KERALA AGRICULTURAL UNIVERSITY
B.Tech.(Agri. Engg) 2018 Admission
II Semester Final Examination-June 2018

Fpme.1202   Theory of Machines (2+0)

Marks: 50
Time: 2 hours

I	**Fill up the blanks**	**(10x1=10)**

1   …….. is the simplest type of motion and is along a straight line path
2   The radial distance of tooth from the pitch circle to the bottom of the tooth, is called -----
3   The maximum fluctuation of energy is the ---------
4   The bearings of heavy series have capacity ------- over the medium series
5   The direction of linear velocity of any point on a link with respect to another point on the same link is -------

Match the following

6	Variable Velocity	a	Friction
7	Radial	b	Constant acceleration
8	Viscous	c	Centripetal acceleration
9	V-belt	d	Trapezoidal shape
10	Single plate Clutch	e	Fluid friction

II   Write Short notes on any FIVE of the following   (5x2=10)

1   Difference between a machine and a structure
2   Explain the binary joint with neat sketch
3   Write the advantages and disadvantages of a gear drive
4   Give the design of spur gear with formula
5   Derive the force required to slide a body on rough horizontal plane
6   Explain the phenomena of slip and creep in a belt drive
7   Mention the application of cams and followers

III   Answer any FIVE of the following.   (5x4=20)

1   Explain the method locating the instantaneous centres in a mechanism
2   Derive the expression for the magnitude and direction of coriolis component of acceleration
3   What is centrifugal tension in a belt? Derive the condition for transmitting the maximum power in a flat belt drive
4   Derive the expression for the length of a chain drive
5   Discuss the description and working principle of clutches
6   Derive the expression for the maximum torque transmitted by a flat collar bearing considering uniform pressure and wear
7   Discuss the procedure for obtaining the cam profile for acceleration and deceleration.

IV   Answer any ONE of the following   (1x10=10)

1   a.   List the types of governors and explain the porter governor with neat sketch
     b.   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

2   a.   Derive the expression for the length of an open belt drive
     b.   A chain drive is used for reduction of speed from 240 rpm to 120 rpm. The number of teeth on the driving sprocket is 20. Find the number of teeth on the driven sprocket. If the pitch circle diameter of the driven sprocket is 600 mm and centre to centre distance between the two sprockets is 800 mm, determine the pitch and length of chain

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