1 One eighth of a half kg pack of icecream has been eaten. The remainder is divided among three people. Approximately what percentage of the pack does each person eat.

(A) 14.6%   (B) 29.2%   (C) 11.3%   (D) 18.1%

Ans:B .

> Initially eaten: 1/8 x ½ = 1/16.
>
> Balance = $\frac{1}{2} - \frac{1}{16}$; this amount was shared by 3 people equally →
>
> in percentage wrt pack content of ½ kg = $\frac{\frac{1}{2} - \frac{1}{16}}{3 \, x \, 1/2}$ x100 = 29.17

2. Food : Hungry::?:?

(A) Thought : Politics   (B)Water : River

(C) Rest : tired   (D) Wine : Intoxication

Ans: C

3. The path of magnetic flux in a transformer should have :

(A) High resistance   (B) High reluctance

(C) Low resistance   (D) Low reluctance

Ans:D

4.   If M men can complete a job in H hours, then in how many hours will 5 men complete this job?

(A)$\frac{MH}{5}$ (B) $\frac{5H}{M}$ (C) $\frac{M}{5H}$ (D) $\frac{H}{5}$

Ans:A

The number of man-.hour to complete the work = MH

Number of hours required if 5 men work =MH/5

5. Flow in a pipe is laminar, if the Reynolds's number is :

(A) Less than 2000   (B) Between 2000 and 4000

(C) Between 4000 and 6000   (D) Above 6000

Ans: A

> **Laminar flow** or streamline flow in pipes (or tubes) occurs when a fluid flows in parallel layers, with no disruption between the layers. At low velocities, the fluid tends to flow without lateral mixing, and adjacent layers slide past one another like playing cards. There are no cross-currents perpendicular to the direction of flow,

nor eddies or swirls of fluids. In laminar flow, the motion of the particles of the fluid is very orderly with all particles moving in straight lines parallel to the pipe walls.

Turbulent flow is a flow regime characterized by chaotic property changes. This includes rapid variation of pressure and flow velocity in space and time. In contrast to laminar flow the fluid no longer travels in layers and mixing across the tube is highly efficient. Flows at Reynolds numbers larger than 4000 are typically (but not necessarily) turbulent, while those at low Reynolds numbers below 2300 usually remain laminar. Flow in the range of Reynolds numbers 2300 to 4000 and known as transition.

https://www.vapourtec.com/flow-chemistry/laminar-turbulent/

The importance of the Reynolds number (Re)

How do we achieve the goal of increase and decrease? In theory the flow pattern depends on four variables:

Diameter of the tube
Speed of the fluid
Density of the fluid
Dynamic viscosity of the fluid

e factors combined provide the so called Reynolds number (Re), an important rameter that describes whether flow conditions lead to laminar flow or turbulent flow. general it can be said that a laminar flow occurs at a low Reynolds number ($\leq$ ca. 00) and a turbulent flow occurs at a high Reynolds number ($\geq$ ca. 3000). In between se two numbers (Re 2300-3000) you have a 'transitional flow', meaning the flow can laminar or turbulent (numbers mentioned are for a cylindrical tube).

https://www.nuclear-power.com/nuclear-engineering/fluid-dynamics/flow-regime/laminar-turbulent-flow/

LAMINAR VS TURBULENT FLOW
LAMINAR FLOW

In fluid dynamics, **laminar flow** is characterized by **smooth or regular paths** of fluid particles, in contrast to **turbulent flow**, which is characterized by the **irregular movement** of particles of the fluid. The fluid flows in **parallel layers** (with **minimal lateral mixing**), with no disruption between the layers. Therefore the laminar flow is also referred to as **streamline or viscous flow**.
The term streamline flow is descriptive of the flow because, in laminar flow, layers of water flow over one another at **different speeds** with virtually no mixing between layers. Fluid particles move indefinite and observable paths or streamlines.
When a fluid is flowing through a **closed channel** such as a pipe or between two flat plates, either of two types of flow (laminar flow or turbulent flow) may occur

depending on the **velocity**, **viscosity** of the fluid, and the **size of the pipe (or on the Reynolds number)**. Laminar flow tends to occur at lower velocities and high viscosity.

In fluid dynamics, **turbulent flow** is characterized by the fluid's **irregular movement** of particles (one can say **chaotic**). In contrast to laminar flow, the fluid **does not flow in parallel layers**, the **lateral mixing is very high**, and there is a disruption between the layers. Turbulence is also characterized by **recirculation, eddies**, and **apparent randomness**. In turbulent flow, the speed of the fluid at a point is continuously undergoing changes in both **magnitude and direction**.
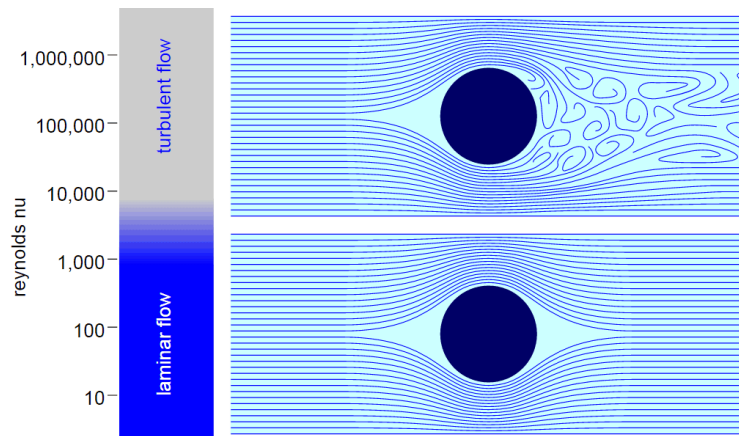
6. Modulus of rigidity is defined as the ratio of:

