



UNIVERSITI KUALA LUMPUR
MALAYSIA FRANCE INSTITUTE

FINAL EXAMINATION
JULY 2010 SESSION

SUBJECT CODE : FFD 33302
SUBJECT TITLE : PRODUCTION COSTING PRINCIPLES
LEVEL : DIPLOMA
TIME / DURATION : 12.30pm – 3.00pm
(2.5 HOURS)
DATE : 11 NOVEMBER 2010

INSTRUCTIONS TO CANDIDATES

1. Please read the instructions given in the question paper **CAREFULLY**.
 2. This question paper is printed on both sides of the paper.
 3. Please write your answers on the answer booklet provided.
 4. Answer should be written in blue or black ink except for sketching, graphic and illustration.
 5. This question paper consists of **TWO (2)** sections. Section A and B. Answer all questions in Section A. For Section B, answer one (1) question only.
 6. Answer all questions in English.
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THERE ARE 4 PAGES OF QUESTIONS AND 2 PAGES OF APPENDIX, EXCLUDING THIS PAGE.

SECTION A (Total: 40 marks)

INSTRUCTION: Answer ALL questions.

Please use the answer booklet provided.

Question 1

(a) NGK has a plant for processing Union from carbon steel material. Last week the facility produced 148,000 units. The effective capacity is 175,000 units. The production line operates 7 days per week with 8 hour shifts per day. The line was designed to process at rate of 1,200 per hour. Determine the design capacity, utilization and efficiency for this plant.

(10 Marks)

(b) The manager need to increases the production demand, and the manager will be adding a second production line. Effective capacity for second line is same as the first line. The second line is operating at an efficiency less than 75%. What is the expected output?

(10 Marks)

Question 2

Welding workshop repair facility has the capacity to repair 800 internal cracks of weld joint structural defects per month. However, due to scheduled maintenance of their equipment, management feels that they can repair no more than 600 internal cracks per month. Last month, two of the employees were absent several days each, and only 400 internal were repaired. What are the utilization and efficiency of the repair shop?

(10 Marks)

Question 3

Yardley Corp. incurred the following manufacturing costs in 2009:

Variable manufacturing costs:

Direct materials = \$ 600,000

Direct manufacturing labor = \$ 560,000

Manufacturing overhead = \$ 40,000

Fixed manufacturing overhead = \$ 540,000

Total manufacturing costs = \$1,740,000

In 2005, the total unit cost at production levels of 40,000 units and 60,000 units is \$37.50 and \$33.00, respectively. The relevant range is 35,000 units to 70,000 units.

Compute the number of units produced in 2009.

(10 Marks)

SECTION B (Total: 60 marks)

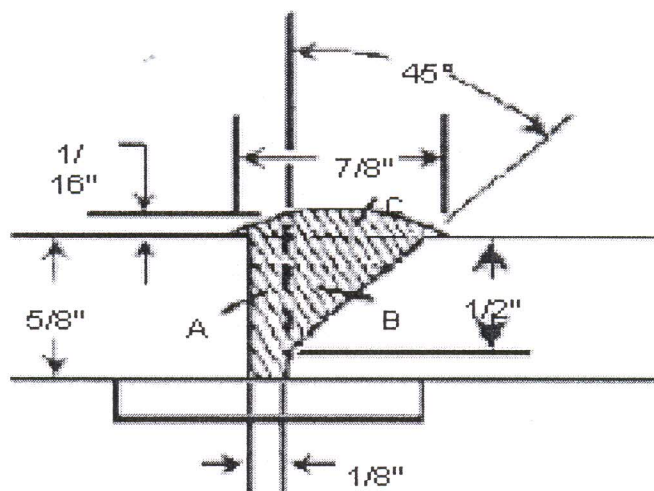
INSTRUCTION: Answer ONE (1) question only.

Please use the answer booklet provided.

Question 1

Calculate the cost of welding 1,280 ft. of a single bevel butt joint as shown in Figure 1 using the following data..

