CBCS SCHEME

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18ME731

Seventh Semester B.E. Degree Examination, Jan./Feb. 2023
Design for Manufacturing

Time: 3 hrs. Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1 a. Explain the guidelines used in design for manufacturing. **(10 Marks)**

b. State the benefits of implementing DFM for an industry. **(10 Marks)**

OR

2 a. A design engineer is working on material selection for a solid cylindrical tie rod of cross-sectional area "A" and length "L" to carry a tensile load "P" with factor of safety "S". Apply "Cost per unit property" method to explain the process of material selection and performance index. **(11 Marks)**

b. Describe the need for implementing DFM in any industry. **(09 Marks)**

Module-2

3 a. Define position tolerancing and explain how to achieve Bonus tolerance for a given true position. **(09 Marks)**

b. Investigate whether the hole feature shown in Fig.Q.3(b) satisfies the applied position tolerance of 0.008. **(11 Marks)**

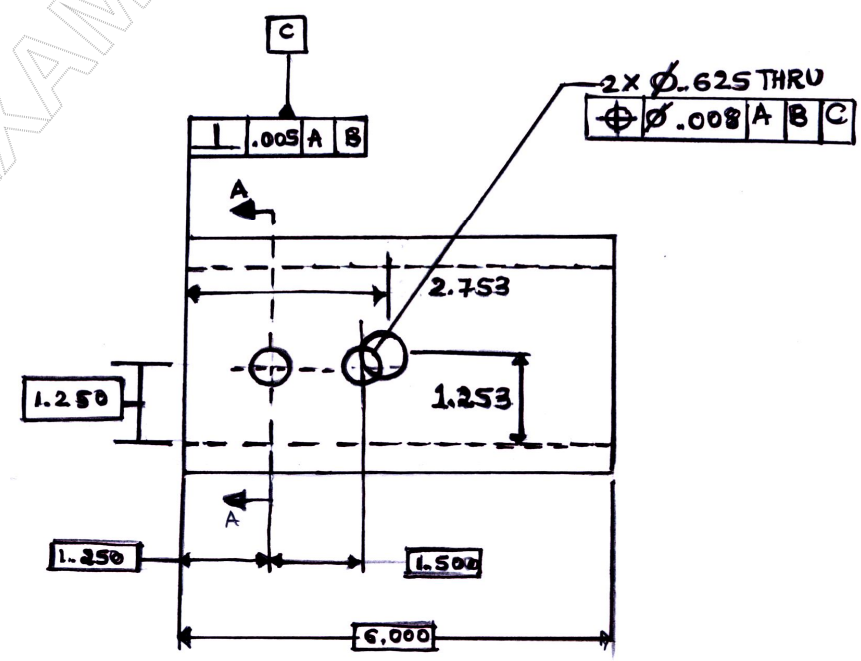

Fig.Q.3(b)

OR

4 a. Explain with an example the "floating fastener" and "fixed fastener" methods used in calculating true position tolerances. **(10 Marks)**

b. With the help of appropriate diagrams, describe maximum material condition and least material condition applied under GD&T. **(10 Marks)**

Module-3

5 a. Considering the shaft shown in Fig.Q.5(a), explain how progressive dimensioning from common reference will minimize the cumulative effect of tolerance built-up. **(10 Marks)**

$L_A = 30^{+0.02}_{-0.01}$ mm, $L_B = 20^{+0.02}_{-0.01}$ mm, and $L_C = 10^{+0.02}_{-0.01}$ mm

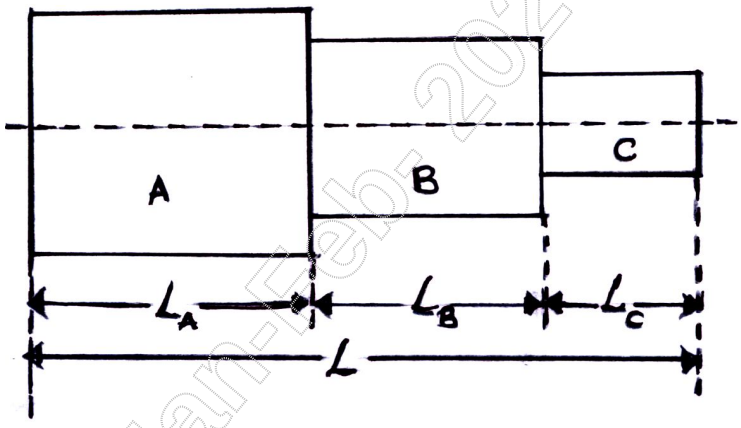

Fig.Q.5(a)

