

Power Plant Engineering (315374)

MSBTE Diploma · K-Scheme · Mechanical Engineering, Semester 5 · Important Questions

How this list was made: Based on MSBTE papers **W-2025** and **S-2026** available on msbte.ac.in (these are the only two K-scheme papers of this course so far, so the sample is small). All 52 questions of both papers were grouped by topic. **High** = asked in both papers, **Medium** = asked in one paper, **Low** = in the K-scheme syllabus but not asked yet. With only two papers, "High" simply means "came in both". Practice guidance only — not a prediction of the exam.

Most repeated topics (asked in both papers)

#	Topic	Unit	Times asked
1	Fuel (coal) handling system – line diagram / equipment	2	3 (S-26, W-25)
2	Fluidized bed combustion (FBC) boiler – working and types	2	3 (S-26, W-25)
3	Load terms: load factor, demand factor, capacity factor, use factor, average and peak load	5	3 (S-26, W-25)
4	Types / classification of power plants	1	2 (S-26, W-25)
5	Site selection for steam power plant	1	2 (S-26, W-25)
6	Electrostatic precipitator (ESP)	2	2 (S-26, W-25)
7	Boiler feed water (three-element) control system	2	2 (S-26, W-25)
8	Components of gas turbine power plant	3	2 (S-26, W-25)
9	Closed cycle gas turbine power plant	3	2 (S-26, W-25)
10	Regulating agencies for nuclear power plants (AERB, IAEA)	4	2 (S-26, W-25)
11	BWR / PWR – working and comparison	4	2 (S-26, W-25)
12	Numerical on plant load factor / capacity factor / use factor / reserve capacity	5	2 (S-26, W-25)
13	NMEEE schemes – PAT, MTEE, EEFP, FEEED	5	2 (S-26, W-25)

Unit I – Fundamentals of Power Plant (12 M)

Question / topic	Marks	Asked in	Probability
Types / classification of power plants <ul style="list-style-type: none"> List different types of power plants. (W-25 Q.1a) Name any four types of power plant. (S-26 Q.1a) 	2 M	S-26, W-25	High
Site selection for steam power plant <ul style="list-style-type: none"> Mention the factors to be considered while selecting site for steam power plant. (W-25 Q.2a) Discuss factors considered for site selection of steam power plant. (S-26 Q.4a) 	4 M	S-26, W-25	High

Importance of power plants • State importance of power plant. (S-26 Q.2a)	4 M	S-26	Medium
Fuels used in conventional power plants • State types of fuels used in conventional power plant. (S-26 Q.1b)	2 M	S-26	Medium
World and national energy demand–supply scenario • Explain world and national scenario of demand and supply of energy in India. (S-26 Q.5a)	6 M	S-26	Medium
Indian Boiler Regulation (IBR) Act / norms • Explain Indian Boiler Regulation Act. (W-25 Q.6a)	6 M	W-25	Medium
MPCB / CPCB norms for power plants • State the MPCB norms for power plants. (W-25 Q.4a)	4 M	W-25	Medium
Fuel properties: calorific value, flash point, fire point; relative cost per kWh In syllabus, not asked yet — prepare for a surprise question.	—	Not yet	Low
Government and private power generating corporations in India In syllabus, not asked yet — prepare for a surprise question.	—	Not yet	Low

Unit II – Modern Steam Power Plant (18 M)

Question / topic	Marks	Asked in	Probability
Fuel (coal) handling system – line diagram / equipment • State any four fuel handling system used in steam power plant. (S-26 Q.1c) • Explain fuel handling system in steam power plant. (S-26 Q.2b) • Draw a neat line diagram of in-plant coal handling and indicate the components used at different stages. (W-25 Q.6b)	2 M, 4 M, 6 M	S-26, W-25	High
Fluidized bed combustion (FBC) boiler – working and types • State the types of FBC boiler. (W-25 Q.1b) • Explain with neat sketch working principle of FBC boiler. (W-25 Q.2c) • Explain with a neat sketch working principle of FBC boiler. Also state types of FBC boiler. (S-26 Q.5b)	2 M, 4 M, 6 M	S-26, W-25	High
Electrostatic precipitator (ESP) • Explain with neat sketch working of electrostatic precipitator. (W-25 Q.2b) • Describe with neat sketch electrostatic precipitators. (S-26 Q.6c)	4 M, 6 M	S-26, W-25	High
Boiler feed water (three-element) control system • Draw schematic diagram of boiler feed water control system. State its importance. (W-25 Q.5a) • Draw schematic diagram of boiler feed water control system and state its importance. (S-26 Q.4b)	4 M, 6 M	S-26, W-25	High

