Printed pages: 2	AG304
(Following paper code and roll No. to be filled in your answer book)	
Paper code: 180311	Roll No.

B TECH
(SEM III) THEORY EXAMINATION 2014-15
THEORY OF MACHINES

TIME: 2 Hours **Total Marks: 50**

Note: Attempt **all** questions.

SECTION - A

Q1. Attempt any five questions: (5*3=15)

a. Explain with sketches the different types of cams and followers.
b. State and prove the Kennedy's theorem of this instantaneous Centre.
c. Derive an expression for the acceleration of a slider cranks mechanism.
d. What is the function of a flywheel? How does it differ from that of a governor?
e. Why is balancing of rotating parts necessary for high speed engines?
f. What do you understand by gear train discuss the various types of gear train.
g. Explain the phenomena of 'slip' and 'creep' in a belt drive.

SECTION – B

Q2. Attempt any three questions: (3*5=15)

a. Describe various inversions of a slider crank mechanism.
b. Draw the displacement, velocity and acceleration diagrams for a follower when it moves with simple harmonic motion. Derive the expression for velocity and acceleration during outstroke and return stroke of the follower.
c. State and prove the law of gearing.
d. Explain followings (a) Degree of freedom (b) elements (c) links (4) pairs (5) kinematic chain
e. Define functions of clutch and explain different types of clutch

SECTION – C

Attempt any two questions: (2*10=20)

Q.3 A Porter governor has equal arms each 250 mm long and pivoted on the axis of rotation. Each ball has a mass of 5 kg and the mass of the central load on the sleeve is 25 kg. The radius of rotation of the ball is 150 mm when the governor begins to lift and 200 mm when the governor is at maximum speed. Find the minimum and maximum speeds and range of speed of the governor.

Q.4. Explain the procedure to construct Klein's construction to determine the velocity and acceleration of a slider crank mechanism.

Q.5. A 100 mm wide and 10 mm thick belt transmits 5kw between two parallel shafts. The distance between the shaft centers is 1.5 m and the diameter of the smaller pulley is 440 mm. The driving and the driven shafts rotate at 60 rpm and 150 rpm respectively. Find the stress in the belt if the two pulleys are connected by:

(1) An open belt, and
(2) A cross belt. The coefficient of friction is 0.22.

Q.6. In an epicylic gear train, an arm carries two gears A and B having 36 and 45 teeth respectively. If the arm rotates at 150 r.p.m. in the anticlockwise direction about the centre of the gar A which is fixed, determine the speed of gear B.