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# B.M.S. College of Engineering, Bengaluru-560019

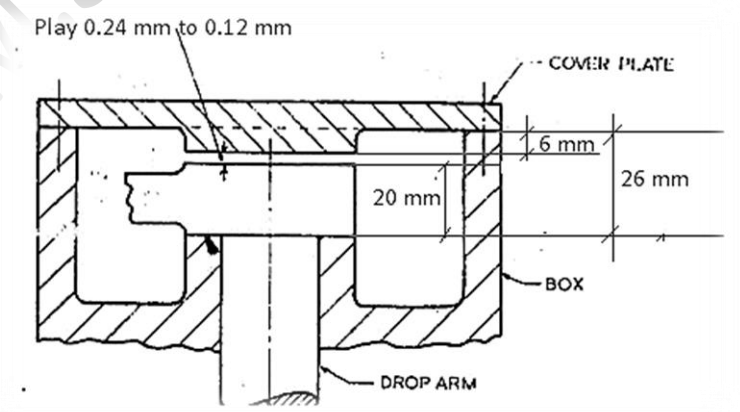
**Autonomous Institute Affiliated to VTU**

## July 2023 Semester End Main Examinations

**Programme: B.E.** **Semester: VI**
**Branch: Industrial Engineering and Management** **Duration: 3 hrs.**
**Course Code: 20IM6DEDFM** **Max Marks: 100**
**Course: Design for Manufacturability** **Date: 17.07.2023**

**Instructions**: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

**Important Note:** Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

| | | UNIT - I | CO | PO | Marks |
|---|---|---|---|---|---|
| 1 | a) | What are the reasons for non-implementation of DFM / DFA? | *CO1* | - | **10** |
| | b) | With the help of a Block diagram, elucidate the typical steps in a DFMA Study using software. | *CO2* | *PO1* | **10** |
| | | **UNIT - II** | | | |
| 2 | a) | What are the types of drawings required for any engineering component? Explain.<br>Also differentiate between<br>i) Functional and Non-Functional Dimensions<br>ii) Tolerance and Limits | *CO1* | - | **10** |
| | b) | An Automobile Steering Box is shown below, where the drop arm is to have a vertical movement of (0.24 mm to 0.12 mm). In the interest of achieving easier machining tolerances, show the two conditions of assembly, with neat diagrams. Include all the relevant component conditions.<br>  | *CO3* | *PO2* | **10** |
| | | **UNIT - III** | | | |
| 3 | a) | Explain Simplification by amalgamation. | *CO2* | *PO1* | **08** |

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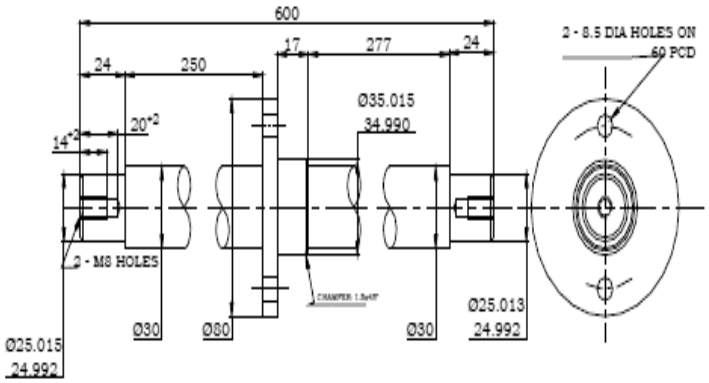
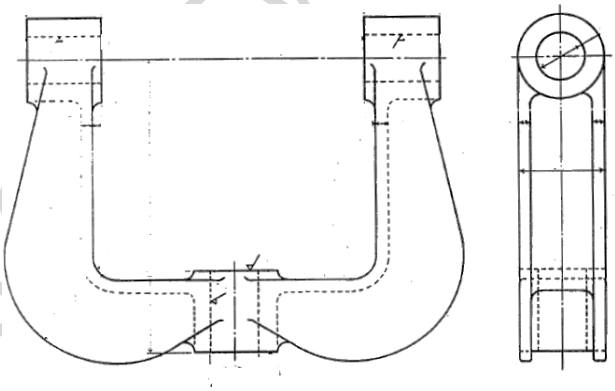
| | | b) | For the component shown in Fig. below (Machine Support Shaft), suggest a design modification to achieve ease of machining. Also, clearly explain the machining procedure for the modified design.<br>  <br> | *CO4* | *PO3* | **12** |
| | | | **OR** | | | |
| | 4 | a) | List and explain the design rules for sand casting. | *CO1* | - | **10** |
| | | b) | For the forked steel lever casting, shown below, indicate the parting line and necessary sand cores. Suggest a design modification that will reduce / eliminate the sand core requirements, while maintaining, as far as possible, the weight of the casting.<br>  | *CO4* | *PO3* | **10** |
| | | | **UNIT - IV** | | | |
| | 5 | a) | Explain how you estimate the moulding cycle time in Injection Moulding. | *CO2* | *PO1* | **10** |
| | | b) | A batch of 15cm diameter disks, with a thickness of 4mm is to be moulded from ABS Plastic. The recommended percentage increase in area due to runner system is 15 % and injection pressure is 1000 bar, with maximum cavity pressure 500 bar. Determine maximum separating force and shot size. | *CO3* | *PO2* | **10** |
| | | | **OR** | | | |

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|---|---|---|---|---|---|---|
| | 6 | a) | Explain with a neat diagram the working of a hot chamber injection moulding machine. | *CO3* | *PO2* | **10** |
| | | b) | Explain how you would select an appropriate press. | *CO1* | *PO* | **10** |
| | | | **UNIT - V** | | | |
| | 7 | | Draw the following GD&T Symbols and explain how they are measured with aid of neat sketches:<br>i) Flatness<br>ii) Cylindricity<br>iii) Run-out<br>iv) Straightness<br>v) Circularity | *CO2* | *PO1* | **20** |

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