

- Q.30 Two pulleys, one 450 mm diameter and the other 200 mm diameter are on parallel shafts 1.95m apart and are connected by a crossed belt drive. Find the length of the belt required and the angle of contact between the belt and each pulley. (CO2)
- Q.31 Describe the working of Scotch-Yoke mechanism with neat sketch. (CO1)
- Q.32 Explain, why balancing is necessary for high speed? (CO5)
- Q.33 Differentiate between flat belt and V-belt (at least five factors). (CO2)
- Q.34 Write short note on damping of vibrations. (CO6)
- Q.35 Explain the compound gear train with neat sketch and write down the velocity ratio's equation. (CO2)

SECTION-D

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

- Q.36 Explain the phenomenon of slip and creep in a belt drive. State their effect on velocity ratio.
- Q.37 The four masses A, B, C and D are attached to a shaft and revolve in the same plane. The masses are 12kg, 10 kg, 18kg and 15kg respectively and their radii of rotation are 40mm, 50mm, 60mm and 30mm. The angular positions of masses B, C and D are 60° , 135° and 270° from mass A. Use graphical method and find position and magnitude of balancing mass required if radius of rotation is 100 mm. (CO5)
- Q.38 Explain principle and working of flywheel with the help of turning moment diagram. (CO3)

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6th Sem. / Mechatronics Sub. : Mechanisms and Machines

Time : 3 Hrs.

M.M. : 100

SECTION-A

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

- Q.1 The rotary internal combustion engine is the inversion of _____.
a) Four bar link chain
b) Double slider crank chain
c) Single slider crank mechanism
d) Rocker crank mechanism (CO1)
- Q.2 A minimum number of links that can make a mechanism are _____
a) 2
b) 3
c) 4
d) None of these (CO1)
- Q.3 Which inversion mechanism is also known as gnomon engine?
a) Rotary IC engine
b) Double crank mechanism
c) Oscillating Cylinder mechanism
d) Crank and Lever mechanism (CO1)
- Q.4 Which one of the following is NOT correct in respect of "V" belt drive.
a) It is compact
b) It can be easily replaced and Maintenance is easy
c) It causes less noise and vibration
d) It is used where distance between driver and driven pulley is more (CO2)

- Q.5 Which one of the following drives is used for transmitting power without slip? (CO2)
 a) Belt drives b) Rope drives
 c) Cone drives d) Chain drives
- Q.6 Flywheel is used in (CO3)
 a) Punch press b) Drilling machine
 c) Surface grinder d) Milling machine
- Q.7 Cylindrical Cams are also known as _____ Cam. (CO4)
 a) Spiral b) Conjugate
 c) Drum d) Spherical
- Q.8 Which among the following cam follower is extensively used in an aircraft engine? (CO3)
 a) Spherical follower b) Roller follower
 c) Flat faced follower d) Knife edge follower
- Q.9 In order to balance the reciprocating masses:
 a) Primary and secondary forces must be balanced
 b) Primary couple must be balanced
 c) Secondary couple must be balanced
 d) All options are correct
- Q.10 S.H.M. stands for _____. (CO4)
 a) Simple Harmonic Machine
 b) Simple Harmonic Motion
 c) Spherical Harmonic Machine
 d) Spherical Harmonic Motion

SECTION-B

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

- Q.11 When one of the links of a kinematic chain is fixed, the chain is known as (CO1)
- Q.12 Define mechanical advantage (M.A.) for a machine. (CO1)

- Q.13 Define compound mechanism. (CO1)
- Q.14 What is the function of Cam. (CO4)
- Q.15 Balancing of single rotating mass by balancing masses in same plane and in different planes can not take place. (True / False) (CO5)
- Q.16 Define Lift (or) Stroke in cam, (CO4)
- Q.17 What is fluctuation of speed? (CO3)
- Q.18 What is the use of double crank mechanism? (CO1)
- Q.19 Define balancing. (CO5)
- Q.20 Define angular acceleration. (CO4)

SECTION-C

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

- Q.21 Define kinematic chain. Name different types of kinematic chain. (CO1)
- Q.22 Define mechanism, equivalent mechanism and inversion of mechanism. (CO1)
- Q.23 Define Coefficient of Fluctuation of speed. Write its equation in terms of angular and linear speed. (CO3)
- Q.24 Write various terminology of gear. Also write the types of gear. (CO2)
- Q.25 Write the advantages of chain drive over belt drive. (CO2)
- Q.26 What are different types of cams? Draw any one type of cam. (CO4)
- Q.27 What do you mean by Simple Harmonic Motion. (CO4)
- Q.28 What are the applications of flywheel? (CO3)
- Q.29 Why roller follower is preferred over knife edge follower? State two applications of roller follower. (CO3)