SECTION-D

Note: Long answer type questions. Attempt any one questions out of two questions. (1x30=30)

Q.26 Construct the profile of a cam for following specifications:-

I) Cam shaft dia = 4 5mm
ii) Least radius of cam = 30 mm
iii) Diameter of roller = 20 mm
iv) Angle of lift = 120°
v) Angle of fall = 150°
vi) Lift of follower = 40 mm
vii) Number of pauses are two of equal interval between motions. During lift, motion is S.H.M during fall, the motion is uniform accelerated and decelerated. The speed of cam shaft is uniform . The line of stroke of follower is offset by 15 mm from centre of shaft.

Q.27 Design and draw a screw jack which used to lift of 200 KN through a height of 400 mm. The elastic strength of material of screw in tension 2 and compression is 500N/mm and in shear is 2 150 N/mm. The elastic strength for the material 2 of nut is taken as 150 N/mm in tension, 2 2 00 N /mm in compression and 90N / mm in shear. The bearing pressure between the nut 2 and screw does not exceed 20N / mm

Roll No. .....

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

Time : 3Hrs. M.M. : 100

SECTION-A

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

Q.1 Which of the following is not the method to reduce stress concentration?

a) Usage of additional notches and holes
b) Usage of fillet radius
c) Usage of additional discontinuities
d) Usage of sharp corners

Q.2 If compressive yield stress and tensile yield stress are equivalent , then region of safety from maximum principal stress theory is of which shape?

a) Rectangle b) Square
c) Circle d) Ellipse

Q.3 Which of the following is not a type of transmission shaft?

a) Crankshift b) Countershaft
c) Transmission shaft d) Line shaft

Q.4 Which of the following expression is not correct for designing a shaft according to rigidity?

a) $T = G\Theta J / L$ b) $J = TL / G\Theta$
c) $\Theta = TL / GJ$ d) $L = G\Theta T / J$

Q.5 Resilience is defined as the property of material to absorb energy when deformed _____and to release this energy when unloaded.

a) Elastically b) Plastically
c) Up to fracture point d) None of the listed

Q.6 _____is used for a shaft that supports rotating elements like wheels, drums or rope sleaves.

a) Spindle b) Axle
c) Shaf d) None of the listed

Q.7 Which of the following is not a type of sunk key?

a) Gib headed key b) Woodruff key
c) Square key d) Hollow saddle key

Q.8 Which is the smallest circle that can be drawn on a cam profile?

a) Prime circle b) Base circle
c) Addendum circle d) Dedendum circle

Q.9 The common normal to the curves of the two teeth must not pass through the pitch point.

a) True b) It must pass
c) It may or may not pass d) None of the listed

Q.10 Which of the following can be used for power transmission in intersecting shafts.

a) Spur Gear b) Helical Gear
c) Bevel Gear d) None of the listed

SECTION-B

Note: Very short answer type questions. Attempt any ten questions out of twelve questions. (10x2=20)

Q.11 Define malleability.

Q.12 Define creep.

Q.13 What is the maximum distortion energy ?

Q.14 Give classification of loads.

Q.15 What is a machine shaft?

Q.16 Name any two materials used for high strength shafts?

Q.17 Define pitch for a thread.

Q.18 Write advantages of screw threads.

Q.19 Name two types of cam.

Q.20 Define tracing point.

Q.21 Define pressure angle in case of gears?

Q.22 Define involute.

SECTION-C

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

Q.23 i) Write down any ten Mechanical properties of material. Explain each property briefly.

ii) Define machine design? Explain the types, necessity and procedure of machine design.

Q.24 Draw the profile of involute teeth for gear having 25 teeth and module 10 mm. Assume pressure angle as 20^{o}. Use base circle method. Explain its method of construction also.

Q.25 A rectangular sunk key is 16 mm wide, 12mm thick and 80 mm long is required transmit a torque 25 kNm from a 100 mm diameter shaft . Find the shear and crushing stress induced in key.