

Seat No.

SET-B Total No. of Pages:6

M.Phil./Ph.D. Entrance Examination, 2025

Civil Engineering

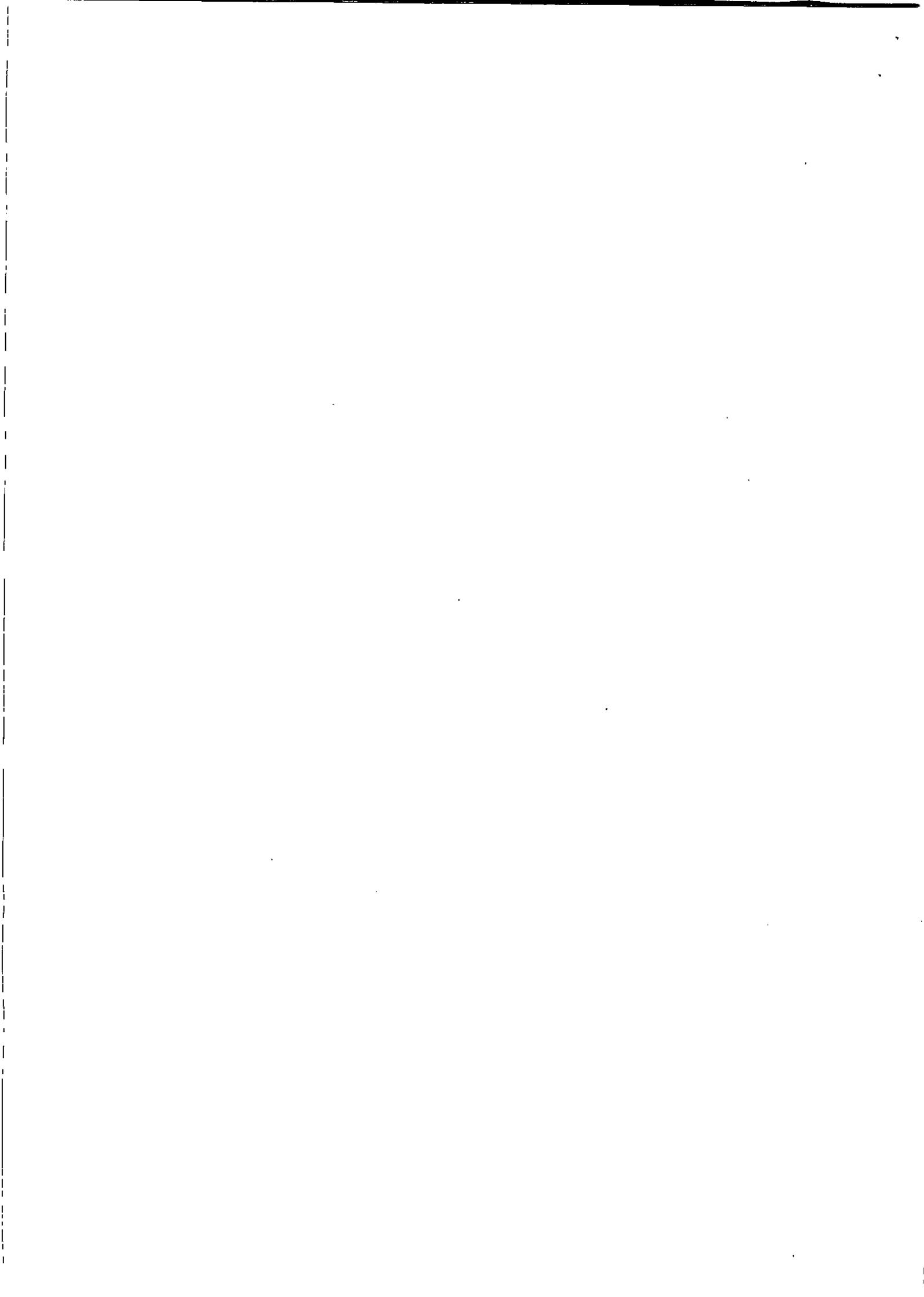
Day and Date:

