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5th Sem, **Branch :** Mech. Engg/Prod./Mechatronics
Subject : Theory of Machines

Time : 3 Hrs. **M.M. : 100**

SECTION-A

Note : Multiple choice questions. All questions are compulsory. (10x1=10)

Q.1 In the higher pairs, there is (CO-1)

a) A surface contact b) A line contact
c) A sliding contact d) None of the above

Q.2 A railway bridge is a (CO-1)

a) Structure b) Mechanism
c) Machine d) None of the above

Q.3 The crowning height of the pulley is generally kept as (CO-7)

a) 1/120 of pulley width
b) 1/96 of pulley width
c) 1/48 of pulley width
d) 1/24 of pulley width

Q.4 The pulley and belt in belt drive act as (CO-3)

a) Cylindrical pair b) Rolling pair
c) Turning pair d) None of the above

Q.5 The gears used to connect two intersecting co-plainer shafts are (CO-3)

a) Straight spur gear b) Straight bevel gears
c) Spiral gears d) None of the above

Q.6 The equation of rotation is (CO-5)

a) $T=Iw$ b) $T = mk^2$
c) $T= r_W$ d) $T = la$

Q.7 With the increases of governor speed (CO-6)

a) Radius of rotation and height of governor increase.
b) Radius of rotation and height of governor decrease.
c) Radius of rotation decreases, but height of governor increases.
d) Radius of rotation increases, but height of governor decreases.

Q.8 According to the surface in contact, the follower are (CO-7)

a) Knife edge follower b) Roller follower
c) Flat faced follower d) All of the above

Q.9 Unbalance in rotating part may be due to (CO-8)

a) un-machined portion of casting
b) lack of homogeity in the material
c) non symmetry of parts
d) all of the above

Q.10 If the balls of a governor have same speed for all radii of rotation it is said to be. (CO-1)

a) Isochronous b) Sensitive
c) Stable d) Hunting

SECTION-B

Note : Objective type questions. All questions are compulsory. (10x1=10)

Q.11 Define inversion of mechanism. (CO-1)
Q.12 What is addendum of a gear. (CO-4)
Q.13 What is pressure angle of a gear. (CO-4)
Q.14 Name two types of governors. (CO-6)
Q.15 What do you understand by isochronisms of a governor. (CO-6)
Q.16 State angle of dwell of a cam. (CO-7)
Q.17 Name any two type of cams. (CO-7)
Q.18 What is creep of belt. (CO-3)
Q.19 What is coefficient of fluctuation of energy. (CO-5)
Q.20 Define damped vibrations. (CO-9)

SECTION-C

Note : Short answer type questions. Attempt any twelve questions out of fifteen questions. (12x5=60)

Q.21 Define theory of machine and its branches. (CO-1)
Q.22 Describe simple gear train with neat diagram. (CO-4)
Q.23 Explain turning moment diagram for four stroke petrol engine. (CO-5)
Q.24 Why is rim type of fly wheel preferred over disc type? (CO-5)
Q.25 Discuss working of watt's Governor. (CO-6)

Q.26 Define the cam and its practical applications. (CO-7)
Q.27 Explain different types of free vibrations. (CO-9)
Q.28 Define any one application of four bar chain with the help of neat sketches. (CO-1)
Q.29 What are the advantages of V-Belts over the Flat Belts. (CO-4)
Q.30 Define sensitiveness of governor. (CO-6)
Q.31 Differentiate between fly wheel and governor. (CO-6)
Q.32 Classify the followers. (CO-7)
Q.33 Different between static balancing and dynamic balancing. (CO-8)
Q.34 What are the causes of vibrations. (CO-1)
Q.35 Calculate vertical height of a watt governor when it rotates at 60 rpm. Also find the change in vertical height when its speed increases to 75 rpm. (CO-4)

SECTION-D

Note : Long Answer type question. Attempt any two questions. (2x10=20)

Q.36 Drive an expression for the ratio of driving tensions for a flat belt drive. (CO-3)
Q.37 Explain the construction and working of Hartnell governor with the help of neat diagram. (CO-6)
Q.38 An engine fly wheel has a mass of 6 tones and the radius of gyration is 1.75m. If the maximum and minimum speeds are 120 rpm and 115rpm respectively. Fine the maximum fluctuation of energy. (CO-4)