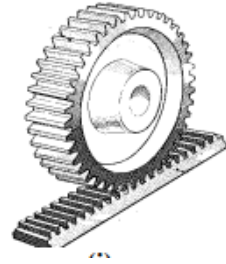


Question 8 – Engineering Higher Level

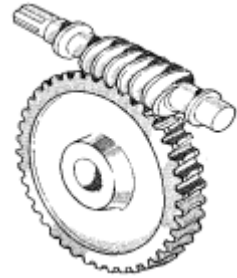
Rack and Pinion

- Rotary motion to linear motion
- As pinion rotates, gear teeth mesh with those on rack
- Applications: Lowering table on pillar drill ; Steering in Car



Worm and Worm wheel

- Transmits power through right angles (90°)
- For every complete turn of the worm, the worm wheel only moves one tooth of its gear
- Can act as a break
- Can reduce speed on motors etc...
- Applications: Crane; Winch etc.....



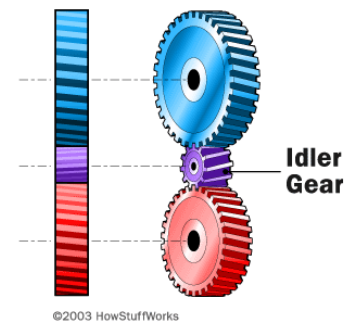
Universal Joint

- Commonly used in shafts that transmits rotary motion
- Transmits power at an angle
- Applications: PTO (Machinery) Steering etc...



Idler Gears

- Inserted between 2 other gears with the purpose of changing the direction of the gear rotation
- No influence on gear ration system
- Input gear and output gear shafts rotate in the same direction



Bevel Gears

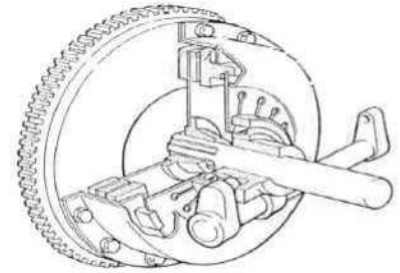
- Transfer motion at a right angle (90°)
- Teeth cut at 45°
- Applications: Hand whisk / Hand Drill



Question 8 – Engineering Higher Level

Clutch

- Used to break and make the drive between the engine and the wheels
- When clutch engages, the pressure plate and friction plate are pushed together
- Flywheel gives momentum or inertia
- Starter motor turns the flywheel to start the engine



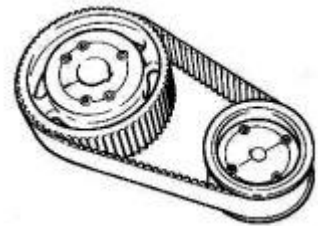
Helical Gears

- Used in pairs to stop moving along the shaft
- Advantages:
 - Quieter in operation than spur gears
 - A number of teeth mesh at the same time providing a strong continuous drive



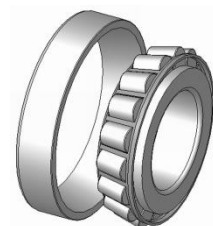
Toothed Belt & Pulley

- Effective grip for timing belts etc...
- Positive Drive – Doesn't slip
- Eg: Timing belt in engine



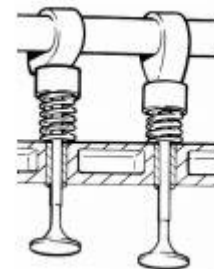
Tapered Roller Bearing

- Eg: Wheel Bearing
- Can take thrust (Force in one direction)
- Can be tightened



Overhead Cam & Valve

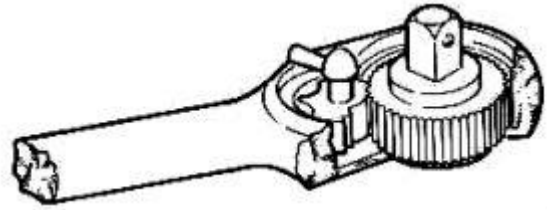
- As the camshaft rotates, the cam open and close valves in sequence



Question 8 – Engineering Higher Level

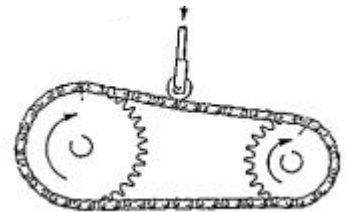
Ratchet & Pawl

- Used to allow socket to turn and lock in either direction due to the design of the locking pawl
- Applications: Ratchet Strap



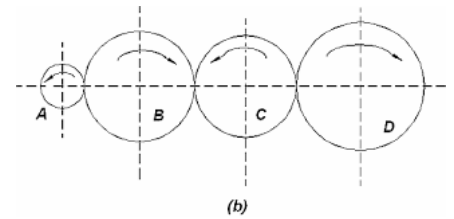
Chain & Sprocket

- Transmit motion from one toothed wheel to another
- Eliminates slip
- Strong Drive
- Application: Bike/Motorbike etc...



