SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY :: PUTTUR
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QUESTION BANK

Subject with Code: Nuclear Engineering (19ME3112) **Course & Branch: M. Tech(TE)**
Sem : I-Sem **Regulation: R19**

UNIT-I

1	a	Explain the nuclear fission process with a neat sketch	6M
	b	Distinguish between nuclear fission and fusion	6M
2		What is the need for enrichment of uranium? Describe the most efficient and elaborated methods suited to produce highly enriched $U^{235.}$	12M
3	a	What is chain reaction**?** What is the difference between controlled and uncontrolled chain reaction?	6M
	b	Which types of neutrons are most suitable for chain reaction? Why.	6M
4	a	Explain the process of breeding with an example?	6M
	b	How to convert nuclear fuels into fertile materials?	6M
5	a	Define the term radioactivity. Explain it with an example	6M
	b	What is the importance of half-life period of radioactive material in nuclear power generation?	6M
6		Explain the following terms in detail (i) Breeding ratio (ii) Fertile Material (iii) Chain reaction	12M
7		Name different methods of power producing process in Nuclear Power Plant and explain them in detail?	12M
8	a	How to control the nuclear power generation?	6M
	b	Explain in brief how uranium material is produced from thorium?.	6M
9	a	Amount of energy released in fusion higher than fission. Justify	6M
	b	Explain the process of conversion of fissile materials into fertile materials	6M
10	a	What is neutron scattering and neutron absorption?	6M
	b	Discuss radioactive decay chain	6M

UNIT-II

1	a	Write the salient equations of Neutron diffusion theory	6M
	b	The slow Neutrons are more useful rather than faster one in power generation. Justify	6M
2	a	Elastic Collisions are the important source for the nuclear power. Justify	6M
	b	What do you know about Neutron transport? Explain	6M
3		Mention the importance of Fick's law in diffusion of Neutron	12M
4	a	Mention various parameters considered in neutron transport calculations	6M
	b	What do you mean by the following (i) Elastic Scattering (ii) Inelastic Scattering (iii) Capture (iv) Fission	6M
5		Mention the importance of diffusion theory of approximation	12M
6	a	How do you make the neutrons slow	6M
	b	Explain about Elastic Collision.	6M
7		Mention the various assumptions and boundary conditions used for the derivation of diffusion equation	12M
8		Write an equation for Neutron transport and explain the terms in it	12M
9	a	What do you understand by diffusion theory of approximation	6M
	b	Distinguish between Elastic and inelastic collisions of atoms	6M
10	a	Explain the diffusion equations for point source and planer source	6M
	b	Why Fick's Law is more important in nuclear power generation	6M

UNIT-III

1	a	Name and Explain various critical parameters in thermal reactors	6M
	b	What is the difference between Artificial Radioactivity and Natural Radioactivity	6M
2		How do you find the solution for multi group diffusion equations	12M
3		Mention the difference between multi group differential equations for single and multi regions	12M
4	a	Find solution for diffusion equations for a particular region	6M
	b	Why thermal reactors are more crucial in power generation	6M

5		Classify the reactors used in nuclear power plant and explain Boiling water Reactor with a neat sketch	12M
6	a	Describe the working of PWR with a neat sketch	6M
	b	What are the merits and demerits of PWR	6M
7	a	Name various parts of a Reactor and also mention the uses of each part	6M
	b	How BWR differs from PWR	6M
8	a	Mention the special features of Fast breeder reactor	6M
	b	With a neat sketch explain the working of Sodium-Graphite reactor	6M
9		Describe the working of Gas Cooled reactor with a neat sketch and also mention its merits and demerits	12M
10	a	Explain the working of reactor mostly used in India with a neat sketch	6M
	b	What are the various features of Homogeneous reactor which makes it special	6M
		UNIT-IV	6M
1	a	Radioactive materials are more dangerous to human beings. Justify	6M
	b	What is the future of nuclear power?	6M
2		Mention the significance of point kinematic equations in the nuclear power	12M
3		How do you dispose radioactive materials without damaging environment	12M
4		Write an equation for simple point Kinematics and mention the importance of each term in that.	12M
5		Define the following terms (i) In hour unit of reactivity (ii) Doller Unit of Reactivity	12M
6		Write the factors which affects the reactivity	12M
7		Mention the importance of point kinematics and the factors which affect them	12M
8		What is the importance of Radiation Hazards and shielding	12M
9	a	What do you understand by Fission Product poison and reactivity coefficients	6M
	b	List out the safety measures for the nuclear power plants	6M
10		Discuss the factors which must be considered while selecting a site for a nuclear power plant	12M

UNIT-V

1	How the temperature is distributed in reactor core	12M
2	What is the need of radiation protection and also mention its standards	12M
3	Discuss about the critical heat flux in reactor core	12M
4	Mention the various safety precautions of Reactor core in nuclear power plant	12M
5	Write equations for temperature distribution in reactor core	12M
6	Write various equations and its solutions for heat transfer in reactor core	12M
7	Heat flux plays very important role in reactor core. Justify	12M
8	What are various units used for reactivity exposure and explain them in detail	12M
9	Why reactor safety is important and mention its safety precautions	12M
10	How reactors are useful in defense. Explain	12M

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