5th Sem / Branch : Mech. Prod., Mecatronics (4th Sem)
CAD/CAM. Mech, Engg. (Fabrication Tech) Mechanical
Engg. (CAD/CAM Design & Robotics)
Sub.: Theory of Machines

Time : 3Hrs.   M.M. : 100

SECTION-A

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

Q.1   In lower pairs, there is
   a)   Point contact
   b)   Line contact
   c)   Surface contact
   d)   A surface contact and the relative motion is either sliding or turning

Q.2   The V-belt sheaves of pulley normally have a groove angle of
   a) $50°$ to $60°$ b) $20°$ to $30°$
   c) $35°$ to $45°$ d) $15°$ to $20°$

Q.3   Crowing of pulley is done
   a)   To make them more sturdy
   b)   To avoid slipping of the belt
   c)   To make pulley work more pleasant in appearance
   d)   to enable pulley rigidly fixed to the shaft

Q.4   The maximum fluctuation of energy flywheel
   a)   Directly proportional to the co-efficient fluctuation of speed
   b)   Is directly proportional to square of angular velocity
   c)   Is directly proportional to the moment of inertia of the flywheel
   d)   All of the above

Q.5   The height of a Walt governor is expressed as
   a) $h = w/g^2$ b) $h = g.w^2$
   c) $h = g.w$ d) $h = g/w^2$

Q.6   The size of a cam depends upon
   a)   Base circle   b)   Pitch circle
   c)   Prime circle   d)   Pitch curve

Q.7   For dynamic balancing of a shaft
   a)   The net dynamic force action on the shaft is equal to zero
   b)   The couple due to the dynamic forces action on the shaft is equal to zero
   c)   Both (a) and (b)
   d)   None of the above

Q.8   The particles of a disc mounted at end of a shaft circle about the shaft axis. Such an effect is caused by
   a)   Longitudinal Vibrations
   b)   Transverse vibrations
   c)   Tensional Vibrations
   d)   Periodically force vibrations

Q.9   The shaft and thrust bearing of a vertical shaft in a turbines is an example of
   a)   Complete constraint
   b)   Incomplete constraint
   c)   Successful constraint
   d)   un-reliable constraint

Q.10   It is possible to have a kinematic chain with
   a)   Three turning pairs
   b)   Four turning pairs
   c)   Five turning pairs
   d)   All of the above

SECTION-B

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

Q.11 Define a resistant body.

Q.12 Generally belts are made from which material?

Q.13 What is law of belting?

Q.14 The quantity of matter contained in a body is called_____.

Q.15 Governor with_____ is called an isochronous governor.

Q.16 The balancing of the moving parts both rotating and reciprocating of high speed machinery is having greater importance. (True/False)

Q.17 When a body said to be vibrating?

Q.18 The cause of vibrations are the ____ forces.

Q.19 On the basis of type of contact kinematic paris may be classified as closed pairs and unclosed pairs. (True/False)

Q.20 Velocity ratio is the ratio of speed between the driven and driving two mating gears is two times of module. (True/False)

SECTION-C

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

Q.21 What are different type of constraints in kinematic paris? Give two practical example.

Q.22 Differentiate between a machine and a structure.

Q.23 What are the advantages of V-Belt over the flat belt pulley drive?

Q.24 What is the effect of centrifugal tension on power transmitted by the flat belt and drive the expression for centrifugal tension?

Q.25 In what circumstances a compound gear train is to be used in preference to a simple gear train?

Q.26 Define flywheel, its principal & applications.

Q.27 Explain working of watt governor with the help of neat sketch.

Q.28 What are the characteristics of a centrifugal governor?

Q.29 Differentiate between static and dynamic balancing.

Q.30 What do you mean by out of balance?

Q.31 Define vibration & its types.

Q.32 What are harmful effect of vibrations?

Q.33 Define the terms co efferent of fluctuation of energy and co-efficient of fluctuations of speed of flywheel.

Q.34 How the gears are classified.

Q.35 Define CAM and its practical applications.

SECTION-D

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

Q.36 Obtain the an expression for the length of a belt in an open belt drive.

Q.37 A fly wheel having a mass of 5 tonnes has radius of gyration 2m. What amount of energy will be stored in the flywheel in changing its speed from 420 rpm to 480 rpm.

Q.38 Explain the working and construction of Hartnell Governor with the help of neat sketch.