Branch : 5th Sem (Mechanical)
Subject:- Machine Design

Time : 3Hrs.   M.M. : 100

SECTION-A

Note: Multiple choice questions. All questions are
compulsory   (10x1=10)

Q.1 The limiting strength for brittle material is
a) Yield stress   b) Breaking stress
c) Ultimate stress   d) Any of the above

Q.2 According to Unwin's formula the relation between
diameters of rivet hole (d) thickness of plate (t) is
given by
a) d=   b) d=6
c) d=2t   d) d=6t

Q.3 Riveted joints mostly fail by
a) Crushing of rivets   b) Bending of plates
c) Tearing of plates   d) Shearing of rivets

Q.4 A woodruff is generally used in
a) Machine tool industry
b) Automobile industry
c) Textile industry
d) Hydraulic industry

Q.5 Crank Shaft is made by
a) Forging   b) Costing
c) Pressing   d) Drawing

Q.6 The plane on which maximum shear stress act are
called
a) Maximum shear plane
b) Principle plane
c) Normal Plane
d) Major principle plane

Q.7 The sleeve or muff coupling is designed as a
a) Thin cylinder   b) Thick cylinder
c) Solid shaft   d) Hollow shaft

Q.8 The cotter are made up of
a) Wrought Iron   b) Mild steel
c) High carbon steel   d) Cast iron

Q.9 In kunckle joint pin is likely to fail in
a) Tension   b) Compression
c) Shear   d) Double Shear

Q.10 A screw is specified by its
a) Major diameter   b) Minor diameter
c) Pitch diameter   d) Pitch

SECTION-B

Note: Objective type questions. All questions are
compulsory.   (10x1=10)

Q.11 Define bearing stress.
Q.12 Define principle stresses.
Q.13 Define equivalent twisting moment.
Q.14 What is feather key ?
Q.15 Name the different parts of socket & spigot joint.
Q.16 What is lap welded joint ?

Q.17 Define fullering process.

Q.18 Define back pitch.

Q.19 Write the function of flexible coupling

Q.20 Write the function of power screws.

SECTION-C

Note: Short answer type questions. Attempt any Four questions out of Six questions. (4x10=40)

Q.21 Explain the gernal procedure of designing the new machine ?

Q.22 Define stress concentration. Explain the methods of reducing stress concentration.

Q.23 A steel shaft is subjected to a bending moment of 10KNm and a torsional moment of 25 KNm. They yield strength of the shaft is 700 MPa. Find the diameter of the shaft by using max. shear theory Take E= 200 GPa and F.O.S=4

Q.24 A rectangular sunk key 25mm wide, 16 mm thick and 100mm long is required to transmit 1 KNm torque from a 120mm diameter shaft.Calculate the induced shear and crushing stresses is the key.

Q.25 A plate 1.8 mm long 85mm thick is welded to another plate at right angles to each other by 20 mm fillet weld. Find the value of max torque that can be induced if the allowable shear stress is 110MPa.

Q.26 Explain various types of screw threads used in power screws

SECTION-D

Note: Long answer type questions. Attempt any two questions out of three questions. (2x20=40)

Q.27 A solid shaft is subjected to a bending moment of 3050Nm and torque of 11 KNm. The shaft is made of 46C8 steel having ultimate tensile stress of 775 MPa and ultimate. shear stress of 600MPa. Assuming a FOS as 5. Determine the diameter of shaft

Q.28 Design and draw a knuckle joint to transmit a load of 150KN with the design stressed as tensile stress is 80N / mm^2 , shear stress 50N/mm^2 crushing stress 160N/mm^2

Q.29 A double riveted lap joint is to be designed for 16mm thick plate. The riveting is of zig-zag type. The following premissible stresses may be assumed tensile stress = 110 MPa shear stress = 75 MPa and crushing stress= 150MPa state how the joint will fail and find the efficiency of joint.