

- Q.30 What parameters are considered for selecting a chain drive for power transmission? (CO2)
- Q.31 Define the following terms related with gear terminology: (CO2)
- a) Module                      b) Diametral pitch
- c) Circular pitch              d) Pitch point
- Q.32 Define: (CO4)
- a) Absolute velocity      b) Relative velocity
- c) Velocity Ratio
- Q.33 Explain the function of flywheel with neat sketch. (CO3)
- Q.34 Write short note on concept of reference plane. (CO5)
- Q.35 What are the significance of turning moment diagram of flywheel? (CO3)

#### SECTION-D

- Note:** Long answer type questions. Attempt any two questions out of three questions. (2x10=20)
- Q.36 What is slider crank chain? Explain different types of slider crank chain with suitable and neat diagram. Also write their uses. (CO1)
- Q.37 A shaft rotating at 200 rpm drives another shaft at 300 rpm and transmits 6 kW through a belt. The belt is 100 mm wide and 10 mm thick. The distance between the shafts is 4 m. The smaller pulley is 0.5 m in diameter. Calculate the stress in the belt, if it is
- i) open belt drive,
- ii) cross belt drive take  $\mu = 0.3$ . Assume suitable data if necessary. (CO2)
- Q.38 What are the causes of vibrations in machines? What are their harmful effects and their remedies? (CO6)

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### 6th Sem / Mechatronics Subject:- Mechanisms and Machines

Time : 3Hrs.

M.M. : 100

#### SECTION-A

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

- Q.1 When one of the links of a kinematic chain is fixed, the chain is known as \_\_\_\_\_ (CO1)
- a) Machine                      b) Mechanism
- c) Inversion                      d) None of these
- Q.2 The approximate value of mechanical advantage for a Four-bar link, if placed in toggle position, is \_\_\_\_\_ (CO1)
- a) Zero                              b) 1.0
- c) 0.5                                d) Infinite
- Q.3 In an ideal machine, the efficiency is equal to \_\_\_\_\_ (CO1)
- a) Zero                              b) Unity
- c) Infinity
- Q.4 The efficiency of power transmission is maximum in case of \_\_\_\_\_ (CO2)
- a) Rope drive                      b) Flat belt drive
- c) V-belt drive                      d) Chain drive
- Q.5 Idler pulley is used \_\_\_\_\_ (CO2)
- a) For changing the direction of motion of the belt
- b) For applying tension
- c) For increasing velocity ratio
- d) All of the above

- Q.6 In vehicles, flywheel is placed in between (CO3)  
 a) Engine and clutch  
 b) Clutch and Propeller shaft  
 c) Propeller shaft and Differential  
 d) Before Engine
- Q.7 The size of the cam depends on (CO4)  
 a) Pitch circle                      b) Prime circle  
 c) Pitch curve                      d) Base circle
- Q.8 Which of the following cam follower has the highest wear rate? (CO4)  
 a) Knife edge follower  
 b) Roller follower  
 c) Flat face follower  
 d) Spherical faced follower
- Q.9 In reciprocating engines, the primary unbalanced force \_\_\_\_\_ (CO5)  
 a) can not be balanced  
 b) can be fully balanced  
 c) can be partially balanced  
 d) is maximum when the angle of crank with the line of stroke is  $45^\circ$ .
- Q.10 At which angle primary unbalanced force in reciprocating engine mechanism is maximum? (CO3)  
 a)  $0^\circ$                                       b)  $90^\circ$   
 c)  $360^\circ$                                       d) All of the above

#### SECTION-B

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

- Q.11 What are the uses of crank and lever mechanism? (CO1)
- Q.12 State any two inversions of single crank drive. (CO2)

- Q.13 Name the different materials used for belts used in power transmission. (CO2)
- Q.14 Oldham's coupling mechanism belongs to \_\_\_\_\_ kinematic chain. (CO1)
- Q.15 1 horse power = \_\_\_\_\_ watts. (CO2)
- Q.16 What is the function of pulley. (CO2)
- Q.17 M O I. stands for \_\_\_\_\_ (CO3)
- Q.18 Write the function of brake. (CO3)
- Q.19 S.H.M. stands for \_\_\_\_\_ (CO6)
- Q.20 State the necessity of balancing. (CO5)

#### SECTION-C

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

- Q.21 What is kinematic pair? Explain different types of pairs. (CO1)
- Q.22 Explain the inversion of double slider crank chain. (CO1)
- Q.23 Write down the formula of length of belt for open belt drive and cross belt drive. (CO2)
- Q.24 State the types of chains and sprockets. (CO1)
- Q.25 Define 'Gear Train'. State its purpose and write the types of gear train. (CO2)
- Q.26 State the advantages of V-belt drive over flat belt drive. (CO2)
- Q.27 How does friction affect efficiency of machines? Explain with an example. (CO3)
- Q.28 In a four-bar chain ABCD, AD is fixed and 150 mm long. The crank is AB is 40 mm long and rotates at 120 rpm clockwise, while the link CD=80 mm oscillates about D. BC and AD are of equal length. Find the angular velocity of link CD when angle BAD= $60^\circ$ . (CO4)
- Q.29 Define the following terms related to cam and follower: (CO4)  
 a) Pitch curve                                      b) Pressure angle