- i. Electrode - $\frac{3}{16}$ " diameter, 14" long, E7018, operated at 25 volts, 250 amps.
- ii. Stub Loss - 2 inches
- ii. Labor and Overhead - \$30.00/hr
- iv. Electrode Cost - \$.57/lb
- v. Power Cost - \$.045/kWh



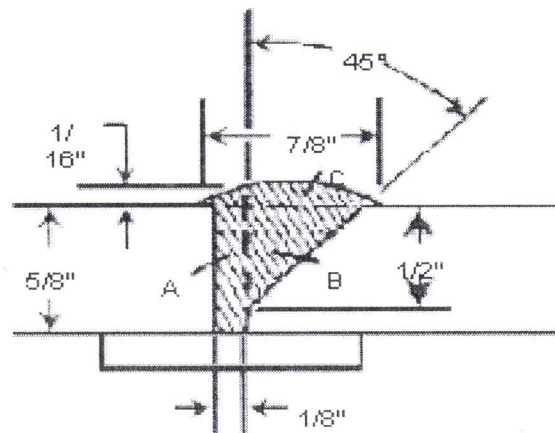
- Figure 1

- a. The cost of labor and overhead per pound of deposited weld (5 Marks)
- b. The cost of the electrode per pound of deposited weld metal (5 Marks)
- c. The cost of electrical power to deposit one pound of weld (5 Marks)
- d. The cost of depositing one pound weld metal (5 Marks)
- e. The cost per foot deposited weld metal (15 Marks)
- f. The cost of the weld for the total job (5 Marks)
- g. Total pounds of electrode required (10 Marks)
- h. Weld time required (10 Marks)

Question 2

Calculate the cost of welding for 740 ft. of a single bevel butt joint as shown.

- i. Electrode - $\frac{3}{16}$ " diameter, 14" long, E9018, operated at 25 volts, 300 amps.
- ii. Stub Loss - 2 inches
- iii. Labor and Overhead - \$40.00/hr
- iv. Electrode Cost - \$0.63/lb
- v. Power Cost - \$0.075/kWh



- Figure 2

- a. The cost of labor and overhead per pound of deposited weld (5 Marks)
- b. The cost of the electrode per pound of deposited weld metal (5 Marks)
- c. The cost of electrical power to deposit one pound of weld (5 Marks)
- d. The cost of depositing one pound weld metal (5 Marks)
- e. The cost per foot deposited weld metal (15 Marks)
- f. The cost of the weld for the total job (5 Marks)
- g. Total pounds of electrode required (10 Marks)
- h. Weld time required (10 Marks)

Table 1: Operating Factor For Welding Process

WELDING PROCESS			
SMAW	+ * GMAW	* FCAW	* SAW
30%	50%	45%	40%

Table 2: Deposition Efficiency

E7016			
ELECTRODE	DEPOSITION EFFICIENCY		
DIAMETER	AMPS	RATE lbs/hr	%
1/8	100	1.7	63.9%
	130	2.3	65.8%
5/32	140	3.0	70.5%
	160	3.2	69.1%
	190	3.6	66.0%
3/16	175	3.8	71.0%
	200	4.2	71.0%
	225	4.4	70.0%
1/4	250	4.8	65.8%
	250	5.9	74.5%
	275	6.4	74.1%
	300	6.8	73.2%
	350	7.6	71.5%

E7024			
ELECTRODE	DEPOSITION EFFICIENCY		
DIAMETER	AMPS	RATE lbs/hr	%
1/8	140	4.2	71.8%
	180	5.1	70.7%
5/32	180	5.3	71.3%
	210	6.3	72.5%
	240	7.2	69.4%
3/16	245	7.5	69.2%
	270	8.3	70.5%
	290	9.1	68.0%
7/32	320	9.4	72.4%
	360	11.6	69.1%
1/4	400	12.6	71.7%

LOW ALLOY, IRON POWDER ELECTRODES TYPES E7018, E8018, E9018, E10018, E11018, AND E12018			
ELECTRODE	DEPOSITION EFFICIENCY		
DIAMETER	AMPS	RATE lbs/hr	%
3/32	70	1.37	70.5%
	90	1.65	66.3%
	110	1.73	64.4%
1/8	120	2.58	71.6%
	140	2.74	70.9%
	160	2.99	68.1%
5/32	140	3.11	75.0%
	170	3.78	73.5%
	200	4.31	73.0%
3/16	200	4.85	76.4%
	250	5.36	74.6%
	300	5.61	70.3%
7/32	250	6.50	75.0%
	300	7.20	74.0%
	350	7.40	73.0%
1/4	300	7.72	78.0%
	350	8.67	77.0%
	400	9.04	74.0%

DEPOSITION DATA - SMAW - COATED ELECTRODES (Con't)

