Code No: **R1641034** **R16** **Set No. 1**

IV B.Tech I Semester Regular/Supple Examinations, March - 2021

POWER PLANT ENGINEERING

(Mechanical Engineering)

Time: 3 hours **Max. Marks: 70**

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any FOUR questions from Part-B
*****

PART–A *(14 Marks)*

1.	a)	What are the different sources of energy?	[2]
	b)	Write short notes on supercharging.	[2]
	c)	What is a surge tank? Why is it important in a hydro-electric power plant?	[3]
	d)	Write short notes on fertile and fissionable material.	[2]
	e)	Discuss the importance of measurement and instrumentation in a power plant.	[2]
	f)	Define diversity factor and explain its significance.	[3]

PART–B *(4x14 = 56 Marks)*

2.	a)	Make a neat sketch and explain the working of multi retort stoker.	[6]
	b)	What is a cyclone furnace? Explain its construction. Mention its advantages and disadvantages.	[8]
3.	a)	Discuss combined steam and gas turbine power plants.	[7]
	b)	Explain with the help of a neat sketch, how air intake and admission system of diesel plant works?	[7]
4.	a)	Discuss the factors which should be considered while selecting a site for a hydro-electric power plant.	[6]
	b)	Explain pumped storage plant with the help of a neat sketch, discuss its advantages and disadvantages.	[8]
5.	a)	What are the different components of a nuclear power plant? Explain the working of a nuclear power plant.	[8]
	b)	Write short notes on radiation shielding in nuclear power plants.	[6]
6.	a)	Show that when two cyclic plants operate in parallel, the overall efficiency lies between the efficiency of the plants.	[6]
	b)	With the help of a neat sketch, explain the coordination of hydro-electric and nuclear power plants.	[8]
7.	a)	What do you understand by connected load and average load? Explain.	[6]
	b)	What are the different pollutants evolved from thermal and nuclear power plants? Explain the methods to control them.	[8]

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Code No: **R1641034** **R16** **Set No. 2**

IV B.Tech I Semester Regular/Supple Examinations, March - 2021

POWER PLANT ENGINEERING

(Mechanical Engineering)

Time: 3 hours **Max. Marks: 70**

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any FOUR questions from Part-B
*****

PART–A *(14 Marks)*

1. a) What is meant by `overfeed` and `underfeed` principles of firing coal? [2]
   b) State the applications of a diesel power plant. [2]
   c) Discuss the importance of mini and micro hydro power plant. [2]
   d) What do you understand by breeding and burn up in nuclear power plants? [3]
   e) Explain the environmental impact of a combined cycle plant. [2]
   f) Define load factor and explain its significance. [3]

PART–B *(4x14 = 56 Marks)*

2. a) Describe the various methods used to fire pulverised coal and state the advantages of pulverised fuel firing. [8]
   b) Make a neat sketch and explain the working of a chain grate stoker. [6]

3. a) Draw a simple line diagram of a simple open cycle gas turbine plant. Explain how `reheating` improves the thermal efficiency of a simple open cycle gas turbine plant? [7]
   b) Explain in detail, the fuel supply system of a diesel engine. [7]

4. a) What is a spill way? Explain why spill ways are required? Discuss the different types of spill ways. [7]
   b) What do you understand by hydrological cycle? Explain with the help of a neat sketch. [7]

5. a) Discuss the factors which go in favour of nuclear power plant as compared to other types of power plants. [6]
   b) With the help of a neat sketch, explain pressurized water reactor? [8]

6. a) With the help of a neat sketch, explain storage type hydro-electric plant in combination with steam plant. [8]
   b) Explain the working of a photo cell type smoke meter. [6]

7. a) Discuss the different methods to control SO_2 in the flue gases. [7]
   b) What are the various costs involved in the power plant economics? Explain them briefly. [7]

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Code No: **R1641034** **R16** **Set No. 3**

IV B.Tech I Semester Regular/Supple Examinations, March - 2021

POWER PLANT ENGINEERING

(Mechanical Engineering)

Time: 3 hours **Max. Marks: 70**

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any FOUR questions from Part-B

*****

PART–A *(14 Marks)*

1. a) Write a short note on the comparison of forced and induced draft system for a boiler. [2]
   b) Enlist the advantages and disadvantages of diesel engine power plant. [2]
   c) What do you understand by hydrograph? Explain. [3]
   d) Discuss the function of a pressurizer in a pressurized water reactor? [2]
   e) How can a combined cycle plant be used for cogeneration? What is its thermodynamic advantage? [2]
   f) Define demand factor and explain its significance. [3]

