

# UNIVERSITI TUN HUSSEIN ONN MALAYSIA

# FINAL EXAMINATION SEMESTER I SESSION 2019/2020

**COURSE NAME** 

: CONSTRUCTION COST ESTIMATION

COURSE CODE

: BPD 31003

PROGRAMME CODE

: BPC

**EXAMINATION DATE** 

: DECEMBER 2019 / JANUARY 2020

**DURATION** 

: 3 HOURS

INSTRUCTION

: ANSWER ALL QUESTIONS

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THIS QUESTION PAPER CONSISTS OF SEVEN (7) PAGES

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- Q1 Construction cost estimating is a technical process of calculating construction costs by building up rates for every single element in tenders. Estimating the cost of building and engineering works involve the average output of mechanical plant per hour, the average output of labour per hour and require the knowledge at the most economical manner to carry out the works. There are two methods of construction cost estimating.
  - (a) Discuss **TWO** (2) purposes of construction cost estimating.

(4 marks)

(b) Explain the **TWO (2)** methods of construction cost estimating.

(12 marks)

- Q2 A tender document may include preliminaries and specification.
  - (a) Explain the importance of specification.

(6 marks)

(b) Analyse the contents of preliminaries for a building work.

(12 marks)

- Q3 Refer to Table 1 and Table Q3 in APPENDIX I and APPENDIX II respectively.
  - (a) Calculate build-up rates for reinforced in-situ concrete Grade 25 ( $1:1\frac{1}{2}:3-19$  mm aggregate) in suspended floor slab not exceeding 100mm thick by using a machine size 10/7 per m<sup>3</sup>.

(17 marks)

(b) Calculate build-up rates for reinforced in-situ concrete Grade 30 (1:3:6 – 40 mm aggregate) in isolated beams by using a machine size 18/12 per m<sup>3</sup>.

(17 marks)

- Q4 Refer to Table 1, Table Q4(a), Table Q4(b) and Table Q4(c) in APPENDIX I, APPENDIX II and APPENDIX III respectively.
  - (a) Calculate build-up rates for 25mm thick cement and sand (1:3) paving with steel trowelled finish to floor level or to falls not exceeding 15° from horizontal on concrete base per m<sup>2</sup>.

(16 marks)



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(b) Calculate build-up rates for 25mm cement and sand (1:3) skirting 100mm high with rounded top edge and cove at bottom to wall on brickwork base per m (Price of mortar is based on answer of **Q4(a)**).

(5 marks)

Q5 Refer to Table 1, Table Q5(a), Table Q5(b) and Table Q5(c) in APPENDIX I, APPENDIX III and APPENDIX IV respectively.

Calculate build-up rates per m<sup>2</sup> for:

5mm clear sheet glass to wood with screwed beads in panes 0.10 - 0.50m<sup>2</sup>. (5 marks)

(b) 8mm thick ready cut of tinted float glass to metal clips and putty in panes 0.50 - 1.00m<sup>2</sup>.

(6 marks)



- END OF QUESTIONS -

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### Table 1: Information for estimating works

A. Materials Cost	
1 bag cement (50kg) (inclusive unloading)	RM 20.00
1 tonne sand	RM 150.00
1 tonne aggregate	RM 165.00
Fine sand per m <sup>3</sup> for finishes	RM 45.00
Clear sheet glass (5mm) per m <sup>2</sup>	RM 27.00
Tinted float glass (8mm)	RM 45.00
Putty per 1 kg	RM 9.00
Additional Information:	7.00
Clips for glass installation	RM 1.50
B. Machine and Equipment Cost	1.50
Mixer (rental) per day	RM 35.00
Diesel per litre	RM 2.18
Diesel use per day for concrete work	RM 26.00
Lubrication oil use per day for concrete work	RM 22.00
Additional Information:	Idvi 22.00
• Diesel use for finishes	1.10 liter
<ul> <li>Lubrication oil use for finishes</li> </ul>	0.04 liter
C. Labour Cost	0.01 IICI
Worker wages per day:	
• Operator	RM 70.00
Skilled worker	RM 70.00
Unskilled worker	RM 70.00 RM 50.00
Labour output:	KIVI 50.00
Mortar mixing per hour	1.25 m <sup>3</sup>
D. Additional Percentage of Shrinkage and Wastage	
Concrete	50%
Mortar	33.33%
Percentage for profit and overhead	
C 1	12%

Instruction: Any other assumptions can be made if no data were given.



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# Table Q3: Machine output for mixing cement and sand

Machine size	Labour	Output/hour (m³)	Diesel/hour (litre)	Lubrication/hour (litre)
5 / 31/2	1 operator, 1 unskilled	1.25	1.10	0.04
7/5	1 operator, 3 unskilled	2.25	1.60	0.06
10 / 7	1 operator, 4 unskilled	3.25	1.80	0.07
14 / 10	1 operator, 4 unskilled	4.50	2.10	0.08
18 / 12	1 operator, 6 unskilled	5.50	2.40	0.10

## Table Q4(a): Labour output for floor paving

Types of Paving (20mm – 25mm thick)	1 Spreader and 1 Unskilled Worke (hour/m²)	
Cement	0.30	
Granolithic	0.35	
Screeded	0.25	
Trowelled	0.30	

# Table Q4(b): Labour output for plastering work

Position	1 Plasterer and 1 Unskilled Worker (hour/n		
Wall	0.40 DRITKA		
Ceiling	0.50		

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### Table Q4(c): Labour output for skirting

Height of Skirting	1 Spreader and 1 Unskilled Worker		
(mm)	Cement and Sand (hour/m)	Granolithic (hour/m)	
75	0.35	0.45	
100	0.38	0.50	
125	0.41	0.55	

# Table Q5(a): Labour output for glass installation to window and door

Size of glass (m <sup>2</sup> )	Glazier (hour/m²)			
	Fixing to wood with screw beads	Fixing to wood with putty	Fixing to metal with clips and putty	
$\leq$ 0.10	1.45	1.35	1.65	
0.10 - 0.50	1.10	1.00	1.25	
0.50 - 1.00	0.90	0.80	1.00	
> 1.00	0.70	0.65	0.75	

## Table Q5(b): Percentage (%) of waste on glass per cut

Material	Additional cos	THE RESIDENCE OF THE PROPERTY
Ready cut of glass	3%	TERBUKA
Cut on site	10%	

#### APPENDIX IV

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### Table Q5(c): Putty for glass installation

Size of glass (m²)	Putty (kg/m² glass)		
	Fixing with putty	Fixing with screw beads	
≤ 0.10	3.00	1.00	
0.10 - 0.50	2.00	0.75	
0.50 - 1.00	1.00	0.33	
> 1.00	0.75	0.25	

