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181756/171756

5th Sem. / Mech
Subject : Machine Design

Time : 3 Hrs. M.M. : 100

SECTION-A

Note: Multiple type Questions. All Questions are compulsory. (10x1=10)

Q.1 Pitch of M24 thread is (CO1)

a) 3mm b) 2mm

c) 4mm d) 5mm

Q.2 The distance between the two adjacent crests is called. (CO1)

a) Lead b) Root

c) Pitch d) Crest

Q.3 Two shaft will have equal strength if (CO5)

a) Twisting moment of both shaft is same

b) Diameter of both the shaft is same

c) Material of both the shaft is same

d) All of the above

Q.4 Which key transmit power though frictional resistance (CO6)

a) Woodruff key b) Sunk key

c) Saddle key d) Flat key

Q.5 Centre pin of a knuckle joint is (CO6)

a) Solid b) Hollow

c) Toper d) Conical

Q.6 Stress produced in the member due to falling load is knows as (CO4)

a) Impact stress b) Fatigue stress

c) Fatigue limit d) Endurance

Q.7 The transverse filled weld is designed for (CO4)

a) Bending strength b) Tensile strength

c) Shear strength d) None of these

Q.8 The rivets used for boiler plate is usually (CO6)

a) Snap head b) Pan head

c) Conical head d) Counter sunk head

Q.9 The material of hub in flange coupling is (CO3)

a) Cast iron b) Wrought iron

c) High carbon steel d) Low carbon steel

Q.10 In square threads the flanks make an angle of _____ with axis. (CO1)

a) 45^0 b) 60^0

c) 90^0 d) 47.5^0

Section-B

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

Q.11 Define Modulus of rigidity. (CO1)

Q.12 Define code? (CO2)

Q.13 Write the angle between the planes of maximum shear of the principle planes. (CO4)

Q.14 Define equivalent bending moment. (CO1)

Q.15 Define Key. (CO6)

Q.16 Give me function of knuckle joint. (CO6)

Q.17 Define butt welded joint? (CO1)

Q.18 Define Caulking. (CO5)

Q.19 Give the purpose of coupling. (CO5)

Q.20 Write the application of power screws. (CO6)

Section-C

Note: Short answer type Question. Attempt any four questions out of six Questions. (40x10=40)

Q.21 Enlist the general consideration in machine design. (CO1)

Q.22 Explain the factors which affect the selection of materials. (CO3)

Q.23 State the maximum shear stress & maximum strain energy theory. (CO4)

Q.24 A shaft is transmitting 120KW at 260rpm. If the allowable sear stress in the material of the shaft is $80N/mm^2$. Find the suitable diameter of the shaft. The shaft is not to twist more than 1^0 m length of 4m. take G= $80x10^0 N/mm^2$. (CO5)

Q25 Drive the expressions for the strength of circular fillet weld subjected to bending moment. (CO6)

Q.26 Explain the various stresses induced in power screw due to axial load. (CO6)

Section-D

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

Q.27 Design a muff coupling which is used to connect two shafts transmitting 40KW at 500rpm. The material for the shaft and key is plain carbon steel for which allowable shear and crushing stresses may be taken as 45MPa and 80MPa respectively. The material for the sleeve is cast iron for which allowable shear stress is 16MPa. (CO2, 4, 6)

Q.28 A single riveted lap joint for 12mm plates with 18mm diameter rivets having a pitch of 55mm and double riveted lap joint for 9mm plate with 18mm dia. rivets having pitch of 58 mm. Take permissible shear stress in rivets is 110MPa crushing stress is 200 MPa and tensile strength of plates is 160 MPa. Find the efficiency of the above joints.

Q.29 A 200 mm diameter shaft rotating at 40rpm transmitting 200 K W power is taken it through a gear whose hub is 250mm long. The key is made of steel having an ultimate shear stress 550 N/mm^2 and F.O.S. is 5. Find out the dimensions of key.