Roll No. .....

24170

B. Tech. 4th Semester (ME) Examination – May, 2017

KINEMATICS OF MACHINE

Paper : ME-204-F

Time : Three Hours] *[Maximum Marks : 100*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Question 1 is ***compulsory*** and attempt any ***one*** questions from each Section. All questions carry equal marks.

1. Explain the following : $2.5 \times 8 = 20$

(a) Define link and explain its types.

(b) Difference between Machine and Mechanism.

(c) Explain different types of Joints with examples.

(d) Define Kinematic chain.

(e) Explain types of friction.

(f) Explain Law of Belting.

(g) Define face of tooth and flank of tooth.

(h) Define trace point, cam angle and pitch curve terms used in cam.

SECTION – A

2. In a crank and slotted lever quick return mechanism the distance between the fixed centres is 150 mm and the driving cranks is 75 mm long. Determine the ratio of the time taken on the cutting and return strokes. 20

3. The crank of a reciprocating engine revolves at a uniform speed of 310 rpm in a clockwise direction. The crank and connecting rod are 15 cm and 65 cm long respectively. Find the velocity of piston for crank positions from 0° to 90° from inner dead centre at intervals of 30°. Plot the velocities on a crank angle base. 20

SECTION – B

4. Derive the question for minimum force required to drag a body on rough inclined surface. 20

5. Find the length of the cross belt and power transmitted by a belt. 20

SECTION – C

6. A cam rotating at 150 rpm operates a reciprocating roller follower of radius 2.5 cm. The follower axis is offset by 2.5 cm to right. The least radius of the cam is 5 cm and stroke of the follower is 5 cm. Ascent and descent both take place by uniform (rotation) acceleration and retardation. Ascent taken place during 75° and descent during 90° of cam rotation. Dwell between ascent and descent is 60°. Draw the cam profile. Also sketch velocity and acceleration diagrams and mark salient values. 20

7. Explain Law of Gearing with the help of neat diagram. 20

SECTION – D

8. Derive the Chebychev Spacing equation. 20

9. Two parallel shafts are to be connected by spur gearing. The approximate distance between the shaft is 600 mm. If one shaft runs at 120 rpm and the other at 360 rpm, find the number of teeth on each wheel, if the module in 8 mm. Also determine the exact distance apart of the shafts. 20
