Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

(A constituent unit of MAHE, Manipal)

VI SEMESTER B. TECH (MECHANICAL/IP ENGG.) END SEMESTER EXAMINATIONS, JUNE 2019

SUBJECT: DESIGN FOR MANUFACTURE AND ASSEMBLY

[MME 4001]

REVISED CREDIT SYSTEM

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer **ALL** the questions.
- Missing data may be suitably assumed.

1A.	List the different steps in the planning for consumption phase	**3**
1B.	Describe the economic & practical considerations in material selection.	**2**
1C.	Analyze the various steps in the third phase of morphology of design process.	**5**
2A.	Explain any 6 design considerations and recommendations for investment casting process with neat sketches.	**3**
2B.	Answer the following pertaining to sand casting process and support your answers with neat sketches a) Why odd number of spokes are recommended in cast wheels? b) What to do when a hole is to be placed in high stress areas?	**2**
2C.	What are the advantages of applying DFMA during product design and also explain any 8 reasons for not implementing it.	**5**
3A.	Answer the following pertaining to turning process and support your answers with neat sketches a) What will happen if a component is chuck-clamped on parting line? b) Why tool clearances needs to be provided while facing shoulders/perpendicular surfaces? c) How turning burrs can be avoided on cast parts?	**3**
3B.	Apply knowledge of DFM pertaining to drilling process with neat sketches in following cases a) Hole aspect ratio b) Blind holes followed by reaming c) Holes close to workpiece surface (perpendicular).	**3**
3C.	List the various tolerances to be considered in forging die design.	**4**
4A.	Explain the effect of shrinkage in injection moulding with neat sketches.	**3**
4B.	Explain design considerations for surface grinding with neat sketches.	**2**

4C.	Answer the following pertaining to die casting process and support your answers with neat sketches a) How to improve hole design to avoid sliding cores? b) Why countersink must be provided on both sides of holes? Give any 3 ways of strengthening an insert.	**5**
5A.	Explain any 3 design guidelines for part handling with neat sketches	**3**
5B.	Explain the following hole considerations in injection moulded components with neat sketches a) Distance between two adjacent holes and side wall b) Distance of hole from edge.	**2**
5C.	When does “undercut” issue arises in powder metallurgy products. How to solve this issue? Provide 3 examples with neat sketch	**3**
5D.	A sheet metal of thickness 2mm needs to be pierced and tapped for threading it with M6 (Major diameter = 6mm) bolt. Will this securely fasten the M6 bolt? Justify your answer.	**2**