   (A) Longitudinal stress to longitudinal strain

   (B) Shear stress to shear strain

   (C) Stress to strain

   (D) Stress to volumetric strain

   Ans: B

7. Functional activities of a cell are controlled by :

   (A) Protoplasm   (B) Nucleolus   (C) Mitochondria   (D) Nucleus

   Ans: D

8. Store house of energy of a cell is

   (A) Protoplasm   (B) Nucleolus   (C) Mitochondria   (D) Nucleus

   Ans: C

8. 1 Power house of a cell:

   (A) Protoplasm   (B) Nucleolus   (C) Mitochondria   (D) Nucleus

   Ans: C

9.   What is 'Agni-II' ?

(A) An intermediate range ballistic missile

(B) A battle tank

(C) A satellite

(D) A satellite launching vehicle

Ans:A

Agni-II, is the second strategic ballistic missile of Agni family envisaged to be the mainstay of the Indian missile-based strategic nuclear deterrence. The Agni-II is a medium-range ballistic missile with two solid fuel stages and a Post Boost Vehicle integrated into the missile's Re-entry Vehicle

10.   The atomic number of an element is determined by :

(A) The number of electrons in one atom

(B) The number of neutrons in one atom

(C) The valency of the element

(D) The number of protons in its nucleus

Ans:D

11.   Time constant of a series R-L circuit is :

(A) L/R second   (B) second   (C) LR second   (D) L/R^2 second

Ans:A

12.   A ring gauge is used to :

(A) Check the clearance between two mating surfaces

(B) Test the accuracy of holes

(C) Check the diameter of shafts or uniform linear circular object

(D) All of the above

Ans:C

RC TIME CONSTANT

$$\tau \equiv R \times C$$

RC is the *time constant* of the RC charging circuit

TIME CONSTANTS IN ELECTRICAL CIRCUITS

In an RL circuit composed of a single resistor and inductor, the time constant τ (in seconds) is

$$\tau = \frac{L}{R}$$

where R is the resistance (in ohms) and L is the inductance (in Henrys).

Similarly, in an RC circuit composed of a single resistor and capacitor, the time constant τ (in seconds) is:

$$\tau = RC$$

where R is the resistance (in ohms) and C is the capacitance (in farads).

Electrical circuits are often more complex than these examples, and may exhibit multiple time constants (See Step response and Pole splitting for some examples.) In the case where feedback is present, a system may exhibit unstable, increasing oscillations. In addition, physical electrical circuits are seldom truly linear systems except for very low amplitude excitations; however, the approximation of linearity is widely used.

In digital electronic circuits another measure, the FO4 is often used. This can be converted to time constant units via the equation $5\tau = \text{FO4}$.[4]

Capacitor voltage step-response.
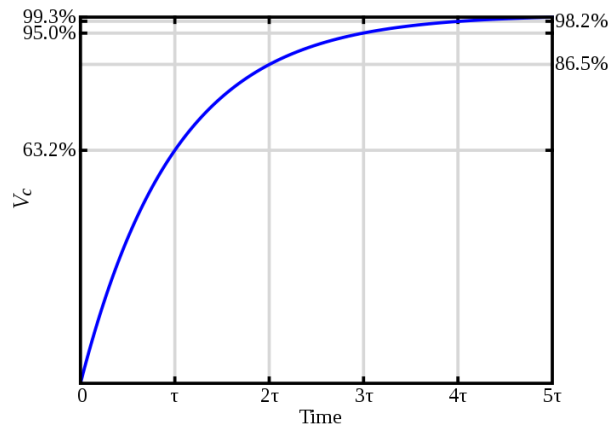
Voltage curve of a charging capacitor in a series RC circuit. The vertical axis shows the voltage across the capacitor as a percentage of the applied voltage to the RC circuit. τ represents the RC time constant

Inductor voltage step-response.

Current curve of a resistor in a charging series RC circuit. The vertical axis shows the current across the resistor as a percentage of the applied voltage to the RC circuit. τ represents the RC time constant.

