

- Q)In the operation of steam engines, the vapour cycle adopted is--> **Modified Rankine cycle**
- Q)The principal constituents of a fuel are--> **Carbon and hydrogen**
- Q)The fuel mostly used in boilers is--> **Non-caking bituminous coal**
- Q)Which of the following fuel has the highest calorific value?--> **Bituminous coal**
- Q)The ideal cycle on which a steam engine works is--> **Rankine cycle**
- Q)Rankine cycle comprises--> **Two isobaric and two isentropic**
- Q)Which of the following gas has the highest calorific value?--> **Coal gas**
- Q)A bomb calorimeter is used for finding the .. calorific value of solid and liquid fuels--> **Higher**
- Q)Which of the following statement is incorrect?--> **The solid fuels have higher efficiency than liquid fuels**
- Q)The smallest quantity of a substance, which can exist by itself in a chemically recognizable form is known as--> **Element**
- Q)A process of heating crude oil to a high temperature under a very high pressure to increase the yield of lighter distillates, is known as--> **Cracking**
- Q)Petrol is distilled at--> **650 to 2200 °C**
- Q)The fuel mostly used in blast furnace for extracting pig iron from iron ores is--> **Hard coke**
- Q)One kg of carbon requires .. of oxygen and produces 7/3 kg of carbon monoxide--> **4/3**
- Q)The mass of carbon per kg of flue gas is given by--> $\frac{8}{11} CO_2 + \frac{3}{7} CO$
- Q)The mass of flue gas per kg of fuel is the ratio of the--> **Mass of carbon in 1 kg of flue gas to the mass of carbon in 1 kg of fuel**
- Q)Which of the following has minimum molecular mass?--> **Hydrogen**
- Q)One kg of carbon monoxide (CO) requires 4/7 kg of oxygen and produces--> **11/7 kg of CO₂**
- Q)The molecular mass of oxygen is--> **32**
- Q)The molecular mass of nitrogen is .. oxygen--> **Less than**
- Q)Stoichiometric air-fuel ratio by mass for combustion of petrol is--> **15.05**
- Q)An analysis which includes the steam in the exhaust is called--> **Wet analysis**
- Q)A chemical fuel is a substance which releases . On combustion--> **Heat energy**
- Q)The most important solid fuel is--> **Coal**
- Q)The mass of excess air supplied is equal to--> $\frac{100}{23} \times \text{mass of excess oxygen}$
- Q)The smallest particle which can take part in a chemical change is called--> **Atom**
- Q)When the fuel is burned and the water appears in the vapour phase, the heating value of fuel is called--> **Lower heating value**
- Q)When the fuel is burned and water is released in the liquid phase, the heating value of fuel is called--> **Higher heating value**
- Q)Enthalpy of formation is defined as enthalpy of compounds at--> **25°C and 1 atmosphere**
- Q)Bomb calorimeter is used to find the calorific value of ----- fuels--> **Solid**
- Q)The orsat apparatus gives--> **A. Volumetric analysis of the dry products of combustion**
- Q)In the Orsat apparatus KOH solution is used to absorb--> **Carbon dioxide**
- Q)In Rankine cycle the work output from the turbine is given by--> **Change of enthalpy between inlet and outlet**
- Q)Regenerative heating i.e., bleeding steam to reheat feed water to boiler--> **Increases thermal efficiency of the cycle**

Q)Regenerative cycle thermal efficiency--> **Is always greater than simple Rankine thermal efficiency**

Q)In a regenerative feed heating cycle, the optimum value of the fraction of steam extracted for feed heating--> **increases with increase in Rankine cycle efficiency**

Q)Rankine efficiency of a steam power plant--> **Improves in winter as compared to that in summer**

Q)Rankine cycle comprises of--> **Two isentropic processes and two constant pressure processes**

Q)Rankine cycle efficiency of a good steam power plant may be in the range of--> **35 to 45%**

Q)Which of the following is a water tube boiler--> **Babcock and Wilcox boiler**

Q)In fire tube boiler--> **The flames and hot gases pass through the tubes which are surrounded by water**

