Values of X, Y and e coefficients for radial bearings

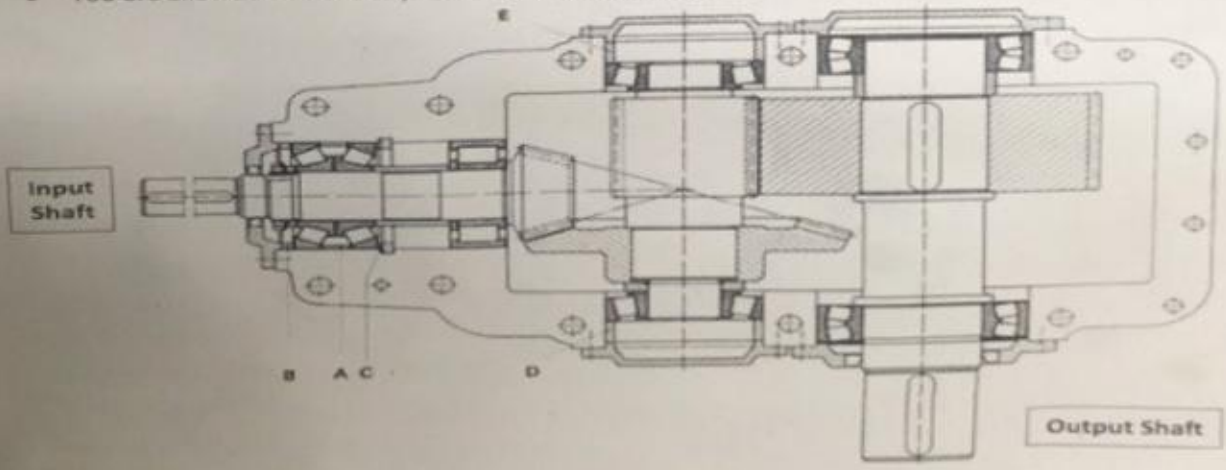
Bearing type	F_a/C_o	Single-row bearings				Double-row bearings				e
		$F_a/F_r \le e$		$F_a/F_r > e$		$F_a/F_r \le e$		$F_a/F_r > e$		
		X	Y	X	Y	X	Y	X	Y	
Angular contact ball bearings	0,178				1,47		1,65		2,39	0,38
	0,357				1,40		1,57		2,28	0,40
	0,714				1,30		1,46		2,11	0,43
	1,07				1.23		1,38		2,00	0,46
	1,43	1	0	0,44	1,19	1	1,34	0,72	1.93	0,47
	2,14				1,12		1,26		1.82	0.50
	3,57				1,02		1,14		1,66	0,55
	5,35				1		1,12		1,63	0,56
	7,14				1,00		1,12		1.63	0,56

Question (3): [10 Marks]

The sketch shows the layout of double stages reducer. The first stage is bevel gears stage while the second is spur gears stage. **You are required to make a well proportional construction drawing for the output shaft only.** This drawing mainly includes output shaft, bearings, methods of bearing fixations, spur gear, frame, etc.

Note:

- The minimum output shaft diameter is 25 mm.
- V-belt pulley of 150 mm diameter with one belt (20×12.5 mm size) should be indicated (not exist in the sketch).
- Type of bearings must be mentioned.
- You are allowed to make any reasonable modifications.



END of Exam, Good Luck

Examination Committee: Dr. Tamer Elnady, Dr. Ayman Abd El_Wahab

Exam. Date : 6th of June, 2022