FIGURE 9

NOTE: EFFICIENCY RATES DO NOT INCLUDE STUB LOSS

Table 3: WEIGHT PER FOOT OF WELD METAL FOR FILLET WELDS AND ELEMENTS OF COMMON BUTT JOINTS (lbs/ft) STEEL

EQUAL LEG
FILLETS
(USE 45° COLUMN)

SINGLE
BEVEL

SINGLE
V-GROOVE

DOUBLE

DOUBLE
BEVEL

SINGLE V
NO GAP

REINFORCEMENT

lbs./ft. of Rectangle A

lbs./ft. of Triangle B

lbs./ft. Reinforcement C

T

G

S

H

Inches	1/16"	1/8"	3/16"	1/4"	3/8"	1/2"	5°	10°	15°	22 1/2°	30°	45°	1/16"	1/8"	3/16"	1/4"
1/8	.027	.053	.080	.106	.159	.212	.002	.005	.007	.011	.015	.027				
3/16	.040	.080	.119	.159	.239	.318	.005	.011	.016	.025	.035	.060	.027			
1/4	.053	.106	.159	.212	.318	.425	.009	.019	.028	.044	.061	.106	.035			
5/16	.066	.133	.199	.265	.390	.531	.015	.029	.044	.069	.096	.166	.044	.884		
3/8	.080	.159	.239	.318	.478	.637	.021	.042	.064	.099	.138	.239	.053	.106		
7/16	.091	.186	.279	.371	.557	.743	.028	.057	.087	.129	.188	.325	.062	.124		
	.106	.212	.318	.425	.637	.849	.037	.075	.114	.176	.245	.425	.071	.141	.212	
9/16	.119	.239	.358	.478	.716	.955	.047	.095	.144	.223	.311	.451	.080	.159	.239	
5/8	.133	.265	.398	.531	.796	1.061	.058	.117	.178	.275	.383	.664	.088	.177	.265	.354
11/16	.146	.292	.438	.584	.876	1.167	.070	.142	.215	.332	.464	.804	.097	.195	.292	.389
3/4	.159	.318	.478	.637	.995	1.274	.084	.169	.256	.396	.552	.955	.106	.212	.318	.424
13/16	.172	.345	.517	.690	1.035	1.380	.098	.198	.301	.464	.648	1.121	.115	.230	.345	.460
7/8	.186	.371	.557	.743	1.114	1.486	.114	.230	.349	.538	.751	1.300	.124	.248	.371	.495
15/16	.199	.398	.597	.796	1.194	1.592	.131	.263	.400	.618	.863	1.493	.133	.266	.398	.530
1	.212	.425	.637	.849	1.274	1.698	.149	.300	.456	.703	.981	1.698	.141	.283	.424	.566
	.239	.478	.716	.955	1.433	1.910	.188	.379	.577	.890	1.241	2.149	.159	.318	.477	.637
1 1/4	.265	.531	.796	1.061	1.592	2.123	.232	.468	.712	1.099	1.532	2.653	.177	.354	.531	.707
1 3/8	.292	.584	.876	1.167	1.751	2.335	.281	.567	.861	1.330	1.853	3.210	.195	.389	.584	.777
1 1/2	.318	.637	.955	1.274	1.910	2.547	.334	.674	1.023	1.582	2.206	3.821	.212	.424	.637	.849
1 5/8	.345	.690	1.035	1.380	2.069	2.759	.393	.792	1.201	1.857	2.589	4.484	.230	.460	.690	.920
1 3/4	.371	.743	1.114	1.486	2.229	2.972	.455	.918	1.393	2.154	3.002	5.200	.248	.495	.743	.990
	.390	.796	1.194	1.592	2.388	3.184	.523	1.053	1.599	2.473	3.447	5.970	.266	.531	.796	1.061
2	.425	.849	1.274	1.698	2.547	3.396	.594	1.197	1.820	2.813	3.921	6.792	.283	.566	.849	1.132
2 1/4	.478	.955	1.433	1.910	2.865	3.821	.752	1.516	2.303	3.561	4.963	8.596	.318	.637	.955	1.273
	.530	1.061	1.592	2.123	3.184	4.245	.928	1.871	2.844	4.396	6.127	10.613	.354	.707	1.061	1.415
2 3/4	.584	1.167	1.751	2.335	3.502	4.669	1.123	2.264	3.441	5.319	7.414	12.841	.389	.778	1.167	1.556
3	.636	1.274	1.910	2.547	3.821	5.094	1.337	2.695	4.095	6.330	8.823	15.282	.424	.849	1.273	1.698

END OF QUESTION