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**UNIVERSITY**

(Karunya Institute of Technology & Sciences)

(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

Reg.No. \_\_\_\_\_\_\_\_\_\_\_\_\_

**End Semester Examination – Nov/Dec - 2016**

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|  |  | **Semester :** | **2016-17 ODD** |
| **Code :** | **12ME204 / ME214** | **Duration :** | **3 hrs** |
| **Sub. Name :** | **METROLOGY AND QUALITY CONTROL** | **Max. marks :** | **100** |

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| **Q. No.** | **Questions** | **Marks** |
| **PART-A(10X1=10 MARKS)** | | |
| 1. | An undesired change in the output input relationship over a period of time is called \_\_\_\_\_\_\_\_. | (1) |
| 2. | Ability of a measuring device to detect small differences in a quantity being measured is \_\_\_\_\_. | (1) |
| 3. | \_\_\_\_\_\_\_\_\_ standards are used for reference purposes in laboratories and workshops. | (1) |
| 4. | Name the material used for making imperial standard yard. | (1) |
| 5. | Direction of the ‘predominate surface pattern’ is called as \_\_\_\_\_. | (1) |
| 6. | Straight edge is used in conjunction with \_\_\_\_\_\_\_\_\_\_\_\_. | (1) |
| 7. | Name the type of CMM that is used for the inspection of very large sized components. | (1) |
| 8. | Optical interferometers are used for checking the \_\_\_\_\_\_ of surfaces. | (1) |
| 9. | The group of items drawn from a lot for the purpose of inspection is called as \_\_\_\_\_\_\_. | (1) |
| 10. | Any kind of non-conformity to a specification is called as a \_\_\_\_\_\_\_\_\_\_\_\_. | (1) |

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| **PART B(5 X 3= 15 MARKS)** | | |
| 11 | List out the differences between ‘Precision’ and Accuracy. | (3) |
| 12 | Differentiate between ‘comparator’ and ‘measuring instrument’. | (3) |
| 13 | Write short notes on ‘best wire size’. | (3) |
| 14 | List the applications of laser micrometer. | (3) |
| 15 | List out the disadvantages of sampling inspection | (3) |

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| **PART C(5 X 15= 75 MARKS)** | | | |
| 16. | a. | Define Error. Explain in detail about the errors in measurements and its causes. | (15) |
| (OR) | | | |
| 17. | a. | Write short notes on readability and sensitivity of measuring instruments. How these parameters affect the process of quality control? | (15) |
| 18. | a. | Explain briefly the construction and use of vernier caliper with neat sketch: | (10) |
| b. | Explain the principle of working of a dial indicator. | (5) |
| (OR) | | | |
| 19. | a. | Describe in brief the construction and working of pneumatic comparator with the help of a neat sketch. | (10) |
| b. | What is sine bar? List out its limitations. | (5) |
| 20. | a. | Describe the construction and working of Tomlinson surface meter. | (15) |
| (OR) | | | |
| 21. | a. | With a neat sketch explain the working of tool maker’s microscope. List its applications. | (15) |
| 22. | a. | Describe the constructional features, types and applications of coordinate measuring machine with neat sketches. | (15) |
| (OR) | | | |
| 23. | a. | Briefly explain the construction and working of laser micrometer. | (8) |
| b. | Write short note on NPL flatness interferometer. | (7) |
| 24. | a. | A control chart is used to control the fraction non-conforming for a plastic part manufactured in a injection molding process. Ten subgroups of variable sample size yield the following data. Samples are taken on week basis. Draw the control chart and analyze the data.   |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | Week No. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | | Number inspected | 52 | 88 | 70 | 60 | 42 | 77 | 72 | 68 | 59 | 62 | | Number rejected | 3 | 4 | 7 | 4 | 2 | 5 | 2 | 6 | 4 | 3 | | (15) |
| (OR) | | | |
| 25. | a. | The length of a shaft is maintained during production by statistical process control technique using and R charts. After 25 subgroups of 5 shafts are examined, the result is as follows.  =29840  =270  Determine CL, UCL, LCL for X and R charts. Assume A2 = 0.58, D3 = 0 and D2 = 2.11 | (15) |

ALL THE BEST