

CVL 779		Formwork for Concrete Structures	MAJOR EXAMINATION	
Time allowed	2.0 HOURS 11:00AM-1:00 PM		Maximum Marks	100
Venue	LH-316		Date	23.11.2022

ASSUME MISSING DATA SUITABLY IF REQUIRED.

✓ Q 1. 30 marks

Design a Slab Formwork with the following data and show the arrangement of sheathing, joists, stringers, and shores with a neat sketch.

Thickness of sheathing is 20 mm, concrete slab = 150 mm, live load = 3.5 kN/m² with 25% additional for impact, and allowable stress in the deck bending = 12 N/mm², shear = 0.5 N/mm², E = 10,000 N/mm², it is decided to use 75 mm × 100 mm batten as the joist. What is the spacing of the joist and what shall be the spacing of the stringer, clear span of the slab is 3.5 m. Maximum permissible bending stress on the timber is 8 N/mm², shear = 0.5 N/mm², E = 10,000 N/mm². Use 100 mm × 150 mm batten as the stringer. Compressive strength normal to the grain = 2.75 N/mm². Compression parallel to the grain is 11 N/mm², E = 4,000 N/mm². Permissible deflection in the sheathing is 1.6 mm. The shores (100 mm x 100 mm) shall be designed as a long column. Permissible compressive stress for a long column is given as 1.39 N/mm².

✓ Q 2. (30 marks)

A construction technique using three levels of shores is proposed in a multistory building construction. Concrete curing temperature of T = 22.8°C is used. A construction cycle of 7 days per floor and stripping time of 5 days is proposed. Determine the loads on the slabs and shores at different levels during construction and show them on sketches. For the load determination, neglect the live load, and self-weight of shores. Compute the loads on days 7, 14, 19, 21, 26, 28, 33, 35, 40, and 42. Narrate the steps after computing loads to check the safety of slabs during construction.

Q 3. (30 marks)

For a construction project, the following formwork quantities have been worked out. The entire formwork quantity is to be done in 6 months. The schedule for each of the formwork types is also given in the table.

$$\frac{70}{27}$$

$$\frac{7}{27} + \frac{1}{3}$$

S. No.	Type of elements	Total quantity (m ²)	Estimated duration
01	Footings/Raft/Pile caps	4,000	1 month
02	Walls	40,000	5 months
03	Columns	10,000	5 months
04	Beams and Slab with floor height up to 4.5 m	40,000	5 months
05	Beams and Slab with floor height more than 4.5 m	16,000	5 months

Based on the above information and assuming reasonable cycle time and other data, please fill the missing details of the following table.

Type of elements	Total area	Area to be catered	Investment in steel	Timber purchase	Plywood purchase	Labor and plant cost per sqm
Footings/Raft/Pile Caps		10	10	0.125		
Walls		20	100	0.10		
Columns			60			
Beams and Slab with floor height up to 4.5 m						
Beams and Slab with floor height more than 4.5 m						

Q 4 (10 marks)

Write short notes (not more than 3-4 sentences)

- (1) Mock up
- (2) Back propping
- (3) Edge beam formwork
- (4) Function of jack rod in slipform construction

****WISH YOU ALL THE BEST****

Q 4