Time: 3 Hours

Max. Marks:75

Instructions:
1. It is compulsory to answer all the questions (1.5 marks each) of Part -A in short.
2. Answer any four questions from Part -B in detail.
3. Different sub-parts of a question are to be attempted adjacent to each other.

PART -A

Q1 (a) What is structural error? (1.5)

(b) What is the difference between machine and mechanism? (1.5)

(c) What are different types of motion that a follower can? (1.5)

(d) Sketch a pantograph. (1.5)

(e) What is constrained motion? (1.5)

(f) What is importance of precision points in designing the mechanism? (1.5)

(g) What is law of gearing? (1.5)

(h) What is band Brake? (1.5)

(i) What is use of steering gears? (1.5)

(j) What are gear trains? (1.5)

PART -B

Q2 (a) With a neat sketch, describe the principle and working of Prony brake dynamometer. (10)

(b) Explain with neat sketch Internal expanding shoe brake. (5)

Q3 What do you understand by term Cam and follower? Classify the followers according to the motion of follower, location of axis of the follower and according to the shape of that part which is in contact with them. (15)

Q4 (a) Explain what is interference and how it is prevented (5)

(b) Differentiate between: i) simple gear train and compound gear train (ii) reverted gear train and epicyclic gear train (10)

Q5 The crank of a slider crank mechanism is 15 cm and connecting rod is 60 cm long. The crank makes 300 r.p.m. in clockwise direction. When it has turned 45^0 from the inner dead centre position, determine: i) Acceleration of the mid-point of connecting rod; and ii) Angular acceleration of the connecting rod. (15)

Q6 A slider crank mechanism for its three positions θ_{12}= 40 degree and θ_{13}=80 degree of the input link and three positions S_{12}= 1.8cm and S_{13}=4.8cm of the output slider block is to be synthesized. Assume that the value of eccentricity , e = 0.9 cm. (15)

Q7 Explain the following: a) Inversions of mechanisms; b) Elliptical trammel: c) straight line mechanism. (15)

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