Objectives of feed water treatment (hardness, pH, TDS) • State the four objectives of feed water treatment in steam power plant. (W-25 Q.3a)	4 M	W-25	Medium
Functions of superheater, air preheater, economiser, feed pump • State single line function of superheater, air preheater, economizer, feed pump. (W-25 Q.3d)	4 M	W-25	Medium
Advantages and disadvantages of steam power plant • State advantage and disadvantages of steam power plant. (S-26 Q.3a)	4 M	S-26	Medium
Schematic of modern steam power plant (circuits) In syllabus, not asked yet — prepare for a surprise question.	—	Not yet	Low
Ash handling system; uses of fly ash In syllabus, not asked yet — prepare for a surprise question.	—	Not yet	Low
Coal pulverization – ball mill In syllabus, not asked yet — prepare for a surprise question.	—	Not yet	Low
Steam traps – need and types In syllabus, not asked yet — prepare for a surprise question.	—	Not yet	Low
Steam temperature control In syllabus, not asked yet — prepare for a surprise question.	—	Not yet	Low

Unit III – Gas Power Plant and Waste Heat Recovery (14 M)

Question / topic	Marks	Asked in	Probability
Components of gas turbine power plant • Name any four components of gas turbine power plant. (W-25 Q.1c) • State any four components of gas turbine power plant. (S-26 Q.1d)	2 M	S-26, W-25	High
Closed cycle gas turbine power plant • Explain with neat sketch closed cycle gas turbine power plant. (W-25 Q.3b) • Explain with neat sketch closed cycle gas turbine power plant. (S-26 Q.3b)	4 M	S-26, W-25	High
Advantages of gas turbine plant over other plants • State the four advantages of gas turbine power plant over other power plant. (W-25 Q.2d)	4 M	W-25	Medium
Applications of gas turbine power plant • State applications of gas turbine power plant. (S-26 Q.4c)	4 M	S-26	Medium
Intercooling (methods to improve efficiency of open cycle GT) • Explain with neat sketch intercooling method used to improve the thermal efficiency of open cycle gas turbine power plant. (W-25 Q.5b)	6 M	W-25	Medium
Compare gas turbine, steam turbine and hydro-electric plants	6 M	S-26	Medium

<ul style="list-style-type: none"> Compare between gas turbine, steam turbine and hydroelectric power plant. (S-26 Q.5c) 			
Need of waste heat recovery <ul style="list-style-type: none"> State the need of waste heat recovery in thermal power plants. (W-25 Q.1d) 	2 M	W-25	Medium
Co-generation – need, example (sugar industry) <ul style="list-style-type: none"> Explain need of co-generation with suitable example. (S-26 Q.2c) 	4 M	S-26	Medium
Trigeneration – definition and necessity <ul style="list-style-type: none"> Define trigeneration and discuss the necessity of it. (W-25 Q.4b) 	4 M	W-25	Medium
Open cycle GT, Brayton cycle, regeneration and reheating In syllabus, not asked yet — prepare for a surprise question.	—	Not yet	Low

Unit IV – Nuclear Power Plant (12 M)

