Mechanical Engineering

Sharif

Spring 2017

Editor-in-Chief: Abolhassan Vafai

This Journal is published under the auspices of Sharif University of technology, Office of the Vice-Chancellor-in-Charge of Research.

The Journal is published quarterly in Farsi language, aims at establishing a relationship between scientists active in different branches of science and technology and, in particular, at providing a forum for exchange of knowledge between scientists and technologists related to scientific problems prevailing in contemporary society. The journal also strives to present practical and theoretical analyses of these issues and facilitates the circulation of modern scientific findings by scientists and researchers for practical application. In addition, "Sharif" publishes original papers focusing on issues of specific concern to universities, including research, technological advancements, and topics related to matters of higher education.

P.O.BOX 11155-8639 AZADI AVENUE, TEHRAN, I.R. IRAN
Phone: (98-21) 66005419 - 66164093 Fax: (98-21) 66012983

 $Web: \ http://journal.sharif.ir/ \qquad http://\ www.\ globalscience journals.com$

E-mail: pajouhesh@sharif.edu

CONTENTS

- 3 ANALYTICAL STUDY OF RESONANT CAPTURE IN ROTATING UNBALANCED SYSTEMS AND EFFECT OF A FREE UNBALANCED DISK ON SYSTEM BEHAVIOR
 - S. Farhadi
- 17 OPTIMUM DESIGN, FABRICATION, AND TEST OF A RADIAL FLOW COMPRESSOR VOLUTE
 - M. Mojaddam and A. Hajilouy Benisi
- 29 FREE VIBRATION OF SINGLE-LAYERED GRAPHENE SHEETS BASED ON DIFFERENT GRADIENT ELASTICITY THEORIES
- 37 COMPARISON OF DIFFERENT THEORIES OF PREDICTING FATIGUE FAILURE OF NOTCHED CK45 CYLINDRICAL SPECIMENS
 J. Amirian and M. Shirani
- 49 EXPERIMENTAL ANALYSIS OF PENETRATION INTO WOVEN FABRIC TARGET IMPREGNATED WITH SHEAR THICKENING FLUID WITH CLAY NANOPARTICLES
 - E. Balali, A. Sadough Vanini , N. Kordani and Gh. Eskafi
- 55 INVESTIGATION OF THE PROPER WAY TO FACILITATE LONG-TERM RETENTION OF VOCABULARY: COMPUTER-ASSISTED, MOBILE-BASED, OR DICTIONARY INVOLVEMENT LEARNING
 M. Alemi and R. Pashmforoosh
- 63 VIBRATIONAL ANALYSIS OF FUNCTIONALLY-GRADED MICRO-ROTORS WITH MASS ECCENTRICITY BASED ON THE COUPLE STRESS THEORY
 - M. Hashemi and M. Asghari
- 73 MODELING AND VIBRATION PERFORMANCE ANALYSIS OF A NONLINEAR DISPLACEMENT-VELOCITY-DEPENDENT DAMPER CONSIDERING THE EFFECT OF MOMENTUM VARIATION OF FLUID AT PISTON ORIFICE
 - R. Moalef Shahri and J. Jahanpour
- 83 THE STRUCTURE INTERACTION MODELING OF FLUID FLOW PATTERNS IN THE DIAPHRAGM PUMP
 - H. Bakhshayesh, A. Sarreshtehdari and H. Fekri
- 93 HARDWARE IMPLEMENTATION OF NUMERICAL SOLUTION OF DIFFERENTIAL EQUATIONS ON FPGA
 - F. Farhani Baghlani, A. Ebrahimi Chamgordani and A. Nikravan Shalmani

RVIEW ARTECLE:

101 DIFFERENT APPROACHES TO FATIGUE DESIGN OF COMPONENTS OF A HELICOPTER

A.R. Shahani and S. Mohammadi

RESEARCH NOTES:

- 121 INVERSE KNEMATICS AND MOTION PLANNING OF A REDUNDANT MANIPULATOR ROBOT IN AN UNKNOWN ENVIRONMENT USING FUZZY CONTROL
 - M. Karimi and A. Dadsetan
- 129 COMPARISON OF PARTICLE SWARM OPTIMIZATION AND GENETIC ALGORITHM FOR OPTIMIZATION OF CGAM PROBLEM

 M. Karimi, B. Ahrar Yazdi and B. Ahrar Yazdi
- 137 AN INVESTIGATION ON THE EFFECT OF GRAPHENE NANO-PLATE ON PERFORMANCE OF A SHAPE-MEMORY-POLYMER BASED NANOCOMPOSITE
 - M. Baghani and M. Baniassadi

APPENDIX

158 ABSTRACTS OF PAPERS IN ENGLISH