	Program: BE MECHANICAL
	Curriculum Scheme: Revised 2016
	Examination: Final Year Semester VIII
	Course Code: ME803 and Course Name: PE
Q=QUESTION	question_description
A=ANSWER	answer_description
	Module-1
Q	Mixture strength is defined as the ratio of
A	Stoichiometric Air-fuel ratio / Actual Air-fuel ratio
A	Stoichiometric Air-fuel ratio / Theoretical Air-fuel ratio
A	Actual Air-fuel ratio / Stoichiometric Air-fuel ratio
A	Theoretical Air-fuel ratio / Stoichiometric Air-fuel ratio
Q	Adiabatic flame temperature is the _____ temperature reactants can achieve during combustion.
A	minimum
A	maximum
A	constant
A	room temperature
Q	A fuel is burned steadily in a combustion chamber. The combustion temperature will be the highest **except** when
A	The fuel is preheated.
A	The fuel is burned with a deficiency of air.
A	The combustion chamber is well insulated.
A	The combustion is complete.
Q	Combustion is a reaction in which a substance reacts with-
A	Hydrogen
A	Nitrogen
A	Oxygen
A	Chlorine
Q	Heat released in a reaction at constant pressure is called
A	Entropy change
A	Enthalpy of reaction
A	Internal energy of reaction
A	Temperature of reaction
Q	The most important solid fuel is
A	wood
A	charcoal
A	coal
A	cruide oil
Q	The smallest particle which can take part in chemical change is called
A	Atom
A	Molecule
A	Electron
A	Compound

Q=QUESTION A=ANSWER	question_description answer_description
	Module-2
Q	The value of critical pressure ratio for initially wet steam is
A	0.546
A	0.5
A	0.554
A	0.582
Q	Under thermal equilibrium, flow of steam is
A	isentropic
A	adiabatic
A	hyperbolic
A	polytropic
Q	A nozzle is said to be choked when
A	Flow through it is zero
A	Flow is attained at maximum value corresponding to critical exit pressure
A	It is not possible to increase the flow by increasing inlet pressure
A	It is discharging into atmosphere
Q	Water (Cp = 4 KJ/kgK) is fed to boiler at 30°C & the enthalpy of vaporisation at the atmospheric pressure in the boiler is 2400 KJ/kg. If the steam coming from the boiler is 0.9 dry, the net heat supplied in the boiler is
A	2160 KJ/kg
A	2400 KJ/kg
A	2440 KJ/kg
A	2280 KJ/kg
Q	The equivalent evaporation (kg/hr) of a boiler producing 2000 kg/hr of steam with enthalpy content of 2426 KJ/kg from feed water at 40°C (liquid enthalpy = 168 KJ/kg) is…. (Take enthalpy of vaporisation of water at 100°C = 2258 KJ/hr.)
A	2000 kg/hr
A	2149 kg/hr
A	1682 kg/hr
A	1649 kg/hr
Q	In a boiler, feed water is supplied per hour is 205 kg while coal fired per hour is 23 kg. The net enthalpy rise per kg of water is 145 KJ. If the calorific value of the coal is 2050 KJ/kg, then the boiler efficiency will be
A	56%
A	63%
A	74%
A	78%
Q	Calculate the efficiency of the boiler having following data: i) Mass of feed water = 2060 kg/hr., ii) Mass of coal supplied = 227 kg/hr., iii) Calorific value of fuel = 30000 KJ/kg, iv) Enthalpy of steam produced = 2750 kJ/kg, v) Enthalpy of feed water = 398 kJ/kg
A	71%
A	57%

A	63%
A	66%
Q	Which is the correct statement in the context of difference between a Lancashire boiler & a Cornish boiler
A	Lancashire boiler is a fire tube boiler whereas Cornish boiler is a water tube boiler
A	Lancashire boiler has two flue tubes & the Cornish boiler has one flue tube
A	Lancashire boiler is horizontal & the Cornish boiler is vertical in placement
A	Lancashire boiler is externally fired & the Cornish boiler isinternally fired
Q	All of the following aspects are true in relation to Babcock-Wilcox boiler, except
A	Size of the drum can be made small as it does not contain any water tube
A	Circulation of water is by convection currents
A	the bank of tubes is so inclined that the hottest of flue gases come in contact with hottest water
A	rather difficult boiler inspection & replacement of boiler tubes
Q	From following which is not method employed in High pressure boilers to increase the heat transfer
A	Evaporating water above critical pressure
A	Heating water by mixing superheated steam
A	Increasing the water velocity inside the tube
A	Increasing the diameter of the water carrying tubes
Q	Which aspect is not true in the context of superheaters?
A	Heat of combustion gases is transferred to superheaters by convention, radiation both
A	Superheaters mainly follow a counter flow arrangment
A	Interdeck superheaters are placed between the bank or row of water tubes
A	Superheaters are essentially coil pipes made from stainless steel
Q	In a simple impulse turbine, the nozzle angle at entrance is 30°. For maximum diagram efficiency, the blade speed ratio is
A	0.25
A	0.75
A	0.5
A	0.43
Q	If α1 = Nozzle angle, Cb = Blade speed & Ca1 = Absolute velocity of the steam jet issuing from the nozzle, which of the following statement is wrong?
A	At Cb/Ca1 = 0, torque on the blades is minimum & no work is done
A	At Cb/Ca1 = 1, both torque & work done are zero
A	At Cb/Ca1 = cos α1/2, maximum work output is obtained
A	At Cb/Ca1 = cos α1/2, the diagram efficiency has a maximum value
Q	If nozzle angle is 30 degree, the efficiency of an impulse turbine would be maximum when the blade speed equals
A	0.43Ca1

A	0.5 Ca1
A	0.75 Ca1
A	0.86 Ca1
Q	A single stage impulse turbine with diameter of 120 cm runs at 3000 rpm. If the blade speed ratio is 0.42, then the inlet velocity will be
A	79 m/sec
A	188 m/sec
A	450 m/sec
A	900 m/sec
Q	If nozzle angle is 30°, the De Laval turbine will have a maximum efficiency of
A	0.43
A	0.5
A	0.75
A	0.875
Q	For three row velocity compounded wheels, the last row of blades will do only ……of the total work
A	1/4th
A	1/8th
A	1/12th
A	1/16th
Q	If the enthalpy drop in the moving blades & fixed blades of a steam turbine is 10 kJ/kg & 15 kJ respectively, then the degree of reaction for the turbine stage is
A	67%
A	60%
A	40%
A	33%
Q	Which is the false statement in connection with a Parson's reaction turbine?
A	both fixed & moving blades are identical
A	the velocity diagram is symmetrical about a vertical centre line
A	the relative velocity of steam either remains constant or reduces slightly when the steam glides over moving blades
A	the turbine has 50% degree of reaction
Q	The Parsons' reaction turbine has
A	Only moving blades
A	Only fixed blades
A	Identical fixed and moving blades
A	Fixed and moving blades of different shape
Q	In a reaction turbine when the degree of reaction is zero, then there is
A	No heat drop in moving blades
A	No heat drop in fixed blades
A	Maximum heat drop in moving blades
A	Maximum heat drop in fixed blades
Q	Impulse blades are in the shape of
A	Rain drop
A	Circular

A	Half moon
A	Straight line
Q	When steam reaches turbine blades the type of force responsible for moving turbine blades are
A	Axial force
A	Shear force
A	Longitudinal force
A	Tensile force
Q	In a reaction turbine, when steam flows through the moving blades,
A	Pressure increases while velocity decreases
A	Pressure decreases while velocity increases
A	Pressure and velocity both decreases
A	Pressure and velocity both increases
Q	A stage, in reaction turbine, is represented by
A	Number of casing
A	Number of entries of steam
A	Number of exits of steam
A	Each row of blades

Q=QUESTION A=ANSWER	question_description answer_description Module-3
Q	Inter-cooling in gas turbines
A	Decreases net output but increases thermal efficiency
A	Increases net output but decreases thermal efficiency
A	Decreases both net output and thermal efficiency
A	Increases both net output and thermal efficiency
Q	In a single-stage open-cycle gas turbine, the mass flow through the turbine is higher than the mass flow through compressor, because
A	The specific volume of air increases by use of intercooler
A	The temperature of air increases in the reheater
A	The combustion of fuel takes place in the combustion chamber
A	The specific heats at constant pressure for incoming air and exhaust gases are Constant
Q	A gas turbine cycle with heat exchanger and reheating improves
A	Only the thermal efficiency
A	Only the specific power output
A	Both thermal efficiency and specific power output
A	Neither thermal efficiency nor specific power output
Q	Which of the following is a type of Gas Turbine Plant?
A	Single Acting
A	Double Acting
A	Open
A	Closed
Q	The thermal efficiency of a gas turbine cycle with ideal regenerative heat exchanger is
A	Equal to work ratio
A	less than work ratio
A	more than work ratio
A	unpredictable
Q	In a two-stage gas turbine plant, with intercooling and reheating
A	both thermal efficiency and work ratio improve
A	work ratio improves but thermal efficiency decreases.
A	thermal efficiency improves but work ratio decreases.
A	both thermal efficiency and work ratios decrease
Q	In a gas turbine, hot combustion products with specific heats Cp=0.98 KJ/KgK and Cv = 0.7538 KJ/KgK enters the turbine at 25 bar and 1200 K and exits at 1 bar. Isentropic efficiency of turbine is 0.94. Work developed by the turbine per kg of gas flow is: (choose the nearest answer)
A	689.64KJ/KG

A	663.26 KJ/KG
A	579.51 KJ/KG
A	480.2 KJ/KG
Q	A gas turbine cycle with reheat and heat exchange improves:
A	Only thermal efficiency
A	Only thermal efficiency
A	Both thermal efficiency and specific power output.
A	Neither thermal efficiency and specific power output
Q	Chose the correct path of air flow in gas turbines:
A	LP Compressor - Heat exchanger - Hp compressor – Intercooler - combustion chamber - HP turbine - LP Turbine - Heat exchanger exhaust.
A	LP Compressor – Intercooler - HP compressor - Heat exchanger - Combustion Chamber - HP turbine - LP Turbine - Heat exchanger - Exhaust.
A	HP Compressor - Intercooler-LP compressor-Heat exchanger-Combustion Chamber-LP Turbine-HP Turbine-Heat Exchanger-Exhaust
A	LP Compressor-Intercooler-HP compressor-Heat exchanger-Combustion Chamber-HP turbine-Intercooler-LP Turbine-Heat exchanger-Exhaust
Q	Choose the False statement:
A	Gas turbines are used in marine fields because they are self-contained.
A	Gas turbines do not require cooling water.
A	Gas turbines are used for power generation because it enables quick installation and starting
A	Gas turbines are self-starting
Q	What is the mechanical efficiency of a gas turbine (nearest value)?
A	95
A	25
A	85
A	72

Q=QUESTION A=ANSWER	question_description answer_description Module-4
Q	Which statement is true for compression in gas turbine engine?
A	temperature at outlet is higher for actual compression as compared to isentropic compression
A	pressure at outlet is higher for actual compression as compared to isentropic compression
A	temperature at outlet is lower for actual compression as compared to isentropic compression
A	temperature in constant during compression
Q	Which statement is true for turbines in gas turbine engine?
A	temperature at outlet is higher for actual compression as compared to isentropic compression
A	pressure at outlet is higher for actual compression as compared to isentropic compression
A	temperature at outlet is lower for actual compression as compared to isentropic compression
A	temperature in constant during compression
Q	Thermal efficiency for propulsive engines is defined as ratio of_____
A	thrust power and heat released by combustion of fuel
A	propulsive power and heat released by combustion of fuel
A	thrust power and propellant flow rate
A	Thrust power and propulsive power
Q	Which one of these is not a thrust augmentation method for Turbojet engine?
A	Reheater
A	Afterburner
A	Air bleed method
A	Intercooler
Q	Which of these engine has highest flight speed possible ?
A	Ramjet engine
A	Turbojet engine
A	Turbofan engine
A	Rocket engine
Q	Find the correct sequence of parts in gas turbojet engine from inlet to outlet.
A	compressor-diffuser-combustion chamber-turbine-nozzle
A	diffuser-compressor-combustion chamber-turbine-nozzle
A	compressor-combustion chamber-turbine-diffuser-nozzle
A	compressor-combustion chamber-diffuser-turbine-nozzle
Q	Which one of these engine are used missiles?
A	Turbojet
A	Ramjet
A	Turboprop
A	turboprop
Q	Which is the common factor for Turbojet and turboprop engine?

A	specific wt. ratio
A	flight speed and altitude of operation
A	runway length required for takeoff and landing
A	gas turbine cycle
Q	Jet engine gives _____acceleration to a _____ weight of air.
A	smaller, smaller
A	Larger, smaller
A	smaller, larger
A	larger, larger
Q	Which engine requires supersonic air inlet to operate?
A	Gas turbine
A	Rocket engine
A	Turbojet
A	Ramjet
Q	Which one of these engines doesn't need moving parts?
A	Ramjet
A	Gas turbine
A	Turboprop
A	Turbojet

Q=QUESTION A=ANSWER	question_description answer_description Module-5
Q	A hydraulic turbine is a prime mover that uses the energy of flowing water & converts it into the
A	hydraulic energy
A	potential energy
A	mechanical energy
A	electrical energy
Q	In a tangential flow turbine of pelton type the water strikes the runner _____ to the path of rotation
A	perpendicular
A	parallel
A	tangential
A	radial
Q	In axial flow turbine water flows _____ to the axis of the turbine shaft.
A	parallel
A	perpendicular
A	tangential
A	radial
Q	A jet of water, 75 mm in diameter, issues with a velocity of 30 m/s and impinges on a stationary flat plate which destroys its forward motion. Find the force exerted by the jet on the plate
A	3956N
A	3976N
A	3961N
A	3986N
Q	A jet of water strikes with a velocity of 35 m/s a flat plate inclined at 30° with the axis of the jet. If the cross-sectional area of the jet is 25 cm2, determine The force exerted by the jet on the plate
A	1531N
A	1541N
A	1520N
A	1525N
Q	A nozzle of 60 mm diameter delivers a stream of water at 24 m/s perpendicular to a plate that moves away from the jet at 6 m/s. Find: The force on the plate
A	910N
A	900N
A	916N
A	925N
Q	A nozzle of 60 mm diameter delivers a stream of water at 24 m/s perpendicular to a plate that moves away from the jet at 6 m/s. Find: The work done
A	5496Nm/s
A	5490Nm/s
A	5485 Nm/s
A	5480Nm/s
Q	The force Exerted by a jet of water on a stationary plate (Fx) for vertical plate
A	ρaV^2

A	$\rho a V^2 \sin 2\Theta$
A	$\rho a V^2 (1+\cos\Theta)$
A	$2\rho a V^2 \cos\Theta$
Q	The force Exerted by a jet of water on a stationary plate (Fx) for an inclined plate
A	$\rho a V^2$
A	$\rho a V^2 \sin 2\Theta$
A	$\rho a V^2 (1+\cos\Theta)$
A	$2\rho a V^2 \cos\Theta$
Q	The force Exerted by a jet of water on a stationary plate (Fx) for a curved plate & jet strikes at the centre
A	$\rho a V^2$
A	$\rho a V^2 \sin 2\Theta$
A	$\rho a V^2 (1+\cos\Theta)$
A	$2\rho a V^2 \cos\Theta$
Q	A fluid jet is a stream of fluid issuing from a nozzle with a high velocity and hence a high _____
A	Potential Energy
A	Kinetic Energy
A	Static Energy
A	jet Energy
Q	The force Exerted by a jet of water on a moving plate in the direction of motion of the plate (Fx) for a moving vertical plate
A	$\rho a (V - u)^2$
A	$\rho a (V - u)^2 \sin 2\Theta$
A	$\rho a (V - u)^2 (1+\cos\Theta)$
A	$2\rho a V^2 \cos\Theta$
Q	The force Exerted by a jet of water on a moving plate in the direction of motion of the plate (Fx) for an inclined moving plate
A	$\rho a (V - u)^2$
A	$\rho a (V - u)^2 \sin 2\Theta$
A	$\rho a (V - u)^2 (1+\cos\Theta)$
A	$2\rho a V^2 \cos\Theta$
Q	For maximum efficiency of a series of curved vanes, the speed is
A	equal to the jet speed
A	3 / 4 of the jet speed
A	1 / 2 of the jet speed
A	1 / 3 of the jet speed
Q	The efficiency of jet propulsion with inlet orifices at right angles to the direction of motion of ship is given by
A	$2u / (v + u)$
A	$2V / (V + u)^2$
A	$2Vu / (V + u)^2$
A	$2u (V - u) / V^3$
Q	The efficiency of jet propulsion when the inlet orifices face the direction of motion of the ship is given by
A	$2V / (V + u)$

A	2u / (V + 2u)
A	2Vu / (V + u)
A	2V / (V + u)
Q	When jet impinges on a plate or vane, it exerts a force on it (due to change in momentum), this force (hydrodynamic) can be evaluated by using _____
A	Energy Conservation Principle
A	Impulse momentum Principle
A	D alembert's Principle
A	Mass-Energy Principle
Q	Low specific speed of turbine implies it is
A	Propeller Turbine
A	Francis Turbine
A	Impulse Turbine
A	Kaplan Turbine
Q	Any change in load is adjusted by adjusting following parameter on turbine
A	net head
A	absolute velocity
A	blade velocity
A	flow
Q	High specific speed of turbine implies it is
A	Propeller Turbine
A	Francis Turbine
A	Impulse Turbine
A	Kaplan Turbine
Q	The specific speed of turbine is defined as the speed of a unit
A	of such a size that it delivers unit dis-charge at unit head
A	of such a size that it delivers unit dis-charge at unit power
A	of such a size that it requires unit power per unit head
A	of such a size that it produces unit horse power with unit head
Q	Reaction turbines are used for
A	low head
A	high head
A	high head and low discharge
A	low head and high discharge.
Q	Impulse turbine is generally fitted
A	at the level of tail race
A	little above the tail race
A	Slightly below the tail race
A	about 2.5m below the tail race to avoid cavitation
Q	Francis, Kaplan & Propeller turbines fall under the category of
A	Impulse turbine
A	Reaction Turbine
A	Axial flow turbine
A	Mixed Flow turbines
Q	The discharge through a reaction turbine with increase in unit speed
A	increases
A	decreases
A	remains unaffected
A	first increases and then decreases

Q=QUESTION	question_description
A=ANSWER	answer_description
	Module-6
Q	Centrifugal pumps do not work upto their capacity and pressure due to
A	Presence of air in suction line
A	High suction lift
A	High speeds
A	Leakage of air into the pump
Q	Pertaining to centrifugal pumps, Muschel curves are also known as…
A	Constant efficiency curve
A	Constant discharge curves
A	Constant head curves
A	Constant volume curves
Q	Factor which is not responsible for cavitation is
A	Restricted suction
A	Runner speed
A	Temperature of the liquid
A	Position of the non –return valve.
Q	Air vessels are used for the following purpose.
A	To increase volumetric efficiency of the pump.
A	To run the pump at different suction heads.
A	To increase the suction.
A	To get continuous supply of the liquid at a uniform rate.
Q	The operation of filling the suction pipe of a centrifugal pump and a portion of the delivery pipe completely from outside source with the liquid to be raised before starting the pump is known as……
A	Throttling
A	Priming
A	Straining
A	Scavenging
Q	The net Positive Suction Head is known as
A	The difference between the inlet head and the head corresponding to the vapour in the liquid.
A	The difference between the pressure head at the outlet and the head corresponding to the vapour .
A	The difference between suction and delivery head.
A	The difference between the delivery head and vapour pressure head
Q	The acceleration head in a reciprocating pump is maximum
A	At the beginning of the suction stroke
A	At the middle of the suction stroke
A	At the end of the suction stroke
A	At the middle of the delivery stroke
Q	The head due to friction loss at the beginning of the suction stroke of a reciprocating pump is
A	Maximum
A	Zero
A	Half the max value
A	Negative
Q	The pressure at the centre when the cylinder is at O.D.C of a reciprocating pump is

A	Above the atmospheric head
A	Below the atmospheric head
A	Equal to the atmospheric head
A	unpredictable
Q	At the middle of the delivery stroke of a reciprocating pump, the head due acceleration is….
A	Zero
A	Maximum
A	Minimum
A	Unpredictable as it depends on other parameters.
Q	Which of the following is not a component of a Reciprocating pump?
A	Cylinder
A	Suction valve
A	Suction pipe
A	Non-return valve
Q	The coefficient of discharge for a reciprocating pump is defined as the ratio of……
A	Theoretical discharge to actual discharge
A	Actual discharge to theoretical discharge
A	Theoretical discharge to total discharge
A	Difference between actual and theoretical discharge to the theoretical discharge
Q	Negative slip in a reciprocating pump occurs due to…
A	The momentum of liquid in the delivery pipe is large enough to open the delivery valve
A	The momentum of the liquid in the suction pipe is large enough to displace the piston outwards.
A	The momentum of liquid in the suction pipe is large enough to open the delivery valves
A	The momentum in the delivery is greater than that in the suction pipe
Q	A reciprocating pump is a
A	Positive displacement pump
A	Axial flow non-positive displacement pump
A	Radial flow non-positive displacement pump
A	Rotodynamic pump
Q	The efficiency of a reciprocating pump is…….
A	Higher than that of centrifugal pump
A	Lower than that of centrifugal pump
A	Equal to that of centrifugal pump
A	Higher or lower than that of centrifugal pumps depending upon the suction head of the pump.
Q	Reciprocating pumps have almost become obsolete because of……..
A	High capital and maintenance cost
A	Poor efficiency
A	Complex construction
A	Its inability to deliver in large capacities
Q	A multistage centrifugal pump which has two or more
A	Reservoirs
A	Collectors
A	Impellers

A	Non-return valves on a single pipe.
Q	The important function of a multi stage centrifugal pump is to…….
A	To produce heads greater than that permissible with a single impeller with discharge remaining constant.
A	To produce greater suction at the same head.
A	To Increase velocity head of the liquid
A	To increase the impeller efficiency.
Q	A series arrangement in case of a multi stage centrifugal pump is employed for…..
A	Delivering small quantities at high heads
A	Delivering large quantities at high heads
A	Delivering small quantity at low heads
A	Delivering large quantity at low heads
Q	The Euler's Momentum equation gives the expression for……
A	Work done per second per unit weight of the centrifugal pump
A	Work done per unit weight of the liquid
A	Work done per unit volume of liquid in a centrifugal pump.
A	Power required by the impeller to initiate suction.
Q	The sum of the suction head and the delivery head is known as
A	Static head
A	Dynamic head
A	Manometric head
A	Effective head