

- 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  $45^\circ, 75^\circ$  and  $135^\circ$ . Find the position and magnitude of the balance mass required, if its radius of rotation is 0.2m

No. of Printed Pages : 4

Roll No. ....

120345

#### **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 mashed 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 tensional 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 double slider crank mechanism works?
- Q.22 Explain a 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 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)

120345