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Total No. of Pages : 02

Total No. of Questions : 07

B.Tech (ME) (2011 Onwards) (Sem.-6)

DESIGN OF MACHINE ELEMENTS-II

Subject Code : BTME-601

M.Code : 71185

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is **COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
2. SECTION-B contains **SIX** questions carrying **TEN** marks each and students have to attempt any **FOUR** questions.
3. Use of a standard design data book is permitted.

SECTION-A**Q1. Answer briefly :**

- a) Differentiate between open belt and crossed belt drives.
- b) Give any four advantages of V-belt over flat belt drive.
- c) What is the main function of a flywheel in an engine?
- d) Define coefficient of fluctuation of energy.
- e) What is nipping in a leaf spring?
- f) Name **any two** materials that are used for the lining of friction surfaces in clutches.
- g) What is a self-energizing brake?
- h) What are the advantages of involute gears over cycloidal gears?
- i) Describe the 20° stub involute system of gear teeth.
- j) What are journal bearings?



SECTION-B

- Q2. A centrifugal clutch is to be designed to transmit 15kW at 900 rpm. The shoes are four in number and the speed at which the engagement begins is $3/4^{\text{th}}$ of the running speed. The inside radius of the pulley rim is 150 mm. Taking coefficient of friction as 0.25, find out the mass and size of the shoes.
- Q3. Discuss the different types of brakes giving at least one practical application for each type.
- Q4. An open belt 100 mm wide connects two pulleys mounted on parallel shafts with their centres 2.4 m apart. The diameter of the larger pulley is 450 mm and that of smaller pulley is 300 mm. Coefficient of friction is 0.3 and the maximum stress in the belt is limited to 14 N/mm width. If the larger pulley rotates at 120 rpm, find the maximum power that can be transmitted.
- Q5. Design a helical compression spring for a maximum load of 1000 N and deflection of 25mm taking Wahl's factor into consideration. Assume spring index as 5, maximum permissible shear stress for spring wire as 420 MPa and modulus of rigidity as 84 kN/mm².
- Q6. a) Mention four important types of gears and discuss their applications.
b) Explain the phenomenon of interference in involute gears. What are the conditions to be satisfied in order to avoid interference?
- Q7. Select a single row deep groove ball bearing for a radial load of 4000 N and an axial load of 5000 N, operating at a speed of 1600 rpm for an average life of 5 years at 10 hours per day. Assume uniform and steady load.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.