Q)The water tubes in a simple vertical boiler are--> **inclined**

Q)Lancashire boiler is a--> **Stationary fire tube boiler**

Q)In a regenerative feed heating cycle, the greatest economy is affected--> **When steam is extracted from several places in different stages of steam turbine**

Q)The maximum percentage gain in regenerative feed heating cycle thermal efficiency--> **Increase with number of feed heaters increasing**

Q)A device attached to the steam chest for preventing explosions due to excessive internal pressure of steam is called--> **Safety valve**

Q)A safety valve mainly used with locomotive and marine boilers is--> **Spring loaded safety valve**

Q)A device used in a boiler to control the flow of steam from boiler to the main pipe and shut off the steam completely when required, is known as--> **Stop valve**

Q)A device used to put off fire in the furnace of the boiler when the level of water in the boiler falls to an unsafe limit, is called--> **Fusible plug**

Q)Which of the following boiler is best suited to meet the fluctuating demand of steam?--> **Locomotive boiler**

Q)Water tube boiler produce steam at a ----- pressure than that of fire tube boilers--> **Higher**

Q)The pressure of feed water has to be raised before its entry into the boiler. The pressure is raised by a device known as--> **Feed pump**

Q)An air preheater--> **Enables low grade fuel to be burnt**

Q)The equivalent evaporation is defined as the--> **Amount of water evaporated or steam produced in kg per kg of fuel burnt**

Q)The amount of water evaporated in kg per kg of fuel burnt is called--> **Evaporative capacity of boiler**

Q)Which of the following are boiler accessories?--> **Economizer**

Q)An economizer ----- the steam raising capacity of a boiler--> **Increases**

Q)A device used to increase the temperature of saturated steam without raising its pressure is called--> **Super heater**

Q)A device used to heat feed water by utilizing the heat in the exhaust flue gases before leaving through the chimney, is known as--> **Economizer**

Q)The draught in locomotive boilers is produced by a--> **Steam jet**

Q)The draught produced by a steam jet issuing from a nozzle placed in the chimney, is called--> **Induced steam jet draught**

- Q)The chimney draught varies with--> **Climatic conditions**
- Q)The mechanical draught produces ----- draught than natural draught--> **More**
- Q)The air pressure at the fuel bed is reduced below that of atmosphere by means of a fan placed at or near the bottom of the chimney to produce a draught. Such a draught is called--> **Induced draught**
- Q)The draught may be produced by a--> **All of these**
- Q)In a boiler, various heat losses take place. The biggest loss is due to--> **Dry flue gases**
- Q)In a boiler installation the natural draught is produced--> **cold air from outside to rush in**
- Q)The draught which a chimney produces is called--> **Natural draught**
- Q)The mechanical draught ----- the amount of smoke--> **Decreases**
- Q)The efficiency of the plant ----- with the mechanical draught--> **Increases**
- Q)The velocity of flue gases (V) through the chimney under a static draught of H' meters is given by--> **$4.43 \sqrt{H'}$**
- Q)Which of the following statement is wrong?--> **The natural draught reduces the fuel consumption**
- Q)For the same draught produced the power of induced draught fan as compared to forced draught fan is--> **More**
- Q)The draught in locomotive boilers is produced by--> **Steam jet**
- Q)The draught produced, for a given height of the chimney and given mean temperature of chimney gases--> **Decreases with increase in outside air temperature**
- Q)The draught produced by chimney of given height at given outside temperature--> **Increases if the chimney gas temperature increases**
- Q)For forced draught system, the function of chimney is mainly--> **To discharge gases high up in the atmosphere to avoid hazard**
- Q)Artificial draught is produced by--> **All of the above**
- Q)In balanced draught system the pressure at force fan inlet--> **Approximately same as that at chimney outlet**
- Q)The steam leaves the nozzle at a--> **Low pressure and high velocity**
- Q)The efficiency of chimney is approximately--> **0.25%**
- Q)The artificial draught normally is designed to produce--> **Less smoke**
- Q)For the induced draught the fan is located-->
- Q)The difference of saturation temperature and super cooled temperature at that pressure is known as--> **Degree of undercooling**
- Q)In a nozzle, the effect of super saturation is to--> **Increase the entropy**
- Q)The flow of steam is super sonic--> **In the divergent portion of the nozzle**
- Q)The effect of friction in a nozzle ----- dryness fraction of steam--> **Increases**
- Q)The velocity of steam leaving the nozzle(V) is given by-->
- Q)The critical pressure ratio for initially dry saturated steam is--> **0.577**
- Q)The critical pressure ratio for initially superheated steam is ----- as compared to initially dry saturated steam--> **Less**
- Q)The isentropic expansion of steam through nozzle for the steam initially dry saturated at inlet is approximated by equation--> **$pv^{1.135} = C$**
- Q)The ratio of exit pressure to inlet pressure for maximum mass flow rate per unit area of steam

