Reg. No. | | | | | | | | | | |

B.E / B.Tech (FT) END SEMESTER EXAMINATIONS – APRIL / MAY 2019

Common to Manufacturing and Mechanical Engineering
Seventh Semester

ME 8073 DESIGN FOR MANUFACTURING

Max. Time: 3 hours | Answer all questions | Max. Marks: 100

(R2012)

PART – A (10 x 2 = 20 marks)

1. What is Taguchi quality loss function?
2. What is meant by designer's tool kit?
3. What are the values of the following surface finish symbols: N1 to N8.
4. Define MMC. When it is used?
5. What are the uses of parting lines in casting?
6. Draw the welding symbol for Fillet and Flat Groove.
7. What are the uses of datum system?
8. What are the applications of automated assembly?
9. What are functional gauges?
10. What is meant by centrality analysis?

PART – B (5 x 16 = 80 marks)

11a. The bearing housing shown in Figure – 11a below has to be manufactured and the process planner has been given the detail drawing for the part. The general tolerance is ±0.5. Carry out the geometric analysis for the part.

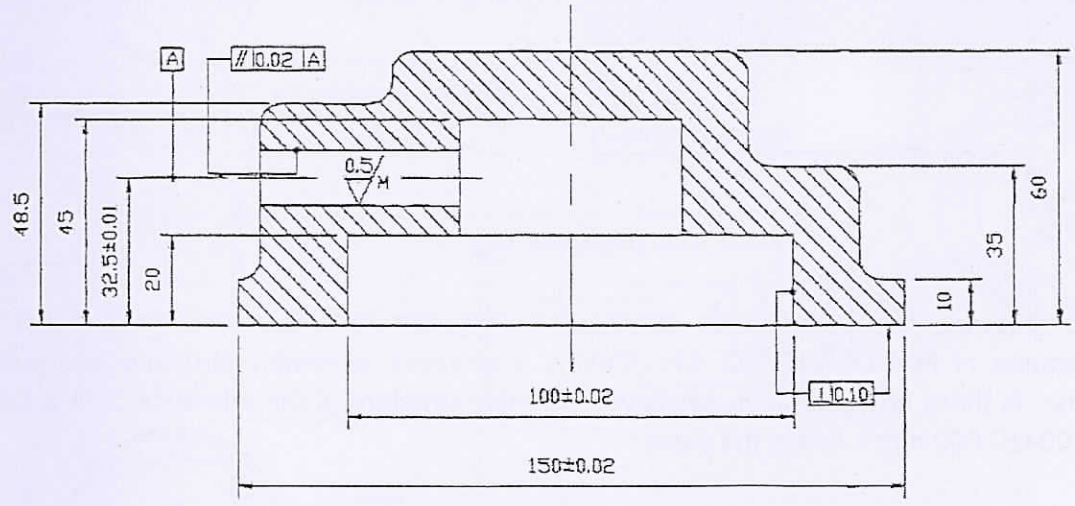

Figure – 11a.

12a. Discuss the following robustness assessment methods with suitable examples:

(i) Best Case – Worst Case Method. (ii) Minimax Regret Method.

(OR)

12b. Describe the development of modular design with the following criteria with suitable examples and diagram:

(i) Minimizing part variations. (ii) Multi-functional / multi-use.

13a. Discuss the design considerations to be used for the following in casting with examples and diagrams.

(i) Parting line. (ii) Core.

(OR)

13b. Given in Figure – 13b is a cast of Swing Bracket. Redesign the Swing Bracket for welding process. Neatly sketch an isometric view and or multi-view of the welded Swing Bracket with necessary details of the welding design recommendation.

