

Electrical and Electronic Measurement (313334)

MSBTE K-Scheme · Electrical Engineering (EE) · Sem III · Important Questions

Based on MSBTE papers S-2024...S-2026 available on msbte.ac.in (papers analysed: W-24, S-25, W-25, S-26). Practice guidance only — not a prediction of the exam.

Probability: **High** = asked in 3 or 4 of the 4 papers · **Medium** = asked in 2 papers · **Low** = asked once, or in syllabus but not asked yet. Questions asked in different wording are grouped together.

Paper pattern (all 4 papers): Q1 any 5 of 7 (2 M) = 10; Q2 any 3 of 4 (4 M) = 12; Q3 any 3 of 4 (4 M) = 12; Q4 any 3 of 5 (4 M) = 12; Q5 any 2 of 3 (6 M) = 12; Q6 any 2 of 3 (6 M) = 12; total 70 marks, 3 hours.

Unit 1: Fundamentals of Measurement

Question / topic	Marks	Asked in (Q. no.)	Times	Probability
Define measurement; need / significance / importance of measurement	2	S-26 (1b), W-25 (1a), S-25 (1a), W-24 (1a)	4	High
Static characteristics - define accuracy, precision, sensitivity, resolution, dead zone, static error	2, 4	S-26 (4a), S-25 (1d), W-24 (4a)	3	High
Torques in indicating instruments - deflecting, controlling (spring / gravity), damping	2, 4	S-26 (1a), W-25 (2a), W-24 (3a)	3	High
PMMC instrument - construction and working (diagram)	4	S-26 (2a), W-24 (2a)	2	Medium
Moving iron (PMMI) instrument - construction and working (attraction / repulsion)	4	S-26 (3a), S-25 (3a)	2	Medium
Compare absolute and secondary instruments / classification of instruments	4	S-25 (2a)	1	Low
Range extension - shunt and series multiplier (use / numerical)	4	S-25 (4a)	1	Low
Types of errors in measurement and their compensation	4	W-25 (4a)	1	Low
Dynamic characteristics of measuring instruments	4	W-25 (3a)	1	Low
Range extension of AC meters by CT and PT; calibration procedure; classification of resistance (low / medium / high) (syllabus)	—	Not asked yet (syllabus)	0	Low

Unit 2: Measurement of Power and Energy

Question / topic	Marks	Asked in (Q. no.)	Times	Probability
Smart energy meter - block diagram and working	4	S-26 (2b), W-25 (2b), S-25 (4b), W-24 (3b)	4	High
Two wattmeter method - setup / proof / numerical on readings / compare with one wattmeter method	4	S-26 (3b), W-25 (4c), S-25 (3c), W-24 (2b)	4	High
Multiplying factor of wattmeter - concept / formula / numerical	2	S-26 (1c), S-25 (1b), W-24 (1b)	3	High
Dynamometer type wattmeter - construction and working	4	S-26 (4b), S-25 (3b)	2	Medium
Reactive power measurement by one wattmeter method (circuit + phasor, star / delta load)	4, 6	S-26 (5a), S-25 (4c)	2	Medium
Single phase induction type energy meter - diagram / construction / working	4	W-25 (3b), S-25 (2b)	2	Medium
Energy meter errors and compensation; energy meter error numerical (meter constant)	4	W-25 (3c), W-24 (4c)	2	Medium
Digital energy meter (single phase / three phase) - block diagram	4	W-25 (4b), W-24 (3c)	2	Medium
Maximum demand indicator - construction and working	4	W-24 (4b)	1	Low
Four quadrant meter - meaning of four quadrants	2	W-25 (1b)	1	Low
Effect of power factor on wattmeter readings in two wattmeter method; three wattmeter method (syllabus)	—	Not asked yet (syllabus)	0	Low

Unit 3: Digital Measuring Instruments

Question / topic	Marks	Asked in (Q. no.)	Times	Probability
CRO - basic block diagram and function of each block (and applications)	2, 4, 6	S-26 (5b), W-25 (5a), S-25 (2c), W-24 (1c/5a)	5	High
Digital instruments - advantages / analog vs digital instruments	2, 4	S-26 (1d), W-25 (1c), S-25 (4d), W-24 (1d)	4	High
Function generator / sine wave generator - block diagram, functions, applications	2, 4, 6	S-26 (3c), S-25 (6a), W-24 (1c/4d)	4	High

