No. of Printed Pages : 4 221745
Roll No. .....

4th Sem./ Mechanical Engg

Subject : Machine Design

Time : 3 Hrs. M.M. : 60

SECTION-A

Note: Multiple choice questions. All questions are compulsory (6x1=6)

Q.1 A bench vice is provided with_____ threads.

a) Acme b) Butteress

c) BSW d) None of the above

Q.2 Fatigue failure of material is due to

a) Shear stress b) Thermal stress

c) Constant stress d) Fluctuating stress

Q.3 Which of the following key is used for light work?

a) Saddle key b) Tangent key

c) Sunk key d) Round key

Q.4 The outermost portion of thread is called

a) Crest b) Root

c) Flank d) slope

Q.5 The factor of safety of steel and for steady load is

a) 2 b) 4

c) 6 d) 8

Q.6 Shaft used in factories and workshop is known as

a) Flexible shaft b) Machine shaft

c) Line shaft d) Prime shaft

SECTION-B

Note: Objective/ Completion type questions. All questions are compulsory. (6x1=6)

Q.7 What is the use of SN curve?

Q.8 The material of key is_____

Q.9 Define creep.

Q.10 Maximum shear stress theory is also known as _____

Q.11 Effect of keyway on shaft is_____

Q.12 Define pitch

SECTION-C

Note: Short answer type questions. Attempt any eight questions out of ten questions. (8x4=32)

Q.13 Write short note on BIS

Q.14 Explain the failure modes of keys with diagrams.

Q.15 Enumerate the types of shafts.

Q.16 Explain stress concentration and methods to reduce stress concentration.

Q.17 Explain the general procedure of designing a new machine.

Q.18 Name different theories of failure. Explain any one

Q.19 What should be the properties of materials used for shafts?

Q.20 Explain the geneal design considerations in machine design.

Q.21 A rod 2 m long and 30mm diameter is subjected to an axial load pull of 30KN. If the Young modulus of material of rod is $2x10^5$ N/mm^2, Determine Stress and strain

Q.22 Explain in detail Maximum principal stress theory.

SECTION-D

Note: Long answer type questions. Attempt any two questions out of three questions. (2x8=16)

Q.23 A 200 mm shaft rotating at 180rpm transmit 360kw. Power is taken through a gear whose hub is 300 mm long. The material of key has shear stress of 450/mm^2, By using a FOS 5, find the dimensions of key.

Q.24 A solid shaft transmit a power of 100 kw at 220 rpm. Taking allowable shear stress as 80 Mpa, find suitable diameter of the shaft, if maximum torque transmitted in each revolution exceed the mean by 25% Find the outer diameter of the shaft whose inside diameter is 0.8 time of outside, which can replace the solid shaft.

Q.25 a) Explain where acme threads are preferred over square threads and why?

b) Explain the terms. Stiffness, Endurance limit, Static load