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P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belgaum)

First Semester, M.Tech - Mechanical Engineering (MCIM)

Semester End Examination; Jan - 2017

Condition Based Maintenance

Time: 3 hrs

Max. Marks: 100

Note: Answer FIVE full questions, selecting ONE full question from each unit.

UNIT - I

- 1 a. Discuss the steps involved in implementation of Condition Based Maintenance. 8
- b. Discuss performance parameters of a steam turbine plant with a case study. 8
- c. Explain the consequences of implementing CBM. 4
- 2 a. List and explain the steps involved in condition monitoring. 6
- b. What is performance trend monitoring? Explain briefly. 8
- c. Briefly explain the formalized assessment of monitoring techniques. 6

UNIT - II

- 3 a. Sketch and explain the shock pulse method in monitoring of a rolling element. 8
- b. What is permanent monitoring? Explain its three categories. 8
- c. Write a note on Kurtosis method. 4
- 4 a. Sketch and explain the fibre optics system in monitoring of a bearing performance. 7
- b. Describe the commonly used pick-ups for machinery vibration analysis. 7
- c. Explain machine failure modes in vibration measurement. 6

UNIT - III

- 5 a. Explain liquid penetrant inspection method in detail. 12
- b. Discuss the safety hazards in the harmful effects of radiation. 8
- 6 a. Discuss the sources of gamma-ray radiography. 10
- b. With the sketches, explain the working principle of ultrasonic NDT. 10

UNIT - IV

- 7 a. Define acoustic emission. With a neat sketch, explain the instrumentation used for its monitoring. 7
- b. Enumerate and explain the various techniques of corrosion monitoring. 7
- c. With a neat sketch, describe threading bar method and induced current flow methods of inspection. 6
- 8 a. Discuss the applications of thermography. 7
- b. Discuss the needs for corrosion monitoring. 6
- c. Define eddy current testing. Discuss the variables affecting performance of eddy current testing. 7

UNIT - V

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| 9 a. | Explain different methods of wear monitoring. | 10 |
| b. | Explain condition monitoring procedure for Repeated failure of fan bearings. | 10 |
| 10a. | Explain condition monitoring procedure for high frequency vibrations of gas compressor. | 10 |
| b. | Briefly explain lubricant sampling and analysis methods. | 10 |

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