VRK/KS/14/2813/3353

Faculty of Engineering & Technology
Fifth Semester B.E. (Mech.) / Fourth Semester
B.E.P.T. (Mech.) Examination
PRODUCTION TECHNOLOGY—I (S—14)
Sections—A & B

Time—Three Hours] [Maximum Marks—80

INSTRUCTIONS TO CANDIDATES

(1) All questions carry marks as indicated.

(2) Answer **THREE** questions from Section A and **THREE** questions from Section B.

(3) Due credit will be given to neatness and adequate dimensions.

(4) Assume suitable data wherever necessary.

(5) Illustrate your answers wherever necessary with the help of neat sketches.

(6) Use of design data book and QC, Normal distribution chart is permitted.

SECTION—A

1. (a) What do you mean by process planning ? What are the various factors considered in process planning ? 5

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(b) A company has given following information on its capacity, sales and costs as follows :

(i) Current capacity = 1,00,000 units

(ii) At current level of operations, its margin of sales is 5% of its break even point

(iii) Contribution margin p/v ratio = 2.5%

(iv) The unutilized capacity at present = 10,000 units

(v) Sales price is Rs. 40 per unit

Find :

(i) Break Even Point in sales volume

(ii) Fixed cost

(iii) Variable costs per unit

(iv) Margin of safety

If fixed costs are decreased by Rs. 1,80,000/-, to what extent can the price be reached to maintain the total profit at current level ? 8

2. (a) Design a general type GO and NOGO gauge for $50H_8d_g$ shaft and hole pair. 10

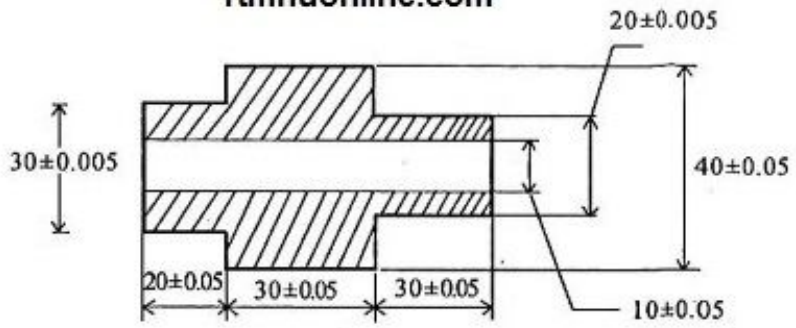
(b) Discuss Taylor's principle for limit gauges. 3

3. (a) Draw neat sketches of various types of fit and explain maximum and minimum allowances and deviations.

7

(b) Explain constant chord method for gear tooth measurement. 6

4. A part to be manufactured is shown in figure :



(i) Draw machine selection chart and select raw material size.

(ii) Prepare process planning chart.

(iii) Prepare Tolerance chart along longitudinal direction.

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5. (a) Discuss with neat sketch, pneumatic comparator giving its advantages, limitations and applications. 7

(b) Explain how straightness can be measured with the help of Auto-collimater. How least square method is used to determine straightness ? 7

SECTION—B

6. (a) Discuss various quality functions. What are main objectives of quality control ? 6

(b) A subgroup of 5 items each from a manufacturing lot are selected at Random. A certain characteristics, is

measured and $\overline{X}$ and R values computed. After 20 sub-groups, it is found that $\sum \overline{X} = 2825.6$ and $\sum \overline{R} = 7.1$. If the specifications limits are 14.40 ± 0.4 and if the process is in statistical control, what conclusion can you draw about the ability of the process to produce items within specifications ? 7

7. (a) What are the various factors on which selection of subgroup size depends ? 6

(b) Discuss control chart for attributes. How it differs from control chart for variables. 7

8. (a) Explain the effect of lot size and sample size on O.C. curve. Discuss average sample number. 7

(b) Discuss sampling inspection. State its advantages and limitations. 6

9. (a) Discuss significance of Average Outgoing Quality Limit (AOQL). How this limit helps in minimizing the acceptance of bad quality items ? 6

(b) Explain double sampling plan with suitable example. Also draw O.C. curve and show different zones. 7

10. (a) Explain essential components and objectives of TQM. 5

(b) Define quality circle. What are the objectives of quality circle. 5

(c) Discuss quality audit. What are its advantages ? 4