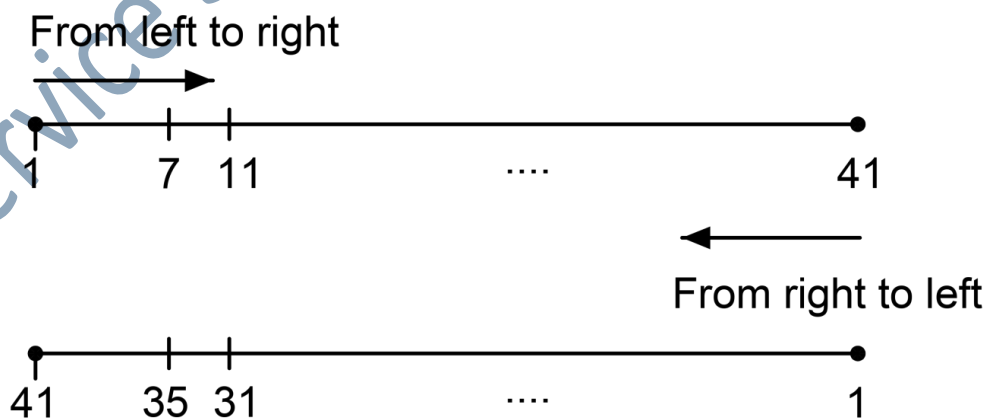https://en.wikipedia.org/wiki/Time_constant
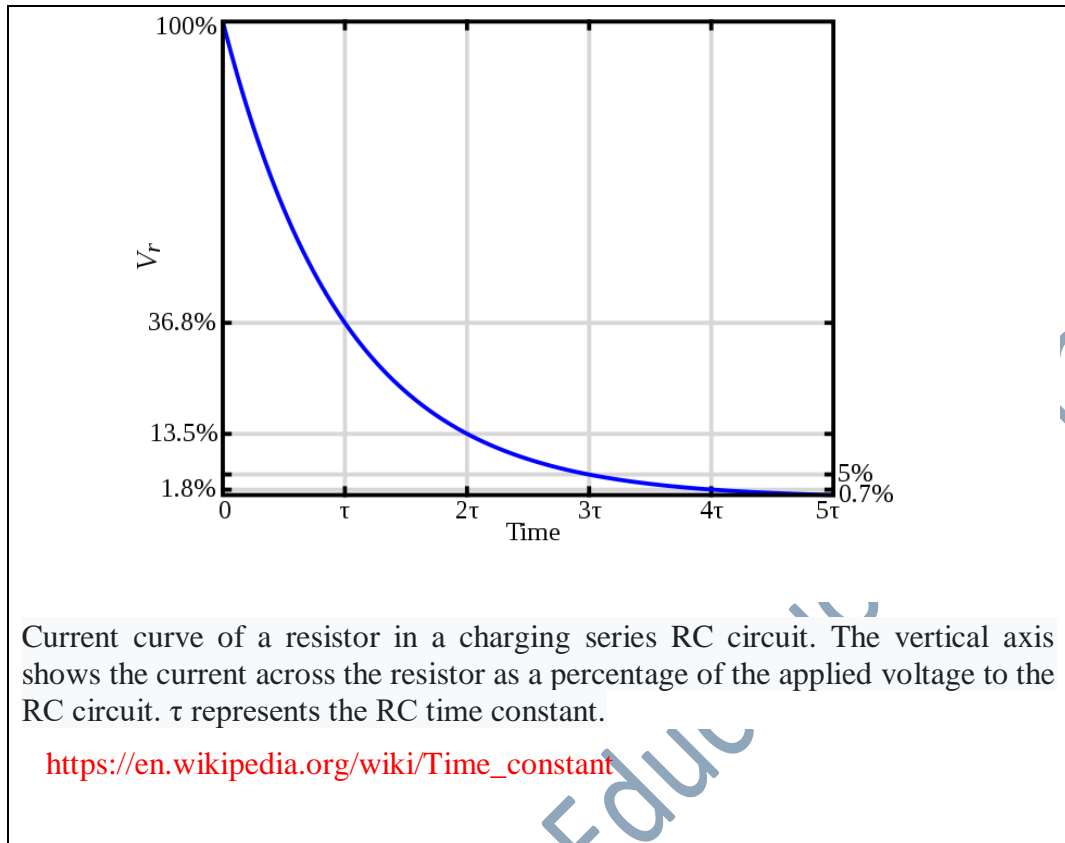
13. Mohan and Ramesh were ranked seventh and eleventh respectively from the top of their class of 41 students. What will be their respective ranks from the bottom of the class?

(A) 30th and 34th (B) 34th and 30th (C) 35th and 31st (D) 36th and 32nd

Ans:C

Position Mohan and Ramesh from left are 1 and 7th.

