

## National Exams Dec 2016

### 98-Civ-B8, Management of Construction

3 hours duration

#### Notes:

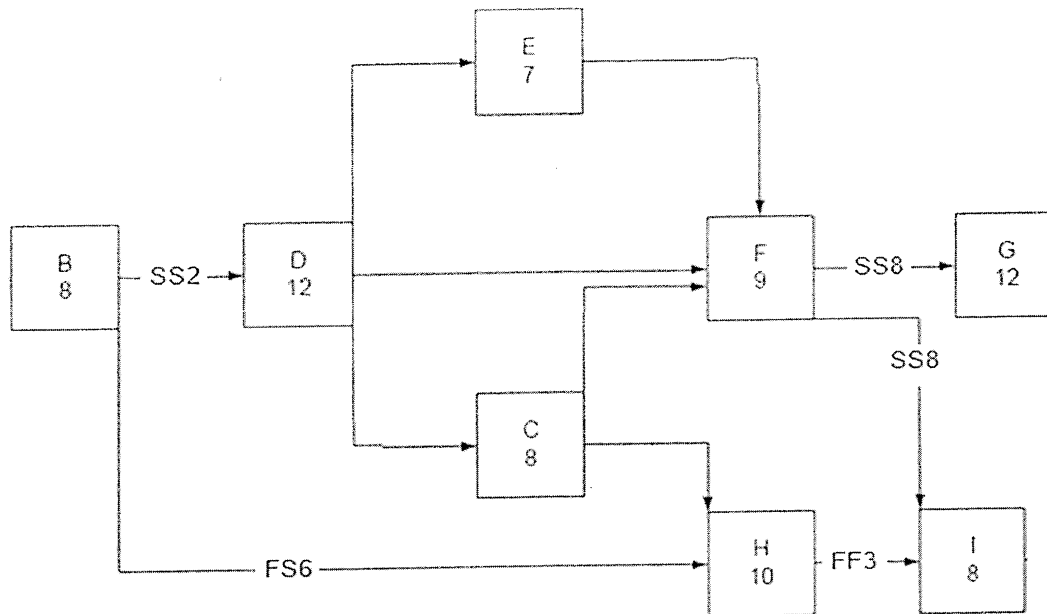
1. If doubt exists as to the interpretation of any question, the candidate is urged to submit with the answer paper, a clear statement of any assumptions made;
2. This is a “Closed Book” exam. Candidates may use one of two calculators, the Casio or the Sharp approved models;
3. Any five questions constitute a complete paper. Only the first five questions as they appear in your answer book will be marked.
4. All questions are of equal value.

#### **Marking Scheme**

1. 20 marks
2. 20 marks
3. 20 marks
4. 20 marks
5. 20 marks
6. 20 marks

### 1. Scheduling:

For the project network below: (a) Identify the critical path and calculate activities' total floats; (b) What is the effect of delaying activity F by 3 days on project duration?



### 2. Contract Administration:

Discuss and compare the following types of contracts/delivery approaches: Lump Sum, Unit Price, Turn-Key, Cost-Plus, in terms of: Suitability to specific projects; relative degree of risk carried by the owner and the contractor; and relative cost/time of delivery.

### 3. Project Control:

- Sketch a typical project S-Curve and show the expenses versus expected payment profiles and discuss ways to reduce interest charges on project financing; and
- Discuss the performance indices that are used for schedule and cost control.

**4. Engineering Economics:**

Annual maintenance costs for a particular section of highway pavement are \$7,000. The placement of a new surface would reduce the annual maintenance cost to \$2,500 per year for the first 5 years and to \$4,000 per year for the next five years. The annual maintenance after 10 years would again be \$7,000. If maintenance costs are the only saving, calculate the maximum investment that can be justified for the new surface, with interest at 5%.

**5. Insurance:**

Discuss the differences between bid bonds and performance bonds. Also, discuss the purpose and mechanics of liens in construction.

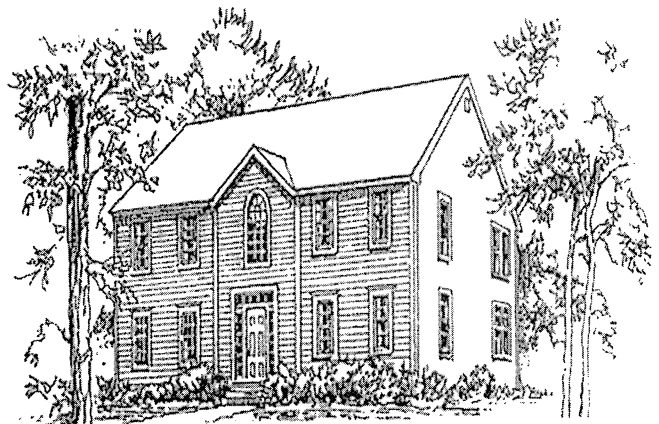
**6. Estimating:**

Use the given R.S.Means form to estimate the cost of a new home with 2,500 total square feet living area, with a finished basement and solid masonry exterior wall.

**RESIDENTIAL**      **Average**      **2 Story**

- Simple design from standard plans
- Single family – 1 full bath, 1 kitchen
- No basement
- Asphalt shingles on roof
- Hot air heat
- Drywall interior finishes
- Materials and workmanship are average
- Detail specifications on p. 27

*Note: The illustration shown may contain some optional components (for example: garages and/or fireplaces) whose costs are shown in the modifications, adjustments, & alternatives below or at the end of the square foot section.*



**Base cost per square foot of living area**

Exterior Wall	Living Area										
	1000	1200	1400	1600	1800	2000	2200	2600	3000	3400	3800
Wood Siding - Wood Frame	82.40	74.15	70.95	68.80	65.95	63.55	61.95	58.30	54.80	53.45	51.90
Brick Veneer - Wood Frame	87.90	79.25	75.70	73.30	70.25	67.65	65.85	61.80	58.10	56.60	54.85
Stucco on Wood Frame	82.85	74.55	71.35	69.15	66.35	63.90	62.25	58.60	55.10	53.75	52.15
Solid Masonry	96.35	87.10	83.05	80.30	76.85	74.00	71.85	67.30	63.15	61.35	59.40
Finished Basement, Add	11.70	11.30	10.90	10.70	10.40	10.25	10.05	9.70	9.45	9.30	9.15
Unfinished Basement, Add	4.70	4.40	4.15	4.00	3.85	3.70	3.60	3.35	3.20	3.10	3.00