

Roll No: -----

**UNIVERSITY OF PETROLEUM
AND ENERGY STUDIES**



End Semester Examination – April, 2017

Program/course: B. Tech ET-IPR
Subject: Metrology and Manufacturing
Code : ADEG 206
No. of page/s: 2

Semester – XII
Max. Marks : 100
Duration : 3 Hrs

SECTION A [60 Marks]

Note: Attempt all questions. All question carry equal marks. Be brief and specific.

1. Discuss the effects of following machining parameters on cutting forces
 - a. Cutting Speed
 - b. Feed
 - c. Depth of Cut

2. Explain quick return mechanism with neat sketch.

3. Diameter of a shaft needs to be reduced from 32 mm to 20 mm through turning operation. The feed used is 0.2 mm/revolution and spindle is rotating at 500 rpm. The length to be turned is 200 mm. calculate machining time required if the maximum depth of cut in single pass is 2 mm.

4. Write short notes on:
 - a) Different types of forging.
 - b) TIG welding.

5. The thickness of a plate is reduced from 30 mm to 10 mm by successive cold rolling passes using identical rolls of diameter 600 mm. If the coefficient of the friction between the rolls & workpiece is 0.1, calculate the minimum number of passes required.

SECTION B [40 Marks]

Note: Attempt all questions. All question carry equal marks. Be brief and specific.

6. **a)** Explain the various shrinkages which occur during solidification of casting. How they are compensated?
b) Explain double shrinkage allowance. Design the wooden pattern for making 500 components of Aluminium of side 50 mm using a pattern of cast iron which will be ultimately made using wooden pattern.
Given: shrinkage values for Al are 13mm/m & for Cast iron, it is 10 mm/m.
c) What is the ideal shape of the sprue? Why it is made tapered?
d) Differentiate between Draft allowance & shake allowance?
7. (a) Discuss the effect of process parameter of Abrasive Water Jet Machining.
(b) Explain R-C circuit for spark generation in Electric Discharge Machining

Or

- (a) Explain material removal through Electron Beam Machining.
- (b) Differentiate between Abrasive Jet Machining and Water Jet Machining.