters.

a) Draw, to a scale of 1:100, the outline plan of the roof and determine the :-

i) true shape of the End Truss at "A" and one top edge bevel;

ii) plumb, seat and edge-cut bevels for the Jack Rafter "B";

iii) true length, also plumb and seating bevels for the Hip Rafter "C".

b) Describe, with the aid of sketches, recommendations for the site storage and handling of trussed rafters.

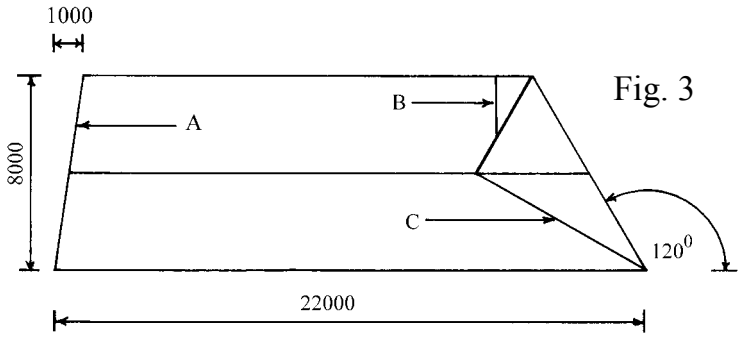

Fig. 3

6. A refurbishment contract for a large building requires :-

(a) Laminated plastic sheeting to be fixed, with the aid of a press in the workshop, and in-situ on the site.

i) Specify a suitable adhesive for use in each situation and state a reason for your choice in each case.

ii) List **FOUR** safety precautions to be observed when using adhesives.

b) That all internal softwood joinery timber to be seasoned to a moisture content of between 13% and 15%. Describe a seasoning process used to achieve the required level of moisture content and include an example of how this may be checked with the aid of a formula.

7. The outline plan of a 13 riser, open newel stair which is required for a private dwelling is shown in Figure 4. The storey height is 2340, the newel posts are Ex 100 x 100, the strings Ex 38 thick, the treads Ex 32 thick, and the risers are Ex 22 thick.

a) Calculate a suitable step rise and going to comply with current Building Regulations.

b) Draw, to a scale of 1:5, a vertical section at A-A to include the bottom three steps and a method of joining the string to the newel post.

c) Draw, to a scale of 1:2, the four faces at the lower portion of newel post "B" to show the housing positions for the tread and risers and mortice positions to receive the string.

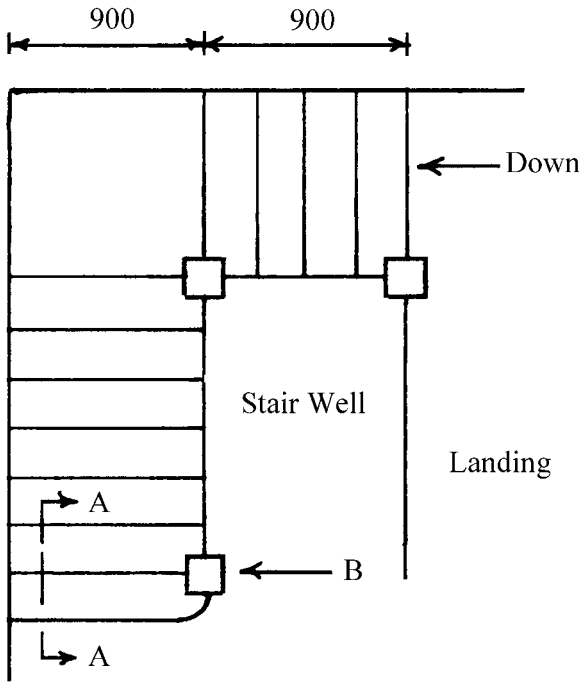

Fig. 4

8. A raking shore is to be erected to support the gable end wall of a three storey building during the adjacent construction of a new factory.

(a) Sketch a raking shore suitable to support the gable wall and name the various members.

(b) Explain with the aid of a sketch a method which may be used to tighten the shore at ground level.

(c) Illustrate the position of the rakers of a shoring system in relation to the floors when the bridging joists are positioned :-

(i) at right angles to the wall being shored;

(ii) (ii) parallel to the wall being shored.

MEMBER Membership

Member membership of the Institute of Carpenters is available to candidates achieving success in the Institute's Member Examination, also to Teachers/Lectures/Instructors of Woodcrafts possessing a trade background.

Further information and application forms may be obtained from

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