1.   Function of flywheel of an IC engine

(a) To even-out the power output
(b) To transmit power
(c) To increase power output
(d) None of these

Ans:(a)

Flywheel - **Flywheel**, heavy wheel attached to a rotating shaft so as to smooth out delivery of power from a **motor** to a machine. It is made of cast iron, aluminum, or zinc disk that is mounted at one end of the crankshaft to provide inertia for the engine. The inertia of the **flywheel** opposes and moderates fluctuations in the speed of the **engine** and stores the excess energy for intermittent use.During the operation of a reciprocating engine, combustion occurs at distinct intervals. The flywheel supplies the inertia required to prevent loss of engine speed and possible stoppage of crankshaft rotation between combustion intervals.

Governor, in technology, device that automatically maintains the rotary speed of an **engine** or other prime mover within reasonably close limits regardless of the load. ... A typical **governor** regulates an **engine's** speed by varying the rate at which fuel is injected/furnished to it.

A governor is a system that is used to maintain the mean speed of an engine, within certain limits, under fluctuating load conditions. It does this by regulating and controlling the amount of fuel supplied to the engine. The governor hence limits the speed of the engine when it is running at the no-load condition, i.e it governs the idle speed, and ensures that the engine speed does not exceed the maximum value as specified by the manufacturers.

https://courses.washington.edu/engr100/Section_Wei/engine/UofWindsorManual/Flywheel.htm

2.   Cooling of engine by jacket cooling water takes place in radiator by

(a) Conduction
(b) Convection
(c)Radiation
(d) All methods

Ans: (b)

3.   Forced lubrication system of an IC engine works on

(a) Lubrication by hand appliance
(b) Pumping lube oil under pressure to different parts through lube oil circuit/system
(c) Allowing lube oil flow through gravitational force
(d) None of these

Ans:(b)

4.   Function of oil filter

(a) To filter out the dirt in oil
(b) To filter out grains of metal war in oil
(c) To cool the oil
(d) Both a and b

Ans:(d)

5   Thermal efficiency of IC engine is ≈

(a) 25%   (b) 40%   (c) 45%   (d) 50%
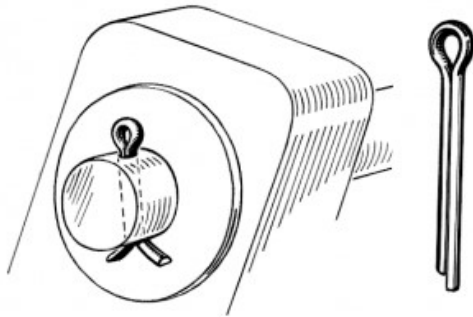
Ans:(a)

6.   The split pin is used in

(a) Spring clips   (b) Wire locks   (c) Flanged nuts   (d) Castle nuts

Ans:(d).

Also known as **a split pin**, **a cotter pin** is a simple fastener that's **used** to secure a bolt — or any other rod-shaped fastener — in place.
As shown in the adjacent image, **cotter pins** consist of a narrow U-shaped piece of metal with a flared and circular top.

It's not uncommon for bolts to loosen over time. If a bolt is attached to a machine, for instance, the vibrations produced by the machine may cause it to come out. There are ways to secure bolts in place, however, including the use of a clutter pin. But what exactly is a cotter pin?

THE BASICS OF COTTER PINS

Also known as a split pin, a cotter pin is a simple fastener that's used to secure a bolt — or any other rod-shaped fastener — in place. As shown in the adjacent image, cotter pins consist of a narrow U-shaped piece of metal with a flared and circular top. Cotter pins are inserted into a bolt to prevent the bolt from loosening.

https://monroeengineering.com/blog/what-is-a-cotter-pin/#:~:text=Also%20known%20as%20a%20split,a%20flared%20and%20circular%20top.

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7.   Lean mixture   air:fuel ratio in petrol engine is

(a) 8 : 1 to 10 : 1   (b) 10 : 1 to 11 : 1   (c) 16 : 1 to 18 : 1   (d) 20 : 1 to 22 : 1

Ans:(c)

Note: When speaking about the lean and rich mixtures within an internal combustion engine, the term is referring to the fuel to air mixture. When optimal, this mixture demonstrates a ratio of 14.7 parts air to 1 part fuel. This ideal ratio for the air to fuel mixture is called the stoichiometric ratio.