14. Angioplasty is the treatment for :

(A) Cancer   (B) Heart Disease   (C) Leprosy   (D) Diabetes

Ans: B

15. Carbondioxide in atmospheric air amounts to about :

(A) 0.039%   (B) 0.003%   (C)0.3%   (D)3%

Ans: A (0.03pertains to 5-7 decades ago)

16. Which of the following is a viral disease ?

(A) Tetanus   (B) Tuberculosis   (C) Typhoid   (D) AIDS

Ans:D

17. Which of the following transistor configurations gives useful current gain?

(A) CE alone   (B) CB alone   (C) CC alone   (D) Both CE and CC

Ans:D

18. 140 liter of acid contains 90% of acid and rest water. The amount of water added to make the water 12.5% of the resulting mixture is :

Ans:B

In the mixture: Acid = 126 liter and water 14 liter (90% : 10%)

Add x liter of water to make the mixture with 12.5% water (87.5% : 12.5%)

$12.5 = \frac{14+x}{126+14+x} x100$. Therefore x = 4.

19. The resistance can be measured most accurately by:

(A) Bridge method   (B) Meggar

(C) Multimeter   (D) Voltmeter-Ammeter method

Ans: A

> Kelvin double bridge method is used for the measurement of very low resistance.
> Wheatstone bridge method is used for the measurement of the medium value of resistance.
> Megger is used for the measurement of very high values of resistance, like insulation resistance.
> https://www.seaward.com/gb/support/resistance/faqs/59780-a-guide-to-resistance-measurement

20. Seema invested a sum of 16,000 for two years at compound interest and received an amountof 17,640 on maturity. What is the rate of interest ?

(A) 8%   (B) 5%   (C) 4%   (D) 3%

Ans:B

21.   In a p-n-p transistor, majority charge carriers are
       (A) Holes   (B) Electrons
       (C) Both (A) and (B)   (D)' None of these
       Ans:A

21.1   In a n-p-n transistor, majority charge carriers are
       (A) Holes   (B) free Electrons
       (C) Both (A) and (B)   (D) None of these
       Ans:b

22.   If l and δl are the length and change in length respectively, the strain is equal to :
       (A) $\frac{\delta l}{l}$ (B) $\frac{l}{\delta l}$ (C) l×δl   (D) l+δl
       Ans:A

CHARACTERISTICS OF CB CONFIGURATION

- This configuration provides voltage gain but no current gain.

- This Configuration provides good stability against increase in temperature.

- The CB configuration is used for high frequency applications.

CHARACTERISTICS OF CE CONFIGURATION

- This configuration provides good current gain and voltage gain.

- This configuration is usually used for bias stabilization methods and audio frequency applications.

CHARACTERISTICS OF CC CONFIGURATION

- This configuration provides current gain but no voltage gain.

- In CC configuration, the input resistance is high and the output resistance is low.

- The voltage gain provided by this circuit is less than 1.

- The sum of collector current and base current equals emitter current.

- The input and output signals are in phase.

- This configuration works as non-inverting amplifier output.

- This circuit is mostly used for impedance matching. That means, to drive a

---

low impedance load from a high impedance source.

23. A car travels from P to Q at a speed of V_1 km/hr and travels back from Q to P at theV_2km/hr. The average speed of the car for the entire journey is :

(A)$\frac{V_1+V_2}{2V_1V_2}$ (B)$\frac{V_1+V_2}{2}$ (C)$\frac{2V_1+V_2}{V_1+V_2}$ (D)$\frac{V_1+V_2}{\sqrt{V_1V_2}}$

Ans:A

24. The tropic of Cancer is :

(A) $66\frac{1}{2}°$N latitude   (B) $66\frac{1}{2}°$Slatitude

(C) $23\frac{1}{2}°$N latitude   (D) $23\frac{1}{2}°$S latitude

Ans: C

24. 1 The tropic of Capricorn is :

(A) $66\frac{1}{2}°$N latitude   (B) $66\frac{1}{2}°$Slatitude

(C) $23\frac{1}{2}°$N latitude   (D) $23\frac{1}{2}°$S latitude

Ans: D

25. The site of respiration in bacteria is :
(A) Episome   (B) Microsome   (C) Mesosome   (D) Ribosome

Ans:C

26. Mechanical efficiency of a gas turbine as compared to internal combustion reciprocating engine is :
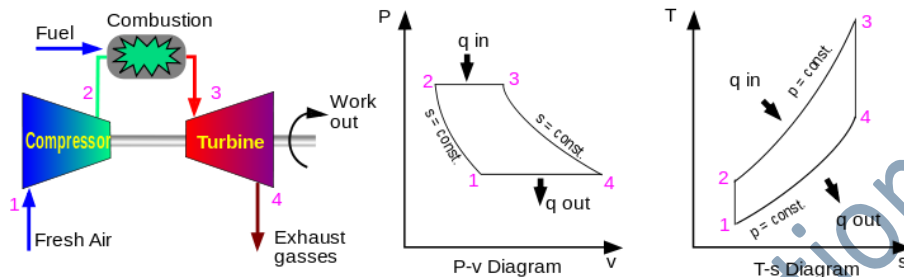
(A) Higher   (B) Lower   (C) Same   (D) None of these

Ans. (A)

A **gas turbine** is a type of continuous internal combustion engine. The main elements common to all gas turbine engines are:

