KUMARAGURU
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Register Number:……..

B.TECH DEGREE EXAMINATIONS: NOV/DEC 2014

(Regulation 2009)

Sixth Semester

TEXTILE TECHNOLOGY

TTX115: Mechanics of Textile Machinery

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

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. To absorb more vibrations and shock loads, the belts should be -----
   a) Thinner and rectangular in cross Section
   b) Thinner and shorter in length
   c) Inelastic and longer in length
   d) Elastic and longer in length
2. Which of the drive is a positive drive?
   a) V belt
   b) Flat belt
   c) Toothed belt
   d) Round belt
3. The profiled surfaces of driving and driven cones in roving machines are
   a) Convex and concave respectively
   b) Concave and convex respectively
   c) Straight
   d) Knurled
4. In a simplex machine if belt slips over cone pulleys, then
   a) Bobbin speed reduces and roving will be stretched
   b) Bobbin speed increases and roving will be stretched
   c) Bobbin speed reduces and slackness accumulates on roving
   d) Bobbin speed increases and slackness accumulates on roving
5. .--- is defined as the distance moved by a body in an angle
   a) Angular displacement
   b) velocity
   c) acceleration
   d) retardation
6. --- is defined as the rate of change of displacement in a given direction
   a) acceleration
   b) Force
   c) Speed
   d) Velocity

7. Energy possessed by the body by the virtue of its position is termed as ------

a) potential energy b) kinetic energy

c) work of rupture d) work factor

8. 1 joule = ---- Nm

a) 1 b) 2

c) 1.5 d) 2.5

9. Friction, experienced by a body, when in motion is termed as ------ friction

a) rolling b) sliding

c) Dynamic d) static

10. The force of friction always acts in a direction, -------- to that in which the body tends to move.

a) parallel b) adjacent

c) vertical d) opposite

PART B (10 x 2 = 20 Marks)

11. What happens if the ratio of tight side and loose side tensions (Tt/Ts) is very large?
12. What is the uniqueness of round belt?
13. What is the problem in using hyperbolic cone pulleys on roving machine?
14. The belt initial position is quite some distance from the edges of cone pulleys on roving machines. Why?
15. Define linear displacement.
16. A yarn guide of winding machine makes 48 doubled traverse/ min., each traverse being 25 cm. Calculate the velocity of yarn guide
17. A traveller in a ring frame is rotating at 8400 rpm. Calculate its angular speed inradians/second.
18. Define kinetic energy.
19. What is the main advantage and disadvantage of simple block brake?
20. What is the main advantage of differential band brake compared with simple band brake?

PART C (5 x 14 = 70 Marks)

21. a) A motor shaft running at 120 rpm is required to drive a machine shaft by means of belt. The pulley on the motor shaft is of 2 m diameter and that of the machine shaft is of 1 m diameter. If the belt thickness is 5 mm, find the speed of the machine shaft when (i) there is no slip, and (ii) there is a slip of 3%. (7+7)

(OR)

b) Find the length of belt for open belt and crossed belt necessary to drive a pulley of 500 mm diameter running parallel at a distance of 12 m from the driving pulley of

diameter 1600 mm.

22. a) Design a shedding tappet for plain weave, using the following particulars

(i) Lift of tappet = 4 inches.

(ii) Distance from the centre of the driving shaft to the nearest point of contact with the treadle bowl is 2 inches.

(iii) Dwell of tappet, one-third of a pick, and

(iv) Diameter of treadle bowl = 2 inches.

(OR)

b) Draw a tappet for a 1 up and 2 down twill, with the following particulars

(i) Centre of the tappet shaft to the nearest point of contact with the treadle bowl = 4 inches

(ii) Lift of tappet = 2 inches

(iii) Treadle bowl diameter = 1.5 inches

(iv) Dwell= one-third of a pick

23. a) A loom shuttle requires 1/12 of a second to pass through the warp sheet having 1.219 m width. Find the average velocity if it is subjected to the retardation of 9.754 m/s2.

(OR)

b) A beater is having diameter of 1.2 m revolving at a speed of 900 rpm. It is required to bring down the speed of 400 rpm before the beater makes 10 revolutions. Find the time taken and also the uniform retardation required. Calculate the length of material delivered by the beater during change of speed (from 900 to 400 rpm). (7+7)

24. a) A carding engine cylinder revolving at 180 rpm has 35,000 joules of kinetic energy stored in it when the belt is shifted of the m/c comes to rest in 130 revolutions. Assuming that the KE is the total for all the moving parts of the m/c, find the power requirement to run it at its operating speed of 180rpm and also the time requirement to stop the m/c.

(OR)

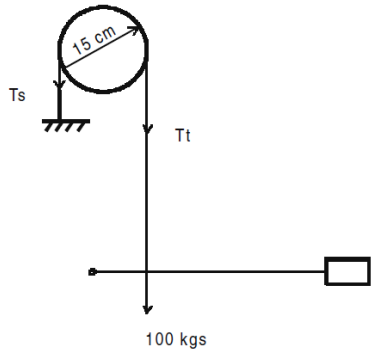
b) A weighing system is used for applying pressure to a pair of calendar roller. It consists of lower and upper lever connected by a vertical rod at each side of machine. Each lever has the mass of 10 kg, has its centre of gravity at 45 cm from the fulcrum and carries the load of 30 kg, at distance in from the fulcrum. The vertical rod is attached 7.5 cm from fulcrum of the lower lever and to one end of the top lever, 20 cm from its fulcrum at other end. The top lever rests on the bush of the top roller. Centre of the

bush being 6 cm from the fulcrum. The top lever has a mass of 5 kg, both levers are horizontal and the top roller has a mass of 90 kg. Calculate the force applied by the top roller to the material passing between them.

25. a) Derive the relationship between the torque, actuating force, coefficient of friction and minimum & maximum radii of the friction lining for old and new single plate friction clutch.

(OR)

b) A let-off for a 100 m beam is arranged as shown in Fig. A band fixed to the frame of the 100 m is coiled around the weighting ruffle and attached to the weighting lever which is pulled down by the weight; the ruffle diameter is 15 cm and the effect of weight is equivalent to 100 kg load suspended from the band the coefficient of friction between band rubble is 0.18. (Calculate the work done against the friction for 1 revolution of the beam is identical break arrangements may be assumed at each end of it).



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