8.   Tab washers are used for

(a) Preventing vibration   (b) Locking the nuts
(c) Self locking   (d) Fastening structured fabrication work

Ans:(b)

Note:Tab washers are an additional form of lock **washer** that features one or more internal or external notches or **tabs** designed to hold the nut in place in relation to the connecting bolt or stud. **Tabs** may be bent or engage into keyways or slots in connected surfaces to provide a positive locking surface

9.   Washers help to

(a) Improve appearance
(b) Distribute force over a larger area
(c) Distribute force to the bolt
(d) Cover the clearance hole of the workpiece.

Ans:(b)

Note: Most notably, **washers** protect the surface from damage during installation. They distribute the pressure and prevent the fastener from moving or corroding. Skipping on **washers** can dramatically reduce the lifespan of how your product is put together

10.   Bald spots appearing on tyre's outer surface is due to

(a) Excessive speed   (b) Lack of rotation of tyres
(c) Unbalanced wheels   (d) Over inflation

Ans:(c)

11.   Excessive king pin bush wear will affect

(a) Caster   (b) Camber   (c) Toe-in   (d) Toe-out

Ans:(b)
12.   Wear on one side of tyre is due to

(a) Excessive camber   (b) Excessive caster
(c) Under inflation   (d) Over inflation

Ans:(b)

13.   To avoid skidding of tyres on turnings

(a) Wheels turns on an arc of common centre and inner wheel
(b) Wheels turns at equal radius
(c) Wheels turns at an arc of common centre but outer wheel turns at larger angle
(d) Inner wheel turns at larger angle but centre of arc is not common.

Ans:(c)

14.   Over inflation of tyre means

(a) Air pressure is less than recommended
(b) Air pressure is more than recommended
(c) No air pressure at all in the tyre
(d) Air pressure is between high and low

Ans:(b)

15.   For rigid suspension system which of the following is correct?

(a) One's wheel's shock is transmitted to other wheels
(b) It is complicated
(c) It is light in weight
(d) Its damping is very effective

Ans:(a)

16.   Which statement is not correct for independent suspension system?

(a) Coil spring is used in this
(b) It is simple
(c) It is vibration damping is more effective
(d) It is light in weight

Ans:(b)

17.   The equivalent conversion of 60 psi to kg/cm^2

(a) 4.14 kg/cm^2 (b) 3.00 kg/cm^2
(c) 8.00 kg/cm^2 (d) 2.4 kg/cm^2

Ans:(a) [$60/14.5 \approx 14.14$]

18.   Helper spring is used in
(a) Cars   (b) Jeep

(c) Light motor vehicle   (d) Heavy trucks

Ans:(a)

Note: Helper s**prings** are enhancement **springs** for high-performance, aftermarket suspensions **used** in motorsports, street performance and off-road applications. The main purpose of the **Helper Spring** is to support, or help, the main **spring** by keeping it in contact with its **spring** perch when the suspension is at full droop

https://suspensionsecrets.co.uk/helper-springs-and-tender-springs-the-difference/

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19. The purpose of shock absorber in a vehicle is

    (a) To receive shocks during braking
    (b) To reduce bouncing of wheels on bumps and pot holes
    (c) To receive shocks during driving
    (d) To stop lateral movement of spring when brake is applied

    Ans:(b)

Note:The role of the **shock absorber** is to keep the **car's** tyres in permanent contact with the road, helping to provide optimum grip, when cornering and braking. **Shock absorbers** are part of the **suspension**, so if the **shocks** are worn, the **vehicle's** ride and comfort is compromised.

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20. When steering gear box variable steering ratio is achieved with?

    (a) Worm and roller steering gear
    (b) Worm and nut steering gear
    (c) Worm and sector steering gear
    (d) Rack and pinion steering gear

    Ans:(d)

21. The universal law of gravitation was propounded by

    (a) Kepler   (b) Galileo   (c) Newton   (d) Copernicus

    Ans:(b)

22. When steering wheel rotates in makes the worn to rotate which in turn rotates the roller/sector/ peg to move

    (a) In an arc   (b) In a semi circle
    (c) In a full circle   (d) In a straight line

    Ans:(a)

23. While the vehicle is negotiating a turn the following happens to front wheels

(a) They come closer to each other
(b) They toe outwards
(c) The inside front wheel and outside front wheel makes different angles
(d) None of these

Ans:(b)

24.   In general, in all vehicles, parking or head brakes are of

(a) Hydraulic type   (b) Mechanical type
(c) Vacuum operated   (d) Air operated

Ans:(b)

> **Note:** The **parking brake** in most **vehicles** is still completely mechanical. Traditionally engaged by pulling a lever, the cables manually engage part of the **car's braking** system, usually the rear disk or drum **brakes.** In road **vehicles**, the parking **brake** is a mechanism used to keep the **vehicle** securely motionless when parked.
>
> Hand brake
>
> A hand brake, also known as a parking brake, usually takes the form of a hand-operated lever and is normally located on the centre console but can sometimes be found between the driver's seat and the door. The handbrake applies the rear disc pads or brake shoes via a cable and is used when the car is parked to stop it rolling forwards or backwards.