- an upstream rotary compressor
- a combustor
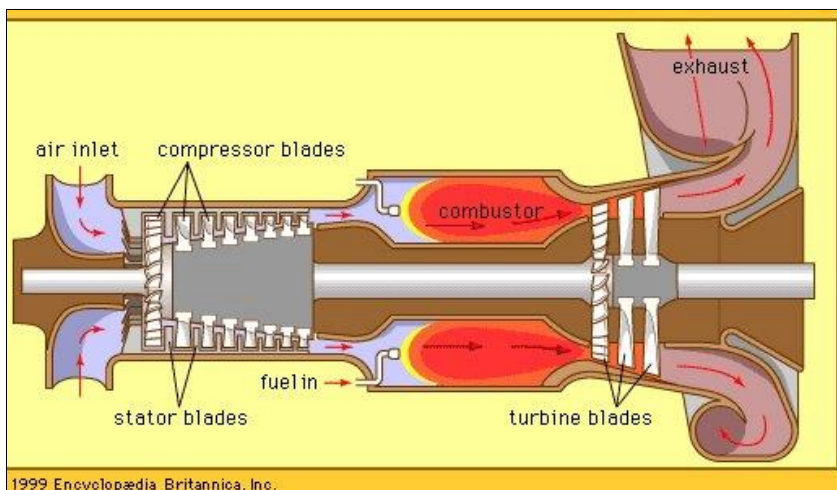- a downstream turbine on the same shaft as the compressor.

https://www.sciencedirect.com/topics/materials-science/turbine-efficiency

en:Image:Brayton cycle.svg.

. . . .

GAS TURBINE PERFORMANCE: AERODERIVATIVE OR HEAVY DUTY GAS TURBINES?

The compressed air is mixed with fuel injected through nozzles. The fuel and compressed air can be pre-mixed or the compressed air can be introduced directly into the combustor. The fuel-air mixture ignites under constant pressure conditions and the hot combustion products (gases) are directed through the turbine where it expands rapidly and imparts rotation to the shaft. The turbine is also comprised of stages, each with a row of stationary blades (or nozzles) to direct the expanding gases followed by a row of moving blades. The rotation of the shaft drives the compressor to draw in and compress more air to sustain continuous combustion. The remaining shaft power is used to drive a generator which produces electricity. Approximately 55 to 65% of the power produced by the turbine is used to drive the compressor. To optimize the transfer of kinetic energy from the combustion gases to shaft rotation, gas turbines can have multiple compressor and turbine stages.

https://www.wartsila.com/energy/learn-more/technical-comparisons/gas-turbine-for-power-generation-introduction

Landis, Fred. "gas-turbine engine". *Encyclopedia Britannica*, 26 Dec. 2008, https://www.britannica.com/technology/gas-turbine-engine. Accessed 28 October 2021.

Efficiency and power output can be increased by raising the turbine-inlet temperature. All materials lose strength at very high temperatures, however, and since turbine blades travel at high speeds and are subject to severe centrifugal stresses, turbine-inlet temperatures above 1,100° C require special blade cooling. It can be shown that for every maximum turbine-inlet temperature there is also an optimum pressure ratio. Modern aircraft gas turbines with blade cooling operate at turbine-inlet temperatures above 1,370° C and at pressure ratios of about 30:1.

27.   The torque developed by a single phase induction motor at starting is :

(A) Pulsating   (B) Uniform   (C) Zero   (D) None of these

Ans:C

28.   A body of mass 20 kg is dropped from a height of 2 m. If g is taken as 10 m/sec^2?, the kinetic energy of the body, just before striking the ground, will be:

(A) 400 J   (B) 4J   (C) 40 J   (D) 10J

Ans:A

(Falling bodies conserve energy, i.e., PE = KE → mgh $=\frac{1}{2}m$v^2; PE = 2x10x2 =400J)

29.   Sodium is related to salt in the same way as oxygen is related to :

(A) Water   (B) Carbon   (C) Hydrogen   (D) Chemistry

Ans:A (sodium, Na- sodium chloride, NaCl and oxygen, O_2 →water H_2O)

30. In India, which of the following is adopted as the standard recording rain gauge ?

    (A) Symon's rain gauge   (B) Tipping bucket type

    (C) Natural siphon type   (D) Weighing bucket type

    Ans:C

31. Lissajous pattern obtained in a CRO depend upon which of the following properties of the two sine waves fed to it?

    (A) Frequency   (B) Amplitude

    (C) Phase relationship   (D)All of these

    Ans:D

When horizontal deflection plates and vertical deflection plates of CRO (Cathode Ray Oscilloscope) are connected to two sinusoidal voltages, the patterns appear at CRO screen are called the Lissajous pattern

The Lissajous pattern obtained in a CRO depend upon frequency, amplitude and phase relationship

