

6. Which of the following displacement diagrams should be chosen for better dynamic performance of a cam-follower mechanism? CO1- U
- (a) simple harmonic motion (b) parabolic motion
(c) cycloidal motion (d) Uniform Velocity
7. Mitre gears are used for CO1- U
- (a) great speed reduction (b) equal speed
(c) minimum axial thrust (d) minimum backlash
8. If the module of a gear be m , the number of teeth T and pitch circle diameter D , then CO1- U
- (a) $m = D/T$ (b) $D = T/m$ (c) $m = D/2T$ (d) none of these
9. When there is only one gear on each shaft is called as CO1- U
- (a) simple gear train (b) compound gear train
(a) epicyclic gear train (b) None of these
10. A gear train having the input and output gears mounted on the same axis is called CO1- U
- (a) simple gear train (b) compound gear train
(c) provide jerk-free movement of vehicle (d) help in turning

PART – B (5 x 2= 10 Marks)

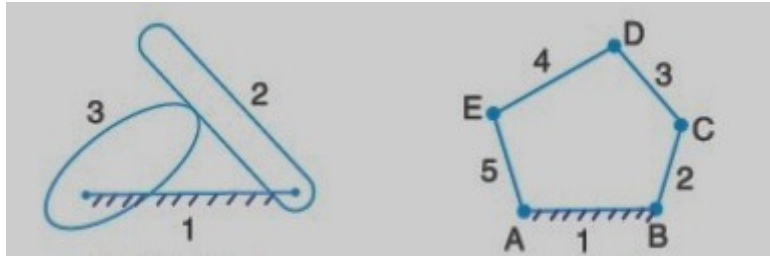
11. Explain the kinematic pair CO1 - U
12. Draw a sketch to explain how total acceleration of a link is obtained CO1 - U
13. List out the functions of cam CO1 - U
14. Define gear ratio and module CO1 - U
15. Explain gear train CO1 - U

PART – C (5 x 16= 80 Marks)

16. (a) Describe the various inversions of single slider crank mechanism with sketches CO1 - U (16)

Or

- (b) Determine the mobility (degrees of freedom) of the mechanism shown in Fig. using Kutzbach mobility criterion and classify them. CO1 - U (16)



17. (a) A four bar chain mechanism PQRS it is drive by the crank PQ which rotates at 600 rpm in clockwise direction. The link PS is fixed. Find the angular velocity of the links QR and RS. Link PQ = 62.5mm, QR = 175mm, RS = 112.5mm, PS = 200mm, QPS = 50° . CO2- App (16)

Or

- (b) In a four bar chain ABCD, AD is fixed and is 90 mm long. The crank AB is 40mm long and rotates at 150 r.p.m. clockwise, while the link CD = 40 mm oscillates about D. BC and AD are of equal length. Find the angular acceleration of link CD when angle BAD = 40° . CO2- App (16)

18. (a) A cam is to give the following motion to a knife edge follower
 1. Outstroke during 120° of cam rotation
 2. Dwell for the next 60° of cam rotation
 3. Return stroke during next 120° of cam rotation.
 4. Dwell for the remaining 60° of cam rotation. The stroke of the follower is 40mm and minimum radius of cam is 25 mm. the follower moves with SHM during outstroke and Uniform velocity at return stroke . Draw the profile of the cam CO2- App (16)

Or

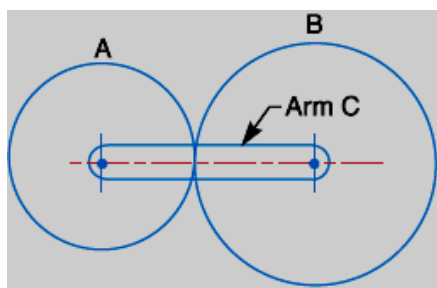
- (b) A cam with a minimum radius of 25mm and rotating, is to be designed for a Flat faced follower with the following Data:
 Ascent of the follower through 45mm during 60° cam rotation;
 Dwell for next 40° of the cam rotation;
 Descent of the follower during the next 90° of the cam rotation;
 Dwell during rest of cam rotation. The ascent and descent of the cam are with simple harmonic. Draw the profile of the cam. CO2- App (16)

19. (a) Two gears of module 4mm have 24 and 33 teeth. The pressure angle is 20° and each gear has a standard addendum of one module. Find the length of arc of contact if the pinion rotates at 120 r.p.m. CO3- App (16)

Or

- (b) The pitch circle diameter of the smaller of the two spur wheels which mesh externally and have involute teeth is 120 mm. The number of teeth are 20 and 35. The pressure angle is 20° and the addendum is 0.45 of the circular pitch. Find the length of the path of contact of the pair of teeth. CO3- App (16)

20. (a) In an epicyclic gear train, an arm carries two gears A and B having 40 and 45 teeth respectively. If the arm rotates at 150 r.p.m. in the anticlockwise direction about the centre of the gear A which is fixed, determine the speed of gear B. If the gear A instead of being fixed, makes 200 r.p.m. in the clockwise direction, what will be the speed of gear B? CO3- App (16)



Or

- (b) In a reverted epicyclic gear train, the arm A carries two gears B and C and a Compound gear D - E. The gear B meshes with gear E and the gear C meshes with gear D. The number of teeth on gears B, C and D are 75, 30 and 90 respectively. Find the speed and direction of gear C when gear B is fixed and the arm A makes 100 r.p.m. clockwise. CO3- App (16)

