SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY- PUTTUR

(AUTONOMOUS)

QUESTION BANK (DESCRIPTIVE)

Subject with Code : Modelling of I.C Engines(19ME3119)

Course & Branch: **M.Tech – (TE)**

Year & Sem: I- & II-Sem **Regulations:** R19

UNIT –I

1		What are the various factors affecting the combustion of diesel engines?	12M
2		What are the various factors affecting the combustion of petrol engines?	12M
3	a)	Explain the combustion phenomena of petrol engines and mention p-θ diagram.	06M
	b)	What are the various governing equations?	06M
4	a)	How do you classify the diesel engine based on ports geometry?	06M
	b)	Explain the combustion phenomena of diesel engines and mention the P-θ diagram	06M
5	a)	Write in detail about engine and its classifications	06M
	b)	How do you classify reciprocating engines by applications?	06M
6		Differentiate CI and SI engines.	12M
7	a)	What approaches are to be consider for modelling?	06M
	b)	What is model building and integration methods?	06M
8	a)	What parameters are used in an engine performance?	06M
	b)	What are the specific advantages of exhaust gas recirculation and explain?	06M
9		Classify the petrol engine with engine geometry?	12M
10		Explain with sketches the valve lift curves.	12M

UNIT –II

1		Differentiate single vs two zone model and its applications of heat release analysis?	12M
2		Distinguish pre mixed and diffusive combustion models.	12M
3		Explain WIEBE functions of combustion heat release.	12M

4		Explain wall heat transfer correlations	12M
5	a)	Narrate the ignition delay.	6M
	b)	More ignition delay, will it improve the performance of an engine- justify.	6M
6		Write a brief note on internal energy estimation .	12M
7		What are the different factors that affect combustion with pre mixed charge	12M
8		Name various factors that influence heat release in combustion process	12M
9		How wall heat transfer that affects engine performance?	12M
10		What factors affect the ignition delay of an IC engine?	12M

UNIT –III

1	a)	How the turbulence affects the engine performance?	6M
	b)	How fuel atomization affects the engine performance?	6M
2	a)	How do you create turbulence in engine?	6M
	b)	Which type of spray structure will improve engine performance and explain.	6M
3		How the fuel droplet will affect the knocking in petrol engines?	12M
4		Smaller fuel droplet will improve the engine performance- justify .	12M
5		What are the various types of fuel injectors and explain any one in detail with a neat sketch	12M
6		Name various fuel injection systems and explain any one in detail with neat sketch	12M
7		What are the types and uses of spray structures?	12M
8		Explain fuel atomization with sketches	12M
9		What are the effects of droplet turbulence interactions -explain.	12M
10		Write the effects of droplet in impingement on walls	12M

UNIT –IV

1		What is turbo charging and how it affects engine performance?	12M
2		Explain the working principle of turbo charger with a neat sketch.	12 M
3		Classify the turbo chargers and explain any one with neat sketch.	12M
4		Distinguish and differentiate between constant pressure and pulse turbo charging.	12M

5		For the charging system, what are the implications from compressor and turbine maps.	12M
6		Name various components of turbo charging system with its functions and sketches.	12M
7		Identify the importance of compressor in the engine performance.	12M
8		Explain the importance of charge air cooler.	12M
9		Explain the components of turbo charging system with its functions in detail.	12M
10		Elaborate the components and its functions of pulse turbo charging.	12M

UNIT –V

1		Draw otto-cycle, p-v diagram and derive a mathematical model for its performance.	12M
2		With sketches show the simulation of otto cycle at full throttle, part throttle and super charged conditions.	12M
3		Explain progressive combustion and its advantages.	12M
4		How auto ignition modelling helps?	12M
5		What is single zone modelling and applications?	12M
6		What is mass burning rate estimation and explain?	12M
7		Elaborate SI engine with stratified charge and applications.	12M
8		What are the effects of friction in pumping, piston assembly, bearings and valve train etc.	12M
9		Differentiate with brief note on friction estimation for warm and warmup engines.	12M
10	a)	How auto ignition modelling helps in cold counties?	6M
	b)	Write a brief note on stratified charge on S.I engine.	6M

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