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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 The cotter is used

a) To connect to piston rod with cross head

b) In foundation bolt

c) Both (A) and (B)

d) None of the above

Q.2 A taper key is

a) taper in width

b) Taper in thickness

c) Use to prevent relative motion

d) Both (b) and ©

Q.3 Brittleness is opposite to

a) Toughness b) Plasticity

c) Malleability d) None of the above

Q.4 Material used for high strength is

a) Nickle steel

b) Chrome-vanadium steel

c) Nickle -chromium steel

d) All of the above

Q.5 Slope of thread is

a) Half of pitch b) Double of pitch

c) Thrice of pitch d) One fourth of pitch

Q.6 Maximum strain energy theory is generally used for .

a) Brittle material b) Ductile material

c) Hard material d) Tough material

SECTION-B

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

Q.7 The angle of butteress thread is _____

Q.8 Equivalent twisting moment, T =_____.

Q.9 The key of circular cross section are called _____.

Q.10 FOS=_____.

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

Q.12 Define endurance limit.

SECTION-C

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

Q.13 Define SN curve and its significance.

Q.14 What is key ? List the various type of keys , also write the parameter of Gib head key.

Q.15 What is shaft? Explain its various types.

Q.16 Compare a design work and undesigned work

Q.17 Explain the design failure by maximum stress theory.

Q.18 Write the characteristics of goods designer.

Q.19 Explain the following

a) crushing stress

b) Power screws

Q.20 Explain the tensile test for ductile material.

Q.21 What is the minimum length of a 500 mm key that you would use with a gear 300 mm in diameter designed to operate at a torsional working stress of $150MN/m^2$

Q.22 Classify the various type of loads.

SECTION-D

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

Q.23 A 100mm diameter shaft rotating at 100 r.p.m. transmit a power of 120kw power is taken off through a gear whose hub is 200 mm long . the key is made of steel having an ultimate shear stress of $500N/mm^2$. Using a factor of safety of 8, determine the dimension of key.

Q.24 Explain the various term related to nomenclature of screw threads. Also list the advantage and disadvantages of screw joints.

Q.25 a) Give the relative advantages and disadvantages of a key joint.

b) Differentiate between temporary and permanent joints with examples.