Q.32 Explain the terms Stiffness, Endurance limit and Static load.

Q.33 Differentiate between Ductility, Malleability.

Q.34 State the need of theories of failure.

Q.35 What is the effect of creep and fatigue on materials?

SECTION-D

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

Q.36 A cam, with a minimum radius of 50mm, rotating clockwise at a uniform speed is required to give a knife edge follower, the motions as described below:

i) To move outward through 50mm during 90degree rotation of the cam.

ii) To dwell for the next 60 degree.

iii) To return to its starting position during next 90degree.

iv) To dwell for the rest period of a revolution. Draw the profile of the cam. The displacement of the follower is to take place with uniform acceleration and deceleration.

Q.37 A solid shaft is transmitting 1 MW at 240 r.p.m. Determine the diameter of the shaft if the maximum torque transmitted exceeds the mean torque by 20%. Take the maximum allowed shear stress 60 N/mm².

Q.38 Show the involute gear profile and its nomenclature by assuming the diameter data and pressure angle of 20 degree.

4th Sem / Branch : Mech, Prod, T&D, Mechatronics (5th sem.), CAD/CAM, CNC, Metallurgy, Adv. Manuf. tech., Mech. Engg (Fabrication Tech), Mech Engg (CAD/CAM Dsgn, Robotics)

Subject:- Machine Design & Drawing

Time : 3Hrs. M.M. : 100

SECTION-A

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

Q.1 The region of safety in maximum shear stress theory contains which of the given shape
a) Hexagon b) Rectangle
c) Square d) None of the mentioned

Q.2 Greater the velocity ratio, smaller the gear box
a) True
b) Greater the gear box
c) Size of gear box remains unaffected
d) None of the listed

Q.3 Which of the following joint two rotating shafts to each other?
a) Key b) Coupling
c) Gear d) Belt drive

Q.4 Stress produced in the member due to falling load is
a) Impact load b) Fatigue stress
c) Fatigue limit d) Endurance limit

Q.5 Shafts are made of
a) Cast iron b) Wrought iron
c) Mild steel d) High speed steel

Q.6 The distance between the two adjacent crests of threads is called
a) Lead
b) Root
c) Pitch
d) Crest

Q.7 The factor of safety of steel and for steady load is
a) 2
b) 4
c) 6
d) 8

Q.8 A woodruff key is generally used in
a) Machine tool industry
b) Automobile industry
c) Textile industry
d) Only a & b

Q.9 When a shaft of high strength is required, the material used in
a) Nickel steel
b) Nickel chrome steel
c) Chrome vanadium steel
d) All of the above

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

SECTION-B

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

Q.11 Working stress is the stress which _____

Q.12 Name two modes of key failures.

Q.13 What is the function of cam?

Q.14 Function of power screw.

Q.15 Stress is linear with reference to strain upto _____ limit.

Q.16 Factor of safety is the ratio of _____ to _____.

Q.17 The metal is easily drawn into wires due to _____ property.

Q.18 Square keys are manufactured on _____ machine.

Q.19 Define stress concentration.

Q.20 Name any two loads that act on shafts.

SECTION-C

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

Q.21 Drive the relation between total depth, addendum and dedendum in a gear with diagram.

Q.22 Discuss the general considerations in machine design.

Q.23 Explain the various methods to reduce stress concentration in details.

Q.24 Classify and explain different types of shafts.

Q.25 Give the relative advantages and disadvantages of a key joint.

Q.26 Write short note on screw thread nomenclature with diagram.

Q.27 Define load, types of load and their effects.

Q.28 Differentiate between temporary and permanent joints.

Q.29 Explain where acme threads are preferred over square threads and why?

Q.30 Sketch and differentiate sunk and saddle key.

Q.31 What are the desirable properties of shaft material?