B.E. Mechanical Engineering Fifth Semester ME502 - Metrology and Quality Control

| P. F Tin | Pages : ne : Th | 2 ree F | Hours $* 1 2 9 6 *$ | GUG/W/18/1647 Max. Marks : 80 |
|-------------|--------------------|---|--|--|
| | Note | es : | All questions carry equal marks. Answer Q. 1 or Q. 2, Q. 3 or Q. 4, Q. 5 or Q. 6, Q. 7 or Q. Due credit will be given to neatness and adequate dimensional distribution of the construction lines. Retain the construction lines. Illustrate your answers wherever necessary with the help of Use of slide rule, Logarithmic tables, Steam tables, Mollie instruments, Thermodynamic tables for moist air, Psychrotic Refrigeration charts is permitted. Use of non-programmable calculator is permitted. | 8, Q. 9 or Q. 10. ons. f neat sketches. r's chart, Drawing netric charts and |
| 1. | a) | Ex | plain the following : | 8 |
| | | i) | Critical product | |
| | | iii) | Auxiliary operation | |
| | | iv) | Critical operation | |
| | b) | Wl | hat do you mean by tolerance ? State its purpose. Explain unilate | ral system of tolerance. 8 |
| | | | OR | |
| 2. | a) | a) Design general type of Go-No Go gauges for 50 H ₇ d ₈ pair. Assume wear allowance as 10% of gauge tolerance. | | wear allowance as 8 |
| | b) | Ex | plain shaft basis system and shaft basis system with detailed sket | ch. 8 |
| 3. | a) | Wl me | hat do you mean by mechanical comparator ? How optical compa echanical comparator ? | urators are better than 8 |
| | b) | Ex | plain constant chord method for gear tooth measurement. | 8 |
| | | | OR | |
| 4. | a) | Ex | plain two wire method for measurement of thread. | 4 |
| | b) | Ex | plain the working principle, construction and advantages of pneu | matic comparator. 6 |
| | | | | |

c) How sine bar is used to measure angular dimension ? Explain with suitable sketch.

6

| 5. | a) | What is process capability ? Give the course of action when the process capability is – i) Greater than a specified tolerance. ii) Equal to specified tolerance iii) Less than specified tolerance | | |
|----|----|--|---|--|
| | b) | Explain the significance of quality of design and quality of conformance. Describe the factors controlling them. | 8 | |
| | | OR | | |
| 6. | a) | a) What do you understand by chance cause and assignable cause ? Explain the significant of these in process control for manufacturing industry. | | |
| | b) | Define quality control and state its objective. Also state the factors affecting quality control. | a. Describe the b. Solution in the significance c. Describe the s. Solution in the significance s. Solution in the | |
| 7. | a) | Define quality control and state its objective. Also state the factors affecting quality ontrol. Explain the acceptance and rectification sampling plan based on AOQ curve. How will ou establish AOQL ? Vrite short notes on any two of the following. | | |
| | b) | Write short notes on any two of the following. | 8 | |
| | | i) ISO 9000 | | |
| | | ii) TQM | | |
| | | iii) Quality Audit | | |
| | | OR | | |
| 8. | a) | What is the concept of quality circle ? How it is useful to an organisation ? | 8 | |
| | b) | Define inspection. State its objectives & types & explain any one type in detail. | 8 | |
| 9. | a) | What are jigs and fixtures ? Explain the design considerations of jigs & fixtures. | 8 | |

b) What is the principle and methods of locating, supporting blanks and tool guidance in jigs **8** and fixtures.

OR

| 10. | a) | With neat sketches explain milling fixtures. | 8 |
|-----|----|--|---|
| | b) | Describe the various types of clamps with neat sketches. | 8 |
