



- Q6) a)** A two jointed robot as shown in Fig.1 has length of its arm as 15 cm and 20 cm. The first arm makes an angle of  $20^\circ$  and second arm makes an angle of  $35^\circ$  to be the first arm Compare the co-ordinate position for the end of the arm. [10]

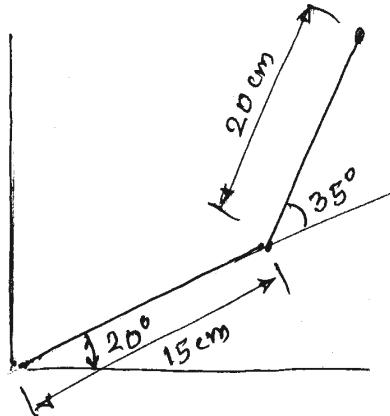


Fig. 1.

- b) Derive kinematic equation for manipulator. [8]
- Q7) a)** Explain the factors to be considered during trajectory planning. [8]
- b) Explain general block diagram of robot control system. [8]

OR

- Q8) a)** Explain modeling and control of a single joint in robot. [8]
- b) Explain different types of controllers used in industrial robots. [8]
- Q9) a)** Explain the different steps involved in segmentation [8]
- b) What is artificial intelligence? Discuss its use in industry. [8]

OR

- Q10)a)** Explain necessity and application of artificial intelligence for robotics system. [8]
- b) Explain the forward and backward search technique in problem solving for AI. [8]