through nozzle when steam is initially superheated is--> **0.5457**

Q)When the back pressure of a nozzle is below the designed value of pressure at exit of nozzle, the nozzle is said to be--> **Under damping**

Q)For a convergent divergent nozzle, critical pressure ratio occurs when--> **Increase in exit and inlet pressure ratio does not increase steam flow rate**

Q)1. The maximum velocity attainable at the throat of a steam nozzle is--> **Sonic velocity**

Q)The effect of considering friction losses in steam nozzle for the same pressure ratio leads to--> **Decrease in exit velocity from nozzle**

Q)The effect of considering friction in steam nozzles for the same pressure ratio leads to--> **Increase in dryness fraction of exit steam**

Q)De-Laval turbines are mostly used--> **For small power purposes and high speeds**

Q)In impulse turbines, when friction is neglected, the relative velocity of steam at outlet tip of the blade is ----- the relative velocity of steam at inlet tip of the blade--> **Equal to**

Q)In an impulse turbine--> **The steam is expanded in nozzles only and there is a pressure drop and heat drop**

Q)If a flow is to be continuously accelerated from a subsonic to a supersonic velocity in nozzle, it must--> **Have throat**

Q)In case of reaction steam turbine--> **There is enthalpy drop both in fixed and moving blades**

Q)Curtis turbine is--> **Velocity compounded impulse steam turbine**

Q)In De-Laval steam turbine--> **The pressure in the turbine rotor is approximately same as in condenser**

Q)The blade friction in the impulse turbine reduces the velocity of steam by ----- while it passes over the blades--> **10 to 15%**

Q)In case of impulse steam turbine--> **There is enthalpy drop in nozzles**

Q)De-Laval turbine is--> **Simple single wheel impulse turbine**

Q)The pressure on the two sides of the impulse wheel of a steam turbine--> **Is same**
cumulative enthalpy drop

Q)For multistage steam turbine reheat factor is defined as--> isentropic enthalpy drop

Q)The value of reheat factor normally varies from--> **1.02 to 1.06**

Q)Rateau steam turbine is--> **pressure compounded impulse steam turbine**

Q)Parson 's turbine is--> **Multi wheel reaction steam turbine**

Q)Stage efficiency of steam turbine is--> $\eta_{\text{nozzle}} \times \eta_{\text{blade}}$

Q)for Parson 's reaction steam turbine, degree of reaction is--> **50%**

Q)combining impulse stages in series results in--> **decrease of speed**

Q)in impulse reaction turbines, the pressure drops--> **in both fixed and moving blades**

Q)the pressure velocity compounding of steam turbine results in--> **shorter turbine for a given total pressure drop**

Q)Steam turbines are governed by the following methods--> **All of the above**

Q)In steam turbines the reheat factor--> **increases with increase in number of stages**

Q)in an impulse turbine, the energy supplied to the blades per kg of steam equals to--> **kinetic energy of jet at entrance per kg of steam**

Q)pick up the correct statement about change of parameter in a reaction turbine 's fixed blades--> **pressure decreases and velocity increases**