Total Marks: 100

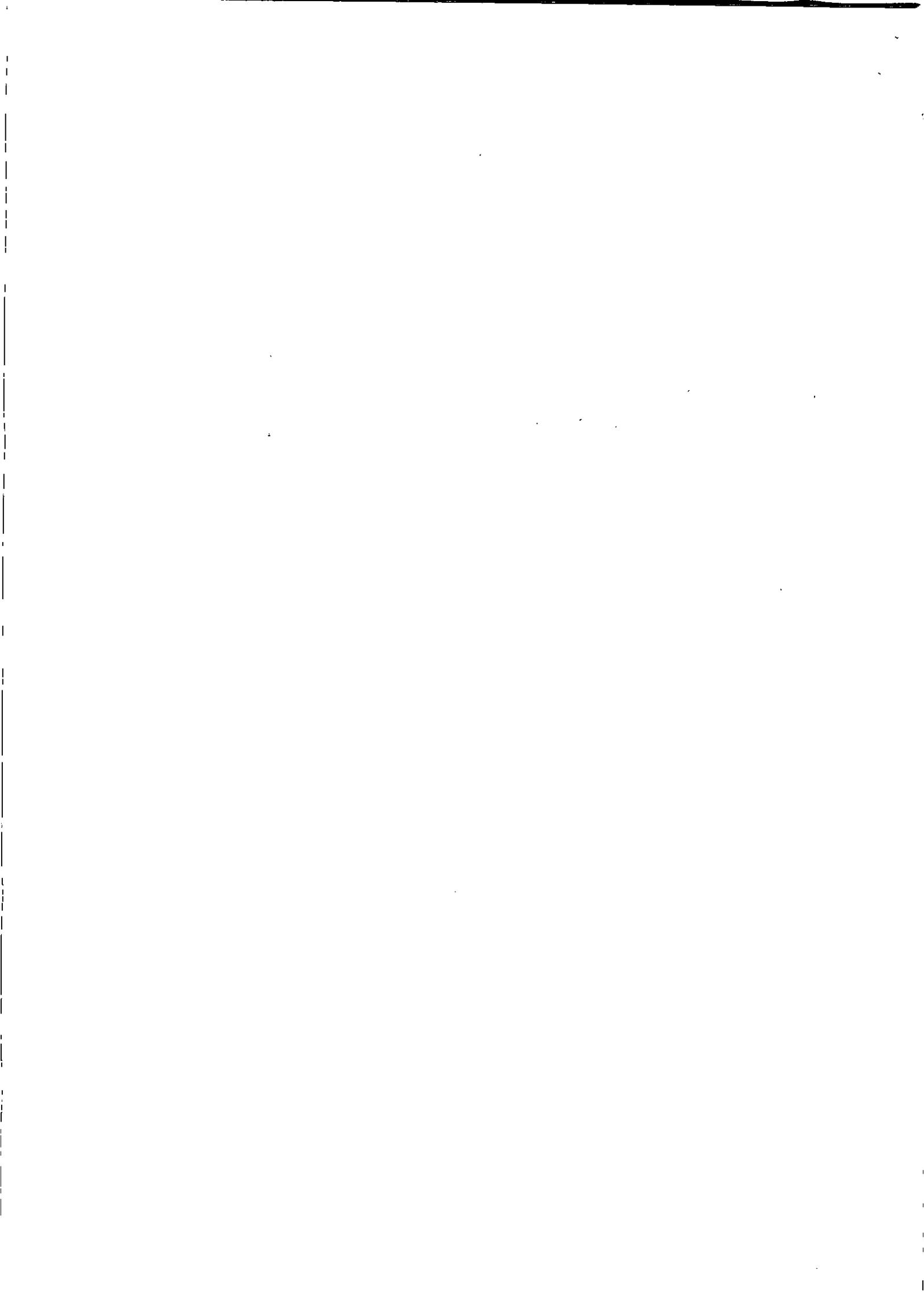
Time:

