Q.30 Explain the following a) Crushing stress b) Power screws.

Q.31 Write the advantages of screw joint.

Q.32 Explain BIS codes and standards.

Q.33 What is shaft? Explain its various types.

Q.34 What is the minimum length of a 40mm key that you would use with a gear 200mm in diameter designed to operate at a torsional working stress of $100MN/m^2$

Q.35 Compare a design work and undersigned work.

SECTION-D

Note: Long answer 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 in required to give a knife edge follower, the motions as described below:

i) To move outward through 40mm during 90° rotation of the cam, with uniform velocity.

ii) To dwell for the next 60°.

iii) To return to its starting position during next 90°. With uniform velocity

iv) To dwell for the rest period of a revolution i.e. 120°.

Q.37 A 100 mm diameter shaft rotation at 50 r.p.m. transmit a power of 112kW. Power is taken off through a gear whose hub is 200mm long. The key is made of steel having an ultimate shear stress of $490N/mm^2$. Using a factor of safety of 7, determine the dimension of key.

Q.38 Explain the various term related to screw threads. Also list the advantage and disadvantages of screw joints.

4th Sem.

Branch : Mech. Prod., T&D, Mecatronics (5th Sem.) CAD/CAM, CNCMetallurgy, Adv. Manuf. Tech., Mech Engg. (Fabrication Tech.) Mech Engg. (CAD/CAM Dsgn. & Robotics)

Subject : Machine Design & Drawing

Time : 3 Hrs. M.M. : 100

SECTION-A

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

Q.1 Brittleness is opposite to
a) Toughness b) Plasticity
c) Malleability d) None of the above

Q.2 The cotter is used
a) To connect to piston rod with cross head
b) In foundation bolt
c) Both A & B
d) None of the above

Q.3 A taper key is
a) Uniform in width
b) Taper is thickness
c) Use to prevent relative motion
d) All of the above

Q.4 The shear stress on principal plane is
a) Zero b) Minimum
c) Maximum d) None of the above

Q.5 Material is use for high strength is

a) Nickle steel   b) Chrome-Vanadium steel

c) Nickle-Chromium steel   d) All of the above

Q.6 Slope of thread is

a) Half of pitch   b) Double of pitch

c) Thrice of pitch   d) One fourth of pitch

Q.7 Unit of Young's modulus of elasticity is same as of_____.

a) Stress   b) Strain

c) Force   d) None of the above

Q.8 Maximum strain energy theory is generally used for

a) Ductile Material   b) Brittle material

c) Hard material   d) Tough material

Q.9 The desired property of shaft material are

a) Notch sensitivity factor should be low

b) Strength should be high

c) It should have better machinability

d) All of the above

Q.10 Which thread is used in lead screw of lathe?

a) B.S.W.   b) Square

c) B.A.   d) Acme

SECTION-B

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

Q.11 The angle of buttress thread is ....

Q.12 Equivalent twisting moment, Te=................................

Q.13 Expand BIS.

Q.14 The key of circular cross section are called.................

Q.15 FOS = ...

Q.16 1MPa = ... N/mm^2

Q.17 The inner most portion of thread is known as .... of thread.

Q.18 Plasticity is opposite to........

Q.19 Name various type of loads on shaft.

Q.20 The screw are used to join two parts permanently. (True or False)

SECTION-C

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

Q.21 Define cam also enlist its various types.

Q.22 Explain the design failure by maximum stress theory.

Q.23 What is key? List the various type of keys, also write the parameter of Gib head key.

Q.24 Explain the uniform motion by cam.

Q25 What is the effect of key on strength of shaft.

Q.26 Write the characteristics of good designer.

Q.27 Define Fatigue and endurance limit.

Q.28 Explain in detail stress strain curve of ductile material subjected to Tensile load.

Q.29 Describe the Nomenclature of gear.