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BTECH
(SEM. VI) THEORY EXAMINATION 2025-26
TOOL DESIGN

TIME: 3 HRS

M.MARKS: 70

Note: Attempt all Sections. In case of any missing data; choose suitably.

SECTION A

1. Attempt all questions in brief.

02 x 7 = 14

Q no	Question	CO	Level
a.	Differentiate between single-point and multi-point cutting tool.	1	K2
b.	What is throwaway insert?	1	K1
c.	State the difference between jig and fixture.	2	K2
d.	Define the role of tolerance and clearance.	2	K2
e.	What is simple piercing and blanking?	3	K1
f.	Explain ejection moulding machine and its elements.	4	K2
g.	Discuss the role of antifriction guideways.	5	K2

SECTION B

2. Attempt any three of the following:

07 x 3 = 21

Q no	Question	CO	Level
a.	Design a single point lathe tool and explain its various angles and parameters.	1	K2
b.	Discuss the economic considerations and standard elements used in jig design.	2	K2
c.	Illustrate the working and applications of cam actuated and precision lamination dies used in sheet metal operations.	3	K2
d.	Explain the ejection mechanism and die locking mechanism.	4	K2
e.	Explain the working and design of speed gear boxes and feed gear boxes in machine tools.	5	K2

SECTION C

3. Attempt any one part of the following:

07 x 1 = 07

Q no	Question	CO	Level
a.	A tangential cutting force of 2500 N acts on a tool with a shank overhang of 50 mm. If the allowable bending stress is 150 MPa, calculate the dimensions of a rectangular shank assuming the height is twice the width ($h = 2b$).	1	K3
b.	Briefly explain the design of a drill bit, including all the necessary parameter and discuss their effect on drilling performance.	1	K2



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4. Attempt any *one* part of the following:

07 x 1 = 07

Q no	Question	CO	Level
a.	Explain the principles of location and clamping of a workpiece in jigs and fixtures.	2	K2
b.	Define the role of guiding and indexing elements in jigs and fixtures, and discuss their importance in ensuring accuracy.	2	K2

5. Attempt any *one* part of the following:

07 x 1 = 07

Q no	Question	CO	Level
a.	Explain in detail the design and working of progressive and compound dies.	3	K2
b.	Discuss spring back effect and spring back factor. Also explain the methods of correction to overcome spring back.	3	K2

6. Attempt any *one* part of the following:

07 x 1 = 07

Q no	Question	CO	Level
a.	Briefly explain the following: a. Compression dies b. Extrusion dies c. Transfer dies.	4	K2
b.	Explain the parameters influencing the design of runner and gate systems in die casting and discuss their importance.	4	K2

7. Attempt any *one* part of the following:

07 x 1 = 07

Q no	Question	CO	Level
a.	Explain the causes and effects of vibration in machine tools and discuss the role of lubrication in improving machine tool performance.	5	K2
b.	Describe the kinematics of machine tools and discuss the various methods of motion transmission used in machine tools.	5	K2