25.   Hand brakes are provided in vehicles

(a) For all 4 wheels only
(b) For front wheels only
(c) For rear wheels only
(d) Only for rear wheels and another for front wheels

Ans:(c)

> **Note:** In road **vehicles**, the parking **brake** is a mechanism used to keep the **vehicle** securely motionless when parked.
>
> A hand brake, also known as a parking brake, usually takes the form of a hand-operated lever and is normally located on the centre console but can sometimes be found between the driver's seat and the door.

26.   Parking brakes are generally operated by

(a) Hand lever operation   (b) Brake pedal operation
(c) Electrical switch control operation   (d) None of these

Ans:(a)

27. The weight of a body (W = mg) is

(a) The same everywhere on the surface of the earth
(b) Maximum at the poles
(c) Maximum at the equator
(d) More on the hills than in the plants

Ans:(b)

28. A person weighs more in a lift which is

(a) Moving up with a constant velocity
(b) Moving down with a constant velocity
(c) Accelerating upward
(d) Accelerating downward

Ans: (c)

29. The work done in holding a weight of 20 kg at the height of 1 m above the ground is

(a) Zero   (b) 20 J   (c) 200 J   (d) None of these

Ans: (a). WD = F.d. Here d is 0.

30. Winding of a watch is actually the process of storing

(a) Electrical energy   (b) Pressure energy
(c) Kinetic energy   (d) Potential energy

Ans: (d)

31. Washing soda is

(a) Sodium chloride   (b) Sodium carbonate
(c) Sodium bi-carbonate   (d) Calcium carbonate

Ans:(b)

32. Common salt is

(a) Sodium chloride   (b) Sodium bi-carbonate
(c) Magnesium carbonate   (d) Calcium chloride

Ans: (a)

33. The most abundant gas in the atmosphere is

(a) Carbon dioxide   (b) Helium   (c) Nitrogen   (d) Oxygen

Ans: (c) 78% by volume.

34.   For the production of iron, the raw materials used is

(a) Iron ore   (b) Lime stone   (c) Coke   (d) All

Ans : d

35.   Four 200 watt, 100 Volt heaters are connected in series across a 400 Volt supply. The total heat given off by the four heaters will be

(a) 200 W   (b) 800 W   (c) 400 W   (d) 1600 W

Ans:(b)

36.   The unit for measurement of energy consumption is

(a) Watt   (b) Kiowatt   (c) Kilo-watt hour   (d) Joule

Ans: (c)

37.   The lowest layer of atmosphere which is closest to the earth's surface is called

(a) Ionosphere   (b) Ozone layer   (c) Troposphere   (d) Stratosphere

Ans: (c). Various layers through their heights: Troposphere> Stratosphere> Ionosphere>Exosphere

38.   The process of photosynthesis forms an important part in a natural cycle called the

(a) Heat cycle   (b) Carbon cycle
(c) Nitrogen cycle   (d) Oxygen cycle

Ans:(b) and d.

39 .   The mineral element which is most abundant in the human body is

(a) Sodium   (b) Calcium   (c) Iron   (d) Iodine

Ans: (b)

THE TOP FOUR ELEMENTS FOUND IN THE HUMAN BODY

Of the elements found in the human body, four of them make up the largest percentage of our body weight (96.2%). The four elements are oxygen, hydrogen, carbon, nitrogen. Before you start thinking we should float away with all the oxygen, hydrogen, and nitrogen atoms,

