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**Research papers**

- ES100201      Website content evaluation: a case of two African countries      35-41  
Deepti Garg and Abhishek Agarwal
- Abstract:** Website becomes a very useful medium for travelers seeking accommodation. Key challenges in building a website is to make sure that the customer and consumers can easily find the information they are looking for. A comparative study of six dimensions of hotel web sites between Botswana and South Africa was done. 55 web sites were studied for hotel information, product information, non-product information, payments, customer relations management and reservations. The results reveal that the web sites compared were very similar in all the dimensions. However, out of 48 features studied some differences were found in information provided in financial reporting, frequently asked questions, free download, customer surveys, mail to friend button, content in other languages, creating customer account. These findings have impact on user friendliness and hotel sales.
- ES100202      Utilisation of solar energy with the help of Flat Plate Solar      42-48  
Collector (FPSC) Installed with Transparent Insulating Material  
(TIM) to operate vapour absorption refrigeration system  
Sagar V. Wankhede, Bhushan L. Patil, Jitendra A. Hole
- Abstract:** Vapor Absorption Refrigeration Systems (VARS) belong to the class of Vapor cycles. But, unlike Vapor compression refrigeration systems, the required input to absorption systems is in the form of heat. Hence these systems are also called as heat operated or thermal energy driven systems ,as they require heat input they can be operated using various heat generating mechanisms. This paper represents an overview of the Flat Plate Solar Collector (hereafter mentioned as FPSC) installed with TIM (Transparent insulating Material) for Operating VARS. Solar Flat Plate Collectors are devices used to trap the solar energy & use them for heating applications. Flat plate collectors are popular for low and medium heating applications and there are undergoing constant development in terms of size reduction and enhanced efficiency.

ES100203      Effect of nanoparticles on enhancement of mechanical properties  
and tribological behavior of FRP composites: a Review      49-57

Shailesh D. Ambekar and Vipin K. Tripathi

**Abstract:** Nanotechnology is spreading vastly in the various demanding fields of engineering and medicines like aerospace, defense, automobiles, electronics, materials, chemistry, energy, environment, information & communication, consumer goods and biotechnology. It created a high impact on development of new generation nano materials with advanced features and wide range of their applications. Fiber reinforced polymer composites show significantly superior performance over many traditional metallic materials because of their superior strength to weight ratio and higher stiffness. Enhancement of properties of FRP composites can be possible by the modification of matrix properties. Significant development in the use of nanoparticles for modification of epoxy matrix has led to improved mechanical properties and tribological behavior of the FRP composites.

ES100204      Design, modeling & FEM analysis of crankshaft and camshaft of a  
passenger car using different materials      58-82

Ketan V. Karandikar and Subim N. Khan

**Abstract:** Crankshaft can be called as the heart of any I.C. engine since it is the first recipient of the power generated by the engine. Its main function is to convert the oscillating motion of the connecting rod into rotary motion of the flywheel. A modern four-stroke four cylinder engine has four crank throws, connected to each other using a common shaft. This is called as a multi-crankshaft. Irrespective of having an intricate profile, crankshafts are mass produced for reduction in cost. Another important component of an I.C. engine is the camshaft. Its main function is to convert rotary motion of the crankshaft into vertically reciprocating motion of the valves required to open and close the intake and exhaust valves of engine cylinders, with the assistance of cams located on it and an intermediate mechanism. The crankshaft and camshaft are connected to each other using pulleys or gears and a timing belt. The loads acting on these multi-crankshafts and camshafts are very high. The crankshaft is subjected to bending stress and torsional shear stress, whereas the camshaft is mainly subjected to compressive stress due to contact pressure, galling and wear and tear. Both of these are subjected to fatigue since these rotate at high speeds during engine operation. This project aims at designing of I.C. engine multi-crankshaft and camshaft using standard design procedures. Further, Creo software is used to create the models of crankshaft and camshaft. After creating the models, the static structural analysis is done for both of these using different materials and loads or boundary conditions using ANSYS software. Finally the results of total deformation and equivalent (Von-Mises) stresses obtained for different crankshaft materials are evaluated and compared with each other to select the best suitable material for manufacturing of crankshaft and camshaft.

Abhishek A. Jadhav and Subim N. Khan

**Abstract:** Radiodensity measurement of human femur bone sample obtained from CT- scan in the form of Hounsfield Units (HU) scale and BMD obtained from Dual-Energy X-ray Absorptiometry (DEXA) scan and Bone Hardness value obtained from Microhardness test .The Aim is to evaluate correlation between bone hardness values obtained from Microhardness test with respect to HU and BMD. Femur Bone Sample of adult human male obtained and evaluated in terms of hardness for cortical and trabecular bone tissue indented at different anatomical sites using Vickers Microhardness indenter. Micro indentations were made at diaphysis and proximal epiphysis region. It was observed hardness value of tissue obtained from Cortical bone are greater than tissues from trabecular bone. The coefficient of variation of the hardness values for trabecular bone tissue is 9.53% and for cortical bone tissue 5.23% correlations were found between BMD and Vickers hardness number (VHN) and between HU and VHN.