The cathode-ray oscilloscope (CRO) is a common laboratory instrument that provides accurate time and amplitude measurements of voltage signals over a wide range of frequencies. Its reliability, stability, and ease of operation make it suitable as a general purpose laboratory instrument. The heart of the CRO is a cathode-ray tube shown schematically in Fig. 1.
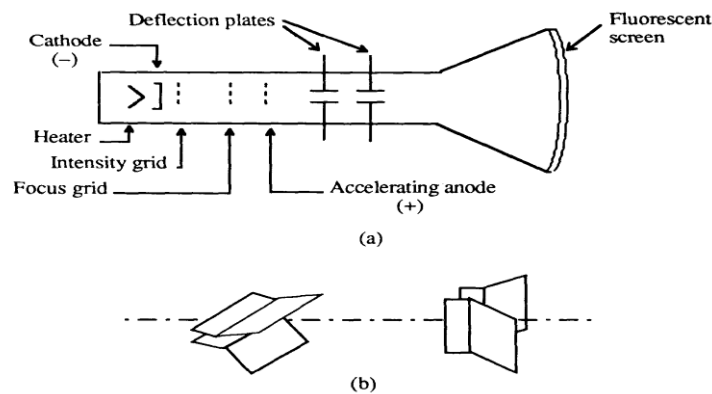

Figure 1. Cathode-ray tube: (a) schematic, (b) detail of the deflection plates.

The cathode ray is a beam of electrons which are emitted by the heated cathode (negative electrode) and accelerated toward the fluorescent screen. The assembly of the cathode, intensity grid, focus grid, and accelerating anode (positive electrode) is called an *electron gun*. Its purpose is to generate the electron beam and control its intensity and focus. Between the electron gun and the fluorescent screen are two pair of metal plates - one oriented to provide horizontal deflection of the beam and one pair oriented tO give vertical deflection to the beam. These plates are thus referred to as the *horizontal* and *vertical deflection plates*. The combination of these two deflections allows the beam to reach any portion of the fluorescent screen. Wherever

the electron beam hits the screen, the phosphor is excited and light is emitted from that point. This conversion of electron energy into light allows us to write with points or lines of light on an otherwise darkened screen. The signal applied to the vertical plates is thus displayed on the screen as a function of time. The horizontal axis serves as a uniform time scale.

http://boson.physics.sc.edu/~hoskins/Demos/CathodeRay.html

32. The value of binary 1111 is :

(A) 2^3-1   (B) 2^3 (C) 2^4-1   (D) 2^4

Ans:C

(Binary number 1111: Decimal equivalent is $1x2^3 + 1x2^2 + 1x2^1 + 1x2^0 = 8+4+2+1=$**15**.)

33. A block of wood floats in water with 2/3 of its volume submerged. Its relative density is :

(A) $\frac{1}{3}$ (B) $\frac{2}{3}$ (C) $\frac{4}{3}$ (D) $\frac{1}{9}$

Ans: B. Relative density = part of body submerged/density of water = 2/3/1

34. A semi conductor Read Only Memory basically is :

(A) a set of flip flop memory elements

(B) a combinational logic circuit

(C) a sequential circuit with flip flops and gates

(D) none of these

Ans:B

35. If the first and 2nd digit of the sequence 5981327438 are interchanged and then third and fourth digits, fifth and sixth digits and so on, which digit would be seventh counting towards left ?

(A) 8   (B) 2   (C) 1   (D) 4

Ans:A

(As per the given condition, 5981327438 → 9518234783. ∴ Seventh from left is 8.)

36. The area of a square field is 5000 m^2. The length of the diagonal of this square will be :

(A) $100\sqrt{2}$m   (B) $50\sqrt{2}$m   (C) 100 m   (D) 50 m

Ans: C (Area A = d^2/2 where d is the diagonal, 5000 = d^2/2 → d = 100)

37. I C engine cylinder bore is finished to proper shape and size by-
    (1) lapping   (2) honing
    (3) reaming   (4) shot blasting

    Ans: 2

38. For easy and quick starting of an engine, the choke valve is-
    (1) Opened   (2) Almost fully closed
    (3) By passed   (4) Half closed

    Ans: 2

In an internal combustion engine, a **choke valve** modifies the air pressure in the intake manifold, thereby altering the ratio of fuel and air quantity entering the engine. Choke valves are generally used in naturally aspirated engines with carburetors to supply a richer fuel mixture when starting the engine. Most choke valves in engines are butterfly valves mounted in the manifold upstream from the carburetor jet to produce a higher partial vacuum, which increases the fuel draw.

A choke valve is sometimes installed in the carburetor of internal combustion engines. Its purpose is to restrict the flow of air, thereby enriching the fuel-air mixture while starting the engine. Depending on engine design and application, the valve can be activated manually by the operator of the engine (via a lever or pull handle) or automatically by a temperature-sensitive mechanism called an autochoke.
https://en.wikipedia.org/wiki/Choke_valve

39. Scavenging used in present day two wheeler, two stroke engine is called-
    (1)   uniflow scavenging   (2)   pump scavenging
    (3)   loop scavenging   (4)   crank case scavenging

    Ans: 4

40. The sealing ring which is compressed into the groove to provide sealing action is called-
    (1)   gasket   (2)   criclip
    (3)   O-ring   (4)   Laybrinth packing

