

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
FIFTH SEMESTER B.TECH DEGREE EXAMINATION, DECEMBER 2018

Course Code: ME369

Course Name: TRIBOLOGY

Max. Marks: 100

Duration: 3 Hours

PART A

Answer any three full questions, each carries 10 marks.

Marks

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| 1 | a) What are the historical developments and industrial significance of tribology? | (5) |
| | b) Differentiate between conforming and non conforming contact | (2) |
| | c) What is meant by Elastic half spheres | (3) |
| 2 | a) Explain the classification of bearing based on the applied load | (2) |
| | b) Explain different types of bearing based on film thickness | (3) |
| | c) What are the advantages and disadvantages of cylindrical roller bearings | (5) |
| 3 | a) What are the laws of friction and explain the exceptions of these laws | (3) |
| | b) Explain Bowden Tabor's theory of friction | (5) |
| | c) Explain any two factors affecting friction | (2) |
| 4 | a) List out any three friction measuring equipment. Explain any one of the methods in detail. | (4) |
| | b) Explain Stick slip phenomenon | (3) |
| | c) How to reduce adhesive component of friction | (3) |

PART B

Answer any three full questions, each carries 10 marks.

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| 5 | a) What are the different types of wear? | (5) |
| | b) Identify any three occurrence of sliding wear in industry | (3) |
| | c) Explain any two factors affecting wear | (2) |
| 6 | a) What is the industrial consequence of wear in industry? | (3) |
| | b) Derive an expression of Archard's Law of sliding friction | (5) |
| | c) List out any two applications in which wear is desirable. | (2) |
| 7 | a) What is viscosity? Explain Newton's law of viscosity | (3) |
| | b) What is the role of lubrication in rolling process? | (3) |
| | c) Explain the mechanism of hydrodynamic journal bearing | (4) |

- 8 a) Explain any two factors affecting boundary lubrication (4)
b) Write down any six desirable properties of lubricant. Explain with examples (6)

PART C

Answer any four full questions, each carries 10 marks.

- 9 a) What is adhesion and what do you mean by adhesive coefficient of friction? (3)
b) What is meant by adhesive index? (2)
c) Explain constructional features of roller bearings with the help of sketches (5)
- 10 a) Write any four advantages of roller bearing over sliding bearing (4)
b) Write any four applications of slider bearings (4)
c) Write any four bearing materials used in industry (2)
- 11 a) What are the different types of journal bearing? (2)
b) Write any four applications of roller bearings (4)
c) What is stiction? (4)
- 12 a) Explain any three geometrical parameters of coating (3)
b) Describe the hard facing coating technique with the help of a sketch (5)
c) Suggest any two methods of coating to acidic environments (2)
- 13 a) What is meant by electro plating? (2)
b) Explain its three advantages and three disadvantages of electroplating method (3)
c) Explain any five micro structural treatments (5)
- 14 a) Describe the Physical vapour deposition technique with the help of a sketch (8)
b) Suggest any two coating methods to improve high temperature oxidation and corrosion (2)
