Unit - 1- INTRODUCTION TO HYDRULICS			
1	Explain difference between simple Manometer and Differential Manometer	5	May-2017
2	Define atmospheric pressure, gauge pressure & absolute pressure. Write the relation between them.	5	Nov-2017
3	. Define the following properties (i)Density (ii)Specific weight (ii)Specific gravity (iv)Capillarity (v)Surface tension (VI)Viscosity	5 2 2	May -2018 Nov/Dec-2018 Nov/Dec-2018 Apr-2019 Nov-2019
4	10a) Explain the phenomenon of capillary tube. (b)Explain with a neat figure U-tube differential manometer	10	May-2017
5	(a)Write any three differences between simple manometer and differential manometer. (b) Explain with a neat sketch the working of a Bourdon's tube pressure Gauge.	10/7	May-2017 Nov-2019 Apr-2019
6	(a)List the advantages and disadvantages of Manometers. (b)Explain with a neat sketch differential Manometer	10	May-2018 Nov-2019 Apr-2019
7	Define the fallowing properties and mention their units: i) Dynamic Viscosity ii) Kinematic Viscosity	5	Nov/Dec-2018 Apr-2019
8	Explain with neat sketch simple manometer	6	Nov/Dec-2018
7	(a)Distinguish between Ideal fluid and Real fluid (b)Explain with a neat sketch Bourdon's tube pressure gauge	10	May-2018
8	Define Hydraulic co-efficient.	5	Nov-2019
9	List different types of manometers and mechanical gauges.	3	Nov-2019
Unit-2-DYNAMICS OF FLUIDS			
1	List the different applications of Bernoulli's theorem.	5 4	May-2017 Nov/Dec-2018 Nov-2019
2	. Define the following: (i) Compressible fluid (ii) Incompressible fluid	5	May-2018 May-2017
3	Define Continuity equation and Bernoulli’s equation.	5	Nov/Dec-2018 Apr-2019
3	State Bernoulli’s theorem and mention the assumptions made.	5	Nov-2017 May-2018 Apr-2019 Nov-2019
3	The water flowing through a pipe of diameter 200mm and 100mm at sections 1 and 2 respectively. The rate of flow through pipe is 35liters/sec. The section 1 is 6m above datum and section 2 is 4m above datum. If the pressure at section 1 is 39.24*10^4	10	Nov/Dec-2018

	N/M^2, find the intensity of pressure at section 2.		
4	An oil of specific gravity 0.8 is flowing through a venturi meter having inlet diameter 200mm and throat diameter 100mm .The oil-mercury differential manometer shows a reading of 250 mm. Calculate the discharge of oil through the horizontal venturi meter. Take C_d = 0.98.	6	Nov/Dec-2018
5	(a) Explain the following		May-2017
	(i)Rotational &Irrigational flow (ii)Laminar and Turbulent flow (b)The water is flowing through the pipe is having diameters 200 mm and 100 mm at the cross-section I and 2 respectively. The velocity of water at section I is 4 m/s. Find the discharge at section 1 and also find the velocity at section 2.	4+6	May-2017
6	(a)Draw a neat figure of orifice meter and mention the parts. (b)A venture meter has an area of 9 to 1, the larger diameter being 300 mm. During the flow the recorded pressure head in the large section is 6.5 m and at throat is 4.25 m. If the co-efficient of discharge is 0.99. Calculate discharge	10	May-2017
7	(a)State the equation of continuity of flow. (b)A horizontal venture meter has inlet and throat diameters of 300 mm and 150 mm respectively is used to measure the flow of water. The reading of differential mercury manometer is 200 mm. Determine the rate of flow in lit/sec take C-0.98	4+6	May-2018 Apr-2019
8	(a) Distinguish between (i)compressible and incompressible flow (ii)Linear and turbulent flow (b) A horizontal venturimeter with inlet and throat diameters 300 mm and 150 mm respectively is used to measure the flow of water. The reading of differential manometer connected to the inlet and throat is 200 mm of mercury. Determine the rate of flow. Take C 0.98	10	May-2018 Apr-2019
9	Distinguish between (a)steady and unsteady flow (a)compressible and incompressible.	6	Nov-2019
10	The water flowing through a pipe of diameter 200mm and 150mm at sections 1 and 2 respectively. The rate of flow through pipe is 40liters/sec. The section 1 is 6m above datum and section 2 is 4m above datum. If the pressure at section 1 is 295kPa.find the intensity of pressure at section 2.	7	Nov-2019
11	Water is supplied to the town of 400000 inhabitants. The reservoir is 6.4 km away from the town and loss of head due to friction in pipeline is measured as 1.5m. Calculate the size of supply main, if each inhabitant consumes 180 liters of water per day and half of the daily supply is pumped in 8 hours. Take the frictional factor for the pipeline as 0.030.	10	Nov 2019
Unit 3-FLOW THROUGH PIPES			

1	. (a) Define the following: (i)Hydraulic gradient line(ii)Total energy line (b)A pipe of 300 m long with a diameter of 0.3 m is supplying water. Calculate the discharge of water through the pipe the loss of head due to friction is 1.5 m. Take Darcy's co-efficient as 0.01	10	Nov-2017 May-2017
2	Explain Hydraulic gradient line and total gradient line	5	May-2017May -2018
3	(a) State Chezy's equation. (b)Find the maximum power transmitted by a pipe to a power station of 3 kms long and 200 mm diameter. The pressure of water in power station is 1500 kPa and t +0.01.	10	Nov-2017
4	(a)Describe different types of losses in fluid flow through pipes (b) A pipe having a diameter of 300 mm and length 3500 m is used for transmission of power by water. The total head available at pipe inlet is 500 m. Find the maximum power available at the outlet of the pipe if f= 0.006	10	May-2018 Apr-2019
5	Identify major energy losses and minor energy losses in flow through pipes.	5	Nov/Dec-2018
6	a) State Darcy's and Chezy's formula for fluid flow through pipes. b) Calculate the discharge through a pipe of diameter 200 mm when the difference ofpressure head between the two ends of a pipe 500 m apart is 4 m of water. Take the valueof f = 0.009.	4 6	Nov/Dec-2018
7	Explain water hammer in pipes.	5	Nov-2019
8	What are air vessels? Mention its functions.	5	Nov-2019
9	Explain Surge tank. Mention its functions.	5	Apr-2019
10	The pressure at inlet of pipe is 400 kPa and pressure drop is 200 kPa. The pipeline is 1.5 km long. If 100 kW is to be transmitted over this pipeline, find the diameter of the pipe and efficiency of transmission. Take f=0.006	10	Apr-2019
11	A 25cm dia pipe carries oil of specific gravity 0.9 at avelocity of 3 m/s. at another section the diameter is 20 cm. find the velocity at this section, discharge through the pipe and mass rate of flow.	6	Apr-2019
	Unit 4-HYDRAULIC MACHINES		
1	Define hydraulic turbine and classify the hydraulic turbines.	5	May-2017
2	Explain with line diagram, the working principle of Reciprocating pump.	5	May-2017
3	Define a turbine and classify them.	5	Nov-2017
4	Explain priming of pumps.	5	Nov-2017
5	a) Explain Surge tank and mentions its function. b) The overall efficiency of a pelton wheel is 86% when the power developed is 500Kwunder a head of 80m. If the coefficient of velocity for the nozzle is 0.97, find thediameter of the nozzle.	4 6	Nov/Dec-2018
5	Differentiate between the centrifugal pump and reciprocating pumps.	5	Nov/Dec-2018 Apr-2019
5	Differentiate between impulse and reaction turbines.	5	May-2017
6	Explain with a neat sketch working of a submersible pump	5	May-2018
7	A single acting reciprocating pump having a bore of 150mm diameter and Stroke of 300mm length discharges 200ltrs of water per minute. Neglecting	6	Nov/Dec-2018 Nov-2019