Question / topic	Marks	Asked in	Probability
Regulating agencies for nuclear power plants (AERB, IAEA) <ul style="list-style-type: none"> Name the regulating agencies for nuclear power plant. (W-25 Q.1e) Name the regulating agencies for nuclear power plant. (S-26 Q.1f) 	2 M	S-26, W-25	High
BWR / PWR – working and comparison <ul style="list-style-type: none"> State different types of nuclear reactors. Explain the working of BWR with neat sketch. (W-25 Q.5c) Compare between BWR and PWR. (S-26 Q.4d) 	4 M, 6 M	S-26, W-25	High
General arrangement / operating principle of nuclear power plant <ul style="list-style-type: none"> Explain with neat sketch operating principle of nuclear power plant. (S-26 Q.3c) Explain with neat sketch general arrangements of nuclear power plant. (S-26 Q.6a) 	4 M, 6 M	S-26	Medium
Functions of AERB <ul style="list-style-type: none"> State the four functions of AERB. (W-25 Q.4d) 	4 M	W-25	Medium
Nuclear power plants in India with capacity <ul style="list-style-type: none"> Name any four nuclear power plant situated in India with their capacity. (W-25 Q.3c) 	4 M	W-25	Medium
Advantages and disadvantages of nuclear power plant <ul style="list-style-type: none"> State four advantages and disadvantages of nuclear power plant. (W-25 Q.4c) 	4 M	W-25	Medium
Types of nuclear fuel <ul style="list-style-type: none"> List different types of nuclear fuel. (S-26 Q.1e) 	2 M	S-26	Medium
Nuclear waste and its disposal; site selection for nuclear plant In syllabus, not asked yet — prepare for a surprise question.	—	Not yet	Low

Unit V – Recent Trends and Economic Analysis of Power Plants (14 M)

Question / topic	Marks	Asked in	Probability
Load terms: load factor, demand factor, capacity factor, use factor, average and peak load <ul style="list-style-type: none"> Define demand factor and load factor. (W-25 Q.4e) Define average load and peak load. (S-26 Q.1g) Define plant capacity factor and plant use factor. Give their mathematical expression. (S-26 Q.4e) 	2 M, 4 M	S-26, W-25	High
Numerical on plant load factor / capacity factor / use factor / reserve capacity <ul style="list-style-type: none"> Two units of 60 MW (7000 h) and one of 20 MW (3000 h), 850×10^6 kWh: plant load factor and plant use factor. (W-25 Q.6c) Max demand 30 MW, load factor 0.6, capacity factor 0.48: daily energy, reserve capacity, plant use factor. (S-26 Q.6b) 	6 M	S-26, W-25	High
NMEEE schemes – PAT, MTEE, EEFP, FEEED <ul style="list-style-type: none"> State the four schemes under NMEEE. (W-25 Q.1g) What is Perform Achieve and Trade (PAT) scheme under NMEEE. (S-26 Q.2d) 	2 M, 4 M	S-26, W-25	High
Fixed cost and running cost of power station <ul style="list-style-type: none"> Explain fixed cost and running cost of a power station. (S-26 Q.3d) 	4 M	S-26	Medium
Captive power plant – definition and benefits <ul style="list-style-type: none"> Define captive power plant. (W-25 Q.1f) 	2 M	W-25	Medium
Numerical on cost of generation per kWh; load curve In syllabus, not asked yet — prepare for a surprise question.	—	Not yet	Low

Exam tips from the two papers

- Unit II diagrams carry the most marks:** coal handling line diagram, FBC boiler, ESP and three-element feed water control together were asked 10 times. Practise drawing each one neatly with labels.
- Closed cycle gas turbine** came as the same 4-mark question in both papers; also learn the components, advantages and applications of gas turbine plants.
- Unit V numericals:** both papers had a 6-mark numerical on load factor / capacity factor / use factor / reserve capacity. Learn every definition with its formula and units (MW, MWh, kWh, 8760 h).
- Nuclear:** regulating agencies (AERB, IAEA) came in both papers as 2 marks; BWR / PWR (working or comparison) came in both. S-26 also asked the general layout of a nuclear plant twice.
- Current-affairs type questions** (NMEEE / PAT, MPCB norms, IBR, energy scenario, Indian nuclear plants) need facts — read our model answers and keep the figures up to date.
- No question on Rankine / Brayton numericals was asked (the syllabus says 'no numericals' for the Brayton cycle); our model papers use cycle diagrams only for understanding.

Note: This is a **important-question list prepared by Ananda Technologies** only for practice and exam preparation, based on the pattern of previous MSBTE question papers and the K-scheme syllabus. It is **not an official MSBTE paper**, and it does **not** mean that these questions will come in the exam. Answers follow standard textbook points; marks shown are indicative. Free for students — anandatechnologies.in

