DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Mid Semester Examination – March 2019

Course: B. Tech in Mechanical Engineering   **Sem : III**

Subject Name: Theory of Machine - 1   **Subject Code: BT-MEC 402**

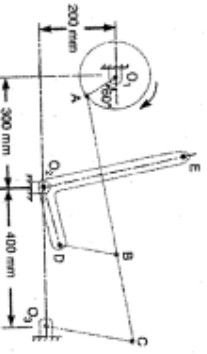**Max Marks: 20**   **Date:-**   **Duration:- 1 Hr.**

Instructions to the Students:
1. Figures to the right indicates full marks
2. Assume suitable data, if and wherever necessary

		Marks
Q1	**Solve**	**6**
i	A kinematic chain is known as a mechanism when	
	(a) None of the link fixed (b) One of the link is fixed	
	(c) Two of the links are fixed (d) None of these	
ii	Which of the following is an inversion of single slider crank chain?	
	(a) Watts indicator diagram (c) Beam engine	
	(c) Elliptical Trammel (d) All of these	
iii	Lead screw of a lathe with nut forms a	
	(a) Sliding pair (b) Rolling pair (c) Screw pair (d) Turning Pair	
iv	The locus of the instantaneous centre in space during a definite motion of the body is called as	
	(a) Body centrod (b) Space centrod (c) Axode (d) None of these	
v	If the links moves in opposite direction, rubbing velocity at pin is	
	(a) $(\omega_1 - \omega_2)$ (b) $(\omega_1 + \omega_2)$ (d) $\omega.r$ (d) $r.\omega^2$	
vi	Direction of linear velocity of any point on a link with respect to another point on same link is	
	(a) Parallel to link joining 2 points (b) perpendicular to link joining 2 points	
	(c) At 45° to the link joining 2 points (d) None of these	

Q.2

(a) Define Kinematic pair, Classify in detail   **3+2**

(b) State and Explain Kennedy's Theorem

Q. 3 **Solve Any One of the following.**

(a) The crank and connecting rod of a steam engine are 0.5 m and 2 m long respectively. The crank makes 180 rpm in clockwise direction. When it has turned 45° from inner dead Centre position, determine by relative velocity method, 1) velocity of piston, 2) angular velocity of connecting rod,3) velocity of point E on connecting rod 1.5m from gudgeon pin, 4) velocities of rubbing at the pins of crankshaft, crank and crosshead when the diameters of their pins are 50 mm,60 mm and 30 mm respectively.   **8**

(b) The mechanism of a wrapping machine , as shown in figure, has the dimensions are O1A = 100 mm ,AC =700 mm, BC =200 mm, O2C= 200 mm, O2E = 400 mm, O2D = 200 mm and BD = 150 mm. The crank O1A rotates at a uniform speed of 100 rad/s. Find the velocity of point E of the bell crank lever by instantaneous Centre method

Figure 1