Reg. No. | | | | | | | | | |

M.E./M.TECH. DEGREE EXAMINATIONS, MAY/JUNE 2017

SECOND SEMESTER

MECHATRONICS ENGINEERING

MS16006 - MACHINE TOOL CONTROL AND CONDITION MONITORING

(Regulation 2016)

Q. Code: 679409

Time: Three Hours **Maximum : 100 Marks**

Answer **ALL** questions

PART A - (10 X 2 = 20 Marks)

1. Differentiate between open loop and closed loop system in machine tools.
2. State the need for data logger in machine tools.
3. Sketch the torque-speed characteristics of D.C. servomotor.
4. State the role of Inductosyn and encoder in machine tools.
5. List the advantages of adaptive control in machine tools.
6. Name any four leading manufacturers of PLC.
7. Differentiate between on-line monitoring and off-line monitoring.
8. How do you monitor the machine tool condition through vibration signatures?
9. State the different categories of lubricant monitoring in machine tool.
10. Mention necessary steps involved in image processing techniques in condition monitoring.

PART B - (5 X16 = 80 Marks)

11. (a) (i) Describe the functioning of open loop and closed loop system in machine tools with neat sketch. (10)

(ii) Differentiate between continuous control and discrete control. (6)

(OR)

(b) (i) Discuss the function of data logger in machine tools. (8)

(ii) Demonstrate the working of supervisory computer control with neat sketch. (8)

12. (a) (i) Compare the features of Hydraulic, Pneumatic and Electrical drives used in machine tools. (8)

(ii) Demonstrate the functioning of Servo motor with neat sketch. (8)

(OR)

(b) (i) Briefly explain the application of feedback devices used in machine tools. (8)

(ii) Describe the working of different encoders with neat sketches. (8)

13. (a) Explain the major functions of adaptive control and types of adaptive control employed in machine tools. (16)

(OR)

(b) Describe in detail, the applications of adaptive control used in machining processes with neat sketch. (16)

14. (a) (i) Differentiate between primary signals and secondary signals. (3)

(ii) Explain on-line and off-line condition monitoring system with neat sketch. (13)

(OR)

(b) (i) Explain the process of machine tool monitoring system in relevance to the measurement of vibration signatures with neat sketch. (8)

(ii) Explain the various processes involved in machine tool monitoring using sound signals with neat sketch. (8)

15. (a) (i) List the most commonly used visual inspection methods. (3)

(ii) Explain leakage monitoring and discuss few leakage mediums used in condition monitoring. (13)

(OR)

(b) (i) Explain various tests involved in lubricant monitoring process with neat sketch. (12)

(ii) Explain the various benefits of condition monitoring system in brief. (4)