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## Draw and explain the turning moment diagram of 4-stroke I.C. Engine.

A turning moment diagram for a four stroke cycle internal combustion engine is shown. We know
that in a four stroke cycle internal combustion engine, there is one working stroke after the crank
has turned through two revolutions, i.e. 720° (or 4 ð radians). Turning moment diagram for a four
stroke cycle internal combustion engine.
Since the pressure inside the engine cylinder is less than the atmospheric pressure during
the suction stroke, therefore a negative loop is formed as shown in Fig. During the compression

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## Write the classification of follower (i) As per shape (ii) As per motion. Draw sketch of any one follower.

Classification of follower:
i) As per shape:

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Knife-edge follower: When the contacting end of the follower has a sharp knife edge, it is
called a knife edge follower.

• Roller follower: When the contacting end of the follower is a roller, it is called a roller follower.
• Flat faced or mushroom follower: When the contacting end of the follower is a perfectly flat
face, it is called a flat faced follower and when the flat faced follower is circular, it is then called a
mushroom follower.
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## Write any two functions and applications of clutch.

Functions of clutch:
i) A clutch is a device used to transmit rotary motion of one shaft to the other shaft when desired.
ii) A clutch is a device used for engaging and disengaging the engine crank shaft instantaneously
when desired by the driver.

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## Differentiate between mechanism and machine.

Difference between Mechanism & machine

Mechanism
Primary function is used to transmit or
modify the motion.
It is not used to transmit the force.
A mechanism is a single system to
transfer the motion

eg.i) In watch, energy stored on winding
the spring is used to move hands.
ii) An indicator is used to draw P-V
diagram of engine

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## Explain the working of Scotch Yoke mechanism with neat sketch.

Scotch yoke mechanism. This mechanism is used for converting rotary motion into a reciprocating motion. The inversion is obtained by fixing either the link 1 or link 3. In Fig. link 1 is
fixed. In this mechanism, when the link 2 (which corresponds to crank) rotates about B as centre,
the link 4 (which corresponds to a frame) reciprocates. The fixed link 1 guides the frame

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## An I.C. Engine developing 10 kW of power is to be transmitted to a machine by flat leather belt. A 0.8 m diameter pulley is fitted on engine shaft and rotates at 300 rpm. The angle of lap is 175 o and coefficient of friction in belt and pulley is 0.25. De

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## Explain with neat sketch method of drawing displacement diagram for SHM of follower.

The displacement diagram is drawn as follows for SHM of follower :
1. Draw a semi-circle on the follower stroke as diameter.
2. Divide the semi-circle into any number of even equal parts (say eight).
3. Divide the angular displacements of the cam during out stroke and return stroke into the
same number of equal parts.
4. The displacement diagram is obtained by projecting the points as shown in Figure

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## Compare Belt Drive and Chain Drive (four points)

PARTICULERS
BELT DRIVE

CHAIN DRIVE

Slip
Slip may occur
No slip (Positive drive)

Use
For low Velocity Ratio
For moderate Velocity Ratio

Suitability
For large centre distance

For moderate centre distance

Space requires
Large
Moderate

Lubrication
Not required
Require

Installation
cost Less
Moderate

Example

Floor Mill, Compressor,Conveyors
Bicycle, Automobile

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## Draw a neat sketch of crank and slotted lever quick return mechanism of shaper. Write formula of cutting ratio.

Crank and slotted Quick Return Mechanism for shaper

&

Formula of cutting ratio

## State the necessity of Balancing. List different types of Balancing methods.

Necessity of Balancing:
[1] The high speed of engines and other machines is a common phenomenon now-a-
days. It is, therefore, very essential that all the rotating and reciprocating parts should
be completely balanced as far as possible.
[2] If these parts are not properly balanced, the dynamic forces are set up. These
forces not only increase the loads on bearings and stresses in the various members,
but also produce unpleasant and even dangerous vibrations.
[3] The balancing of unbalanced forces is caused by rotating masses, in order to

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