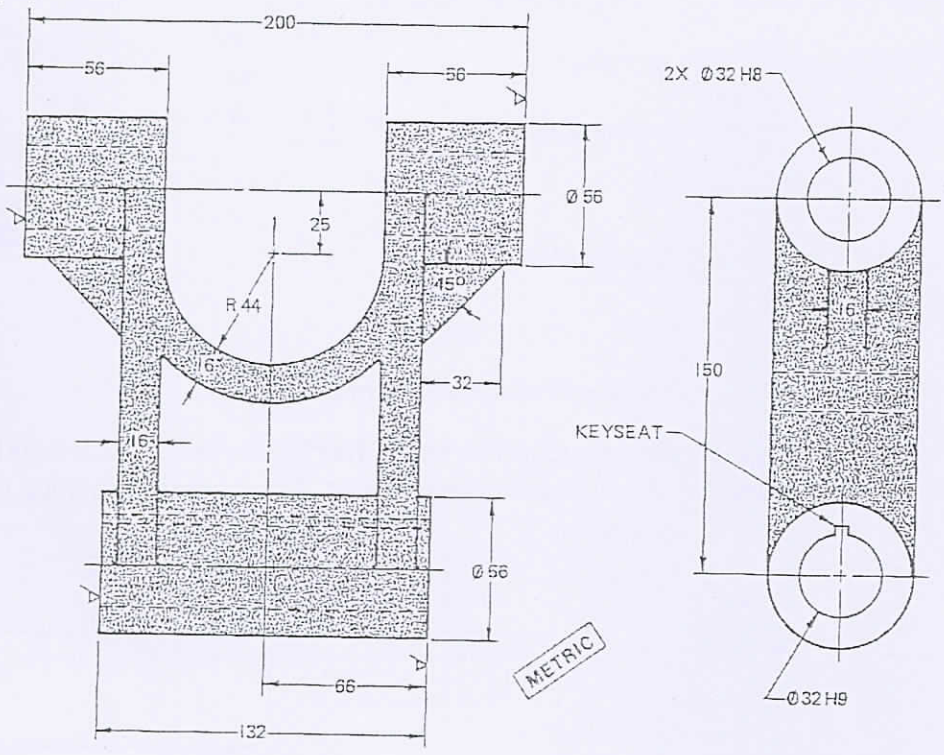

Figure – 13b.

14a. The following two components as shown in Figure – 14a are to be assembled with a tolerance of fit +0.002±0.002 mm. Design a selective assembly structure and justify the same. Is there any change in selective assembly structure, if the tolerance of fit is set to be +0.004±0.002 mm? Justify the same.

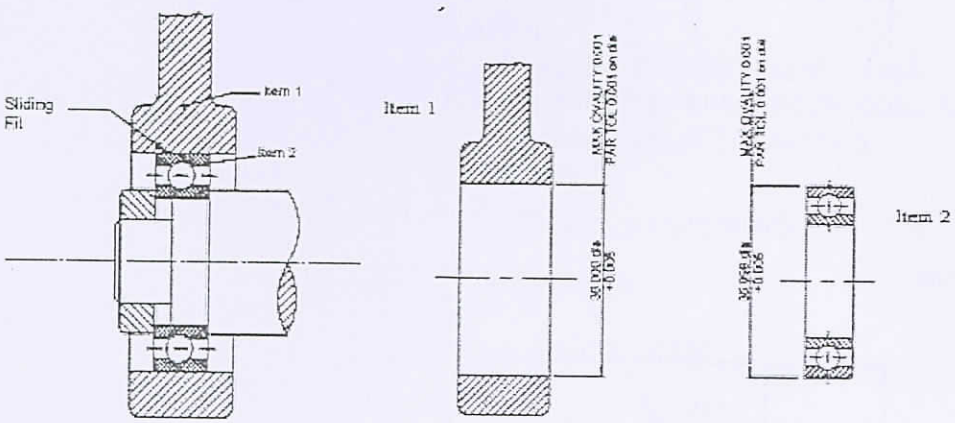

Figure – 14a

(OR)

14b. Figure – 14b shows a part with assigned dimensions and tolerances. Apply the Worst Case Arithematic method to calculate the tolerance information for the axial dimension design function F of the outside surface shown. All dimensions are in millimeters.

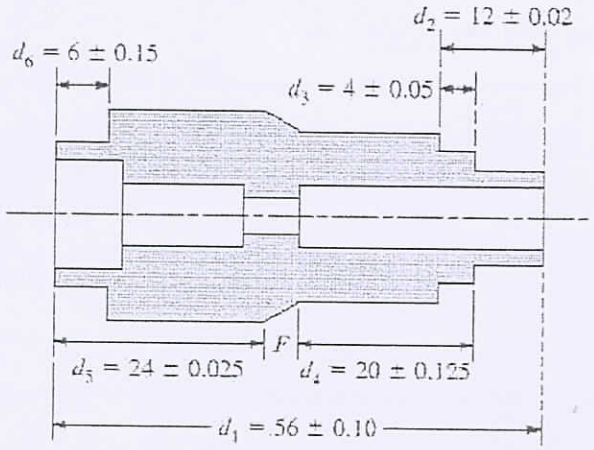

Figure – 14b

15a. For the component shown in Figure – 15a, Prepare a process diagram for different operations in sequence for the component. The billet used is 180 in length X ø 100 mm.

