

**General scoring instructions (except problems 5 and 9)**

Correct solution	4 p
Correct principle with small errors	2-3 p
Partially correct solution	1-2 p
Rounding errors	-1 p
Missing or wrong unit	-1 p
If necessary, half of a point can be used	
1. Only d) is impossible.	4 p
2. $300 \cdot 8 / 16 = 150$ rounds per minute = 9000 (rounds in an hour)	3 p 1 p
3. Correct answer 3 with or without calculations (Correct equations but wrong answer, 2p)	4 p
4. a) Load number 3 b) $10 / 25 = 0,4 = 40 \%$	1 p 3 p
5. a) $x = -4$ b) $y = 33/5$ c) $r = \sqrt[2]{\frac{v}{12\pi h}}$ d) $a = 2000\text{mm}$	1,5 p 1,5 p 1,5 p 1,5 p
6. a) $\alpha = \text{asin}(0,34) = 20\text{deg}$ b) $x = 1500 \cdot \cos(20\text{deg}) = 1500 \cdot 0,94 = 1410$ c) $h_2 = h + 200\text{mm} = 510\text{mm} + 450\text{mm} = 960\text{mm}$ $\alpha_2 = \text{asin}(h_2/1500) = \text{asin}(960/1500) = \text{asin}(0,64) = 40\text{deg}$ $x_2 = 1500\text{mm} \cdot \cos(40\text{deg}) = 1500\text{mm} \cdot 0,77 = 1155\text{mm}$ $x_2 - x = 1410\text{mm} - 1155\text{mm} = 255\text{mm}$	1 p 1 p 2 p
7A. $v = 60 \text{ km/h} = 100/6 \text{ m/s} = 16,667 \text{ m/s}$ $x = v \cdot t = 100/6 \cdot 3 = 50 \text{ m.}$	1 p 3 p
7B. $[\text{H}^+] = [\text{HCl}]$ needs no justification $[\text{H}^+] = 10^{(-\text{pH})}$ $[\text{HCl}] = 10^{(-4)} \text{ mol/l} = 0,0001 \text{ mol/l} = 0,1 \text{ mmol/l}$	1 p 3 p
8A. $1/R_{\text{tot}} = 3 \cdot 1/R = 3/2$ (-> $R_{\text{tot}} = 2/3$ ) $U_{\text{tot}} = 2 \cdot 3 = 6 \text{ V}$ $P = U^2/R = 6^2 \cdot 3/2 = 54 \text{ W}$	1 p 1 p 2 p
8B. O: $50/16 \sim 3$ ; N: $44/14 \sim 3$ ; H: $6/1 = 6$ ratios $\sim 1:1:2$ a) $\text{NH}_4\text{NO}_2$ is the best match	1 p 2 p 1 p

Engineering Entrance Exam 2016 D, ANSWERS

9. Understanding the assignment: max 2 p

The student understands the idea of SWOT and discusses all four aspects (strengths, weaknesses, opportunities and threats) using full sentences.

The length of the answer is 200-250 words.

The content of the answer: max 2 p

The answer includes topics like motivation, commitment to studies, interest in the field, life and time management skills

The use of language: max 2 p

The use of language is so weak that the text is difficult to read and/or understand: 0 p

The text is relatively easy to read and understand despite obvious problems with grammar and/or vocabulary: 1 p

The use of language is fluent, mostly flawless and easy to read: 2 p

If necessary, half of a point can be used.

English test

1 – 4. Each correct answer gives 0,5 point.

1. b
2. c
3. d
4. a

5 – 6. Both answers are graded on a scale 0 – 3.

The candidate

has not understood the question or cannot produce understandable text: 0 p

understands the question but produces text which is difficult to read or understand: 1 p

understands the question well and produces easy-to-read text which contains some flaws: 2 p

gives a nearly complete answer and produces easy-to-read text which is nearly flawless: 3 p