    Ans: 3

41. The rating of a vehicle tyre is decided by-
    (1)   Tyre pressure
    (2)   Tyre dimensions
    (3)   Layers of cord fabric in the tyre carcass
    (4)   Tread pattern

    Ans: 2

42. Punctured float in a carburetor may cause-
    (1)   No fuel supply   (2)   Reduced fuel supply
    (3)   Decreased air pollution   (4)   Flooding of engine with fuel

    Ans: 4

43. The working cycle of an engine (IC engine) in which the expansion ratio exceeds the compression is called-
    (1)   Brayton cycle   (2)   Ranking cycle
    (3)   Diesel cycle   (4)   Atkinson cycle

    Ans: 4

The Atkinson Cycle

The Atkinson cycle can be defined as a modified version of the Otto cycle, designed by *James Atkinson* in 1882. It is characterised for having a greater expansion stroke than a compression stroke, a fact that is implemented to use more of the energy available in the injected fuel as it is given more time to the mixture to expand and therefore, produce a greater amount of work within the combustion chamber.

In order to achieve its functionality, the Atkinson cycle appeals to the concept of *Late*
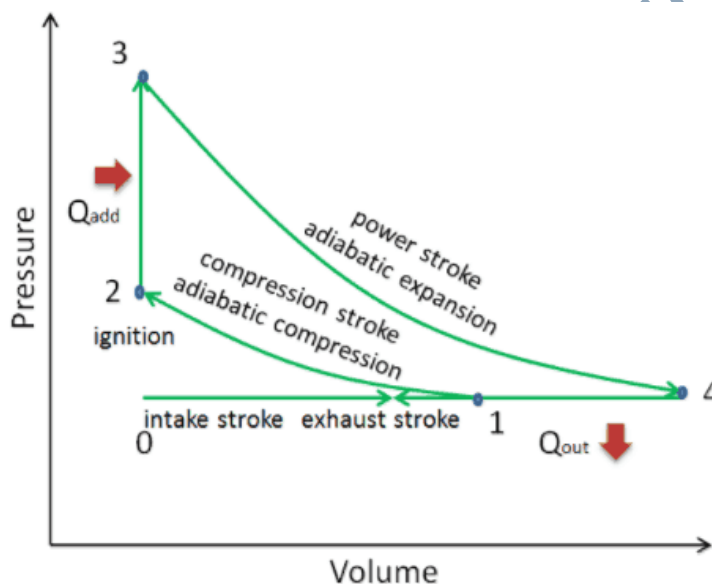

Intake Valve Closing (LIVC). This method consists of leaving the intake valves open certain degrees after the piston gets to the *Bottom Dead Centre (BDC)* with the objective of making sure a correct and uniform air filling is carried out throughout all the cylinders.

https://www.claytex.com/tech-blog/the-atkinson-cycle-and-improving-the-ices-efficiency/

ATKINSON CYCLE – PROCESSES

In an **Atkinson cycle** (modified Otto cycle), the system executing the cycle undergoes a series of four processes: two isentropic (reversible adiabatic) processes alternated with one isochoric process and one isobaric process:

During the **Atkinson cycle**, work is done on the gas by the piston between states 1 and 2 (**isentropic compression**). Work is done by the gas on the piston between stages 3 and 4 (**isentropic expansion**). The difference between the work done by the gas and the work done on the gas is the net work produced by the cycle and it corresponds to the area enclosed by the cycle curve. The work produced by the cycle times the rate of the cycle (cycles per second) is equal to the power produced by the Atkinson engine.

https://www.nuclear-power.com/nuclear-engineering/thermodynamics/thermodynamic-cycles/atkinson-cycle-atkinson-engine/

44. A long tool with number of cutting teeth which is pushed or pulled through a hole or across a surface to form the desired shape and size is called-

(1) Boring bar   (2) Reamer
(3) Tap   (4) Broach

Ans: 4

45. Flow separation in flow past a solid object is caused by

(1)   a reduction of pressure to vapour pressure
(2)   a negative pressure gradient
(3)   a positive pressure gradient
(4)   the boundary layer thickness reducing to zero
Ans:4

46. A correctly designed convergent-divergent nozzle working at a designed load is

(1)   always isentropic   (2)   always choked
(3)   never choked   (4)   never isentropic
Ans:2

47. The value of Biot number is very small (less than 0.01) when

(1)   the convective resistance of the fluid is negligible
(2)   the conductive resistance of the fluid is negligible
(3)   the conductive resistance of the solid is negligible
(4)   none of these

Ans:3

48. For the same inlet and oulet temperatures of hot and cold fluids, the Log Mean Temperature Difference (LMTD) is
(1)   greater for counterflow heat exchanger than for parallel flow heat exchanger
(2)   greater for parallel flow heat exchanger than for parallel flow heat exchanger
(3)   same for both parallel and counter flow heat exchangers
(4)   dependent on the properties of the fluids
Ans:1

49. The coupling used to connect two shafts with large angular misalignment is

(1)   a Flange coupling   (2)   an Oldham's coupling
(3)   a Flexible bush coupling   (4)   a Hooke's joint
Ans:3

A **universal joint** (**universal coupling**, or **Hooke's joint**) is a joint or coupling connecting rigid rods whose axes are inclined to each other, and is commonly used in shafts that transmit rotary motion. It consists of a pair of hinges located close together, oriented at 90° to each other, connected by a cross shaft. The universal joint is not a constant-velocity joint.

