

COLLEGE OF ENGINEERING, PUNE.
(AN AUTONOMOUS INSTITUTE OF GOVT. OF MAHARASHTRA)

END SEMESTER EXAMINATION

(PE-310) PROCESS PLANNING AND STATISTICAL PROCESS CONTROL

Programme: T. Y. B. TECH. (PRODUCTION S/W)

Year: 2012-13

Duration: 3 hr

Semester: **II**

Max. Marks: 50

Instructions:

1. All questions are compulsory.
2. All questions carry equal marks
3. Draw neat sketches wherever required.
4. Use of Non-programmable calculator is permitted

- Q.1 Attempt any two:**
- a) State and explain the different functions of process engineer. 5
 - b) State different types of functional surfaces which are to be identified in part print analysis. Also explain the importance of them. 5
 - c) Explain the following terms 5
 - i. Flatness
 - ii. Parallelism
 - iii. Straightness
 - iv. Squareness
 - v. Symmetry
- Q.2 Attempt any two:**
- a) State and explain purpose and utilization of tolerance chart. 5
A rectangular workpiece having thickness 50 (+0.005, -0.009) is thermal sprayed and 25 ± 1 microns material added on top and bottom surfaces, find the resultant thickness of the plate.
 - b) State and explain with neat examples the effect of centreline and locator spacing on the dimensional control. 5
 - c) What is meant by alternate location theory? Explain with suitable examples 5
- Q.3 Attempt any two:**
- a) What do you mean by major process operations? Classify major process operations and explain them. 5
 - b) Explain with neat flow chart the procedure to determine the manufacturing sequence for the process. 5
 - c) What is meant by process picture? State the information included in the process picture with neat example. 5
- Q.4 Attempt any two:**
- a) Write short note on following 5
 - i. Commercial tooling
 - ii. Regular tooling
 - b) Explain briefly the term 'Economics of metal cutting.' 5
For metal machining following information is available
Tool change time = 10 min, Tool regrind time = 8 min, Tool depreciation per regrind = Re. 1, Machining cost = Rs. 25 per hr, n = 0.25 K = 150. Calculate the optimum cutting speed.

- c) Write short note on following
- i. Design of experiments
 - ii. Type I and Type II errors

Q.5 Attempt any two:

- a) The following table gives the ages of operators and points earned by them for good performance. Compute the correlation coefficient and test for its significance. 5

Age	23	27	28	29	30	31	33	38	36	39
Points	18	22	23	24	25	26	28	29	30	32

- b) State the characteristics and importance of normal distribution. 5
 If the diameter of the ball bearings are normally distributed with mean 61.40 mm and standard deviation 0.25 mm, determine the percentage of bearing with diameters i) between 61.0 and 61.8 mm in inclusive ii) greater than 61.7 mm iii) less than 60.8 mm

- c) The following data give the experience of machine operators and their performance ratings as given by the number of good parts turned out per 100 pieces. Calculate the regression line of performance rating on experience and estimate the probable performance if an operator has 7 years of experience. 5

Operator	1	2	3	4	5	6	7	8
Experience	16	12	18	4	3	10	5	12
Performance Rating	87	88	89	68	78	80	75	83
