TME- 504

Roll No. | | | | | | | | | | |

Odd Semester Examination 2019-20
B.Tech-Mechanical Engineering (Semester-5th)
MANUFACTURING SCIENCE-II

Time: 3:00 hrs. **Max. Marks: 100**

Total no. of printed pages: 2

Note: All Questions are compulsory.

Q.1 Attempt any four: **4*5 = 20**

a) What do you understand by the term Tool designation or tool signature?
b) Why negative rake angle is normally employed for cutting hard and strong materials?
c) Explain machinability and tool life.
d) With the help of a sketch, show cater wear and flank wear on a cutting tool.
e) Write a short note wear of tool? What are the locations, where wear usually occurs?
f) What are the various types of chips? Under what conditions is each formed

Q.2 Attempt any four: **4*5 = 20**

a) How lathes are classified? Describe in brief the different types of lathe.
b) Derive the Merchant's shear angle relationship $2\phi + \beta - \alpha = \pi/2$, where ϕ is the shear angle, β is the friction angle and α is the rake angle.
c) Explain with a neat sketch what you understand by orthogonal cutting.
d) Derive an expression for optimum value of cutting speed tool life.
e) Explain the classification of automatic lathe.
f) Write a short note on "selection of cutting fluid"

Q.3 Attempt any two: **2*10 = 20**

a) Discuss in brief various parts of Capstan and Turrret lathes.
b) What are the common abrasives used in a grinding wheel? Which abrasive are recommended for grinding (i) medium carbon steel and (ii) brass.
c) During straight turning of a 24 mm diameter steel bar at 300 r.p.m. with an H.S.S. tool, a tool life of 9 min. was obtained. When the same bar was turned at 250 r.p.m., the tool life increased to 48.5 min. What will be the tool life at a speed of 280 r.p.m.?

P.T.O

Q.4 Attempt any two: **2*10 = 20**

a) Explain TIG and MIG welding process and enumerate its advantages.

b) What are the various welding defects? Give the reasons and suggest the remedies.

c) The following data relate to an orthogonal turning process:

Chip thickness = 0.62 mm

Feed = 0.2 mm/rev

Rake angle = 15^0

(i) Calculate the cutting ratio and chip reduction co – efficient.

(ii) Calculate shear angle.

(iii) Calculate the dynamic shear strain involved in the deformation process.

Q.5 Attempt any two: **2*10 = 20**

a) Write a short note on: lapping, broaching process, Super finishing.

b) Explain with a neat sketch diagram difference between resistance and friction welding.

c) Explain milling process. What are the various work holding devices used in milling. Explain their relative applications and disadvantages.
