S. B. Roll. No.....

MACHINE DESIGN
6TH Exam/Mech./5336/Nov'24
(For 2018 Batch Onwards)

Duration: 3Hrs. **M.Marks:75**

Note: Machine Design Data Book and Scientific calculators are allowed for the Exam.

SECTION-A

Q1. Fill in the blanks. **15x1=15**

a. The objective of Caulking in a riveted joint is to make the joint _____.
b. The maximum shear stress theory is used for _____materials.
c. The limiting strength for a ductile material is _____ stress.
d. The largest diameter of an external screw thread is known as _____diameter
e. Center to center distance between two consecutive rivet rows is called _____.
f. A Rivet is identified by _____.
g. Screws ,Keys ,cotter , pins are examples of _____
h. The parallel fillet welded joint are designed for _____ strength.
i. If d is the diameter of shaft, then the width of key is _____
j. The resistance to fatigue failure is measured by its _____.
k. Working stress should never exceed _____ stress.
l. Knuckle joint is always subjected to _____ .
m. A keyway _____ the strength of a shaft.
n. Shock resistance of steel is increased by adding _____.
o. 18/8 steel contains _____,

SECTION-B

Q2. Attempt any six questions. **6x5=30**

i. Design the rectangular key for a shaft of 50mm diameter. The shearing and the crushing stresses for the key material are 42 MPa and 70 MPa .
ii. Briefly ,explain the codes and standards
iii. Define following property a) Brittleness (b) Ductility (c) Toughness (d) Hardness
iv. What is the maximum principal stress theory? Explain.
v. Discuss possible failures of riveted joints.
vi. Explain the purpose and types of couplings
vii. What are the causes of shaft failure?
viii. Define the term screw thread and state two important function of thread.
ix. What are power screws? Classify them.

SECTION-C

Q3. Attempt any three questions. **3x10=30**

a. A steel shaft is required to transmit 100 KW at 200 r.p.m. The allowable shear stress is 60 N/mm^2. Find the suitable diameter of the shaft. The angle of twist is 1^o in a length of 3 m of the shaft .$G=80KN/mm^2$.
b. Explain joints and its types. Explain failures of Welded joint
c. Explain the design procedure for Flange Coupling
d. Design and draw a cotter joint to connect two mild steel rods for a pull of 30 KN. The maximum permissible stresses are 55 MPa in tension: 40 MPa in shear and 70 MPa in crushing.
e. A single riveted lap joint is made in 15 mm thick plates with 20 mm rivets diameter. Determine the strength of joint, if the pitch of rivets is 60 mm.
Assume, allowable, tensile stress is 120 MPa, and allowable shear stress and compressive stresses are 90 MPa and 160 MPa.