

Scheme – I

Sample Question Paper

Programme Name : Diploma in Production Engineering / Production Technology

Programme Code : PG / PT

Semester : Third

Course Title : Theory of Machines

Marks : 70

22344

Time: 3 Hrs.

Instructions:

- (1) All questions are compulsory.
- (2) Illustrate your answers with neat sketches wherever necessary.
- (3) Figures to the right indicate full marks.
- (4) Assume suitable data if necessary.
- (5) Preferably, write the answers in sequential order.

Q.1) Attempt any FIVE of the following.

10 Marks

- a) List different inversion of Four bar Chain Mechanism
- b) Define-Kinematic Pair
- c) State the necessity of Acceleration diagram of Mechanism
- d) State the applications of Cam
- e) Define- lift of Cam
- f) List any 4 applications of clutches
- g) State the necessity of Balancing

Q.2) Attempt any THREE of the following.

12 Marks

- a) Explain with example- Lower pair and higher Pair
- b) Differentiate between Simple and Compound Gear Train
- c) Describe the construction of spherical faced follower
- d) Describe the construction of Epicyclical gear train

Q.3) Attempt any THREE of the following.

12 Marks

- a) Explain the mechanism of pendulum pump
- b) Draw the construction of 'Scotch yoke Mechanism'
- c) Explain the principle of working of Internal Expanding Brake
- d) Distinguish between Radial and Cylindrical Cam

- e) Explain the method of balancing of different masses revolving in the same plane

Q.4) Attempt any TWO of the following.

12 Marks

- a) Explain with sketch the construction and working of 'Whitworth's quick Return Mechanism'
- b) In the Single slider crank mechanism crank $OB=50\text{mm}$, the length of connecting rod $AB=125\text{ mm}$. The point 'G' is at 60 mm from point 'B', crank OB is turned 45 degree from OA. The Crank rotates at 200 rpm, find out the velocity of point 'G' and angular acceleration of AB
- c) A cam is to be designed for knife edge follower with following data-cam lift 40mm during 90 degree of cam rotation with SHM, Dwell for 30 degree, during return stroke 60 degree of cam rotation by SHM and remaining is for dwell. Draw profile of cam

Q.5) Attempt any TWO of the following.

12 Marks

- a) Explain the construction of Reverted gear train and state its four applications.
- b) In slider crank mechanism length of crank and connecting rod is 30mm and 120mm. The crank rotates at 180 rpm clockwise. When crank rotates 45 degree from Inner Dead centre. Find Velocity and acceleration of Slider using Klein's construction
- c) Explain with sketch construction of Hartnell Governor

Q.6) Attempt any TWO of the following.

12 Marks

- a) A leather belt is 125mm wide and 6mm thick transmit power from pulley 750mm diameter which runs at 500 rpm. The angle of lap is 150 degree and coeff of friction=0.3. If mass of 1 m^3 of leather is 1Kg and stress in the belt is not to exceed 2.75MPa, find maximum power that can be transmitted
- b) Explain with sketch construction of Diaphragm Clutch.
- c) Draw Turning Moment diagram for single cylinder 4-stroke petrol engine with explanation

Scheme – I

Sample Test Paper - I

Programme Name : Diploma in Production Engineering / Production Technology

Programme Code : PG / PT

Semester : Third

Course Title : Theory of Machines

Marks : 20

22344

Time: 1 Hour

Instructions:

- (1) All questions are compulsory.
- (2) Illustrate your answers with neat sketches wherever necessary.
- (3) Figures to the right indicate full marks.
- (4) Assume suitable data if necessary.
- (5) Preferably, write the answers in sequential order.

Q.1 Attempt any FOUR.

08 Marks

- a. Define- Kinematics
- b. List different types of Constrained Motion
- c. Define- Space Diagram
- d. State term Relative velocity
- e. List different types of motion with which follower moves
- f. State the applications of Cam

Q.2 Attempt any TWO

12 Marks

- a. Draw the sketch of 'Elliptical Trammel'
- b. In the Single slider crank mechanism crank $OB=50\text{mm}$, the length of connecting rod $AB=125\text{ mm}$. the point 'G' is at 60 mm from point 'B', crank OB is turn 45° from OA . The Crank rotates at 200 rpm , find out the velocity of point 'G' and angular acceleration of AB
- c. The cam is to give following motion to knife edge follower -1. Outstroke during 60° degree 2. Dwell $=30^\circ$ degree 3. Return stroke $=60^\circ$ degree 4. Dwell for remaining 210° degree. Draw a Cam Profile of a given cam if stroke of follower is 40mm and minimum radii of cam is 50mm , the follower moves with uniform velocity during both outward and inward stroke

Scheme – I

Sample Test Paper - II

Programme Name : Diploma in Production Engineering / Production Technology

Programme Code : PG / PT

Semester : Third

Course Title : Theory of Machines

Marks : 20

22344

Time: 1 Hour

Instructions:

- (1) All questions are compulsory.
- (2) Illustrate your answers with neat sketches wherever necessary.
- (3) Figures to the right indicate full marks.
- (4) Assume suitable data if necessary.
- (5) Preferably, write the answers in sequential order.

Q.1 Attempt any FOUR.

08 Marks

- a. Define- Angle of Lap
- b. State Law of Gearing
- c. List different types of brakes
- d. List any 4 applications of clutches
- e. Define- Coefficient of fluctuation of energy
- f. List different types of Balancing

Q.2 Attempt any TWO.

12 Marks

- a. Select the gear train for following application with suitable reason - automobile gear box ,
Hoist crane gear box, Differential, Steering gear box
- b. Explain with sketch construction of Multiplate clutch
- c. Explain the method of balancing of different masses revolving in the same plane