NARSIMHA REDDY ENGINEERING COLLEGE
UGC AUTONOMOUS INSTITUTION
Maisammaguda (V), Kompally - 500100, Secunderabad, Telangana State, India

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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 of4 stroke petrol engine with neat sketch.	2	1	1
	b)	How does the Zenithcarburettor 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 venture 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 4stroke C.I engine with neat sketch.	3	2	1
	b)	Draw a line diagram of Ic engine and lable the parts	3	2	1
16	a)	Whatis the difference between the 2stroke and 4stroke 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

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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 SIengine 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

Performance of I.C engines Reciprocating compressors

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 efficiency2)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 compressionratioin 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 cycleis 1900 kJ/kg ofair.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)	Deriveanexpressionforefficiency of a root blower in terms of pressure ratio and ratio of specific heats	3	3	3

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14	a)	What is the effect of clearance on the performance of reciprocating compressor	2	3	3
	b)	Schematicallyexplainthe study of heat balance ofan 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 of15.6degC.It	4	3	3

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		is compressed adiabatically to 6.1bar. Calculate the theoretical power required to drivethecompressor 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 barand293kto4.8bar.Findthepowerrequired to drive the compressor, if the compression is isentropic pv1.3=constant	3	3	3
16	a)	What isa 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 outputis80kW. If the mechanicalefficiencyis75%, calculatethe 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 forsingle stageaircompressor 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 flowair compressor of 50% reaction design has blades with inlet and outlet angles of 500 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 45degC.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

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	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 theworking principle and mechanical details of a root blower	4	4	3

UNIT–V

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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 at1 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 γ=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; L4 – Analyzing; L5 – Evaluating; L6 – Creating)

Course Outcomes (CO)

Program Outcomes (PO)

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