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UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION
SEMESTER II
SESSION 2015/2016**

COURSE NAME : CONSTRUCTION COST ESTIMATION
COURSE CODE : BPD 31003
PROGRAMME CODE : BPC
EXAMINATION DATE : JUNE/JULY 2016
DURATION : 3 HOURS
INSTRUCTION : ANSWER ALL QUESTIONS

THIS QUESTION PAPER CONSISTS OF SEVEN (7) PAGES

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Q1 The whole process of tendering in the construction industry is a comprehensive and complex procurement process and very expensive exercise for employer and tenderers. Tendering especially for big and complex projects can be a costly exercise equally for an employer and tenderers, but this would be money well spent if the targets are achieved successfully.

Explain the reasons which contribute the process of tendering for big and complex projects can be a costly exercise for employer and tenderers.

(10 marks)

Q2 Mr. Hasrizan just bought a double-storey link house in Temerloh, Pahang. He is thinking of doing some renovation to the new house. He is concerned about using concrete as the main material for the renovation. He then met Mr. Tim, a consultant to get information on concrete. Mr. Tim has advised him on price factors for concrete works.

Analyse **FOUR (4)** price factors that influence the concrete works.

(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 19.50
1 tonne sand	RM 130.00
1 tonne aggregate	RM 160.00
1 no. of clay brick	RM 0.35
1 no. of cement and sand block	RM 1.50
1 piece of colour glazed tile	RM 2.00
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
Additional Information:	
• Mortar required per 1m ² (inclusive wastage) for brick works	0.05m ³
• Mortar required per 1m ² (inclusive wastage) for block works	0.011m ³
• Cement paste required per 1m ² (inclusive wastage) for tiling works	0.02m ³
• Total use of clay bricks for 1m ²	118 pieces
• Total use of cement and sand block for 1m ²	22 pieces
• Brush	3%
• Cost for cement per bag inclusive unloading cost	
B. Machine and Equipment Cost	
Mixer rental per day	RM 100.00
Diesel use per day	RM 26.00
Lubrication oil use per day	RM 13.00
Additional Information:	
• Diesel use for finishes	1.10 litre
• Lubrication oil use for finishes	0.04 litre
C. Labour Cost	
Worker wages per day:	
• Skilled worker and Operator	RM 60.00
• Unskilled worker	RM 40.00
Labour output:	
• Brick laying per hour	120 pieces
D. Additional Percentage of Shrinkage and Wastage	
Clay brick	3%
Cement and sand block	5%
Mortar	33.33%
Tile	5%
Percentage of profit and overhead	10%

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Q3 Refer to **Table Q3(a)** and **Table Q3(b)**:

Calculate build-up rates per m² for;

- (a) 215mm thick common brick wall in composition cement and sand (1:6) mortar as specified, laid in Flemish bond using a machine with an output of 10/7.

(22 marks)

- (b) 150mm thick wall in cement and sand block size 400mm x 100mm x 100mm thick for partition walling in cement mortar (1:6) mix using a machine with an output of 14/10.

(22 marks)

Q4 Refer to **Table Q3(a)**, **Table Q4(a)**, **Table Q4(b)** and **Table Q4(c)**:

Calculate build-up rates per m² for;

- (a) 20mm thick cement and sand (1:3) screeded bed to receive ceramic tiles to floor level or to fall not exceeding 15° from horizontal on concrete base using a machine with an output of 7/5.

(17 marks)

- (b) 200mm x 250mm x 7mm thick colour glazed wall tile bedded and jointed in cement paste and pointed in white cement to wall on screeded backing.

(11 marks)

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

Calculate build-up rates per m² for;

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

(6 marks)

-END OF QUESTIONS-

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Table Q3(a): Machine output for mixing cement and sand

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 Q3(b): Labour output for brick and block works

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
Block work	0.50	0.50

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Table Q4(a): Labour output for floor paving

Types of paving (20mm – 25mm thick)	1 Tiler and 1 Unskilled Worker (hour/m ²)
Cement	0.30
Screeded bed	0.25
Trowelled bed	0.30

Table Q4(b): Number of tiles for 1 m²

Size of tiles	Number (piece)
100 mm x 150 mm	67
150 mm x 200 mm	33
200 mm x 200 mm	25
200 mm x 250 mm	20

Table Q4(c): Labour output for tiles installation

Size of tiles	1 Tiler and 1 Unskilled worker (hour/m ²)	
	Floor	Wall
≥ 150 mm x 150 mm	0.75	1.00
< 150 mm x 150 mm	1.90	1.25

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Table Q5(a): Amount of paint

Description	Surface Types (100m ²)	
	Wood	Plaster
Primer coat	8.00 litre	-
Undercoat	7.00 litre	-
Finish coat	7.00 litre	8.00 litre

Table Q5(b): Labour output for painting works

Description	Painter (100m ² /hour)	
	Wood Surface	Plaster Surface
Preparation of surfaces	-	2.00
Primer coat	8.00	-
Undercoat	8.00	-
Finish coat	9.00	9.00