Universal Joints are mainly used to create a flexible connections between two rigid shafts at an angle. It permits the transmission of constantly varying power. It is used to connect the propeller shaft with the gearbox shaft to transmit the rotary motion.

Shaft coupling, in machinery, a device for providing a connection, readily broken and restored, between two adjacent rotating shafts. A coupling may provide either a rigid or a flexible connection; the flexibility may permit misalignment of the connected shafts or provide a torsionally flexible (yielding) connection, mitigating effects of shock.

A common type of rigid coupling consists of two mating radial flanges (disks) that are attached by key-driven hubs to the ends of the shafts and bolted together through the flanges. Alignment of the shafts is usually achieved by means of a short cylindrical projection (rabbet joint) on the face of one flange that fits snugly into a circular recess on the face of the other flange.

The chain coupling consists of two hardened-steel sprockets, one on each shaft, with a nylon or metal roller chain wrapped around the closely aligned sprockets and connected at the ends. Clearances between the sprocket teeth and the chain allow for a small amount of shaft misalignment.

Britannica, The Editors of Encyclopaedia. "Shaft coupling". *Encyclopedia Britannica*, 15 Aug. 2013, https://www.britannica.com/technology/shaft-coupling. Accessed 19 October 2021.

For connecting shafts whose axes intersect but are inclined to one another at a larger angle than a flexible coupling can accommodate, universal joints are used. The most common of these is the Hooke, or Cardan, joint, which consists of two yokes attached to the shaft ends and a cross-shaped connecting member.

https://www.semanticscholar.org/paper/ANALYSIS-OF-UNIVERSAL-COUPLING-UNDER-DIFFERENT-
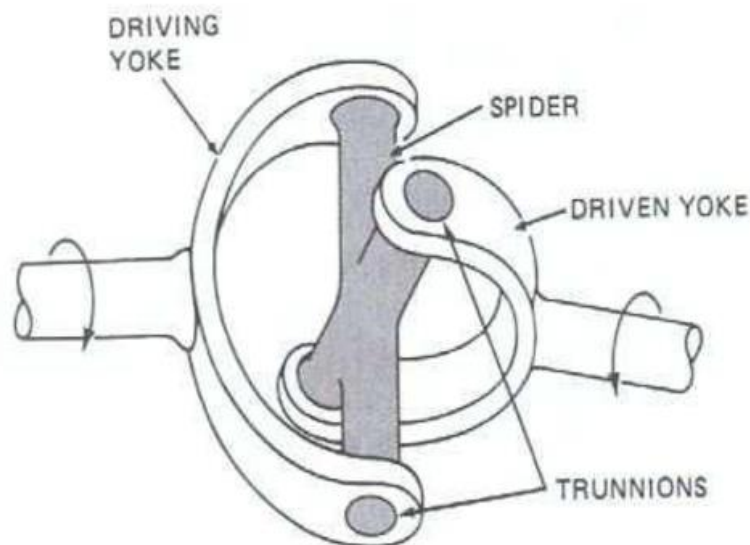
50. The coupling used to connect two shafts with an offset and not collinear is

(2) a Flange coupling   (2) an Oldham's coupling
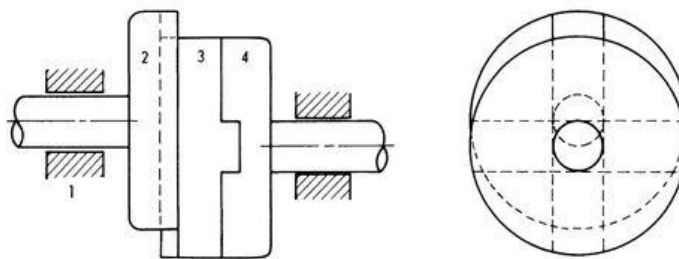(4) a Flexible bush coupling   (4) a Hooke's joint
Ans:2

Figure 1:

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Construction : This mechanism is inversion of Double slider Crank Chain .It has two turning & two Sliding pair.

Two flanges with respective shafts are free to rotates with respect to frame both flanges have rectangular slots . An intermediate piece has two rectangular projections on both sides, both projections are perpendicular to each other , each projection fits inside the slot of flange.

Working: When one shaft is given rotary motion,it is transmitted to another shaft the intermediate piece. The intermediate piece slides & adjusts itself, to keep both shafts runnings. The centre of the intermediate piece traces the path of a circle with radius equal to offset between shafts.

Application : This coupling is used to connect two shaft having some eccentricity (offset).

https://www.mechdiploma.com/q21-explain-sketch-oldham%E2%80%99s-coupling