

- Q.28 How the power is transmitted in front wheel drive from engine to wheel?
- Q.29 Write a short note various resistances faced by vehicle during motion.
- Q.30 Explain the concept of weight during braking.
- Q.31 Describe working of the Ackermann steering gear mechanism.
- Q.32 Explain the working of dynamic balancing machine.
- Q.33 Explain the method of balancing a single rotating mass by another mass in same plane.
- Q.34 Enlist the causes of vibration in rotating bodies (any five)
- Q.35 Compare damped vibration with forced vibration.

SECTION-D

Note: Long answer type questions. Attempt any two questions out of three questions. (2x10=20)

- Q.36 Describe flywheel and give its uses. Derive a relationship for the coefficient of fluctuation of speed in terms of maximum fluctuation of energy and the kinetic energy of the flywheel at mean speed.
- Q.37 Show the kinematic pairs with examples depending upon relative motion.
- Q.38 Four masses m_1 , m_2 , m_3 and m_4 are 200, 300, 240 and 260 kg respectively. The corresponding radii of rotations are 0.2, 0.15, 0.25 and 0.3 m respectively and angles between successive masses are 45° , 75° and 135° . Find the position and magnitude of the balance mass required, if its radius of rotation is 0.2m

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4th Sem / Branch : Automobile Engineering

Subject:- Mechanics of Vehicles

Time : 3Hrs.

M.M. : 100

SECTION-A

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

- Q.1 For what purpose are the quick return mechanisms used?
- To convert reciprocating motion into oscillatory motion
 - To convert oscillatory motion into reciprocating motion
 - To convert reciprocating motion into rotary motion
 - To convert rotary motion into reciprocating motion
- Q.2 When the two elements of a pair have _____ when in motion, it is said to a lower pair.
- line or point contact
 - surface contact
 - permit relative motion
 - none of the mentioned
- Q.3 The maximum fluctuation of energy is the
- difference between the maximum and minimum energies.
 - some of the maximum and minimum energies

- c) variations of energy above and below the mean resisting torque to the
 - d) ratio of the mean resisting torque to the work done per cycle
- Q.4 In a steering gear, a gear sector to toothed roller is mated with a
- a) ball bearing b) roller bearing
 - c) worm d) steering wheel
- Q.5 Due to slip of the belt, the velocity ratio of the belt drive
- a) Decreases b) Increases
 - c) Does not change d) None of the above
- Q.6 The included angle for the V-belt is usually
- a) $20^\circ - 30^\circ$ b) $30^\circ - 40^\circ$
 - c) $40^\circ - 60^\circ$ d) $60^\circ - 80^\circ$
- Q.7 A differential gear in an automobile is a
- a) simple gear train b) epicyclic gear train
 - c) compound gear train d) None of the above
- Q.8 What is running resistance of the vehicles?
- a) Rolling resistance
 - b) Aerodynamic resistance
 - c) Some of rolling and aerodynamic resistance
 - d) Traction force
- Q.9 Generally which brakes are on the front wheels?
- a) Drum brake b) Disk brake
 - c) Shoe brake d) Double Shoe brake
- Q.10 When there is a reduction in amplitude over every cycle of vibration, then the body is said to have
- a) Free vibration b) Forced vibration
 - c) Damped vibration d) None of the above

(2)

120345

SECTION-B

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

- Q.11 Define kinematic chain.
- Q.12 What is turning moment diagram?
- Q.13 Describe fly wheel.
- Q.14 Define slip in case of belt.
- Q.15 What are helical gears?
- Q.16 Define rolling resistance
- Q.17 What is front wheel drive?
- Q.18 Define braking friction.
- Q.19 Describe torsional vibrations.
- Q.20 Name different types of free vibrations.

SECTION-C

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

- Q.21 How does double slider crank mechanism work?
- Q.22 Explain an inversion of double slider crank chain
- Q.23 What is the impact of fluctuation of energy for flywheel (any five)?
- Q.24 State the functions of Hook's joint.
- Q.25 Explain different types of gears with their applications in brief.
- Q.26 Two pulleys one diameter 450 mm and other diameter 180mm are on parallel shaft 1.8m apart and are connected by cross belt drive, find the length required for the belt.
- Q.27 Explain effect of centrifugal force on vehicle stability on banked road and unbanked road.

(3)

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