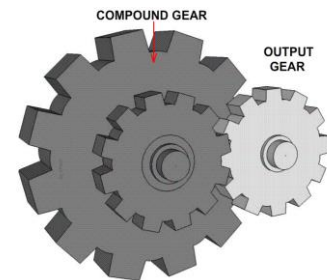
Simple Gear Train

- Only one gear on each shaft



Compound Gear Train

- More than one gear on the shaft



Square Thread

- 90°
- Vice/Jack



Acme Thread

- 29°
- Lead Screw on Lathe



Question 8 – Engineering Higher Level

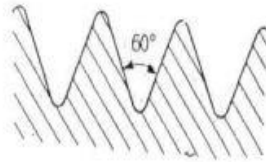
Buttress Thread

- 45°
- Eg: Wood Work Vice



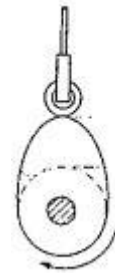
ISO Metric Thread

- 60°
- Nuts & Bolts



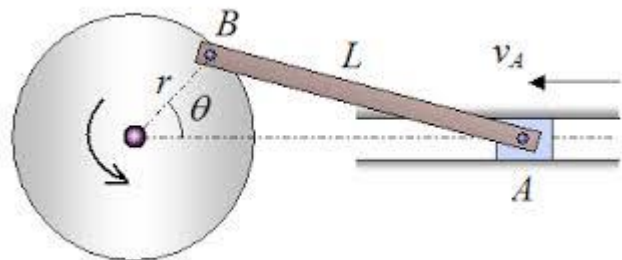
Cam & Follower

- Rotary motion to reciprocating motion
- Various different shaped cams



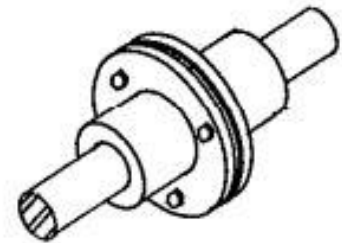
Crank & Slider

- Converts rotary motion to reciprocating motion
- Eg: Piston & Crankshaft / Power Hacksaw



Flanged Coupling

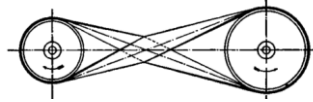
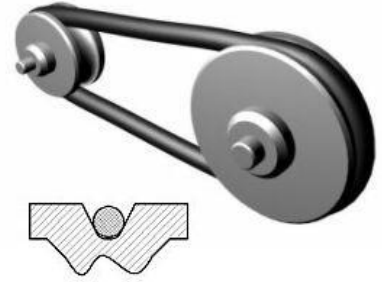
- Used on pipework
- On Parts that need to be easily removed for maintenance



Question 8 – Engineering Higher Level

Belt & Pulley

- Preventing pulley belt slip
 - Maintain tautness with a jockey wheel
 - Use a vee belt/ toothed belt
- To Reverse
 - Cross the belt

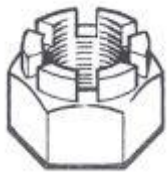


Ball Bearing

- Allows a shaft to rotate in the centre of the bearing while it is held in a machine or structure
- Reduces friction and promotes the free running of the shaft
- Reduces the build-up of heat



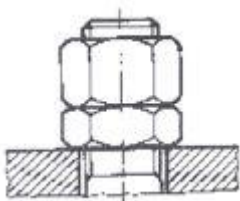
Castled Nut



Winged Nut



Lock Nut



Question 8 – Engineering Higher Level

MOSTLY OPTIONAL (OR)

Solenoid

- Coil of wire wrapped around a soft iron core – Energised
- Magnetic force induced by current pulls the bar towards the centre
- Solenoid spring will return the bar to its original position
- EG: controlled entry door locks

Shuttle Valve

- Controls a single acting pneumatic cylinder from 2 positions
- An air signal from one side of the valve closes the opposite side

Non-return valve

- Mechanism which will only allow the flow of air/liquid/gas in one direction
- Prevents backflow

Dividing Head

- Used when machining around the periphery of a component eg:
Splines/shafts
- Used to index the component accurately so that it may be machined the required number of times

Integrated Circuit (I.C.) / Silicon Chip

- Electronic Component (eg: transistors, resistors, capacitors etc)
- Commonly known as an I.C. or a Silicon Chip
- These circuits are used to control electronic appliances

DPDT Switch

- Double Pole Double Throw Switch
- ON/OFF/REVERSE

SPST Switch

- Single Pole Single Throw Switch
- ON/OFF

Question 8 – Engineering Higher Level

Capacitor

- Used to store electrical charge
- Will discharge through a circuit so that the benefit of the stored charge is effective