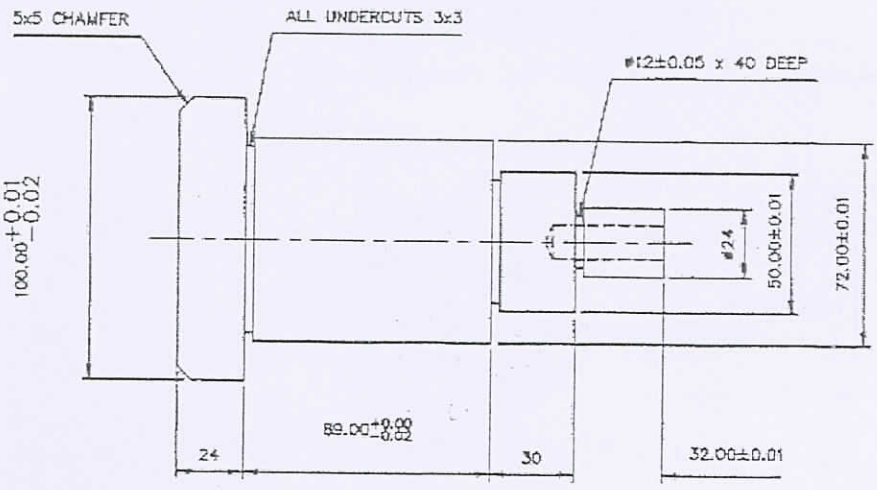

Figure – 15a.

(OR)

15b. Complete paper layout gauging for the part shown in Figure – 15b with the help of Table – 15b.

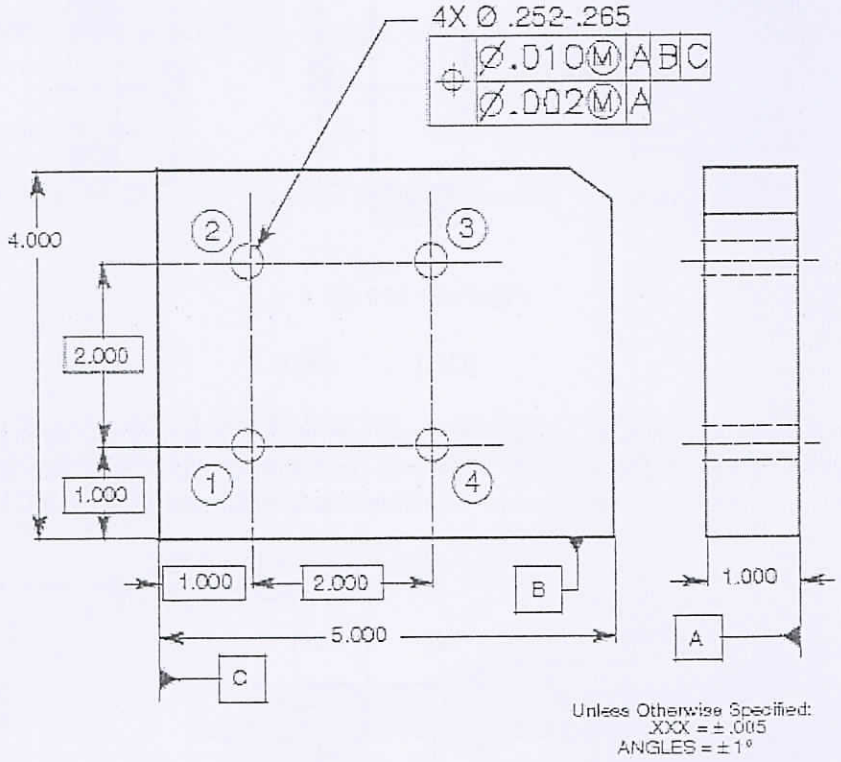

Figure – 15b.

Table – 15b.

Feature number	Feature location from datum C X-axis	Feature location from datum B Y-axis	Feature size	Departure from MMC (bonus)	Datum-to-pattern tolerance zone size	Feature-to-feature tolerance zone size
1	.997	1.003	Ø.256	.004	Ø.014	Ø.006
2	1.004	3.004	Ø.258	.006	Ø.016	Ø.008
3	3.006	2.998	Ø.260	.008	Ø.018	Ø.010
4	3.002	.998	Ø.254	.002	Ø.012	Ø.004