*Instructions: i) All questions are compulsory**ii) Each question carries 2 marks**iii) Write the correct option in the box at right**iv) Use of non-programmable calculator is allowed*

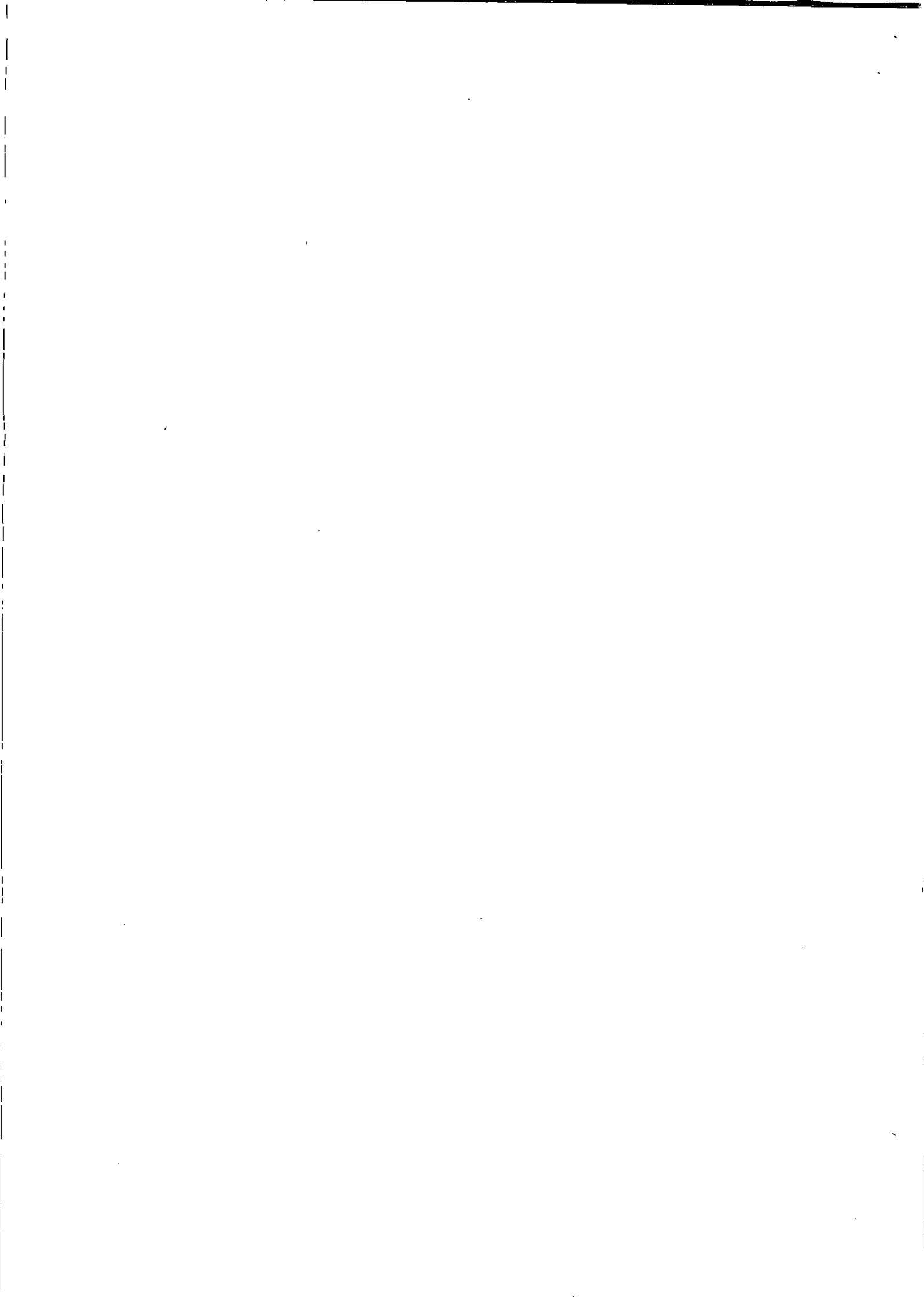
		Correct Option
Q. 1)	The probability of rejecting a true null hypothesis is known as:	
	A) Type I error	B) Type II error
	C) Power	D) Sensitivity
Q. 2)	The primary purpose of a pilot study is to:	
	A) Test hypotheses	B) Refine tools and procedures
	C) Analyze large datasets	D) Conduct inferential statistics
Q.3)	A research instrument that accurately measures the theoretical construct it intends to measure demonstrates	
	A) Criterion validity	B) Internal consistency
	C) Construct validity	D) Content validity
Q. 4)	Latent variables are:	
	A) Directly observed	B) Impossible to measure
	C) Measured using indicators	D) Exogenous variables only
Q.5)	In research, <i>parsimony</i> refers to:	
	A) Minimizing sample size	B) Preferring the simplest adequate explanation
	C) . Using multiple variables	D) Eliminating confounding factors
Q. 7)	In quantitative research, multicollinearity refers to:	
	A) High correlation among independent variables	B) High correlation among dependent variables
	C) Low reliability of instruments	D) Heteroscedasticity in residuals
Q.8)	When the sample statistics systematically differ from population parameters, it is known as:	
	A) Sampling error	B) Sampling bias
	C) Measurement error	D) Type II error
Q. 9)	In research ethics, <i>beneficence</i> primarily means:	
	A) Minimizing risks and maximizing benefits	B) Ensuring equal selection of participants
	C) Maintaining anonymity	D) Providing incentives



