Dedan Kimathi University of Technology
University Examinations 2020/2021

Fourth Year Second Semester for the Degree of Master of Science in Machine Tool Design & Manufacturing

EMM 6103 Machine Tools & Mold Design

DATE: 10/8/2021 4 Hours TIME: 10.00am

Instructions: *Attempt Question ONE and any other TWO Questions. Your computer MUST have a functioning CAD software*

Question One (50 Marks)

Using any CAD software of your choice, design a mold of the following two components. Generate a parts list, working drawings and an exploded assembly of the mold. [Use your own scale of the component]

Question Two (20 Marks)

Injection molding is a processing widely used in converting, processing and forming raw materials (thermoplastic) into specific configurations. An injection molding machine consists of various components. With aid of a detailed sketch, describe these components citing their technical requirements for achievement of the thermoplastic processing.

Question Three (20 Marks)

a) With help of a clear sketch, describe the construction and operation of a typical mold for an injection molding machine. [10 Marks]
b) Describe the three types of molds (and their applications) used in the injection molding industry today. [5 Marks]

c) A batch of 15 cm diameter disks with a thickness of 4 mm are to be molded from ABS in a six-cavity mold. Estimate the size of injection molding machine required. The approximate increase in area due to runner system is 15% and the recommended pressure for ABS injection is 1000 bars. (Use Table 3(c)) [5 Marks]

Table 3(c): Injection molding machines and their specifications

Clamping force (kN)	Shot size (cc)	Operating cost ($/h)	Dry cycle times (s)	Maximum clamp stroke (cm)	Driving power (kW)
300	34	28	1.7	20	5.5
500	85	30	1.9	23	7.5
800	201	33	3.3	32	18.5
1100	286	36	3.9	37	22.0
1600	286	41	3.6	42	22.0
5000	2290	74	6.1	70	63.0
8500	3636	108	8.6	85	90.0

Question Four (20 Marks)

Discuss the significant features to incorporate/consider into your mold design when developing a mold for each of following injection molded components.

(a)

(b)

(c)