Meen.3107   Machine Design (2+1)   Marks: 50
                                                                     Time: 2 hours

I   **Fill in the blanks:**   (10x1=10)
    1   The ratio of ultimate stress to the design stress is known as----------
    2   The product of diametral pitch and circular pitch is equal to---------
    3   Oldham coupling is used to connect two shafts which are------------
    4   Hooke's law holds good up to---
    5   The stress corresponding to that of failure is known as----------------

         State True or False
    6   The unit of strain is kg/cm^2
    7   The axle have the shape of shaft and is stationary
    8   Spur gears are used to transmit power in between two shafts whose axes are intersect
    9   In thrust bearings the load acts along the axles of rotation
    10   In engines, connecting rod is subjected to torsional loads.

II   **Write Short notes on ANY FIVE of the following**   (5x2=10)
    1   What are all the important mechanical properties of engineering materials?
    2   Define factor of safety and write about its importance.
    3   List various types of keys and their application.
    4   Define coupling and mention classification of couplings.
    5   What is spring constant? Mention types of springs.
    6   Write short notes on selection of antifriction bearings.
    7   Differentiate between cotter joint and knuckle joint.

III   **Answer ANY FIVE of the following**   (5x4=20)
    1   What is a knuckle joint? Write the design procedure of it.
    2   Write the design procedure of muff coupling along with its advantages.
    3   List the various theories of failure and explain any one theory.
    4   Specify the conditions for flat belt drive and briefly explain the design procedure
         of a 'V' belt drive.
    5   Compare gear drive with belt drives and explain the various terminologies of spur gear.
    6   Write short notes on crane hooks and universal couplings.
    7   Explain the procedure for the design of a leaf spring.

IV   **Write an essay on ANY ONE of the following**   (1x10=10)
    1   Explain the design of threaded fasteners subjected to direct static loads.
    2   Explain the design procedure of rigid flange coupling and compare rigid with flexible
         coupling.

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