	losses, find a) Theoretical discharge in liters/minute. B) Coefficient of dischargec) Slip of the pump.		
7	(a)Write any three differences between Impulse turbine and Reaction turbine. (b) Explain working principle of centrifugal pump with neat figure.	10 4	May-2017 Nov/Dec-2018 Nov-2019
8	Two jets strike the buckets of a Pelton wheel, which is having shaft power as 15450 kW. The diameter of each jet is given as 200 m I the net head on the turbine is 400 mm. Find the overall efficiency of the turbine, take Cv 1.0	10	May-2017
9	A Pelton wheel develops 13,000 kW at 430 rpm. If the overall efficiency is 85% at a head of 100 m. Determine the following: (a) Discharge (b) Dia. Of wheel	10	Nov-2017
	I Dia. Of jet (d) No. of Buckets (e) Width & depth of buckets Assume v 0.46 Coefficient of discharge y 0.98		
10	(a).Explain Slip and Negative Slip. (b) A double acting reciprocating pump of stroke 300 mm and piston diameter is 150 mm. Pre delivery and suction head of 26 m and 4 m respectively. If the pump runs at 60 rpm. Find the power required to drive the pump with efficiency 60%.	10	May-2018 Nov-2019
11	(a) Explain draft tube. Mention its types (b)A Pelton wheel develops 2000 kW under a head of 100 m and with an overall efficiency of85%. Find the diameter of the nozzle, if the co-efficient of velocity for the nozzle is 0.98.	10	May-2018
12	(a)Explain slip and negative slip of Reciprocating pump. (b) A centrifugal pump having an overall efficiency of 75% is discharging 30 liter/sec. of water through a pipe of 150 mm diameter and 125 m long Calculate the power required to drive the pump if the water is lifted into a height of 25 m. Take co-efficient of friction as 0.01	10	Nov-2017
13	Sketch and explain working principle of lobe pump.	5	Nov-2019
14	A pelton wheel has to develop 5000 kW under a net head of 300 m, while running at a speed of 500 rpm. If the co-efficient of velocity for the jet is 0.97, Speed ratio is 0.46 and the ratio of jet diameter is 1/10 of wheel diameter. Calculate a) Quantity of water supplied to wheel b) Diameter of pitch circle c) Diameter of jet and d) No. of jets. Assume overall efficiency of wheel as 80%.	10	Nov 2019
15	(a) Explain (i) Penstock (ii) Anchor block (b) A pelton wheel develops 2000 kW under a head of 100 m with an overall efficiency of 85%. Find the diameter of the nozzle if Cv for nozzle is 0.98.	10	Apr-2019
16	A centrifugal pump having an overall efficiency of 75% is discharging 30 litres of	10	Apr-2019

	water/ sec. through a pipe of 150 mm dia. 125 m long. Calculate the power required to drive the pump if the water is lifted through a height of 25 m.Take f=0.001.		
	Unit5-HYDRAULIC SYSTEM		
1	a) Explain the non-return valve b) Sketch and explain simple relief pressure valve.	4 6	Nov/Dec-2018 Nov-2019
2	List the hydraulics system components with block diagram.	5	Nov/Dec-2018 Nov-2019
3	Sketch and explain the gear pump.	5	Nov/Dec-2018
1	a) State the advantages of Hydraulics system. b) Sketch and explain the pilot operated valve.	4 6	Nov/Dec-2018
1	Write functions of Control valves.	5	May-2017
2	Describe accumulator with neat sketch.	5	May-2017
3	(a)Write any four advantages and disadvantages of Hydraulic systems. (b) Explain lobe pump with neat sketch	10	May-2017 Nov-2017
4	(a) Write any four functions of Control valves. (b)With the neat sketch, explain working principle of gate valve	10	May-2017
5	What are accumulators? Explain hydraulic spring loaded accumulator.	5	Nov-2017 Nov-2019 Apr-2019
6	List the advantages of hydraulic system.	5	May-2018
7	.(a)Sketch and explain gear pump (b) Explain DC valve & its uses.	10	May-2018
8	(a) State classification of control valves with their functions (b) Sketch and explain the pressure reducing valve.	10	May-2018
9	(a) Explain the non-return valve (b) Sketch and explain the spring loaded Accumulator.	10	May-2018
10	Write a short note on ports and positions of valve.	5	Nov-2019
11	List the application of hydraulic system.	5	Nov-2019
12	Explain the construction of rotary spool valve.	5	Nov-2019
13	List the hydraulics system components with their functions.	5	Apr-2019
14	State the classification of control valves with their functions.	5	Apr-2019
15	Sketch and explain the pressure reducing valve.	5	Apr-2019
16	Sketch and explain gear pump.	5	Apr-2019
	Unit 6-PNEUMATIC SYSTEM		
1	List the components of pneumatic system.	5	May-2017
2	Explain the general layout of pneumatic system.	5	May-2018
3	Draw the Block diagram of Pneumatic system and label the parts.	5	Nov-2017
4	State and explain Pascal's law	5	May-2018
5	Sketch the following pneumatic symbols. i)Air compressor ii)Air motor ii)2/2 D.C. valve iv)Shut Of valve v)double acting cylinder	5	Nov/Dec-2018
5	State the advantages of pneumatics.	5	Nov/Dec-2018
5	a) State the applications of pneumatics. b) Explain the piston motor with sketch.	4 6	Nov/Dec-2018
5	Explain the general layout of a Pneumatic system.	10	Nov-2017
6	(a)Sate Pascal's law and explain one application with neat sketch. (b)Explain with neat sketch, the double-acting cylinder.	10	May-2017 Apr-2019
7	(a) Define an air motor and mention types. (b) Explain non-return or check valve	10	Nov-2017
8	.(a) Explain the Pneumatic actuators. (b)Explain the working principle of vane motor with neat sketch.	10	May-2018
9	(a) What is FRL unit? State the functions of FRL unit.	4	Nov-2019

	(b) Explain the working of reciprocating air compressor with neat sketch	6	
10	(a) Explain the working of single acting cylinder with neat sketch (b) Write the symbolic representation of the following 1. FRL unit 2. 3/2 pilot operated DCV 3. Variable displacement 4. Flow control valve 5. Shuttle valve	5	Nov-2019
11	List the advantages of pneumatic system.	5	Apr-2019
12	Write the symbolic representation of the following 1. FRL unit 2. Air compressor 3. Single acting cylinder 4. 2/2 DC Valve 5. Non-return valve	5	Apr-2019
13	Sketch and label the vane compressor.	5	Apr-2019
14	(a) Explain lubricator. Mention its functions. (b) Explain piston motor with sketch.	10	Apr-2019

Unit –1 BASIC CONCEPTS AND LAWS OF THERMODYNAMICS			
S.No	**Questions**	**marks**	**Appeared in**
1	Explain closed system and isolated system of thermodynamics.	4m	NOV/DEC 2018
2	Explain the types of properties and give examples.	5m	NOV/DEC 2018
3	Define specific heat at constant pressure and specific heat at constant volume.	5m	NOV/DEC 2018
4	A quantity of gas occupies a space of 0.3m3 at a pressure of 2 bar and a temperature of 77°C which is heated at a constant volume, until the pressure is 7 bar and temperature is 952°C. Determine (a)change in internal energy and (b) change in enthalpy.	5m	NOV/DEC 2018
5	A vessel of capacity 3m3 capacity air at a pressure of 1.5bar and a temperature of 25°C. Additional air is now pumped into the system until the pressure rises to 30 bar and temperature rises ti 60°c. find the mass of air pumped in and express the quantity as a valume at a pressure of 1.2bar and a temperature of 20°C.	6m	NOV/DEC 2018
6	Define a) Intensive Property b)Open system	5m	APRIL/ MAY2018
7	Prove that Cp-Cv=R with usual notations.	5m	APRIL/ MAY2018 NOV/DEC 2017
8	The net work output of a cyclic process is 45 kN-m. If the heat input is 125 kJ, determine the efficiency of the cycle	5m	APRIL/ MAY2018
9	Define the terms 1)system 2) Boudary 3)surroundings	5m	APRIL/ MAY2017
10	Define steady flow process & write steady flow energy equation with notations.	5m	APRIL/ MAY2017
11	A vessel contains 6.5m3 of nitrogen under a pressure of 12bar and temperature of 40'c Find i)Mass of gas ii)specific valume iii)Density of gas. Take molecular mass of nitrogen as 28.	5m	APRIL/ MAY2017
12	A piston - cylinder containing air expands at a constant pressure of 150 KPa from a temperature of 285 K to a temperature of 550 K. The mass of air is 0.05 kg. Determine the heat transfer, work transfer and change in internal energy during the process Cp =1.01 kJ/kg K and Cv = 0.72 kJ/kg K.	6m	APRIL/ MAY2017
13	Determine the coefficient of performance and heat transfer rate in a condenser of a refrigerator in kJ/hr whose refrigeration capacity is 11000 kJ/hr if the power input is 1.5kW.	4m	APRIL/ MAY2017
14	Define the terms: i) Enthalpy (ii) Entropy (iii)Internal Energy	3m	NOV/DEC/2017
15	A steel vessel of mass 1.75kg contains 7.25 kg of water at a temperature of 23°c. find heat required to warm the vessel and water to 85°c. Take specific heat of steel as 0.49KJ/Kg-K specific heat of water as 4.187KJ/Kg-K	5m	NOV/DEC/2017
16	The chamber of valume 25m^3, pressure of 1.026bar and temperature of 25°c is to be reduced to pressure of 0.32bar and temperature of 5°c. how ma y kg of air this mass as valume measured at 1.026 bar and 25°c Take R=287J/Kg-K	7m	NOV/DEC/2017

17	State first law and second law of thermodynamics. Define laws of thermodynamics.	5m	NOV/DEC/2017,2018
18	State two statements of second law of thermodynamics.	5m	MAY 2019
19	A closed system undergoes a reversible constant pressure process of 3.5 bar and its volume changes from $0.14m^3$ to $0.007m^3$. During the process of 40 kJ of heat is rejected. Find the change in internal energy of the system.	5m	MAY 2019
20	Explain open system with examples	5m	MAY 2019
21	One litre of hydrogen at $0^{\circ}C$ is suddenly compressed to one-half its volume. Detyermine the change in temperature of the gas if the ratio of two specific heats for hydrogen is 1.4.	5m	MAY 2019
22	Define the terms i. System ii. State of a system iii. Cycle iv. Enthalpy v. Specific heat	5m	Nov-19
23	One kg of air is heated in a closed vessel at a constant volume from a pressure of 2 bar to 5 bar. If the initial temperature of the air is 300° K. Determine the change in internal energy, work done. C_v=0.712 kJ/kg K.	5m	Nov-19
24	Differentiate between intensive and extensive properties of a system. Give examples for each	5m	Nov-19
25	A domestic food freezer is to be maintained at a temperature of -15° C. The ambient air temperature is 30°C. If the heat leaks into the freezer at the continuous rate of 1.75 kJ/sec. Find the power required to pump this heat out continuously, if the actual COP if one-third of theoretical COP.	5	Nov-19
Unit: 2 THERMODYNAMIC PROCESSES			
1	Prove that the heat absorbed or rejected during polytropic process (γ-n)/(γ-1)* work done. Where γ is the ratio of two specific heat and n is the polytropic index.	5m	NOV/DEC 2018
2	A certain gas at constant valume chamber of 0.3m^3 capacity contains 2kg of this gas at $5^{\circ}C$, the heat transferred to the gas until the temperature is $100^{\circ}C$. Find the (i) Work done (ii) Heat transferred (iii) Change in internal energyTakeCp=1.96kJ/kg$^{\circ}$KCv=1.5kJ/kg$^{\circ}$K	6m	NOV/DEC 2018
3	The gas initially at 63K expands until its vakume is 5.2 times the initial valume according to PV^n=C. If the intial and final pressure are observed to be 8.5 bar and 1 bar, determine the polytrophic index and work done per kg of gas. take Cv=0.712 kJ/kg$^{\circ}$K γ=1.4	6m	NOV/DEC 2018
4	Determine the difference between the work done when the gas having a valume of $1.6m^3$ and pressure of 0.7 N/mm^2 is expanded to a valume of $8m^3$. (i) Adiabatically (ii)Isothermally	6m	NOV/DEC 2018
5	Explain (a) throttling process (b) free expansion process with sketch..	5m	**APRIL/ MAY 2018** **NOV/DEC2017,2018**

6	Derive expression for work done in constant entropy (Isentropic) or adiabatic process with PV diagram.	5m	APRIL/ MAY, NOV/DEC 2018
7	A volume of 0.5 m3 of gas at a pressure of 10 bar and 200◦C is expanded in a cylinder to 1.2 m3 at constant pressure. Determine the amount of work done by the gas and the increase in internal energy. Assume Cp = 1.005 kJ/kg K and Cv = 0.712 kJ/kg K.	5m	APRIL/ MAY 2018
8	A certain quantity of air has a volume of 0.028 m^3 at a pressure of 1.25 bar and 25◦C. It is compressed to a volume of 0.0042 m3 according to the law $PV^{1.3}$= C. Determine the final temperature and work done during compression. Also determine the reduction in pressure at a constant volume required to bring the air back to its original temperature.	6m	APRIL/ MAY 2017, 2018
9	Derive expression for work done in constant temperature process with PV diagram.	5m	Apl/May 2017, MAY 2019
10	A quantity of gas occupies a space of 0.3m3 at a pressure of 2 bar and a temperature of 77◦C which is heated at a constant volume, until the pressure is 7 bar. Determine (i) Temperature at the end of the process (ii) mass of the gas (iii) change in internal energy and (iv) change in enthalpy during the process. Assume: Cp = 1.005 kJ/kg K, Cv = 0.714 kJ/kg K, R = 287 J/kg K.	6m	Apl/May 2017
11	List out the different thermodynamic processes on gases.	5m	MAY 2019
11	Derive an expression for work done during polytrophic process	5m	Nov/Dec 2017
12	0.2m^3 of air at a pressure of 2 bar is expanded isothermally to 0.8m^3. Calculate the final pressure of the gas and heat supplied during the process.	5m	MAY 2019
13	2 kg of air is allowed to expand adiabatically. Its temperature during the process falls from 515 K to 390 K and the work the work done by air is 180 kJ. Calculate Cp and Cv for air.	5m	MAY 2019
14	A gas has a molecular mass of 26.7. The gas is compressed through a ratio of 12 according to the law $PV^{1.25}$ = C, from initial conditions of 0.9 bar and 333K. Assuming specific heats at constant volume Cv=0.79kJ/kg K, find per kg of mass. work done and heat flow across the cylinder walls, gas constant and ratioof specific heat.	10 m	MAY 2019
15	State the characteristics of throttling process	5m	Nov-19
16	Derive the characteristics gas equation PV=mRT	5m	Nov-19
17	A gas having initial pressure, volume and temperature as 275 kN/m^2, 0.09 m^3 and 185°C respectively is compressed at constant pressure until its temperature is 15°C. Calculate the amount of heat transferred during the process. Take R= 290 J/kgK and C_p= 1.005 kJ/kgK	5m	Nov-19
18	Draw PV & TS diagram for Iso-thermal process with indicate various process.	5m	Nov-19

19	One kg of air at a temperature of 40° C is compressed isothermally from a pressure of 1.5 bar to 6 bar. Determine the ehat rejected by the air during the process of compression. For air Cp= 1.005kJ/kgK and Cv=0.712 kJ/kgK.	5	Nov-19

Unit: 3 THERMODYNAMIC CYCLES			
1	List the assumptions made in thermodynamic air standard cycle.	5m	Apl/May, Nov/Dec, 2017, 2018, MAY 2019/ Nov-19
2	A Carnot engine working between 655 K and 320 K, produces 150 kJ of work. Determine thermal efficiency and heat added during the process.	5m	Apl/May 2017, MAY 2019
3	With the help of P-V and T-S diagrams, derive an expression for the air standard efficiency of otto cycle.	6m	Apl/May, Nov/Dec 2017/Nov-19
4	An Otto cycle has a cylinder diameter of 150 mm and a stroke of 225 mm. The clearance volume is $1.25*10^{-3}m^3$. Calculate the air standard efficiency of the cycle. Take γ= 1.4.	4m	Apl/May 2017
5.	A Carnot engine operates with a thermal efficiency of 70%. The minimum temperature of the cycle is 30^oC. Determine the maximum temperature of the cycle.	7m	Apl/May 2017
6	List the conditions for reversibility and main casues for the irreversibility of a cycle.	5m	Nov/Dec 2017 APRIL/ MAY2018
7	0.1 m3 of air at a pressure of 1.5 bar is expanded isothermally to 0.5 m3 Determine the final pressure of the gas and heat supplied during the process.	4m	Apl/May 2017
8	Explain with the help of P-V and T-S diagrams working of Dual cycle	5m	Nov/Dec 2017
9	A quantity of air has a valume of 60.5. Its and a pressure of 7.23bar. It is expanded in a cylinder to pressure of 7.23bar. It is expanded in a cylinder to a pressure of 1.08bar. calculate the work done, if the expansion is i)Isothermal ii) Adiabatic iii)$PV^{1.2}$ =C, γ = 1.4	6m	Nov/Dec 2017
10	A diesel cycle operating with the temperatures at the beginning and end of compression are 57_oC and 603_oC respectively. The temperatures at the beginning and end of expansion are 1950^oC and 870^oC respectively. Determine the ideal efficiency of the cycle. Take γ = 1.4. If the compression ratio is 14 and the pressureat the beginning of compression is 1 bar. Determine the maximum pressure of the cycle.	5m	Nov/Dec 2017
9	A Carnot engine working between 700°c and 50°c, Determine theoretical efficiency of the engine.	5m	APRIL/ MAY 2018
11	The efficiency of an Otto cycle is 50% and γ = 1.5, find the compression ratio.	5m	APRIL/ MAY 2018
12	An Otto cycle has a cylinder diameter of 150 mm and a stroke of 225 mm. The clearance volume is 1.25X10-3 m3. Calculate the i)air standard efficiency ii) Compression ratio of the cycle. Take γ= 1.4	10m	APRIL/ MAY 2018
13	Explain with the help of P-V and T-S diagrams working of Carnot cycle.	5m	APRIL/ MAY 2018/Nov-19
14	Derive an expression for the ideal efficiency of a constant pressure cycle	10m	NOV/DEC 2018

15	Compare Otto cycle with diesel cycle.	5m	MAY 2019
16	In an Otto cycle, the beginning and end temperatures of an isentropic compression are 314 K and 604 K respectively. Determine the air standard efficiency and the compression ratio. Take $\gamma = 1.4$.	5m	MAY 2019
17	With the help of P-V and T-S diagrams, derive an expression for the air standard efficiency of otto cycle.	10m	MAY 2019
18	The net work output of a cyclic process is 40 kN-m. If the input is 110kJ, determine the efficiency of the cycle.	3m	MAY 2019
19	A gas has a molecular mass of 26.7. The gas is compressed through a ration of 12, according to the law $PV^{1.25}=C$ from initial condition of 0.9 bar and 333K. Assuming specific heat at constant volume Cv=0.79kJ/kgK, determine per kg of mass, work done, heat flow across the cylinder walls, gas constant and ratio of specific heat. Take Ru=8314J/kgK.	10m	Nov-19
20	The compression ratio of an ideal air standard diesel cycle is 1.5. The heat transfer is 1465 kJ/kg of air. Determine the pressure and temperature at the end of each process and cycle efficiency, if the inlet conditions are 300K and 1 bar. Take γ=1.4 and Cv=0.712 kJ/kgK and Cp= 1kJ/kgK for air.	10m	Nov-19
	Unit- 4 IC ENGINES		
1	Define IC engine and give the classification of IC engines..	5m	Apl/May 2017
2	Explain with neat diagram the working of four stroke petrol engine.	10m	Apl/May 2017
3	During the test on single cylinder diesel engine, working on the four stroke cycle and fitted with a rope brake, the following readings are taken: Effective diameter of brake wheel = 360 mm; Dead load on brake = 200 N;Spring balance reading = 30 N; Speed = 450 rpm; Area of indicator diagram = 420 m_2; Length of indicator diagram = 60 mm; Spring scale = 1.1bar per mm; Diameter of cylinder = 100 mm; Stroke = 150 mm; Quality of oil used = 0.815 kg/hr; Calorific value of oil = 42000 kJ/kg.Determine brake power, indicated power, mechanical efficiency, brake thermal efficiency and brake specific fuel consumption.	10m	Apl/May 2017
4	Explain with the help of line diagram the working of 2-stroke cycle petrol engine.	4m	NOV/DEC 2018
5	A test on a single cylinder 4 stroke oil engine having bore 18 cm and stroke 36 cm yielded the following results : Brake torque 0.44 kN-m, MEP 7.2 bar, fuel consumption 3.5 kg/min, cooling water flow 4.5 kg/min, water temperature rise 36^0C, A/F ratio 25, exhaust gas temperature 415^0C, Room temperature 21^0C, Specific heat of exhaust gases 1.05 kJ/kgK, calorific value 45200 kJ/kg, speed = 286 rpm. Construct up a heat balance sheet on kJ/min basis.	10m	Nov 2017,MAY 2019
6	Explain the nomenclature assosciated with IC engine.	5m	Nov/Dec 2017
7	Explain with diagram Rope brake dynamometer	5m/5m	Nov/Dec 2017, MAY 2019/ Nov-19
8	Define Brake Power and Swept valume.	5m	APRIL/ MAY2018
9	Explain with neat diagram the working of two stroke Diesel engine.	10m	APRIL/ MAY2018

10	The following data refer to a test on a petrol engine: Indicated power=30Kw, Engine speed==1800rpm, Fuel consumption=9.1kg/hr, caloric value=44100kJ/kg. calculate a)Mechanical efficiency b)Indicated thermal efficiency c)brake thermal efficiency	10m	APRIL/ MAY2018
11	The following observations were made during a test on a single cylinder petrol engine 4 stroke cycle. Speed=2500, Brake power=118kW, Cylinder bore=110mm, Stroke length=120mm, calorifiv value of fuel=41150kJ/kg, Petrol consumption=40kg/hr, cooling water used=2800kg/hr, jacket water inlet temp=20°c, jacket water outlet temp=65°c. Calculate a)Heat equivalent of BP b)Heat carried by cooling water c)Heat supplied by fuel.	10m	APRIL/ MAY2018
12	A gas engine working on four stroke constant volume cycle, gave the following results when loaded by friction brake during a test of an hour's duration :Cylinder diameter 240 mm; Stroke length 480 mm; Clearance volume 445010^6 m^3; Effective circumference of the brake wheel 3.86 m; Net load on brake 1260 N at overall speed of 226.7 rpm; Average explosions/min 77; mep of indicator card 7.5 bar; Gas used 13 m^3/hr at15^0C and 771 mm of Hg; Lower calorific value of gas 49350 kJ/m^3 at NTP; Cooling jacket water 660 kg raised to 34.2 ^{0}C; Heat lost to exhaust gases 8%. Determine: i) IP ii) PB, iii) Indicated thermal efficiency iv) Efficiency ratio. Also Construct a heat balance sheet for the engine.	10m	Nov/Dec 2017
13	Write the comparisons of petrol and diesel engine.	10m	Apr 2017
14	Explain with neat diagram the working of four stroke diesel engine.	5m/10m	Nov/Dec 18/Nov-19
15	Name the various measurements which are to be taken in a test of an I C engine.	5m	Nov/Dec 2018
16	An I.C. engine uses 6 kg of fuel having calorific value 44000 kJ/kg in one hour. The I.P developed is 18 kW. The temperature of 11.5 kg of cooling water was found to rise through 25˚C per minute. The temperature of 4.2 kg of exhaust gas with specific heat 1 kJ/kgK was found to rise through 220˚C. Construct heat balance sheet for the engine	10m	Nov/Dec 2018
17	A gas engine working on 4-stroke constant valume cycle gave the following results when loaded by friction brake during a test of an hour duration. Cylinder diameter-240mm, Stroke length-480mm,Effective circumference of brake wheel-3.86m, Clearance valume-4450-10^3 mm^3,Net laod on the brake=1260N, Overall speed=226rpm, No. explosions per minute=77,m.e.p=7.5bar,gas used=13m^3, calorificvalue of gas=44000kJ/m^3, Rise in cooling jacket water temp.=35˚C, heat lost by exhaust gas=8%, cooling jacket water=660kg/hour, Find IP, BP. Draw up the heat balance sheet in kJ/min on IP. Basis for the engine.	10m	Nov/Dec 2018
18	Define : Indicated power, Brake power and Mechanical efficiency	5m	MAY 2019
19	Draw the neat diagram of an I.C. engine indicating the component parts	5m	MAY 2019
20	A heat engine has a piston diameter of 225mm, length of stroke 600mm and mean effective pressure 5 bar. The engine makes 100 explosions per minute. Determine the mechanical efficiency of the engine, if the engine BP is 14 kW.	5m	MAY 2019

21	A diesel engine uses 6 kg of oil per hour of calorific value 42,000kJ/kg. If the BP of the engine is 32 kW and mechanical efficiency 85%, Calculate: i) Indicated thermal efficiency ii) Brake thermal efficiency iii) Specific fuel consumption in kg/BP/hr.	5m	MAY 2019
22	Define the following: i. Cylinder bore ii. Swept volume iii. Compression ratio iv. Indicate power v. Brake power	5m	Nov-19
23	A test on a single cylinder 4 stroke oil engine having bore 18cm and stroke 36cm yielded the following results: i. Brake torque=0.44kN-m ii. MEP=7.2 bar iii. Fuel consumption=305kg/min iv. Cooling water flow=4.5kg/min v. Water temperature rise=36°C vi. A/F ratio=25 vii. Exhaust gas temperature =415°C viii. Room temperature=21°C ix. Specific heat of exhaust gases=1.05kJ/kgK x. Calorific value=45200 kJ/kgK xi. Speed=286 rpm. Draw up a heat balance sheet on kJ/min basis	10m	Nov-19
24	The following data refer to a test on a petrol engine: i. Indicated power=30kW ii. Brake power=26kW iii. Engine speed=1800 rpm iv. Fuel per brake power hour=0.35 kg v. Calorific value of the fuel used=44100 kJ/kg. Calculate mechanical efficiency, Indicated power efficiency and Brake thermal efficiency.	5m	Nov-19
	Unit- 5 - Heat Transfer		
1	Derive an expression for heat transfer through a composite slab.	5m	APRIL/ MAY 2017, 2018/Nov-19
2	A furnace wall is made up of bricks of 200 mm thick. The inner and outer surfaces of the wall have temperature of 800 ˚Cand 200 ˚C. Determine the heat loss. If the outside temperature becomes 25 ˚C, after the furnace wall is covered with insulator of 100 mm thick, Determine the reduction in heat loss. A. Take K_{brick} = 4.5 W/mK, $K_{insulator}$ = 0.5 W/mK.	10	Nov 2017, MAY 2019
3	Glass windows of a room have a total area of 10 m2 and the glass is 4 mm thick. Determine the quantity of heat that escapes from the room by conduction per second when the inside surfaces of windows are at 25 ˚Cand the outside surfaces at 10˚Cthe value of K is 0.84 W/mK.	10m	APRIL/ MAY 2017, 2018
4	The tube has internal radius 20mm and external radius 25mm. The inside of the tube is maintained at 100˚C and 20˚C. calculate the quantity of heat conducted through the tube per sec. Take length of tube =1m K=380W/mK.	5m	APRIL/ MAY 2018
5	How do you define thermal conductivity of the material?	4m	NOV/DEC 2018
6	Heat is conducted through a wall of room made of composite plate with a conduction of 134 W/mK and 60 W/mK and thickness 36 mm and 42 mm respectively. Thetemperature at the outer face is 96˚Cand 8˚C. Determine the temperature at the interface of the two materials.	6m	NOV/DEC 2018
7	Explain Black body.	5m	MAY 2019
8	Explain with line diagram radial heat transfer by conduction through thick cylinder.	5m	Nov-19
9	Heat is conducted through a wall of room made of composite plate with a conduction of 134 W/mK and 60 W/m K and thickness 36mm and 42mm respectively. The temperature at the outer face 96° C and at the inner face 8°C. Determine the temperature at the interface of the two materials.	5m	Nov-19

Unit- 6 - Gas turbine and jet Propulsions			
1	Identify the difference between the closed cycle gas turbine and a open cycle gas turbine.	5m/5m	APRIL/ MAY 2017, NOV/DEC 2018/ Nov-19
2	Explain with neat diagram the turbo-jet engine.	10m/5m	APRIL/ MAY 2017,/Nov-19
3	Explain with neat diagram the working of Ram-jet engine.	10m	Nov /Dec 2017
4	List the classifications and State two the applications gas turbine.	5m	APRIL/ MAY 2018
5	Explain the closed cycle gas turbine with schematic diagram.	5m	APRIL/ MAY 2018
6	Explain the working principle of rocket engine with line diagram.	7	Nov /Dec 2018, MAY 2019
7	State the applications of gas turbine	5	MAY 2019

Prepared by: Shrishail S Phutane

MACHINE TOOL TECHNOLOGY [**15ME43T**]

	Unit – 1- THEORY OF METAL CUTTING		
1.	State the important characteristics of cutting tool materials.	5m	Apr 2017, Nov 2017
2.	Explain Oblique Cutting.	5m	Nov 2017
3.	Write and explain Taylor's Tool Life Equation.	5m	Nov 2017
4.	Sketch the geometry of single point cutting tool.	10m	Apr 2017, Nov 2017
5.	Explain the different types of chips	5m	Apr/May 2018,Dec 2019
6.	Sketch the geometry of single point cutting tool	5m	Apr/May 2018
7.	Outline the classification of cutting tools	5m	Nov/Dec 2018
8.	Explain orthogonal cutting	5m	Nov/Dec 2018
9	List any five cutting fluids	5m	May 2019
10	Differentiate between orthogonal and oblique cutting	5m	May 2019,Dec 2019
11	Explain Taylor's tool life equation.	5m	May 2019
12	List the factors affecting tool life.	5m	Dec2019
	Unit – 2- LATHE AND OPERATIONS		
1	Explain taper turning by tailstock set-over method	5m	Apr 2018
2	Explain thread cutting operation	5m	Apr 2018, Dec 2019
3	Sketch and explain the working of single spindle automats	10m	Apr 2018
4	List the properties of cutting fluid	5m	Apr2018Nov 2018
5	State the advantages of turret lathe over capstan lathe.	5m	Nov 2017/ Nov 2018
6	Explain the important method of holding work in a lathe. (Chuck, Faceplate, Mandrel, Steady rest)	5m	Apr 2017/May 2019
7	Differentiate between capstan and turret lathe.	5m	Apr 2017, Dec 2019
8	Explain any Two taper turning methods with sketch./ Setting over the tailstock method and swiveling the compound rest method	10m	Apr 2017/May19
9	Explain the thread cutting operation with sketch.	10m/ 5m	Apr 2017, Nov 2017/ May 19, Dec 2019
10	Write the Specification of a centre Lathe.	5m	Apr 2017/ Nov 2018
11	Compare the applications and disadvantages of 3 jaw chuck & 4 jaw chucks	5m	Nov 2017/ Nov 2018
12	Explain with a neat sketch Face plate	5m	Nov 2018
13	Differentiate between the Steady rest and Follower rest	10m	Nov 2018/19
14	Name various operations performed in lathe	5m	Dec 2019

15	Explain 3 jaw chuck with neat sketch.	5m	Dec 2019
16	Sketch and explain the working of multiple spindle automatic lathe.	10m	Dec 2019
	Unit – 3- RECIPROCATING MACHINE TOOLS		
1	List the various operations performed in planer.	5m	Nov 2017 Apr 2018
2	Differentiate between shaper and planer.	5m,6 m	Apr 2017, Nov 2017 Apr 2018, Dec 2019
3	Sketch and Explain the working of slotter.	10m	Nov 2017 Nov 2018/ May 2019, Dec 2019
4	Sketch and Explain the working of Hydraulic shaper mechanism.	10m	Apr 2017, Nov 2017 Apr 2018 Nov 2018 / May 2019
5.	Sketch and Explain the working of Planer.	10m	Apr 2017 Apr 2018
6	Define cutting speed, feed, depth of cut and machining time related to shaper	10m	Nov 2018
7	Write the classification of shaper	5m	Nov 2018
8	List the various operations performed on a shaper	5m	May 2019,Dec 2019
9	List the types of planer	5m	May 2019
10	Mention the specification of a shaper.	5	Dec 2019
	Unit- 4 - DRILLING AND MILLING MACHINES		
1	State the importance of jigs & Fixture.	10m	Apr 2017
2	Differentiate between up milling and down milling process.	10m	Nov 2017,Dec 2019
3	Describe briefly any two locating devices with sketch	10m	Nov 2017 Apr 2018
4.	Explain Counter sinking and counter boring	10m	Nov 2017
5.	Explain with neat sketch up milling and down milling process.	10m	Nov 2017 Apr 2018 Nov 2018 May 2019
6.	Sketch and Explain any four Milling Operations.	10m,4 m	Apr 2017,Dec 2019
7.	Sketch Column and knee type of milling machine and label the parts	10m	Apr 2017 Nov 2018
8.	Sketch and Explain the working of radial drilling machine.	10m	Apr 2017 Apr 2018

			Nov 2018 May 2019
9	Explain with neat sketch Twist drill geometry	10m	Apr 2018
10	List any five drilling machine operations	5m	May 2019
11	Define w.r.t milling i)cutting speed ii) Feed iii) Depth of cut	5m	May 2019
12	Sketch and explain drill jig	5m	May 2019
13	Differentiate between jig and fixture	5m	May 2019,Dec 2019
14	Classify Milling Cutters	5m	Dec 2019
15	What is indexing? Explain simple and compound indexing.	10m	Dec 2019
16	Explain radial drilling machine with a sketch	10m	Dec2019
	Unit- 5 - SUPER FINISHING PROCESSES		
1	Sketch and Explain the working of surface grinding.	10m	Apr 2017 Apr 2018 Nov 2018
2	What are the factors for selection of grinding wheel?	5m	Nov 2017
3	State the advantages of centre less grinding over cylindrical grinding.	10m	Apr 2017 Nov 2018
4	Explain super finishing process.	5m	Apr 2017
5	State the specification of grinding wheel	5m	Apr 2018
6	Explain Lapping process	5m	Dec 2019
7	Sketch and explain the centreless grinding.	10m	Dec 2019
	Unit- 6 - NON CONVENTIONAL MACHINING PROCESS		
1	Give the classification of nonconventional machining process.	5m	Apr 2017
2	Sketch and explain Ultrasonic Machining.	10m	Apr 2017 Nov 2018
3	Sketch and explain Electric Discharge Machining	10m	Apr 2017,
4	Describe the principle of laser beam machining(LBM)	5m	Dec 2019
5	Explain with a neat sketch principle of working of Abrasive Jet Machining (AJM)	10m	Dec 2019 Nov 2017 Apr 2018
6	Briefly describe the principle of additive manufacturing	5m	Apr 2018 Nov 2018

S No	Questions	Marks	Appeared in
Unit - 1 HUMAN VALUES			
1	List the different meanings of Ethics.	5	May-2017
2	List the benefits of Empathy.	5	May-2017, May-2018, Nov 2019
3	Distinguish between Morality and Ethics.	5	May-2017, Nov 2018, April-2019
4	Explain methods of developing Self-Confidence	10	May-2017, Nov 2018
5	List the different types of values with example	5	Dec 2017, Nov 2019
6	List the factors to live peacefully	5	Dec 2017, Nov 2018
7	State the specific virtues relating to honesty	5	Dec 2017
8	Distinguish between 'Sharing' and 'Caring'	10,5	Dec 2017, May-2018, Nov 2018, April 2019
9	Explain any two human values in detail	5	Dec 2017
10	State the two approaches to Engineering ethics	5	May-2018
11	Define character and spirituality	5	May-2018
12	Explain the term 'Respect for others' with examples	5	May-2018, Nov 2019
13	Explain any two human values in detail	5	May-2018
14	What is moral integrity? Write on its significance	5	May-2018, Nov 2018
15	List the, different types of values and give few examples in each.	5	Nov 2018
16	Explain service learning.	5	Nov 2018,Nov 2019
17	List the Civic virtues one should develop.	5	April-2019, Nov 2019
18	List the different types of human values.	5	April-2019
19	Describe briefly : (1) Empathy, (2) Self-Confidence	5	April-2019
20	Explain what should one do or not to do to live peacefully.	5	Nov 2019
Unit - 2 ENGINEERING ETHICS			
1	Write a note on Industrial Standards.	5	May-2017
2	Explain Corporate Social Responsibility.	5	May-2017, Dec 2017
3	Explain the difficulties in solving moral problems	10	Dec 2017, May-2018

4	Define the term Moral dilemma. List the situations when these arise	5	Dec 2017, May-2018, Nov 2018, Nov 2019
5	Why do people behave unethically?	5	May-2018
6	State the five characteristics of professionals.	5	Nov 2018, Nov 2019
7	List the steps in confronting moral dilemma	5	Nov 2018
8	Define Corporate Responsibility & Corporate accountability	5	April-2019
9	State the difference between bribe and gift	5	April-2019
10	List the benefits of Ethics at work-place.	5	April-2019
11	List the skills for improving moral autonomy	5	April-2019
12	Explain variety of moral issues	5	April-2019
13	Define Moral dilemma. List the steps to solve moral dilemma,	5	April-2019
14	Explain two approaches of Engineering Ethics.	5	April-2019, Nov 2019
15	Explain the terms profession, professional and professionalism	5	Nov 2019
Unit - 3 SAFETY, RESPONSIBILITIES OF ENGINEERS			
1	Define Safety and Risk.	5	May-2017
2	What are the responsibilities of an Engineer ?	10	May-2017
3	Explain occupational crime and give two examples	10,5	May-2017, May-2018, Nov 2018, April-2019
4	Define corporate responsibility	5	Dec 2017, Nov 2018
5	List the factors that affect the risk acceptability.	5	Dec 2017
6	Explain collective bargaining with example	10,5	Dec 2017, May-2018, Nov 2018, Nov 2019
7	Name the factors that influence the perception of risk	5	May-2018
8	Name few techniques (steps) to reduce risk	5	Nov 2018
9	Explain Risk benefit Analysis.	5	April 2019
10	List factors / principles to justify confidentiality.	5	Nov 2019
11	Describe the virtues fulfilled under professional responsibility.	5	Nov 2019
	Explain occupational crime	5	Nov 2019

Unit - 4 ETHICAL ESSUES IN ENGINEERING PRACTICE			
1	Describe briefly code of Ethics.	5	May-2017, Dec 2017
2	Explain the code of ethics followed in institution of Engineers.	10	May-2017
3	Define 'Computer Ethics'. List the issues in 'Computer Ethics'	10	Dec 2017
4	List the ethical problems by computers in workplace	5	May-2018, Nov 2019
5	How plastic waste disposals create havocs?	5	May-2018, Nov 2018, Nov 2019
6	Explain Environmental Ethics	5	May-2018, Nov 2018, Nov 2019
7	Explain how E-waste pollutes air, water and soil.	5	April-2019
8	Explain issues related to computer Ethics.	5	April-2019
9	Explain the code of ethics followed in Institutional of Engineers.	5	April-2019
Unit - 5 HUMAN RIGHTS			
1	Who is a child? List the rights of the child.	5	May-2017
3	Explain Dowry Prohibition Act 1961	10	May-2017, April 2019
4	State the features of employee rights	5	Dec 2017, April-2019
5	Explain the steps taken to eliminate discrimination against women in education, employment and healthcare	10	Dec 2017
6	Explain briefly the concept of patents, copyright, trademark	10	Dec 2017 , May-2018, May-2017
7	List the features of International Human Rights	5	May-2018
8	Describe intellectual property rights	5	May-2018, Nov 2018
9	Explain the concept of women empowerment	5	May-2018
10	List the various special programs for women's development from government.	5	Nov 2018, Nov 2019
11	Explain Domestic Violence Act, 2005.	5	Nov 2018, April-2019
12	Explain briefly the copy rights	5	Nov 2018, Nov 2019
13	Explain code of ethics followed in Institution of	5	Nov 2018

	Engineers		
14	Differentiate between copyright and trademark.	5	April-2019
15	Explain Right to Education Act	5	April-2019
16	State various provisions under human rights.	5	Nov 2019
17	Describe briefly Trademark.	5	Nov 2019
Unit - 6 INDIAN CONSTITUTION			
1	Explain Fundamental Rights of an Indian Citizen	10, 5	May-2017, May-2018, Nov 2018, Nov 2019
2	Explain the salient features of Indian Constitution	10,5	May-2017, Nov 2018
3	Explain the powers & functions of the President of India	10, 5	May-2017, May-2018, Nov 2018
4	Explain the procedure followed in Parliament in making a law	10	May-2017, Dec 2017, April 2019
5	What are the functions of Gram Panchayat?	10	May-2017
6	Explain the powers and positions of the governor	10	Dec 2017
7	Describe the structure of state legislation	10	Dec 2017
8	Explain the fundamental duties of every citizen	10, 5	Dec 2017, Nov 2018
9	Explain procedure to make a bill in Parliament	5	May-2018
10	Write the structure of Parliament and explain it	5	May-2018, Nov 2019
11	Describe division of powers, Union list. State list and Concurrent list,	6	May-2018, Nov 2019
12	Write the necessary qualification to become Lok Sabha Member.	4	May-2018
13	Explain the formation of three tier system for local self government	5	May-2018, April-2019
14	Write the Power of Union Legislative	5	May-2018
15	Describe the Jurisdictions of Supreme Court	5	May-2018
16	Explain the Directive Principles of State Policy.	5	Nov 2018, April 2019
17	List the functions and powers of Parliament.	5	Nov 2018,Nov 2019
18	State powers and functions of Prime Minister.	5	Nov 2018
19	State the functions of Zilla Panchayat	5	Nov 2018
20	Explain the structure of the Judiciary	5	April-2019

21	State the functions of Speaker in Lok Sabha.	5	April-2019
22	List the functions of Governer.	5	April-2019
23	Describe the Jurisdiction of High Court,	5	April-2019
24	Describe the role of Gram Panchayaths in Community upliftment	5	Nov 2019
25	Explain the formation and composition of constituent assembly	5	Nov 2019
26	List the function of urban local bodies.	5	Nov 2019
27	Explain the functions of Supreme Court.	5	Nov 2019