Reg.No. \_\_\_\_\_\_\_\_\_\_\_\_

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**End Semester Examination – Nov/Dec – 2018**

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| **Code :** | **17ME3022** | **Duration :** | **3hrs** |
| **Sub. Name :** | **ADVANCED TOOL DESIGN** | **Max. marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

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| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | Define threaded tool components that are to be heat-treated be made from an oil-hard or air-hard tool steel? | CO2 | 15 |
| b. | List the material generally used for cast electrodes? Why? | CO1 | 5 |
| (OR) | | | | |
| 2. | a. | Compared to carbide and high-speed-steel cutting tools, what are the major advantages of cast-alloy cutting tools? | CO2 | 18 |
| b. | Analyze the critical cooling rate of tool steel. | CO1 | 2 |
|  |  |  |  |  |
| 3. |  | For turning hard aluminium alloy on a 15 KW lathe (mechanical efficiency 80%) at a width of cut of 6 mm, a rake angle of 10°, and a cutting speed of 100 m/min, the coefficient of friction was found to be 0.3. The chip thickness was 2 mm. What is your estimate of the material’s shear strength? | CO5 | 20 |
| (OR) | | | | |
| 4. | a. | Examine the important properties of materials from which gauges used in gauge manufacturing increased? | CO3 | 15 |
| b. | Recall the concentric location. Give an example. | CO2 | 5 |
|  |  |  |  |  |
| 5. |  | A machinability rating to be determined for a new work material using to cutting speed for a 60 min tool life as the basis of comparison. For the base material (B1112 steel), test data resulted in Taylor’s tool life equation parameter values of n = 0.29 and C = 500, where speed is in m/min and tool life in a min. For the new material, the parameter values were n = 0.21 and C = 400. These results were obtained using cemented carbide tooling. (a) Compute a machinability rating for the new materials. (b) Suppose the machinability criterion was the cutting speed for 10min tool life. Compute the machinability rating for this case. (c) What do the results of the two calculationsshowabout the difficulties in machinability measurements? | CO4 | 20 |
| (OR) | | | | |
| 6. | a. | Infer the three ways chips are removed from drill jigs? | CO3 | 10 |
| b. | Label the limitations and the advantages of latch clamps? | CO4 | 10 |
|  |  |  |  |  |
| 7. | a. | Identify the common setting distance used on mill-fixture setting gauges? | CO3 | 10 |
| b. | Examine, why the pilot length usually at least 6 mm longer than the punch length? | CO6 | 10 |
| (OR) | | | | |
| 8. | a. | Generally speaking, what is the amount of springback for common materials? | CO2 | 10 |
| b. | Name the materials are generally used to construct the core for surface-cast tools? | CO2 | 10 |
|  | |  |  |  |
|  | | **Compulsory**: |  |  |
| 9. | a. | Examine the lathe chucks used as holding fixtures in N/C machines tools? | CO6 | 16 |
| b. | What tool is used to correct the errors of the swing tool? | CO5 | 4 |