Question / topic	Marks	Asked in (Q. no.)	Times	Probability
Digital earth tester - working / procedure for earth resistance measurement	4, 6	W-25 (4d), S-25 (5a), W-24 (2c)	3	High
Synchroscope - construction and working	4, 6	S-26 (6a), W-25 (2c), W-24 (6a)	3	High
Frequency meter (Weston type)	4, 6	S-26 (4c), W-24 (6a)	2	Medium
Applications of clamp-on meter / multimeter	2	S-26 (1e), S-25 (1c)	2	Medium
Phase sequence indicator	6	W-24 (6a)	1	Low
Tachometer - advantages of non-contact type	2	W-25 (1d)	1	Low
LCR meter - working	6	W-25 (6a)	1	Low
DSO block diagram, digital megger, ohmmeter, power factor meter (syllabus)	—	Not asked yet (syllabus)	0	Low

Unit 4: Transducer and Pressure Measurement

Question / topic	Marks	Asked in (Q. no.)	Times	Probability
Define sensor / transducer with examples; differences between sensor and transducer	2, 6	S-26 (1f), W-25 (1e/6b), S-25 (1e), W-24 (1e)	5	High
LVDT - construction, working, characteristics; LVDT vs RVDT	4, 6	S-26 (4d), W-25 (2d), S-25 (5b)	3	High
Bourdon tube with LVDT as secondary transducer (pressure measurement)	4, 6	S-26 (6b), W-25 (5b), W-24 (4e)	3	High
Piezoelectric transducer - working / operation	4, 6	S-26 (2c), W-25 (4e), W-24 (5b)	3	High
Instrumentation system - block diagram and function of each block	4, 6	S-26 (3d), W-24 (6b)	2	Medium
Load cell (strain gauge type)	6	W-24 (5b)	1	Low
Selection criteria of transducer for given applications	4	S-25 (4e)	1	Low
Applications of capacitive and inductive transducers	6	S-25 (6b)	1	Low
Pressure - units, types (absolute, gauge, vacuum); classification of pressure devices; potentiometer (syllabus)	—	Not asked yet (syllabus)	0	Low

Unit 5: Flow, Level and Temperature Measurement

Question / topic	Marks	Asked in (Q. no.)	Times	Probability
Electromagnetic flow meter - working / applications	6	S-26 (5c), W-25 (5c), W-24 (5c)	3	High
Classification of flow meters / flow transducers	2, 6	S-26 (5c), W-25 (1f), W-24 (5c)	3	High
Capacitive level measurement	4	S-26 (2d), W-25 (3d), W-24 (2d)	3	High
Classification / methods of level measurement	2	S-26 (1g), W-25 (1g), S-25 (1f)	3	High
RTD - construction, working (and applications)	2, 4, 6	S-26 (6c), S-25 (1g), W-24 (3d)	3	High
Radiation type level measurement	4, 6	S-26 (4e), W-24 (6c)	2	Medium
Variable area flow meter (rotameter)	2, 6	S-25 (5c), W-24 (1g)	2	Medium
Thermocouple - principle, types J/K/R/S materials, temperature measurement	4, 6	W-25 (6c), S-25 (2d)	2	Medium
Temperature - definition and units	2, 6	S-26 (6c), W-24 (1f)	2	Medium
Selection of temperature transducer for applications (thermistor / RTD / thermocouple)	6	S-25 (6c)	1	Low
Ultrasonic vs radar level measurement	4	S-25 (3d)	1	Low
Ultrasonic flow meter	6	W-24 (6c)	1	Low

Top repeated topics (all units)

1. CRO - basic block diagram and function of each block (and applications) — in 4 of 4 papers (5 times)
2. Define sensor / transducer with examples; differences between sensor and transducer — in 4 of 4 papers (5 times)
3. Define measurement; need / significance / importance of measurement — in 4 of 4 papers (4 times)
4. Smart energy meter - block diagram and working — in 4 of 4 papers (4 times)
5. Two wattmeter method - setup / proof / numerical on readings / compare with one wattmeter method — in 4 of 4 papers (4 times)
6. Digital instruments - advantages / analog vs digital instruments — in 4 of 4 papers (4 times)

7. Function generator / sine wave generator - block diagram, functions, applications — in 3 of 4 papers (4 times)
8. Static characteristics - define accuracy, precision, sensitivity, resolution, dead zone, static error — in 3 of 4 papers (3 times)
9. Torques in indicating instruments - deflecting, controlling (spring / gravity), damping — in 3 of 4 papers (3 times)
10. Multiplying factor of wattmeter - concept / formula / numerical — in 3 of 4 papers (3 times)

How to use: prepare every High topic fully (diagram + table + example), then Medium topics. Numericals (multiplying factor, shunt / multiplier, two wattmeter readings, energy meter error, bridge balance, RTD) come with new values every time — practise the method, not the answer.

Note: This is a **important-questions 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