Q.33 A line shaft rotating at 200 rpm is to transmit 20 KW. The shaft may be assumed to be made of mild steel with an allowable shear stress of 42 MPa. Determine the diameter of the shaft, neglecting the bending moment of the shaft.

Q.34 Find the module and diametral pitch of a gear if its pitch circle diameter is 40mm and number of teeth is 20.

Q.35 Differentiate between Designed & Undesigned work.

SECTION-D

Note: Long answer type questions. Attempt any two questions out of three questions. (2x10=20)

Q.36 A shaft is transmitting 100 KW at 160rpm. Find a suitable diameter for the shaft if the maximum torque transmitted exceeds the mean by 25%. Take maximum allowable shear Stress as 70 MPa.

Q.37 A cam operates a knife edge follower:-

i) It lifts the follower through 40mm during its 90° rotation with S.H.M.

ii) The follower remains stationary for the next 30° rotation of cam.

iii) The follower then descends to its original position during 60° of cam rotation.

iv) The follower remains stationery for the rest of revolution. Take least radius of Cam as 50mm From the above data, draw the profile of cam.

Q.38 Draw four involute teeth of a gear having 30 teeth of 10 mm module and 25° pressure angle.

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4th Sem /Mech. Engg. (MSIL)
Subject:- Machine Design and Drawing

Time : 3Hrs. M.M. : 100

SECTION-A

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

Q.1 In static loading, stress concentration factor is more serious in.

a) Brittle materials b) Ductile materials
c) Both a & b d) Elastic materials

Q.2 The standard length of shaft is .

a) 5m b) 6m
c) 7m d) All of these

Q.3 The usual proportion for width of key is

a) d/8 b) d/6
c) d/4 d) d/2

d= diameter of shaft

Q.4 A keyway lowers the_____of the shaft.

a) strength b) rigidity
c) both a& b d) ductility

Q.5 The angle between the direction of the follower motion and a normal to pitch curve is called.

a) Pitch angle b) prime angle
c) base angle d) pressure angle

Q.6 S.H.M. stands for

a) Simple Harmonic Motion
b) Simple honest motion
c) Severe Harmonic Motion
d) Suspended Harmonic Motion

Q.7 A spur gear with pitch circle diameter D has number of teeth T. The module m is defined as.

a) D/T b) T/D
c) D/2T d) 2T/D

Q.8 The common point of contact between two pitch circles is known as.

a) Module b) pitch circle point
c) prime point d) pitch point

Q.9 A screw is specified by.

a) Minor diameter b) Pitch circle diameter
c) Major diameter d) Pressure diameter

Q.10 The ratio of maximum stress to working stress is called.

a) Poison ratio b) Tensile strain
c) factor of safety d) Compressive stress

SECTION-B

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

Define the following:

Q.11 Stress concentration.
Q.12 B.I.S. standards.
Q.13 Elasticity.
Q.14 Tensile Load.
Q.15 Torsion.

Q.16 Module.
Q.17 Cam.
Q.18 Spur gear.
Q.19 Addendum of gear.
Q.20 Screw jack.

SECTION-C

Note: Short answer type questions. Attempt any twelve questions out of fifteen questions. (12x5=60)

Q.21 Why design is necessary?
Q.22 Write any five characteristics of good designer.
Q.23 Explain any two mechanical properties of engineering materials.
Q.24 Explain the maximum stress theory.
Q.25 Classify and explain the loads on the basis of direction of applied load with suitable diagram.
Q.26 Explain the types of loading on shaft.
Q.27 Write the function of Key.
Q.28 Write any four advantages of screwed joints.
Q.29 Explain any two types of cam with diagram.
Q.30 Define any four important terms in screw threads.
Q.31 Write any three advantages of involute gears.
Q.32 Classify the followers according to the surface in contact and motion of the follower.