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4th Sem.
Branch : Mechanical Engg.
Sub. : Machine Design

Time : 3 Hrs. **M.M. : 60**

SECTION-A

Note: Multiple type Questions. All Questions are compulsory. (6x1=6)

Q.1 A crankshaft is manufactured by ____process.

a) Forging b) Casting

c) Pressing d) Drawing

Q.2 The property of shock resistance is increase by adding following in steel

a) Nickel

b) Chromium

c) Sulphur, lead and phosphorus

d) Nickel & chromium

Q.3 _____ is the common material used for shafts

a) Cast iron b) Mild steel

c) Wrought iron d) High carbon steel

Q.4 What are the factors which influence the machine design?

a) Load applied b) Purpose

c) Availability d) All of the above

Q.5 The rivet head used for boiler plate riveting is usually

a) Pan head b) Conical head

c) Snap head d) Counter sunk head

Q.6 Which key transmits power due to frictional resistance only

a) Woodruff key b) Sunk key

c) Saddle key d) Flat key

SECTION-B

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

Q.7 What is the use of SN curve?

Q.8 The material of key is _____.

Q.9 Define creep.

Q.10 Maximum shear stress theory is also known as _____.

Q.11 Effect of keyway on shaft is ___.

Q.12 Define pitch of screw.

SECTION-C

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

Q.13 What is the difference between caulking and fullering? Explain with diagram.

Q.14 Explain failure as explained by maximum strain theory?

Q.15 Describe various general design considerations.

Q.16 Explain various failure modes of keys.

Q.17 Two steel plates 9mm thick and 100mm wide are joined by double transverse welded joint, subject to a force of 120kN. Determine the length of weld if allowable tensile stress for weld materials is 100 N/mm^2.

Q.18 Describe various shaft materials and the loads on them.

Q.19 Enumerate the steps by step procedure to design flange coupling.

Q.20 Explain various types of knuckle joint.

Q.21 Explain various types of welded joints with their diagrams.

Q.22 Draw freehand any 4 rivet heads with their proportionate dimensions.

SECTION-D

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

Q.23 A double riveted lap joint is to be designed for 9mm thick plate. The joint is of zigzag type riveting. The following permissible stresses for the rivet as well the plate may be assumed.

σ_t = 100Mpa, τ=80, Mpa, σ_t = 140Mpa, Check and State how the joint will fail.

Q.24 Explain the concept and importance of stress concentration. Give the various methods to reduce stress concentration.

Q.25 A helical spring is made of wire of diameter 6mm and has outside diameter of 75mm. If the permissible shear stress is 350 MPa and modulus of rigidity 84kN/mm^2, find the axial load which the spring can carry and the deflection per active turn