

Engineering Entrance Exam D, 2017

ANSWERS:

1. a)  $\frac{1}{9}$  (1 p)

b)  $2a^2 - 9a - 3$  (1 p)

c)  $a + b$  (2 p)

2. a)  $x = -1 \vee 0$  (2 p)

b)  $x = 1$  (2 p)

c)  $x = \frac{3}{4}$  (2 p)

3.  $D = 35$  (4 p)

4. a)  $A = 12 \text{ cm}^2$  (2 p)

b) 7 cm is width and length is 14 cm (1 p)

$A = 98 \text{ cm}^2$  (1 p)

5. 2 h (4 p)

6. C (4 p)

7. a)  $S_1 = 900 \text{ m}$  (2p)

$S_2 = 1200 \text{ m}$  (1p)

$S_{\text{tot}} = 2100 \text{ m}$  (1p)

b)  $M(\text{NaCl}) = 60 \text{ g/mol}$  (2p)

$c = 5 \text{ mol/dm}^3$  (2p)

8. a)  $a_{\text{max}} + g = 30 \text{ m/s}^2$  (2p)

$F_{\text{max}} = m * (g + a_{\text{max}}) = 70 \text{ kg} * 30 \text{ m/s}^2 = 2100 \text{ N}$  (2p)

- b) I)  $1 \text{ C}_3\text{H}_8 + 5 \text{ O}_2 \rightarrow 3 \text{ CO}_2 + 4 \text{ H}_2\text{O}$  (2p)
- II)  $M(\text{C}_3\text{H}_8) = 44 \text{ g/mol}$ ;  $n(\text{C}_3\text{H}_8) = 10 \text{ mol}$ ;  $n(\text{CO}_2) = 30 \text{ mol}$  (1p)
- $V = 750 \text{ l}$  (1p)

**Task 9. SWOT analysis essay is graded as follows:**

- 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 approximately 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 a point can be used.

→ **Maximum is 6 points.**

**Part II (English test)**

**True/false statements 1-4**

- Each correct answer gives 0.5 point.

1. T
2. F
3. F
4. F

**Essay questions 5 and 6 are graded on a scale 0-3 as follows:**

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: 2p
- gives a nearly complete answer and produces easy-to-read text which is nearly flawless: 3 p

→ **Maximum is 8 points.**