

QUESTION BANK TE-I

UNIT-I IC ENGINES

S.No	Questions	BT	CO	PO
Part – A (Short Answer Questions)				
1	What are the different strokes in two stroke engines?	1	1	1
2	List out the differences between the IC engine and EC engine	1	1	1
3	What are assumptions made in air standard cycles?	1	1	1
4	List the main parts of a lubrication system	1	1	1
5	What is the need of providing lubrication to the IC engine	1	1	1
6	Write the classification of IC engines	1	1	1
7	What are the functions of 1)wrist pin 2)crankshaft 3)cam shaft	1	1	1
8	Write the functions of carburetor in ic engines	1	1	1
9	State the advantages of multi cylinder engine?	1	1	1
10	What is a cycle? What is the difference between an ideal and actual cycle?	1	2	1
Part – B (Long Answer Questions)				
11	a) Explain the working of 4 stroke petrol engine with neat sketch.	2	1	1
	b) How does the Zenith carburettor fulfil the requirements of a good carburetor?	2	2	1
12	a) Explain the working of splash lubricating system with neat sketch	3	2	1
	b) Explain with neat sketch thermosyphon cooling system	4	2	1
13	a) What is the purpose of venturi in SI engine fuel supply system?	5	1	1
	b) Draw the neat sketch and explain the working of Carter carburetor?	2	1	1
14	a) Draw the valve time diagram of a 4-stroke diesel engine	2	2	
	b) With the help of a neat sketch explain the working of fuel supply system of an IC engine	2	2	1
15	a) Explain the working of 4 stroke C.I engine with neat sketch.	3	2	1
	b) Draw a line diagram of IC engine and label the parts	3	2	1
16	a) What is the difference between the 2 stroke and 4 stroke engines?	3	2	1
	b) Explain the working of magneto ignition system?	2	2	1

UNIT-II COMBUSTION IN SI ENGINES

S.No	Questions	BT	CO	PO
Part – A (Short Answer Questions)				
1	What is the Need for air movement in CI engine	2	3	2
2	Explain about anti knock additives	2	2	2
3	Write a short note on turbo charging	1	3	2
4	Define pre-ignition and knocking	1	3	1



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5	Write a short note on supercharging	1	3	1
6	What is abnormal combustion?	1	3	1
7	What is meant by delay period?	1	2	1
8	What is the need of providing lubrication to the IC engine?	1	2	1
9	Define the phenomenon Knocking in spark ignited engines	1	2	1

10	What are the types of combustion chambers used in C.I. engines		1	2	1
Part – B (Long Answer Questions)					
11	a)	Explain the working of solid injection system with neat sketch	1	3	2
	b)	Explain the phenomenon of knock in SI engine. Discuss the effect of engine variables on knock.	2	3	2
12	a)	Discuss about direct and indirect injection combustion chambers	2	3	2
	b)	Explain the stages of combustion in SI and CI engines	2	3	2
13	a)	What is ignition lag? Explain the factors effecting ignition lag	3	3	2
	b)	Bring out clearly the process of combustion in CI engines and also explain various stages of Combustion	4	3	2
14	a)	What are the ideal requirements of SI engine fuel? Discuss how SI engine fuel rating is done.	2	3	2
	b)	What are the ideal requirements of CI engine fuel? Discuss how CI engine fuel rating is done.	2	2	1
15	a)	What is the importance of flame speed? Explain in detail various factors that influence the flame speed	2	3	2
	b)	Explain with figures the various types of combustion chambers used in SI engines	2	3	2
16	a)	Explain the phenomenon of knock in SI engines.	5	3	2
	b)	Explain normal and abnormal combustions in SI engine	2	2	1

S.No	Questions		BT	CO	PO
Part – A (Short Answer Questions)					
1	Define Volumetric efficiency? Explain its importance for calculation of volumetric efficiency in the performance test		1	2	1
2	Define brake power and indicated power		1	2	1
3	Define Mechanical efficiency, thermal efficiency		1	3	1
4	What do you mean by performance of IC engine		1	3	1
5	What are applications of air compressors		1	3	1
6	Define 1)isothermal efficiency 2)adiabatic efficiency		1	3	1
7	What do you understand by a slip factor in dynamic compressors		1	3	1
8	Explain piston speed?		1	3	1
9	What is meant by Cetane number?		1	3	1
10	Why retardation test is conducted?		1	3	1
Part – B (Long Answer Questions)					
11	a)	With neat sketch rope and prony brake dynamometer	1	3	2
	b)	Explain Morse test on multi cylinder ic engine	2	3	2
12	a)	The compression ratio in an air-standard Otto cycle is 8. At the beginning of compression process, the pressure is 1bar and the temperature is 300K. The heat transfer to the air per cycle is 1900 kJ/kg of air. Calculate) thermal efficiency) the mean effective pressure	2	3	2
	b)	Discuss the various methods for measurement of brake power?	3	3	2
13	a)	Compare and contrast fans, blowers and compressors	3	3	3
	b)	Derive an expression for efficiency of a root blower in terms of pressure ratio and ratio of specific heats	3	3	3



