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4th Sem / Mechanical Engg.

Subject : Machine Design

Time : 3 Hrs. M.M. : 60

SECTION-A

Note: Multiple choice questions. All questions are compulsory (6x1=6)

Q.1 Which of the following is a common design consideration in machine design?

a) Safety b) Reliability

c) Maintainability d) All of the above

Q.2 Which of the following is a common type of shaft used in power transmission systems?

a) Solid shaft b) Hollow shaft

c) Square d) All of the above

Q.3 Which of the following is a type of key used to transmit power between a shaft and a hub?

a) Taper key b) Woodruff key

c) Gib-head key d) All of the above

SECTION-D

Note: Long answer type questions. Attempt any two questions out of three questions. (2x8=16)

Q.23 Explain the various failure theories.

Q.24 A solid circular shaft is subjected to a bending moment of 100 Nm and a torsional moment of 50 Nm. The allowable shear stress for the material is 80 Mpa. Determine the required diameter of the shaft.

Q.25 Explain the various term related to nomenclature of screw threads. Also list the advantage and disadvantages of screw joints.

Q.4 Why are couplings used in power transmission systems?

a) To connect two shafts with different diameter

b) To accommodate misalignment between shafts

c) To produce vibration

d) All of the above

Q.5 Which of the following is a temporary joint?

a) Riveted joint b) Welded joint

c) Cotter joint d) Knuckle joint

Q.6 What is the term for the distance between two adjacent threads?

a) Pitch b) Lead

c) Helix angle d) Major diameter

SECTION-B

Note: Objective/ Completion type questions. All questions are compulsory. (6x1=6)

Q.7 The angle of butteress thread is_____

Q.8 Give examples of temporary joints.

Q.9 What are the two primary types of shafts?

Q.10 FOS=_____.

Q.11 The inner most portion of thread is known as _____ of thread.

Q.12 What is the purpose of a spring in a suspension system?

SECTION-C

Note: Short answer type questions. Attempt any eight questions out of ten questions. (8x4=32)

Q.13 Why is design necessary?

Q.14 What are the two main types of shafts based on cross-section ? Explain types of loading on shafts?

Q.15 What is the primary function of a key in a shaft-hub connection?

Q.16 How does a keyway affect the strength of a shaft?

Q.17 What is a flange coupling? What are the key design considerations for a flange coupling?

Q.18 What is the primary purpose of a cotter joint? Explain in detail.

Q.19 What are welded joints? Name the types of Welded joints. Explain any two

Q.20 How can the spring rate of a helical spring be increased?

Q.21 Classify riveted joints.

Q.22 Explain the tensile test for ductile material.