PART–B *(4x14 = 56 Marks)*

2. a) What do you understand by a cooling tower? Explain an indirect dry cooling tower where a direct contact spray type condenser is used? [8]
   b) Describe the various factors which determine the location of a steam power station. [6]

3. a) What is a semi-closed cycle gas turbine plant? Explain it with the help of a sketch of a plant. [7]
   b) Give the layout of a diesel engine power plant. Explain in detail. [7]

4. a) Explain the underground hydro-electric power station and over ground power stations. Discuss its advantages and disadvantages. [7]
   b) State the function of a dam. Briefly discuss a few important types of dams. [7]

5. a) Explain the properties of moderator used in a nuclear reactor? Explain the principle of a sodium-graphite reactor. [8]
   b) Write short notes on radio-active waste disposal in a nuclear power plant. [6]

6. a) With the help of a neat sketch, explain pumped storage plant in combination with nuclear power plant. [8]
   b) Explain the magnetic wind method for the measurement of O_2 in flue gases. [6]

7. a) Explain how NO_x emissions can be reduced in the flue gases? [7]
   b) Explain load duration curve in detail. [7]

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Code No: **R1641034** **R16** **Set No. 4**

IV B.Tech I Semester Regular/Supple Examinations, March - 2021

POWER PLANT ENGINEERING

(Mechanical Engineering)

Time: 3 hours **Max. Marks: 70**

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any FOUR questions from Part-B
*****

PART–A *(14 Marks)*

1. a) Discuss the advantages of mechanical methods of firing coal. [3]
   b) List the major components of a gas turbine power plant and give its limitations. [3]
   c) What do you understand by storage and pondage? [2]
   d) On what factors does nuclear reaction rate depends? Explain. [2]
   e) Discuss the advantages of a combined cycle power generation. [2]
   f) Define maximum demand and average load in power plant economies. [2]

PART–B *(4x14 = 56 Marks)*

2. a) Describe the various types of burners used to burn pulverised coal. [7]
   b) Name various draught systems. Describe the operation of a balanced draught system. [7]

3. a) Bring out the differences between the closed cycle and open cycle gas turbine power plants. [6]
   b) Explain the operation of a fuel pump in a diesel engine. How is the fuel supply to the engine regulated? [8]

4. a) How are dams classified? Discuss the factors considered for the selection of the site and type of the dam? [6]
   b) Explain the different ways of classifying a hydroelectric power plant. With the help of a neat sketch, explain run off river plant. [8]

5. a) What is a homogeneous reactor? Discuss with the help of neat sketch, the homogeneous aqueous reactor. [8]
   b) Discuss the various factors to be considered while selecting the site for nuclear power station. Discuss its advantages and disadvantages. [6]

6. a) With the help of a neat sketch, explain run off river plant in combination with steam plant. [8]
   b) Discuss different types of hygrometers used in power plants. [6]

7. a) Enumerate the latest pollution laws in existence in India. [6]
   b) What is the impact on the environment and human health for the effluents released from the thermal power plants? Explain how to control them. [8]

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Code No: **R1641034** **R16** **Set No. 1**

IV B.Tech I Semester Regular Examinations, October/November - 2019

POWER PLANT ENGINEERING

(Mechanical Engineering)

Time: 3 hours **Max. Marks: 70**

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any FOUR questions from Part-B
*****

PART–A *(14 Marks)*

1.	a)	What is a spreader stoker?	[2]
	b)	Discuss cooling systems used in internal combustion engine.	[3]
	c)	Explain mini and micro hydel plants.	[2]
	d)	Define the term radioactivity.	[2]
	e)	Discuss the analysis between base load and peak load stations.	[3]
	f)	What is load factor?	[2]

PART–B *(4x14 = 56 Marks)*

2.	a)	Describe the working of pneumatic or vacuum extraction ash handling system.	[7]
	b)	Explain the working of tray type deaerating heater.	[7]
3.	a)	Write the advantages and disadvantages of a Diesel power plant.	[7]
	b)	Describe the working of constant pressure combustion gas turbine.	[7]
4.	a)	Discuss the function and uses of flow duration curve.	[7]
	b)	Describe the working of pumped storage plant.	[7]
5.	a)	Discuss fertile materials and fissionable materials.	[7]
	b)	With a neat sketch, explain the working of boiling water reactor.	[7]
6.	a)	Explain the combination of pump storage plant with nuclear power plant.	[7]
	b)	Describe the electrical circuit for the measurement of carbon dioxide content in the gases.	[7]
7.	a)	Explain fixed cost and running cost of hydro electric power plant.	[7]
	b)	Discuss air and water pollution by thermal power plants.	[7]

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Code No: **R1641034** **R16** **Set No. 2**

IV B.Tech I Semester Regular Examinations, October/November - 2019

POWER PLANT ENGINEERING

(Mechanical Engineering)

Time: 3 hours **Max. Marks: 70**

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any FOUR questions from Part-B
*****

PART–A *(14 Marks)*

1.	a)	Write various ash handling systems.	[2]
	b)	What is meant by constant volume combustion gas turbine?	[3]
	c)	Discuss the function of penstock pipe.	[2]
	d)	Write the function of moderator.	[2]
	e)	Discuss the purpose of measurement of moisture in carbon dioxide circuit.	[3]
	f)	What is radioactive pollution?	[2]

PART–B *(4x14 = 56 Marks)*

2.	a)	Discuss the ways for storage of coal.	[7]
	b)	With advantages and disadvantages, describe the working of mechanical dust collectors.	[7]
3.	a)	Explain the individual pump injection system of a Diesel power plant.	[7]
	b)	Describe the function of combined gas turbine and steam power plant.	[7]
4.	a)	How dams are selected? With advantages and disadvantages, explain the working of earth fill dam.	[7]
	b)	Discuss the classification of hydro electric power plants.	[7]
5.	a)	Discuss the process of fission of nuclear fuel.	[7]
	b)	Describe the working of breeder reactor.	[7]
6.	a)	Explain the storage hydro electric plant in combination with steam plant.	[7]
	b)	Describe precipitator chamber and detection system in nuclear measurement.	[7]
7.	a)	Discuss sinking fund method for finding out depreciation cost.	[7]
	b)	Explain the methods suggested to reduce pollution.	[7]

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Code No: **R1641034** **R16** **Set No. 3**

IV B.Tech I Semester Regular Examinations, October/November - 2019

POWER PLANT ENGINEERING

(Mechanical Engineering)

Time: 3 hours **Max. Marks: 70**

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any FOUR questions from Part-B
*****

PART–A *(14 Marks)*

1.	a)	What is pulverized fuel firing?	[2]
	b)	Write the auxiliaries of gas turbine plant.	[2]
	c)	List down the factors considered for a hydro electric power plant.	[3]
	d)	Write the purpose of radiation shield in nuclear power plant.	[2]
	e)	What could be the importance of measurements in power plant?	[3]
	f)	Define connected load.	[2]

PART–B *(4x14 = 56 Marks)*

2.	a)	Explain the principle and operation of overfeed stoker.	[7]
	b)	Describe the working of mechanical draught cooling tower.	[7]
3.	a)	Explain the exhaust system of a Diesel power plant.	[7]
	b)	Discuss the working of combined gas turbine and diesel power plants.	[7]
4.	a)	What is hydrology? Explain the hydrological cycle.	[7]
	b)	Describe the working of medium head power plant.	[7]
5.	a)	Discuss the classification of nuclear reactors.	[7]
	b)	Stating the advantages, explain the working of gas cooled reactor.	[7]
6.	a)	Discuss the coordination of different types of power plants.	[7]
	b)	Describe with a neat sketch, the working of reflected light dust recorder	[7]
7.	a)	Define the terms diversity factor and plant capacity factor.	[7]
	b)	Explain radioactive pollution to environment from nuclear power plants.	[7]

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Code No: **R1641034** **R16** **Set No. 4**

IV B.Tech I Semester Regular Examinations, October/November - 2019

POWER PLANT ENGINEERING

(Mechanical Engineering)

Time: 3 hours **Max. Marks: 70**

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any FOUR questions from Part-B
*****

PART–A *(14 Marks)*

1.	a)	Write the concept of cyclone burner.	[3]
	b)	How internal combustion engine is started by compressed air system?	[2]
	c)	What are draft tubes?	[2]
	d)	Discuss nuclear chain reaction.	[3]
	e)	What is the purpose of carbon monoxide measurement?	[2]
	f)	What are operating costs?	[2]

PART–B *(4x14 = 56 Marks)*

2.	a)	With merits and demerits, explain the working of belt conveyer in steam power plant.	[7]
	b)	Discuss the natural draught in a chimney.	[7]
3.	a)	Explain the effect of supercharging on the performance of Diesel engine.	[7]
	b)	Describe the working of simple gas turbine power plant.	[7]
4.	a)	What are the types of spill ways? Explain the working of saddle spill way.	[7]
	b)	Discuss the auxiliaries of hydro power plant.	[7]
5.	a)	Describe the function of nuclear reactor.	[7]
	b)	Explain the method to dispose radioactive waste.	[7]
6.	a)	Discuss the load division between power stations.	[7]
	b)	Describe the working of paramagnetic oxygen analyser.	[7]
7.	a)	What is a load curve? Explain its significance.	[7]
	b)	Explain how different pollutants effect on human health and vegetation.	[7]

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Code No: **R1641034** **R16** **Set No. 1**

IV B.Tech I Semester Regular/Supple Examinations, March - 2021

POWER PLANT ENGINEERING

(Mechanical Engineering)

Time: 3 hours **Max. Marks: 70**

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any FOUR questions from Part-B
*****

PART–A *(14 Marks)*

1.	a)	What are the different sources of energy?	[2]
	b)	Write short notes on supercharging.	[2]
	c)	What is a surge tank? Why is it important in a hydro-electric power plant?	[3]
	d)	Write short notes on fertile and fissionable material.	[2]
	e)	Discuss the importance of measurement and instrumentation in a power plant.	[2]
	f)	Define diversity factor and explain its significance.	[3]

PART–B *(4x14 = 56 Marks)*

2.	a)	Make a neat sketch and explain the working of multi retort stoker.	[6]
	b)	What is a cyclone furnace? Explain its construction. Mention its advantages and disadvantages.	[8]
3.	a)	Discuss combined steam and gas turbine power plants.	[7]
	b)	Explain with the help of a neat sketch, how air intake and admission system of diesel plant works?	[7]
4.	a)	Discuss the factors which should be considered while selecting a site for a hydro-electric power plant.	[6]
	b)	Explain pumped storage plant with the help of a neat sketch, discuss its advantages and disadvantages.	[8]
5.	a)	What are the different components of a nuclear power plant? Explain the working of a nuclear power plant.	[8]
	b)	Write short notes on radiation shielding in nuclear power plants.	[6]
6.	a)	Show that when two cyclic plants operate in parallel, the overall efficiency lies between the efficiency of the plants.	[6]
	b)	With the help of a neat sketch, explain the coordination of hydro-electric and nuclear power plants.	[8]
7.	a)	What do you understand by connected load and average load? Explain.	[6]
	b)	What are the different pollutants evolved from thermal and nuclear power plants? Explain the methods to control them.	[8]

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Code No: **R1641034** **R16** **Set No. 2**

IV B.Tech I Semester Regular/Supple Examinations, March - 2021

POWER PLANT ENGINEERING

(Mechanical Engineering)

Time: 3 hours **Max. Marks: 70**

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any FOUR questions from Part-B
*****

PART–A *(14 Marks)*

1. a) What is meant by `overfeed` and `underfeed` principles of firing coal? [2]
   b) State the applications of a diesel power plant. [2]
   c) Discuss the importance of mini and micro hydro power plant. [2]
   d) What do you understand by breeding and burn up in nuclear power plants? [3]
   e) Explain the environmental impact of a combined cycle plant. [2]
   f) Define load factor and explain its significance. [3]

PART–B *(4x14 = 56 Marks)*

2. a) Describe the various methods used to fire pulverised coal and state the advantages of pulverised fuel firing. [8]
   b) Make a neat sketch and explain the working of a chain grate stoker. [6]

3. a) Draw a simple line diagram of a simple open cycle gas turbine plant. Explain how `reheating` improves the thermal efficiency of a simple open cycle gas turbine plant? [7]
   b) Explain in detail, the fuel supply system of a diesel engine. [7]

4. a) What is a spill way? Explain why spill ways are required? Discuss the different types of spill ways. [7]
   b) What do you understand by hydrological cycle? Explain with the help of a neat sketch. [7]

5. a) Discuss the factors which go in favour of nuclear power plant as compared to other types of power plants. [6]
   b) With the help of a neat sketch, explain pressurized water reactor? [8]

6. a) With the help of a neat sketch, explain storage type hydro-electric plant in combination with steam plant. [8]
   b) Explain the working of a photo cell type smoke meter. [6]

7. a) Discuss the different methods to control SO_2 in the flue gases. [7]
   b) What are the various costs involved in the power plant economics? Explain them briefly. [7]

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Code No: **R1641034** **R16** **Set No. 3**

IV B.Tech I Semester Regular/Supple Examinations, March - 2021

POWER PLANT ENGINEERING

(Mechanical Engineering)

Time: 3 hours **Max. Marks: 70**

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any FOUR questions from Part-B

*****

PART–A *(14 Marks)*

1. a) Write a short note on the comparison of forced and induced draft system for a boiler. [2]
   b) Enlist the advantages and disadvantages of diesel engine power plant. [2]
   c) What do you understand by hydrograph? Explain. [3]
   d) Discuss the function of a pressurizer in a pressurized water reactor? [2]
   e) How can a combined cycle plant be used for cogeneration? What is its thermodynamic advantage? [2]
   f) Define demand factor and explain its significance. [3]

PART–B *(4x14 = 56 Marks)*

2. a) What do you understand by a cooling tower? Explain an indirect dry cooling tower where a direct contact spray type condenser is used? [8]
   b) Describe the various factors which determine the location of a steam power station. [6]

3. a) What is a semi-closed cycle gas turbine plant? Explain it with the help of a sketch of a plant. [7]
   b) Give the layout of a diesel engine power plant. Explain in detail. [7]

4. a) Explain the underground hydro-electric power station and over ground power stations. Discuss its advantages and disadvantages. [7]
   b) State the function of a dam. Briefly discuss a few important types of dams. [7]

5. a) Explain the properties of moderator used in a nuclear reactor? Explain the principle of a sodium-graphite reactor. [8]
   b) Write short notes on radio-active waste disposal in a nuclear power plant. [6]

6. a) With the help of a neat sketch, explain pumped storage plant in combination with nuclear power plant. [8]
   b) Explain the magnetic wind method for the measurement of O_2 in flue gases. [6]

7. a) Explain how NO_x emissions can be reduced in the flue gases? [7]
   b) Explain load duration curve in detail. [7]

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Code No: **R1641034** **R16** **Set No. 4**

IV B.Tech I Semester Regular/Supple Examinations, March - 2021

POWER PLANT ENGINEERING

(Mechanical Engineering)

Time: 3 hours **Max. Marks: 70**

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any FOUR questions from Part-B
*****

PART–A *(14 Marks)*

1. a) Discuss the advantages of mechanical methods of firing coal. [3]
   b) List the major components of a gas turbine power plant and give its limitations. [3]
   c) What do you understand by storage and pondage? [2]
   d) On what factors does nuclear reaction rate depends? Explain. [2]
   e) Discuss the advantages of a combined cycle power generation. [2]
   f) Define maximum demand and average load in power plant economies. [2]

PART–B *(4x14 = 56 Marks)*

2. a) Describe the various types of burners used to burn pulverised coal. [7]
   b) Name various draught systems. Describe the operation of a balanced draught system. [7]

3. a) Bring out the differences between the closed cycle and open cycle gas turbine power plants. [6]
   b) Explain the operation of a fuel pump in a diesel engine. How is the fuel supply to the engine regulated? [8]

4. a) How are dams classified? Discuss the factors considered for the selection of the site and type of the dam? [6]
   b) Explain the different ways of classifying a hydroelectric power plant. With the help of a neat sketch, explain run off river plant. [8]

5. a) What is a homogeneous reactor? Discuss with the help of neat sketch, the homogeneous aqueous reactor. [8]
   b) Discuss the various factors to be considered while selecting the site for nuclear power station. Discuss its advantages and disadvantages. [6]

6. a) With the help of a neat sketch, explain run off river plant in combination with steam plant. [8]
   b) Discuss different types of hygrometers used in power plants. [6]

7. a) Enumerate the latest pollution laws in existence in India. [6]
   b) What is the impact on the environment and human health for the effluents released from the thermal power plants? Explain how to control them. [8]

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