

L.E Collge, Morbi

Mechanical Engineering Department

Question Bank of Subject Kinematics and Theory of Machines (3131906)

1	Define the following terms: (1) Module of gear (2) Pressure angle in cam-profile (3) Self-locking brake (4) Lower pair (5) Higher pair (6) successfully constrained motion (7) completely constrained motion (8) Kinematic chain (9) Degree of freedom (10) Mechanism (11) Instantaneous center (12) Body centrode & Space centrode (13) Relative velocity (14) pressure angle (15) helix angle (16) circular pitch (17) Dry friction (18) film friction (19) limiting angle of friction (20) Kinematic link (21) Dry friction (22) Film friction (23) Limiting angle of friction (24) Structure (25) Module of gear (26) Backlash (27) Self locking brake (28) Contact Ratio (29) Module (30) Circular pitch (31) Addendum.
2	Define the following terms as applied to cam with a neat sketch: - Base circle, Pressure angle, and Pitch circle.
3	Define the following terms as applied to gear with a neat sketch: - Base circle, Pressure angle, and Pitch circle.
4	Explain different types of kinematic pairs.
5	Explain various inversion of double slider kinematic chain with examples
6	Describe working principle of internal expanding shoe brake with a neat sketch.
7	Construct three position synthesis of single slider crank mechanism by relative pole method.
8	Derive Freudenstein's equation for four bar mechanism. OR Formulate freudenstein's equation.
9	Explain and prove Arnold Kennedy theorem.
10	Explain coriolis component and derive its equation.
11	Draw an acceleration diagram of single slider crank mechanism.
12	Classify the toothed gear.
13	State and derive law of gearing.
14	Explain the term 'Interference' as applied to gears.
15	Derive the empirical relation for the ratio of driving tensions for flat belt drive.
16	Describe with a neat sketch the working of a single plate clutch.
17	What are usual types of joints in a mechanism?
18	Illustrate the inversion of a double slider crank mechanism giving example.
19	Contrast Linear velocity & Velocity of rubbing.
20	Interpret the Phenomenon of "slip" & "creep" in a belt drive.
21	Derive the relation for ratio of belt tension in a flat belt drive.
22	State and explain angular-velocity ratio theorem as applicable to mechanism.
23	Explain briefly dimensional synthesis.
24	Explain solid friction, rolling friction and greasy friction.
25	What are different types of pulleys? Explain briefly with sketch.
26	What is contact ratio? Explain its significance
27	Explain in brief Function, Path & Motion Generation.
28	Differentiate between Involute and Cycloidal profile of gear tooth.
29	State & prove the law of gearing.
30	Explain types of constrain motion.
31	Explain internal expanding shoe brake.
32	Explain cone clutch with sketch

33	Classify followers & explain with neat sketch.
34	Explain the working principle of any quick return mechanism with net sketch.
35	Explain the relation between linear and angular terms: displacement, velocity and acceleration
36	Explain Rigid link, Flexible link and Fluid link with example.
37	State and prove 'Aronhold Kennedy's Theorem' of three instantaneous centers.
38	Define rubbing velocity at a pin joint. What will be the rubbing velocity at pin joint when the two links move in the same and opposite directions?
39	Explain in brief Function, Path & Motion Generation
40	What do you understand by the term "interference" as applied to the gear?
41	Bridges and roof of workshop uses structure element, justify with reason.
42	Explain with sketches the different types of cams and followers
43	Derive an expression for the length of path of contact for two involutes profile gear in mesh.
44	Explain the phenomena of slip and creep in a belt drive.
45	Explain with the neat sketch the "sun and planet wheel".
46	Enlist the quick return mechanisms and describe working of any one of them with neat sketch
47	Explain types of Instantaneous centers of mechanism.
48	Prove that if three links move relatively to each other they have three instantaneous centers which must lie on a straight line.
49	Explain the phenomena of slip and creep in a belt drive.
50	Construct two position synthesis of single slider crank mechanism by relative pole method.
51	List and describe the three phases of synthesis.
52	Derive the empirical relation for the ratio of driving tensions for flat belt drive.
53	Explain with reason the case in which the shoe of the single shoe brake will be pivoted.
54	Draw a neat sketch of single plate clutch and also label each component.
55	State and derive the law of gearing.
56	Make a comparison of cycloidal and involute tooth form.
57	List and describe the three phases of synthesis.
58	Construct two position synthesis of single slider crank mechanism by relative pole method.
59	Derive analytical expression for the displacement and velocity analyses of a slider crank mechanism.
60	Classify "followers" and explain with neat sketch.
61	Compare chain drive with rope drive.
62	Explain the phenomenon of "slip" and "creep" in a belt drive.
63	Distinguish between the function of a clutch, brake and dynamometer.
64	Derive an expression for the efficiency of an inclined plane when a body moves up a plane.
65	What do you mean by interference in gear?
66	Derive an expression for the length of the path of contact in a pair of meshed spur gears.
67	Explain briefly the differences between simple, compound, and epicyclic gear trains.
68	Explain compound gear train with neat sketch.
69	Explain epicyclic gear train with the help of neat sketch. Write its merits and demerits as compared to reverted and compound gear trains.
70	Discuss coriolis component of acceleration.
71	State and prove the law of gearing. Show that involute profile satisfies the conditions for correct gearing.
72	List quick return motion mechanisms with application.
73	Explain degree of freedom with neat sketch. Also State and explain Grashof's criterion.