MATERIALS SCIENCE I

CHARPY IMPACT TEST

Student:	Year:
Date:	Teacher:

Program:

a) Impact testing

b) Testing specimens

c) Characteristics determined from impact test

d) Transition temperature

IMPACT TEST (EN ISO 148-1)

Tasks:

Carry out an impact fracture test on a given set of specimens and evaluate the results.

a) Find out absorbed energy for different testing conditions.

b) Determine the Transition temperature $\mathbf{T_p}$.

c) Sum up the test results.

Tested material:

According to EN: **S235JR**, where: **S** → structural steel, **235** → minimum yield strength 235 MPa, **JR** → material toughness (Charpy V-Notch impact test at 27J at room temperature)

Sketch of the specimen:

Sketch of the testing apparatus (Charpy method):

TABLE 1: *Measured data*

	Temperature [°C]								
Specimen	**T [°C]**	**-80**	**-60**	**-40**	**-20**	**0**	*	**40**	**80**
1	**KV [J]**	5	18	65		135		163	150
2		12	10	72		150		150	165
3		15	12	70		145		152	150
	$\overline{\textbf{KV}}$ **[J]**								
1	**A**	10	10	9,0		9,5		0	0
2				8,0		6,5			
3				9,5		8,0			
1	**B**	8	8	7,0		1,0		0	0
2				7,5		1,0			
3				6,5		1,0			
1	**FA [%]**	0	0					100	100
2									
3									
	$\overline{\textbf{FA}}$ **[%]**	0	0			90		100	100

* *Laboratory temperature*

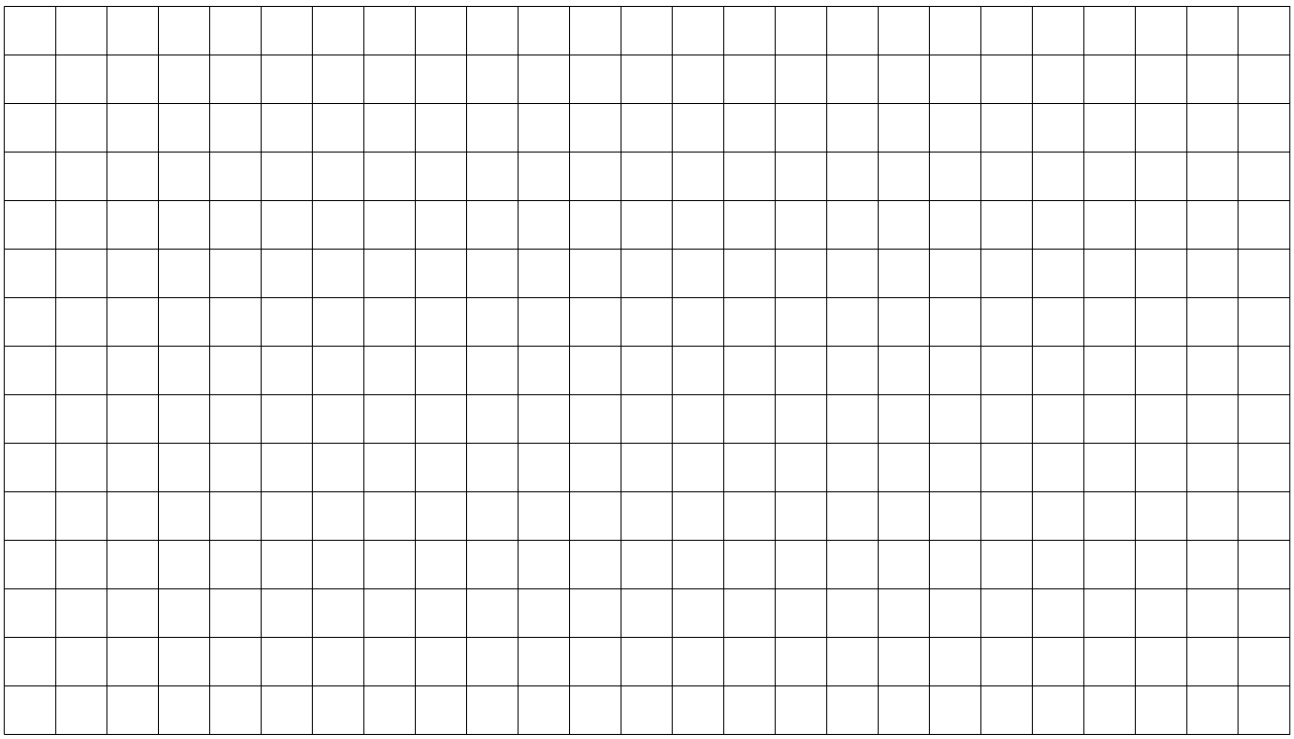

Fig. 1*: Dependence of absorbed energy **KV** and **FA** on testing temperature **T***

Transition temperatures:

	KV [J]	FA [%]
T_p [°C]		

Is this material suitable for a construction of a dynamically stressed part which is working at -40°C? Why?

Conclusion: