



INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad - 500 043

MECHANICAL ENGINEERING

DEFINITIONS AND TERMINOLOGY QUESTION BANK

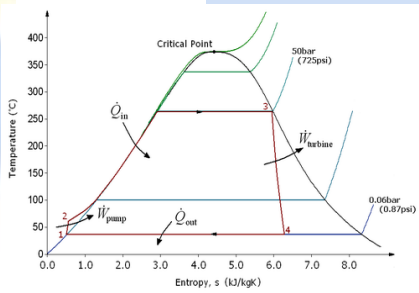
Course Title	THERMAL ENGINEERING				
Course Code	AME013				
Programme	B Tech				
Semester	V	ME			
Course Type	Core				
Regulation	IARE - R16				
Course Structure	Theory			Practical	
	Lectures	Tutorials	Credits	Laboratory	Credits
	3	-	3	-	-
Chief Coordinator	Mr. P. Sadanandam, Assistant Professor				
Course Faculty	Dr. CH VKNSN Moorthy, Professor Mr. P. Sadanandam, Assistant Professor				

OBJECTIVES:

I	Understand ideal and air standard vapor cycle and evaluate the performance in open systems like steam power plant, gas turbine etc.
II	Analyse different air standard cycles specifically related to IC engines and solve problems on the intricacies of performance of the cycle
III	Understand the direction law and concept of entropy increase of the universe

DEFINITIONS AND TERMINOLOGY QUESTION BANK

S.No	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
UNIT-I						
1	What are binary cycles ? Give examples.	A binary vapor cycle is defined in thermodynamics as a power cycle that is a combination of two cycles, one in a high temperature region and the other in a lower temperature region The use of mercury-water cycles	Remember	CO1	CLO1	AME013.01
2	Why majority of coal based thermal power plants are located near Seashore ?	Once the quality of that steam has too much decreased, it cannot be of use for electricity production any more. It has to be cooled down till it turns back to water, that can be reused to produce high quality steam. This cooling takes place in the condensor and requires	Remember	CO1	CLO1	AME013.01

S.No	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
		large quantities of cooling-water.				
3	Explain basic Thermodynamic cycles.	A thermodynamic cycle consists of a linked sequence of thermodynamic processes that involve transfer of heat and work into and out of the system, while varying pressure, temperature, and other state variables within the system, and that eventually returns the system to its initial state	Remember	CO1	CLO1	AME013.01
4	What are the four main circuits of a Thermal power plant?	a. Coal and ash circuit b. Air and flue gas circuit c. Feed water and steam circuit d. Cooling water circuit	Remember	CO1	CLO1	AME013.01
5	Why thermal plants are not suitable for supplying fluctuating loads?	Because change in load demand requires corresponding change in the output energy. In the thermal plants thermal energy is produced by burning of coal and hence there is always a large time lapse between the change in energy at output and input, which is not desirable and hence such power stations are used only as base load stations, supplying constant power.	Remember	CO1	CLO1	AME013.01
6	What are the processes in a Rankine cycle?	The Rankine cycle is an idealised thermodynamic cycle of a heat engine that converts heat into mechanical work. 	Understand	CO1	CLO1	AME013.01
7	Define air standard cycle efficiency.	It is the ratio of work done during the process to the heat supplied. Air Standard efficiency = Work done/Heat supplied. Where Work done = Heat supplied - Heat rejected.	Understand	CO1	CLO2	AME013.02
8	Which processes do the Rankine cycle contain?	the Rankine cycle contain two isentropic and two isobaric processes	Understand	CO1	CLO2	AME013.02
9	Which ideal process is carried out at the turbine in vapour power cycle?	reversible adiabatic expansion	Remember	CO1	CLO2	AME013.02
10	Sometimes the pump work in vapour power cycle is neglected because	the pump work is very small compared to the heat addition	Understand	CO1	CLO2	AME013.02
11	What is heat rate in steam power	the rate of heat input in kJ required to produce unit net shaft work (1 kW)	Remember	CO1	CLO2	AME013.02

S.No	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
	plant?					
12	For the same pressure ratio, what is the relation between work required to compress steam in vapour form and work required to compress steam in liquid form?	work required to compress steam in vapour form is more than work required to compress steam in liquid form	Understand	CO1	CLO3	AME013.03
13	What is the relation between efficiency of Rankine cycle (η_{Rankine}) and efficiency of actual vapour power cycle ($\eta_{\text{Actual Cycle}}$)?	the relation between efficiency of Rankine cycle (η_{Rankine}) and efficiency of actual vapour power cycle ($\eta_{\text{Actual Cycle}}$) is $(\eta_{\text{Rankine}}) > (\eta_{\text{Actual Cycle}})$	Remember	CO1	CLO3	AME013.03
14	How can we differentiate Rankine cycle from Carnot cycle?	Heat addition process of Rankine cycle is reversible isobaric whereas heat addition process of Carnot cycle is reversible isothermal	Remember	CO1	CLO3	AME013.03
15	What is the function of The maximum efficiency of Rankine cycle (η_{Rankine}) ?	The maximum efficiency of Rankine cycle (η_{Rankine}) is the function of the mean temperature of heat addition (T_m) only	Remember	CO1	CLO3	AME013.03
16	What is the effect of superheated steam on efficiency of Rankine cycle?	efficiency of Rankine cycle increases with increase in superheat of the steam	Understand	CO1	CLO4	AME013.04
17	What is the effect of increase in pressure at which heat is added on the pump work in the Rankine cycle?	The pump work increases with increase in pressure of heat addition	Understand	CO1	CLO4	AME013.04
18	What is the effect of reheat on the net work output of the steam power plant?	the net work output of the steam power plant increases	Remember	CO1	CLO4	AME013.04
UNIT-II						
1	What is the effect of friction on the flow through a steam nozzle?	(i) The expansion process will not be isentropic and enthalpy drop will get reduced, which further lead to reduced exit velocity. (ii) The final dryness fraction will increase. (iii) The specific volume of the steam will increase.	Remember	CO2	CLO5	AME013.05
2	What do you mean by supersaturated	The steam may not have time to condense and remains dry, when the expansion through the nozzle is very	Remember	CO2	CLO5	AME013.05

S.No	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
	flow?	rapid. This type of flow is called supersaturated flow.				
3	What are the various types of nozzles and their functions?	Nozzle is a duct of varying cross-sectional area in which the velocity increases with the corresponding drop in pressure.	Remember	CO2	CLO5	AME013.05
4	Define nozzle efficiency and critical pressure ratio.	Nozzle efficiency: It is defined as the ratio of actual enthalpy drop to the isentropic enthalpy drop Nozzle efficiency = Actual enthalpy drop / Isentropic enthalpy drop Critical pressure ratio: There is only one value of the ratio (P_2/P_1) which produces maximum discharge from the nozzle. The ratio is called critical pressure ratio. Critical pressure ratio $P_2 / P_1 = (2/n+1)^{n/n+1}$ Where, P 1= Initial pressure P 2= Throat pressure.	Remember	CO2	CLO5	AME013.05
5	What are the conditions that produce super saturation of steam in nozzles?	When the superheated steam expands in the nozzle, the condensation will occur in the nozzle. Since, the steam has more velocity, the condensation will not take place at the expected rate. So, the equilibrium between the liquid and vapour phase is delayed and the steam continues to expand in a dry state. The steam in such set of condition is said to be supersaturated or meta stable flow.	Remember	CO2	CLO5	AME013.05
6	What are the effects of super saturation in a steam nozzle?	The following effects in a nozzle on steam, in which super saturation occurs, may be summarized as follows. 1. The dryness fraction of the steam is increased. 2. Entropy and specific volume of the steam are increased. 3. Exit velocity of the steam is reduced. 4. Mass of steam discharged is increased.	Understand	CO2	CLO5	AME013.05
7	What is critical pressure ratio of a steam nozzle?	Critical pressure is the ratio of the outlet pressure to inlet pressure only when the mass flow per unit area is maximum.	Remember	CO2	CLO5	AME013.05
8	What do you understand by the term boiler draught?	Boiler draught may be defined as the small difference between the pressure of outside air and that of gases within a furnace or chimney at the grate level, which causes flow of air/hot flue gases to take place through boiler.	Remember	CO2	CLO5	AME013.05
9	Define steam rate and heat rate?	Heat rate is the common measure of system efficiency in a steam power plant. It is defined as "the energy input to a system, typically in Btu/kWh, divided by the electricity generated, in kW." Mathematically:	Remember	CO2	CLO5	AME013.05

S.No	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
		$\text{Heat Rate (BTU/kWh)} = \frac{\text{Input Energy (BTU/hr)}}{\text{Output Power (kW)}}$				
10	What are the different sources of energy available for power generation? How long they can last?	1. Steam 2. Gas or air 3. Diesel and petrol 4. Nuclear 5. Renewable energy sources such as solar, wind ,geothermal, tidal, wave, MHD etc	Understand	CO2	CLO6	AME013.06
11	State how the steam boilers are classified.	Steam boilers are classified on the basis of boiler pressure,fuel, boiler material, boiler tube type, circulation, method of combustion, type of support, furnace construction, furnace position, use ,erction, mobility, ASME code and heat source.	Remember	CO2	CLO6	AME013.06
12	Define boiler mountings and accessories.	The devices which are used for functioning with the safe operation of a boiler are called boiler mountings. The devices which are used to increase the efficiency of the boiler are called boiler accessories.	Understand	CO2	CLO6	AME013.06
13	Define super critical boilers.	Boilers only with economizer and super heater are called super critical boilers.	Understand	CO2	CLO6	AME013.06
14	What is super-critical boiler? Give any two advantages.	If boilers incorporate only economizer and super heater, they are called supercritical boilers. The super critical boilers are above 300MW capacity units available.	Remember	CO2	CLO7	AME013.07
15	What are types of fluidized bed boilers?	1. Bubbling fluidized bed boilers (BFB). 2. Circulating fluidized bed boilers (CFB).	Understand	CO2	CLO7	AME013.07
16	What is the affect of sulfur in coal when used in boiler?	Sulfur will get oxidized to SO ₂ and fraction of SO ₃ and will react with water to form sulfuric acid and this occurs at a temperature called the acid dew point which normally is about 120 oC. The sulfuric acid so formed corrodes the steel when it comes in contact with it.	Understand	CO2	CLO7	AME013.07
17	What do you understand by 'water tube boilers' and 'fire tube boilers'?	In water tube boilers the water passes through the tubes and the hot gases passes outside the tubes where as in case of fire tube boiler the hot gases passes through the tubes and the water passes over the tubes	Understand	CO2	CLO7	AME013.07
18	What are the parameters required to estimate the boiler efficiency by 'direct method'?	a) Steam flow rate b) GCV of fuel c) Fuel flow rate d) Steam conditions (pressure and temperature) e) Feed water temperature	Understand	CO2	CLO7	AME013.07
19	Why boiler blow-down is required?	As the feed water evaporate into steam, dissolved solids concentrate in the boiler. Above certain level of	Remember	CO2	CLO7	AME013.07

S.No	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
		concentration, these solids encourage carryover of water into steam. This leads to scale formation inside the boiler, resulting in localized overheating and ending finally in tube failure. Hence blow-down is very much required for boilers.				
UNIT-III						
1	What is meant by compounding of steam turbines?	Compounding is a method of absorbing the jet velocity in stages when the steam flows over moving blades.	Understand	CO3	CLO8	AME013.08
2	Explain the need of compounding in steam turbines.	In the simple impulse turbine, the expansion of steam from the boiler pressure to condenser pressure takes place in a single stage turbine. The velocity of steam at the exit of turbine is very high. So, there is a considerable loss of kinetic energy. Also, the speed of the rotor is very high. There are several methods of reducing this speed to a lower value. Compounding is a method of absorbing the jet velocity in stages when the steam flows over moving blades.	Understand	CO3	CLO8	AME013.08
3	Enumerate the energy losses in steam turbines.	Losses in regulating valves • Losses due to steam friction • Losses due to Mechanical friction • Losses due to leakage • Residual velocity losses • Carry over losses • Losses due to wetness of steam • Losses due to radiation.	Understand	CO3	CLO8	AME013.08
4	What is the purpose of condenser?	The main purpose of a steam condenser in turbine is to maintain a low back pressure on the exhaust side of the steam turbine.	Understand	CO3	CLO8	AME013.08
5	Explain any two types of surface condensers.	(i) Down flow type (ii) Central flow condenser (iii) Evaporation condenser	Understand	CO3	CLO8	AME013.08
6	What is a steam turbine?	Steam turbine is a device which is used to convert kinetic energy of steam into mechanical energy.	Remember	CO3	CLO8	AME013.08
7	What are the different methods of compounding?	1. Velocity compounding 2. Pressure compounding 3. Pressure-velocity compounding	Remember	CO3	CLO9	AME013.09
8	What is meant by carry over loss?	The velocity of steam at exit is sufficiently high thereby resulting in a kinetic energy loss called "Carry over loss" or "Leading velocity loss".	Remember	CO3	CLO9	AME013.09
9	What Is A Stage In A Steam Turbine?	In an impulse turbine, the stage is a set of moving blades behind the nozzle. In a reaction turbine, each row of blades is called a "stage." A single Curtis stage may consist of two or more rows of moving blade.	Remember	CO3	CLO9	AME013.09

S.No	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
10	What Is A Diaphragm?	Partitions between pressure stages in a turbine's casing are called diaphragms. They hold the vane-shaped nozzles and seals between the stages. Usually labyrinth-type seals are used. One-half of the diaphragm is fitted into the top of the casing, the other half into the bottom.	Remember	CO3	CLO10	AME013.10
11	What Is A Radial-flow Turbine?	In a radial-flow turbine, steam flows outward from the shaft to the casing. The unit is usually a reaction unit, having both fixed and moving blades. They are used for special jobs and are more common to European manufacturers, such as Sta-Laval (now ABB).	Remember	CO3	CLO10	AME013.10
12	In Which Turbine Is Tip Leakage A Problem?	Tip leakage is a problem in reaction turbines. Here, each vane forms a nozzle; steam must flow through the moving nozzle to the fixed nozzle. Steam escaping across the tips of the blades represents a loss of work. Therefore, tip seals are used prevent this.	Understand	CO3	CLO10	AME013.10
13	What Are Two Types Of Clearance In A Turbine?	1.Radial - clearance at the tips of the rotor and casing. 2. Axial - the fore-and-aft clearance, at the sides of the rotor and the casing.	Understand	CO3	CLO10	AME013.10
14	Why Should A Steam Or Moisture Separator Be Installed In The Steam Line Next To A Steam Turbine?	All multistage turbines, low-pressure turbines, and turbines operating at high pressure with saturated steam should have a moisture separator in order to prevent rapid blade wear from water erosion.	Understand	CO3	CLO11	AME013.11
15	What Is Steam Rate As Applied To Turbo-generators?	The steam rate is the pounds of steam that must be supplied per kilowatt-hour of generator output at the steam turbine inlet.	Understand	CO3	CLO11	AME013.11
16	What Are The Two Basic Types Of Steam Turbines?	1. Impulse type. 2. Reaction type	Remember	CO3	CLO11	AME013.11
17	What Is The Operating Principle Of An Impulse Turbine?	The basic idea of an impulse turbine is that a jet of steam from a fixed nozzle pushes against the rotor blades and impels them forward. The velocity of the steam is about twice as fast as the velocity of the blades. Only turbines utilizing fixed nozzles are classified as impulse turbines.	Remember	CO3	CLO11	AME013.11
18	What Is The Operating Principle Of A Reaction Turbine?	A reaction turbine utilizes a jet of steam that flows from a nozzle on the rotor. Actually, the steam is directed into the moving blades by fixed blades designed to expand the steam. The result is a small increase in velocity	Remember	CO3	CLO12	AME013.12

S.No	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
		over that of the moving blades. These blades form a wall of moving nozzles that further expand the steam. The steam flow is partially reversed by the moving blades, producing a reaction on the blades. Since the pressure drop is small across each row of nozzles (blades), the speed is comparatively low. Therefore, more rows of moving blades are needed than in an impulse turbine.				
UNIT-IV						
1	Name the various gas power cycles	Otto Cycle, Diesel Cycle, Dual Cycle & Brayton Cycle.	Remember	CO4	CLO13	AME013.13
2	List down the various processes of the Brayton cycle.	1. Isentropic compression 2. Constant pressure heat supplied 3. Isentropic expansion and 4. Constant pressure heat rejection	Remember	CO4	CLO13	AME013.13
3	What are all the modifications are carried out in Brayton cycle? Why?	In Brayton we incorporate (i) Regenerator (ii) Reheater and (iii) Intercooler, because of increasing thermal efficiency of the cycle.	Remember	CO4	CLO13	AME013.13
4	Is it always useful to have a regenerator in a gas turbine power cycle? Why?	It is not always useful to have a regenerator in a gas turbine cycle. Regenerator causes pressure drop of 0.035 to 0.2 bar in compressed air and about 0.035 bar in exhaust gases. These pressure drops affect to a contain extend the gain in efficiency due to regeneration.	Remember	CO4	CLO13	AME013.13
5	What is the expression for optimum pressure ratio for maximum specific work out-put in Brayton cycle?	Optimum pressure ratio $R_p = \left(\frac{T}{T} \right)^{\frac{\gamma}{2(\gamma-1)}}$	Remember	CO4	CLO13	AME013.13
6	What are the effects of introducing regeneration in the basic gas turbine cycle?	(i) The fuel economy is improved. The quantity of fuel required per unit mass of air is less. (ii) The work output from turbine, work required to the compressor will not change. (iii) Pressure drop will occurs during regeneration. (iv) It increases thermal efficiency when low pressure ratio	Understand	CO4	CLO13	AME013.13
7	What are the effects of providing the intercooler in the gas turbine cycle?	(i) Heat supply is increased (ii) It decreases the thermal efficiency (iii) Work ratio will be increased (iv) Specific volume of air is reduced	Remember	CO4	CLO13	AME013.13

S.No	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
8	When the reheater is employed in the gas turbine cycle	When the air-fuel ratio is high, the combustion products after expansion in the highpressure turbine contain more oxygen. This, by introducing reheater the exhaust pressure can be reheated and expanded again in the low-pressure turbine.	Remember	CO4	CLO12	AME013.12
9	What is the condition for maximum work in the case of reheater employed in the gas turbine cycle?	For optimum work pressure ratio is equal for all the stages. i.e. $RP_1 = RP_2 = \dots = (RP)^{1/n}$ Where RP = pressure ratio n – number of stages	Understand	CO4	CLO12	AME013.12
10	Name two combined power cycles?	1 Combined cycle of gas turbine and steam power plant. 2 Combined cycle of gas turbine and diesel power plant.	Remember	CO4	CLO12	AME013.12
11	Define turbo charging in combined gas turbine and diesel cycles?	In the combined cycle, the exhaust gas from the diesel engine is expanded in the turbine, which is coupled with compressor which supplies pressurized air to the diesel engine. This increases diesel engine output. This arrangement is known as turbo charging.	Remember	CO4	CLO12	AME013.12
12	In Gas Turbines Compressors raise the pressure of air by how many times	Compressor work is to raise the pressure of the air at constant volume. In gas turbines it raises by a factor of 30.	Understand	CO4	CLO13	AME013.13
13	In Gas Turbines, what purpose the Turbine is used?	Highly pressurized gas from compressor burns the fuel injected into combustor and those hot gases released move with high velocity towards turbine which rotates the turbine.	Remember	CO4	CLO13	AME013.13
14	How many burners are placed in can-annular combustors in gas turbines?	Multiple or single burners are evenly spaced in combustor.	Remember	CO4	CLO12	AME013.12
15	Were the Axial flow turbines are used?	Axial flow gas turbines are mostly used for industrial purposes.	Understand	CO4	CLO12	AME013.12
16	What completes a stage in Turbine expansion ?	Turbine expansion takes place in stages. One stage comprises of a Row of stationary blades followed by a row of moving blades.	Remember	CO4	CLO12	AME013.12
17	What does TRIT in a gas turbine stand for ?	TRIT stands for Turbine Rotor Inlet Temperature and TIT stands for Turbine Inlet Temperature.	Remember	CO4	CLO12	AME013.12
18	When at idle conditions Gas Turbine Engines use more fuel	Though the conditions may be idle but to run the turbine compressor to work, compressor takes as much as the two thirds of the total power produced from	Remember	CO4	CLO13	AME013.13

S.No	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
	when compared to Reciprocating engines.	combustion and remaining one third is used for power output. So during Idle conditions power output may not be required but compressor uses its 2/3 of energy, whereas reciprocating engines doesn't require any compressors equipped separately and hence less fuel will be burnt during idle time when compared to Gas turbines.				
19	What are the effects of providing the intercooler in the gas turbine cycle?	(i) Heat supply is increased (ii) It decreases the thermal efficiency (iii) Work ratio will be increased (iv) Specific volume of air is reduced	Remember	CO4	CLO13	AME013.13
20	What are all the modifications are carried out in Brayton cycle? Why?	In Brayton we incorporate (i) Regenerator (ii) Reheater and (iii) Intercooler, because of increasing thermal efficiency of the cycle.	Remember	CO4	CLO15	AME013.15
21	In Gas Turbines, what purpose the Turbine is used?	Highly pressurized gas from compressor burns the fuel injected into combustor and those hot gases released move with high velocity towards turbine which rotates the turbine.	Understand	CO4	CLO15	AME013.15
UNIT-V						
1	What is meant by a jet propulsion system?	It is the propulsion of a jet aircraft (or) other missiles by the reaction of jet coming out with high velocity. The jet propulsion is used when the oxygen is obtained from the 1. surrounding atmosphere.	Remember	CO5	CLO16	AME013.16
2	How will you classify propulsive engines?	The jet propulsion engines are classified in to: i. Air breathing engines and ii. Rocket engines which do not use atmospheric air.	Remember	CO5	CLO16	AME013.16
3	Why a ram jet engine does not require a compressor and a turbine?	In general, the speed of a ram jet engine is supersonic (the range of Mach number) is very high. At this flight speed the contribution of the compressor to the total static pressure rise is insignificant. Hence, ram jet engine does not require compressor and turbine.	Remember	CO5	CLO16	AME013.16
4	Why after burners are used in turbojet engine?	Exhaust gases from the turbine have large quantity of oxygen, which can support the combustion of additional fuel. Thus if a suitable burner is installed between the turbine and exhaust nozzle, a considerable amount of fuel can be burned in this section to produce temperatures entering the nozzle as high as 1900°C. The increased temperature greatly augments the exhaust gas velocity, and	Remember	CO5	CLO17	AME013.17

S.No	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
		hence provides the thrust increase.				
5	What is the basic difference between compressible and incompressible fluid flow?	Compressible 1. Fluid velocities are appreciable compared with the velocity of sound 2. Density is not constant 3. Compressibility factor is greater than one. Incompressible 1. Fluid velocities are small compared with the velocity of sound 2. Density is constant 3. Compressibility factor is one	Understand	CO5	CLO17	AME013.17
6	What is the normal shock?	When the shock waves are right angles to the direction of flow and the rise in pressure is abrupt are called normal shock waves	Remember	CO5	CLO17	AME013.17
7	Define oblique shock where it occurs.	The shock wave which is inclined at an angle to the two dimensional flow direction is called as oblique shock. When the flow is supersonic, the oblique shock occurs at the corner due to the turning of supersonic flow.	Remember	CO5	CLO18	AME013.18
8	Give the difference between normal and oblique shock.	Normal Shock (a) The shock waves are right angles to the direction of flow. (b) May be treated as one dimensional analysis. Oblique Shock (a) The shock waves are inclined at an angle to the direction of flow. (b) Oblique shock is two dimensional analysis.	Understand	CO5	CLO18	AME013.18
9	List the different types of jet engines.	i. Turbo-jet ii. Turpo-prop engine, iii. Ram jet engine, iv. Pulse jet engines	Understand	CO5	CLO18	AME013.18
10	Define the principle of Ram jet engine.	The principle of jet engine is obtained from the application of Newton's law of motion. We know that when a fluid is accelerated, a force is required to produce this acceleration is the fluid and at the same time, there is an equal and opposite reaction force of the fluid on the engine is known as the thrust, and therefore the principle of jet propulsion is based on the reaction principle.	Remember	CO5	CLO19	AME013.19
11	Give the components of a turbo jet.	i. Diffuser ii. Mechanical compressor, iii. Combustion chamber, iv. Turbine and v. Exhaust nozzle.	Understand	CO5	CLO19	AME013.19
12	Give the difference between pulse jet and ram jet	Pulse Jet a) Mechanical valve arrangements are used during combustion. b) The stagnation temperature at the	Understand	CO5	CLO19	AME013.19

S.No	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
	engine.	diffuser exit is comparatively less. Ram Jet a) Works without the aid of any mechanical device and needs no moving parts. b) Since the mach number in Ram jet engine is supersonic, the stagnation temperature is very high.				
13	Give the difference between turbojet and ram jet engine	Turbo Jet a) Compressor and turbine are used. b) Lower thrust and propulsive efficiency at lower speeds. c) Construction cost is more. Ram Jet a) Compressor and turbine are not used but diffuser and nozzle are used. b) It provides high thrust per unit weight. c) In the absence of rotating machines, the construction is simple and cheap.	Understand	CO5	CLO19	AME013.19
14	What is specific impulse?	Specific impulse is the thrust developed per unit weight flow rate through the propulsive device. It is a useful performance parameter in aerospace propulsion systems. $W = F/I_{sp}$	Remember	CO5	CLO19	AME013.19
15	Give the difference between jet propulsion and rocket propulsion.	a) Oxygen is obtained from the surrounding atmosphere for combustion purposes. b) The jet consists of air plus combustion products. c) Mechanical devices are also used. a) The propulsion unit consists of its own oxygen supply for combustion purposes. b) Jet consists of the exhaust gases only. c) Mechanical devices are not used.	Remember	CO5	CLO19	AME013.19

Signature of the Faculty

Signature of HOD