Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER II
SESSION 2014/2015

COURSE NAME	:	CONSTRUCTION COST ESTIMATION
COURSE CODE	:	BPD 31003
PROGRAMME	:	3 BPC
EXAMINATION DATE	:	JUNE 2015 / JULY 2015
DURATION	:	3 HOURS
INSTRUCTION	:	ANSWER **ALL** QUESTIONS

THIS QUESTION PAPER CONSISTS OF **SEVEN (7)** PAGES

Q1 The tender pricing document sets out the way in which the design team and client wish to review of the overall tender prices provided by tendering contractors. It is effectively an unpriced bill of quantities.

Explain the bill of quantities.

(8 marks)

Q2 Finishing works requires a delicate finishes in building construction process where it shows the building aesthetic value. Several types of finishes can be used based on materials used, environmental conditions and costs. Finishing works can be divided into several types namely floor finishing, wall finishing and ceiling finishing.

(a) Compare in-situ floor finishes and applied floor finishes.

(9 marks)

(b) Mr. Raju lives in a double-storey semi-detached house for more than 10 years in Kerteh, Terengganu. He never made any alteration or renovation to the house. Recently, he decided to change the wall finishes of his master bedroom's toilet. However, he is worried about the cost involved in changing the wall finishes.

Outline the cost estimating process for the wall finishes works of Mr. Raju master bedroom's toilet.

(12 marks)

Instruction: Use information in Table 1 to answer **Q3 – Q5**. Any other assumptions can be made if no data given.

Table 1: Information for estimating works

A. Materials Cost	
1 bag cement (50kg)	RM 18.50
1 tonne sand	RM 130.00
1 tonne aggregate	RM 160.00
1 no. of brick	RM 0.35
1 litre varnish	RM 6.00
1 kg putty	RM 9.80
1 tin primer coat (5 litre)	RM 50.00
1 tin undercoat (5 litre)	RM 65.00
1 tin finish coat (5 litre)	RM 95.00
1 piece sand paper	RM 1.30
Additional Information:	
• Mortar required per $1m^2$ (inclusive wastage) for brick works	$0.05m^3$
• Total use of bricks for $1m^2$	118 pieces
• Brush	3%
B. Machine and Equipment Cost	
Mixer rental per day	RM 130.00
Diesel use per day	RM 25.00
Lubrication oil use per day	RM 11.50
C. Labour Cost	
Worker wages per day:	
• Skilled worker and Operator	RM 60.00
• Unskilled worker	RM 40.00
Unloading cost for 1 bag of cement	RM 1.00
Labour output:	
• Brick laying per hour	120 pieces
D. Additional Percentage of Shrinkage and Wastage	
Concrete	50%
Brick	3%
Mortar	33.33%
Percentage of profit and overhead	10%

Q3 Cost estimating for concrete works is not an easy task, as many factors are involved. Some of these factors including grading, formwork and reinforcement.

(a) Discuss **FOUR (4)** factors affecting formwork cost.

(8 marks)

(b) Vibrated reinforced concrete Grade 25 (1:3:6 – 20mm aggregate) in pad footing by using machine with output of 10/7. This machine produces approximately 4.00 m^3 of mixed concrete in 1 hour (Refer **Table Q3(b)**).

Calculate build-up rates per m^3 for the concrete work.

(17 marks)

Q4 Quantity of bricks and quantity of mortar are among factors involved in the build-up of a unit rate for brick works.

(a) Explain these **TWO (2)** factors for brick works.

(4 marks)

(b) 215mm thick common brick wall in composition cement and sand (1:3) mortar as specified, laid in Flemish bond using machine with output of 14/10. This machine produces approximately 1.20m^3 of mortar in 1 hour (Refer **Table Q3(b)** and **Table Q4(b)**).

Calculate build-up rates per m^2 for the brick works.

(21 marks)

Q5 Refer to **Table Q5(a)**, **Table Q5(b)** and **Table Q5(c)**:

Calculate build-up rates per m^2 for;

(a) Knotting, stopping one coat primer, one coat undercoat and two coats gloss finish to general surfaces of wood not exceeding 150mm girth internally.

(16 marks)

(b) Two coats of emulsion paint to general surfaces of plastered wall over 300mm girth internally.

(5 marks)

-END OF QUESTIONS-

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TABLE Q3(b)

Machine size	Labour	Output/hour (m^3)	Diesel/hour (litre)	Lubrication/hour (litre)
5 / 3½	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(b)

Description	Bricklayer (hour/m^2)	Unskilled Worker (hour/m^2)
Half brick wall for common brick	1.00	0.35
One brick wall for common brick	1.75	0.70

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TABLE Q5(a)

Description	Surface Types ($100m^2$)	
	Wood	Plaster
Primer coat	8.00 litre	-
Undercoat	7.00 litre	-
Finish coat	7.00 litre	8.00 litre
Varnish	5.50 litre	-
Wood cleaning	0.75 litre	-
Wood filling	2 kg putty	-
Sand paper	10 pieces	-

TABLE Q5(b)

Description	Quantity of paint	Labour cost
General surfaces not exceeding 150mm girth.	10%	30%
General surfaces exceeding 150mm but not exceeding 300mm girth.	5%	15%

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TABLE Q5(c)

Description	Painter ($100m^2$/hour)	
	Wood Surface	Plaster Surface
Wood cleaning	3.00	-
Wood filling	3.00	-
Wood rubbing	3.00	-
Preparation of surfaces	-	2.00
Primer coat	8.00	-
Undercoat	8.00	-
Finish coat	9.00	9.00