remember that the oxygen molecules are mainly part of the water in our body (H2O). In fact, over half of the human body is made up of water (50-70%).
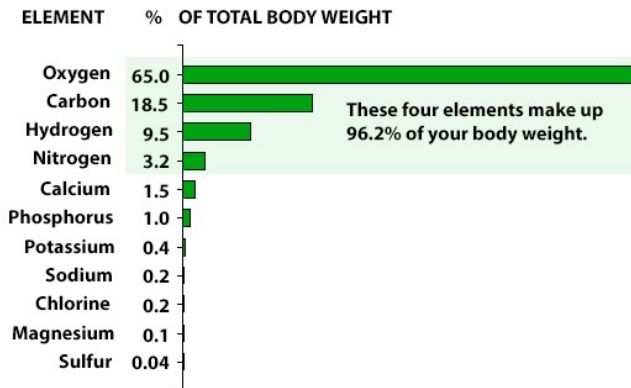
The eleven common elements found in the human body and their percentage of total body weight. The other trace elements (less than 0.01%) are: boron (B), cadmium (Cd), chromium(Cr), cobalt (Co), copper (Cu), fluorine (F), iodine (I), iron (Fe), manganese (Mn), molybdenum (Mo), selenium (Se), silicon (Si), tin (Sn), vanadium (V), and zinc (Zn).

Note: The four most abundant elements in the human body – **hydrogen**, **oxygen**, **carbon** and nitrogen – account for more than 99 per cent of the atoms inside you. They are found throughout your body, mostly as water but also as components of biomolecules such as proteins, fats, DNA and carbohydrate. Almost 99% of the mass of the human body is made up of six elements: oxygen, carbon, hydrogen, nitrogen, calcium, and phosphorus. Only about 0.85% is composed of another five elements: potassium, sulfur, sodium, chlorine, and magnesium

https://askabiologist.asu.edu/content/atoms-life

40. The fundamental units in SI system of measurement for length, time and temperature are

(a) Centimetre, minutes, centigrade
(b) Centimetre, seconds, kelvin
(c) Metre, second, Kelvin
(d) Metre, seconds, Fahrenheit

Ans: (c)

41. The file which has individual, sharp, pointed teeth in a line and is useful for filing wood, leather and other soft materials is called

(a) Single cut file   (b) Double cut file
(c) Rasp cut file   (d) Curved cut file

Ans:(c)

42. Ball bearings are generally made of

(a) Cast iron (b) Malleable Cast iron

(C) CHROME STEEL (D) STAINLESS STEEL

Ans. c

Ball bearings are most **commonly made** of steel, ceramic or plastic. Stainless steel materials are used to make bearing components because it is more resistant to surface corrosion due to the higher content of chromium (~18%) with the addition of nickel. The chromium reacts with oxygen to form a layer of chromium oxide on the surface, creating a passive film. Bearing components made from 300 series stainless steel materials have greater corrosion resistance and are non-magnetic because of the low carbon content.

43.   Fatigue failure occurs when a part is subjected to

(a) Tensile stress (b) Compressive stress
(c) Torsion (d) Fluctuating stress

Ans:(d)

Fatigue failure is the formation and propagation of cracks due to a repetitive or cyclic load. The **failure occurs** due to the cyclic nature of the load which causes microscopic material imperfections (flaws) to grow into a macroscopic crack (initiation phase)

Fatigue Failure of Materials Fatigue failure of materials refers to their failure under the action of cyclic elastic stress. Fatigue generally involves the formation and gradual growth of cracks and ultimately to fracture as a result of reduced load carrying capacity.

44.   The surface of a slip gauge is produced by

(a) Milling (b) Lapping (c) Grinding (d) Burnishing

Ans:(b)

45.   Which of the following is a clearance fit?

(a) Push fit (b) Sliding fit
(c) Press fit (d) None

Ans:(b)

46.   The method of testing hardness by Brinell hardnes test is based on the principle of

(a) Indentation (b) Penetration (c) Rebound (d) Scratching

Ans:(a)

47.   Which one does not fit with the rest in the following?

(a) Hot chisel (b) Reamer (c) Hot punch (d) Hammer

Ans:(b)

48.   A master gauge is

(a) Gauge used by the instructor
(b) Used universally by all mechanics
(c) A standard gauge for checking accuracy of gauges used on shop floor
(d) A gauge used by experienced technician.

Ans:(c)

49.   The length of a hacksaw blade is measured from

(a) Extreme end to extreme end
(b) between centre of holes.
(c) The formula L = 16 x width
(d) From the end of handle to the end of the blade.

Ans:(b)

Note: The length of the **blade** is **the distance** between the centers of the holes at each end. The common **lengths** are 8", 10", and 12". The point is **measured** by the number of teeth per inch.

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50.   Dentist use which type of mirror and why?

(1) Plane mirror, to get real image   (2) Convex mirror, to get virtual image
(3) Concave mirror; to get magnified image (4) None.

Ans:(3)