CBCS SCHEME

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18MDE31

Third Semester M.Tech. Degree Examination, Dec.2019/Jan.2020
Design for Manufacture and Assembly

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 effects of a manufacturing process on design. **(10 Marks)**

b. Explain with a block diagram, the effect of Material properties on design. **(10 Marks)**

OR

2 a. The material of a solid cylindrical tie rod of cross sectional area "A" and the length "L" is to be selected for carrying a tensile load "P" with FOS "S". Explain the process of material selection as per cost per unit property method. **(10 Marks)**

b. Explain the following:
i) Process capability ii) Geometric tolerance with their symbol. **(10 Marks)**

Module-2

3 a. Sketch and explain the selective assembly Model-I. **(10 Marks)**

b. The plate shown in Fig.Q.3(b) is to have a maximum axial freedom of movement of 10.15mm and a minimum axial freedom of moment 9.85mm. Using the nominal sizes specified draw the three components and show only the appropriate limits to achieve the required axial freedom of moment. **(10 Marks)**

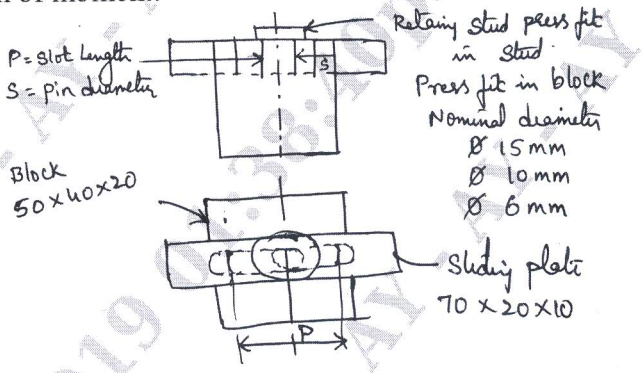

Fig.Q.3(b)

OR

4 a. Explain the functional and manufacturing datum by taking a suitable example and give the procedure for changing the Datum. **(10 Marks)**

b. For the component as shown in Fig.Q.4(b). Mention the sequences of the functional and Manufacturing process suggest suitably Manufacturing dimensions and redesign the component for manufacture. **(10 Marks)**

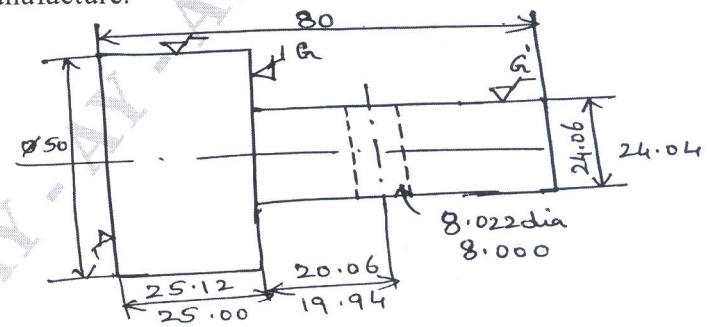

Fig.Q.4(b)

Module-3

5 a. Explain with sketch the specific design fracture to be provided for the case of Machining.
   i) External screw threads
   ii) Internal screw threads
   iii) Blind reamed hole
   iv) Blind bored holes. **(12 Marks)**

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

OR

6 a. Explain the following with example.
   i) Drill entry and run out
   ii) Reduction of Machined area. **(08 Marks)**

   b. Explain the following with example.
   i) Dowels and doweling procedure
   ii) Principle of separation
   iii) Internal and External grinding of cylindrical surfaces
   iv) Keys ways Sunken and run out. **(12 Marks)**

Module-4

7 a. Explain fixed fastener and floating fastener. **(10 Marks)**

   b. Explain the following:
   i) Virtual size concept
   ii) Maximum Material Condition. **(10 Marks)**

OR

8 a. Define true position tolerance. Differentiate between true position tolerance systems coordinate tolerance system with an example. **(10 Marks)**

   b. Explain the principles underlying "Zero true position tolerance and bring out its merits". **(10 Marks)**

Module-5

9 a. Explain the Taylor's principle of gauge design. **(10 Marks)**

   b. A ϕ 25H8f7 fit is to be checked. The limit sizes for the hole are 25.033 and 25.000 while the limit sizes for the shaft are 24.980mm and 24.959mm respectively. Taking the gauge makers tolerance to be 10% of the work tolerance design a plug gauge and a snap gauge. **(10 Marks)**

OR

10 a. Sketch and explain the different types of limit or holes gauges used for gauging internal diameter. **(10 Marks)**

   b. Design a suitable plug gauge and ring gauge for controlling dimensions of hole and shaft having ϕ25H7/f8 find $\phi 25H7 = \frac{25.21}{25.00}$ $\phi 25f8 = \frac{24.98}{24.95}$ **(10 Marks)**

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