b. Change the datum for the drawing of a stud from bottom of groove to right hand end face (see Fig.Q.5(b)). **(10 Marks)**

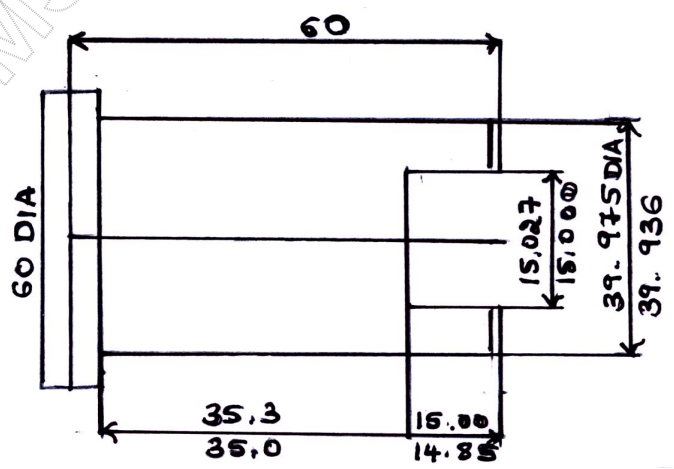

Fig.Q.5(b)

OR

6 a. With the aid of suitable sketches, explain the design consideration for machining processes. **(10 Marks)**

b. With the aid of suitable examples, explain the "reduction of machined areas" as design consideration for machining. **(10 Marks)**

Module-4

7 a. With suitable diagrams explain various possible and probable parting line for the cast part shown in Fig.Q.7(a). **(12 Marks)**

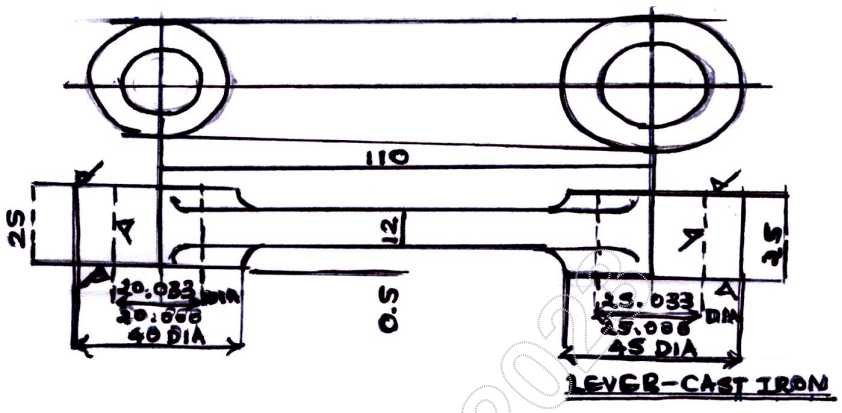

Fig.Q.7(a)

b. With suitable examples, explain cast holes, cored holes and machined holes. **(08 Marks)**

OR

8 a. Write note on welding distortion and propose the methods to minimize the distortion. **(08 Marks)**

b. Explain the design recommendations for spot Weldments with suitable sketches. **(12 Marks)**

Module-5

9 a. Explain following design consideration for injection moulded parts:
i) Ribs and Gussets
ii) Draft Angle
iii) Support for Bosses. **(12 Marks)**

b. With the aid of suitable diagram describe design consideration for power metallurgy parts. **(08 Marks)**

OR

10 a. Explain the material selection importance for injection moulding as one of design requirement. **(08 Marks)**

b. Write note on following design consideration for forging:
i) Draft angle
ii) Fillet and Radii
iii) Ribs and thin sections. **(12 Marks)**

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