14	a)	What is the effect of clearance on the performance of reciprocating compressor	2	3	3
	b)	Schematically explain the study of heat balance of an engine?	4	3	3
15	a)	A single cylinder, single acting air compressor has a cylinder diameter of 15.25cm and a stroke of 22.8cm. Air is drawn into the cylinder at a pressure of 1.013bar and a temperature of 15.6degC. It	4	3	3

		is compressed adiabatically to 6.1bar. Calculate the theoretical power required to drive the compressor if it runs at 100rpm and the mass of air compressed per minute			
	b)	A rotary air compressor compresses 100 kg of air/minute from 1.2 bar and 293K to 4.8bar. Find the power required to drive the compressor, if the compression is isentropic $p v^{1.3} = \text{constant}$	3	3	3
16	a)	What is a rotary compressor? How are rotary compressors classified?	2	3	2
	b)	Find the brake specific fuel consumption in kg/kWh of a diesel engine whose fuel consumption is 5grams per second when the power output is 80kW. If the mechanical efficiency is 75%, calculate the indicated specific fuel consumption.	3	3	3

UNIT-IV

ROTARY COMPRESSORS

S.No	Questions	BT	CO	PO
Part – A (Short Answer Questions)				
1	Give the working details of roots blower	1	4	3
2	Explain the concept of slip factor in centrifugal compressor	1	4	3
3	Give two examples of positive displacement and rotary compressors	1	4	3
4	Define the volumetric efficiency of the reciprocating compressor	1	4	3
5	Define degree of reaction for the axial flow compressor?	1	4	3
6	List out the advantages of multistage compression	1	4	3
7	define surging	1	4	3
8	Define Mean effective pressure?	1	4	3
9	Write a short note on heat balance sheet	1	4	3
10	Describe the Morse test	1	4	3
Part – B (Long Answer Questions)				
11	a) Classify the Rotary compressors and give the salient features	2	4	4
	b) With help of a neat sketch explain the construction and working of an axial flow compressor	2	4	4
12	a) Derive the work done for single stage air compressor with and without clearance volume	3	4	4
	b) Explain the working of centrifugal compressor with a neat sketch	3	4	4
13	a) Compare rotary compressors and reciprocating compressors.	3	4	4
	b) Explain the working of Vane sealed compressor with a neat sketch.	3	4	3
14	a) An axial flow air compressor of 50% reaction design has blades with inlet and outlet angles of 50° and 150° respectively. The compressor is to produce a pressure ratio of 6:1 with an overall isentropic efficiency of 0.8 when the air inlet temperature is 45°C. The blade speed and axial velocities are constant throughout the compressor.	3	4	3
	b) Derive the expression for slip factor and pressure coefficient in case of centrifugal compressor	4	4	3
15	a) Discuss about surging and choking.	3	4	3



	b)	With the help of a neat sketch explain Lysholm compressor	4	4	3
16	a)	Discuss the differences centrifugal and reciprocating compressors	4	4	3
	b)	Discuss the working principle and mechanical details of a root blower	4	4	3

UNIT-V

GAS TURBINES

S.No	Questions	BT	CO	PO
Part – A (Short Answer Questions)				
1	What is the purpose of inter cooling in gas turbine.	1	5	2
2	Draw two combustion chambers of gas turbine plant	2	5	2
3	What are the different methods to improve the performance of GT	2	5	2
4	Compare gas and steam turbines	2	5	2
5	What are applications of gas turbines	2	5	2
6	What are classifications of gas turbines	2	5	2
7	Define gasturbine?explain gas turbine fuels	2	5	2
8	Explain the brayton cycle with the help of P-V and T-S diagrams.	2	5	2
9	What are advantages of gas turbines over IC engines	2	5	2
10	What are the components of gas turbines	2	5	2
Part – B (Long Answer Questions)				
11	a) Draw line diagram and explain Regenerative gas turbine cycle	3	5	4
	b) Explain the need and significance of inter cooling in gas turbines	5	5	4
12	a) Derive the thermal efficiency of an ideal gas turbine power plant.	3	5	4
	b) Explain the working of brayton-cycle	3	5	4
13	a) A gas turbine plant receives air at 1 bar and 290K and compresses it to 5bar. If the temperature of air after compression is 1000K. Find the thermal efficiency of the turbine. Take $\gamma=1.4$ for air.	4	5	4
	b) Explain with neat sketch open cycle gas turbine	4	5	4
14	a) With a neat sketch explain closed gas turbine	3	5	4
	b) What are differences between open and closed cycle gas turbines	3	5	3
15	a) Explain the working of constant volume gas turbine	3	5	3
	b) Explain the working of constant pressure gas turbine	4	5	3
16	a) Explain the effect of regeneration, inter cooling, and reheating on the performance of Gas turbine plant	3	5	3
	b) What are the disadvantages of a closed cycle gas turbine over open cycle gas turbine?	3	5	3

* **Blooms Taxonomy Level (BT)** (L1 – Remembering; L2 – Understanding; L3 – Applying; – Analyzing; L5 – Evaluating; L6 – Creating)

L4

Course Outcomes (CO)

Program Outcomes (PO)

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HOD