Resistor

- Restricts / Regulates the flow of current

Thermostat

- Controls temperature of a system
- Turns on/off
- Eg: Heating system

Pneumatic Flow Regulator

- Restricts/Regulates the flow of air in one direction in a pneumatic circuit

Single Acting Cylinder

- Pneumatic output device
- Requires pressed air to make the piston move
- If the air is removed the piston will return

Double Acting Cylinder

- Needs compressed air to move the piston
- Will stay in this position if the air is turned off
- It needs air to return the piston to its original position

Heat Sink



- Used in electronics to conduct away heat generated by a component
- Normally corrugated or finned to dissipate heat to the surrounding air

Electrical Relay

- When a small current passes through the coil, it closes the switch contacts of the relay
- A larger current can be controlled by a relay
- Eg: Lighting systems and motors


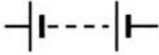
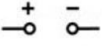


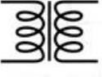
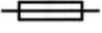

Question 8 – Engineering Higher Level

Seoltóirí

cumar seoltóirí  junction of conductors	seoltóirí ag trasnú a chéile gan cheangal  conductors crossing with no connection
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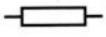
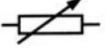
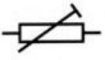
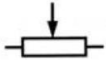
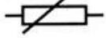
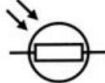
Conductors

Soláthar cumhachta

cill  cell	ceallra  battery	soláthar s.d.  d.c. supply	soláthar s.a.  a.c. supply
cill fhótavoltach  photovoltaic cell	claochladán  transformer	fiús  fuse	talmhú  earth





Power supply

Friotóirí

friotóir fosaithé  fixed resistor	friotóir inathraithe (réastat)  variable resistor (rheostat)	friotóir inathraithe réamshocraithe  preset variable resistor	roinnteoir poitéinsil  potential divider
teirmeastar  thermistor	friotóir solas-spleách  light-dependent resistor		

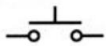




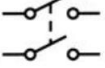
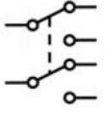
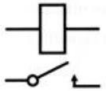
Resistors

Toilleoirí

toilleoir  capacitor	toilleoir leictrealaíoch (toilleoir polaraithe)  electrolytic capacitor (polarised capacitor)	toilleoir inathraithe  variable capacitor	toilleoir inathraithe réamshocraithe  preset variable capacitor
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Capacitors

Lasca





sá-lasc chun ceangail  push-to-make switch	sá-lasc chun gearrtha  push-to-break switch	lasc gnáthoscailte (lasc aon phoil aon bhealaigh) (SPST)  normally open switch (single-pole single-throw switch) (SPST)	lasc gnáthdhúnta (SPST)  normally closed switch (SPST)
lasc dhá bhealach (lasc aon phoil dhébhhealaigh) (SPDT)  two-way switch (single-pole double-throw switch) (SPDT)	lasc phoil dhúbailte aon bhealaigh (DPST)  double-pole single-throw switch (DPST)	lasc phoil dhúbailte dhébhhealaigh (DPDT)  double-pole double-throw switch (DPDT)	athsheachadán  relay

Switches

Question 8 – Engineering Higher Level






Dé-óidí

Diodes

<p>dé-óid</p>  <p>diode</p>	<p>dé-óid Zener</p>  <p>Zener diode</p>	<p>fótaidhé-óid</p>  <p>photodiode</p>	<p>dé-óid astaithe solais (LED)</p>  <p>light-emitting diode (LED)</p>
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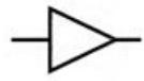
Méadair

Meters

<p>voltmhéadar</p>  <p>voltmeter</p>	<p>galbhánaiméadar</p>  <p>galvanometer</p>	<p>aimpmhéadar</p>  <p>ammeter</p>	<p>óm-mhéadar</p>  <p>ohmmeter</p>
<p>ascalascóp</p>  <p>oscilloscope</p>			

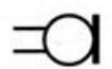






Trasraitheoirí agus aimplíú

Transistors and amplification

<p>trasraitheoir cumair npn</p>  <p>npn-junction transistor</p>	<p>trasraitheoir tionchar réimse n-chainéil (JFET)</p>  <p>n-channel field-effect transistor (JFET)</p>	<p>fótathrasraitheoir</p>  <p>phototransistor</p>	<p>aimplitheoir</p>  <p>amplifier</p>
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Fuaim

Audio

<p>micreafón</p>  <p>microphone</p>	<p>cluasán</p>  <p>earphone</p>	<p>callaire</p>  <p>loudspeaker</p>	<p>cloigín</p>  <p>bell</p>
<p>dordánaí</p>  <p>buzzer</p>	<p>trasduchtóir píseleictreach</p>  <p>piezoelectric transducer</p>	<p>aeróg</p>  <p>aerial (antenna)</p>	