

Highway Engineering (313323)

Most repeated questions — MSBTE K-scheme papers S-2026, W-2025, S-2025, W-2024

How to read: **Asked in** shows the MSBTE papers where the same question came (same idea, any wording).

High = came in 3 or 4 of the 4 papers, **Medium** = 2 papers, **Low** = 1 paper. Prepare High ones first. Unit names are as per our reading of the K-scheme syllabus.

Top questions (came in all 4 papers)

1. Road alignment — define / requirements of ideal alignment / factors affecting alignment (2/4 marks)
2. Cross-section of National Highway in embankment / cutting (draw and label components) (4/6 marks)
3. Cross-section elements — define right of way, kerb, carriageway, shoulder, side slope; purpose of land width, berms etc. (2/4/6 marks)
4. Camber — define, purpose, types, factors, IRC values (2/4 marks)
5. Design speed — define, factors affecting, IRC design speeds (4/6 marks)
6. Gradient — define, types (ruling, limiting, exceptional...), IRC values, factors (2/4/6 marks)
7. Traffic signs — draw warning / mandatory / informatory signs (2/4/6 marks)
8. Landslides — define, causes, preventive measures (2/4/6 marks)

Unit I — Overview of highway engineering (transport modes, road classification, alignment)

Question / topic	Marks	Asked in	Probability
Road alignment — define / requirements of ideal alignment / factors affecting alignment	2/4	S-26, W-25, S-25, W-24 (4/4)	High
Modes of transportation — enlist / advantages and disadvantages of any one mode	2/4	S-26, S-25, W-24 (3/4)	High
Classification of roads as per Nagpur Road Plan	2/4	S-26, W-25, W-24 (3/4)	High
Classification of roads by location / by material of construction	2	S-25 (1/4)	Low
Characteristics of road transport	2	S-26 (1/4)	Low
National Highways passing through Maharashtra	2	W-25 (1/4)	Low

Unit II — Geometric design of highways (cross-section, camber, sight distance, gradient, curves)

Question / topic	Marks	Asked in	Probability
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Cross-section of National Highway in embankment / cutting (draw and label components)	4/6	S-26, W-25, S-25, W-24 (4/4)	High
Cross-section elements — define right of way, kerb, carriageway, shoulder, side slope; purpose of land width, berms etc.	2/4/6	S-26, W-25, S-25, W-24 (4/4)	High
Camber — define, purpose, types, factors, IRC values	2/4	S-26, W-25, S-25, W-24 (4/4)	High
Design speed — define, factors affecting, IRC design speeds	4/6	S-26, W-25, S-25, W-24 (4/4)	High
Gradient — define, types (ruling, limiting, exceptional...), IRC values, factors	2/4/6	S-26, W-25, S-25, W-24 (4/4)	High
Super-elevation — define / explain with sketch	2/4	W-25, S-25, W-24 (3/4)	High
Curves — advantages, horizontal, vertical (summit / valley), transition curve	6	W-25, S-25, W-24 (3/4)	High
Super-elevation numerical (design e / friction for given V, R)	6	S-26, W-24 (2/4)	Medium
Stopping sight distance numerical (with reaction time, brake efficiency)	4/6	S-26, W-24 (2/4)	Medium
Sight distance / SSD — define	2	W-25, W-24 (2/4)	Medium
Overtaking sight distance — explain with neat sketch	4/6	W-25, S-25 (2/4)	Medium
Objectives of geometric design of highways	4	S-26 (1/4)	Low

Unit III — Pavement materials and construction (flexible, rigid, WBM, CC roads)

Question / topic	Marks	Asked in	Probability
Flexible vs rigid pavement (differentiate, 4–8 points)	4	S-26, W-25, W-24 (3/4)	High
Construction of CC road — alternate bay / continuous bay method	4/6	W-25, S-25, W-24 (3/4)	High
Joints in CC pavement — expansion, contraction, warping, construction, longitudinal, dowel bar	4/6	S-25, W-24 (2/4)	Medium
Construction procedure of WBM road	6	S-26, S-25 (2/4)	Medium
Cross-section / component layers of flexible pavement (wearing, base, sub-base, subgrade)	4	S-25, W-24 (2/4)	Medium
Pavement materials / properties of bitumen / tests on bitumen (softening point, extraction)	2/4	S-26, W-25 (2/4)	Medium
Subgrade soil — desirable properties; CBR test with sketch	2/4	S-26 (1/4)	Low

Situations where flexible pavement is adopted	6	S-25 (1/4)	Low
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Unit IV — Traffic engineering (traffic studies, signs, islands, intersections)

Question / topic	Marks	Asked in	Probability
Traffic signs — draw warning / mandatory / informative signs	2/4/6	S-26, W-25, S-25, W-24 (4/4)	High
Passenger Car Unit (PCU) — define	2	S-26, W-24 (2/4)	Medium
Traffic volume study — define, purpose, types	2/4	W-25, S-25 (2/4)	Medium
Traffic islands / rotary island — types, explain with sketch	4/6	S-25, W-24 (2/4)	Medium
Clover leaf intersection with traffic movement	6	W-25 (1/4)	Low
Traffic control devices and their use	4	S-26 (1/4)	Low

Unit V — Hill roads, drainage and highway maintenance

Question / topic	Marks	Asked in	Probability
Landslides — define, causes, preventive measures	2/4/6	S-26, W-25, S-25, W-24 (4/4)	High
Hill road — cross-section and components (breast, parapet, retaining wall, catch water drain)	2/4/6	S-26, W-25, W-24 (3/4)	High
Highway maintenance — necessity / reasons	2/4	S-26, S-25, W-24 (3/4)	High
Failures of flexible pavement (causes, with sketch)	4	W-25, W-24 (2/4)	Medium
Failures of rigid pavement	4	S-26, S-25 (2/4)	Medium
Repair of potholes / remedial measures for ruts	4	W-25, W-24 (2/4)	Medium
Surface drainage — define, cross-section, drain with grating	2/4	S-26, S-25 (2/4)	Medium
Subsurface drainage with sketch	4	W-25, W-24 (2/4)	Medium
Requirements of a good highway drainage system	4	S-26 (1/4)	Low

Also in syllabus but not yet asked (prepare briefly): extra widening on curves (formula and numerical), parabolic camber ordinates, PCU numerical, penetration and ductility test of bitumen, traffic signals and road markings, construction of bituminous surfaces.

Note: Based on MSBTE papers S-2024...S-2026 available on msbte.ac.in (K-scheme papers found: W-2024, S-2025, W-2025, S-2026). Practice guidance only — not a prediction of the exam. Prepared by Ananda Technologies; not an official MSBTE document. Study the full syllabus. Free for students — anandatechnologies.in