Q.10)	Which type of research focuses on exploring and understanding a phenomenon in depth?		C
	A) Experimental research	B) Quantitative research	
	C) Qualitative research	D) Descriptive research	
Q. 11)	Which of the following is a feature of a good hypothesis?		C
	A) Diffuse	B) Highly abstract	
	C) Specific	D) Unverifiable	
Q.12)	Closed-ended questions are those which:		B
	A) Allow respondents to answer freely	B) Require fixed answer choices	
	C) Do not have options	D) Vary randomly for each participant	
Q. 13)	To improve the validity of research, a researcher should:		A
	A) Take a representative sample	B) Ignore extraneous factors	
	C) Use only qualitative data	D) Avoid literature review	
Q.14)	Which technique helps in delimiting the research scope and prevents wandering?		B
	A) Data collection	B) Research design	
	C) Literature review	D) Hypothesis testing	
Q. 15)	A research report is a formal statement of:		A
	A) Research process	B) Hypothesis formulation only	
	C) Literature review	D) Sampling technique	
Q.16)	Which of the following describes an abstract concept that can be measured?		B
	A) Sample	B) Variable	
	C) Hypothesis	D) Theory	
Q. 17)	Which of the following enhances external validity in experiments?		A
	A) Proper randomization	B) Control group only	
	C) Use of biased instruments	D) No sampling design	
Q.18)	A bibliography in a research report helps:		B
	A) Demonstrate researcher's knowledge	B) Support further research	
	C) Increase report length	D) Improve formatting	
Q. 19)	What type of research aims at establishing cause-effect relationships?		C
	A) Correlational	B) Descriptive	
	C) Experimental	D) Exploratory	
Q.20)	Why is research design important?		C
	A) Ensures ethics	B) Increases sample size only	
	C) Ensures validity and reliability	D) Guarantees findings will be published	
Q. 21)	Correlation research primarily investigates:		B
	A) Cause and effect	B) Relationships between variables	
	C) Sampling errors	D) Research design choice	
Q.22)	A hypothesis that states no difference or effect is called:		B



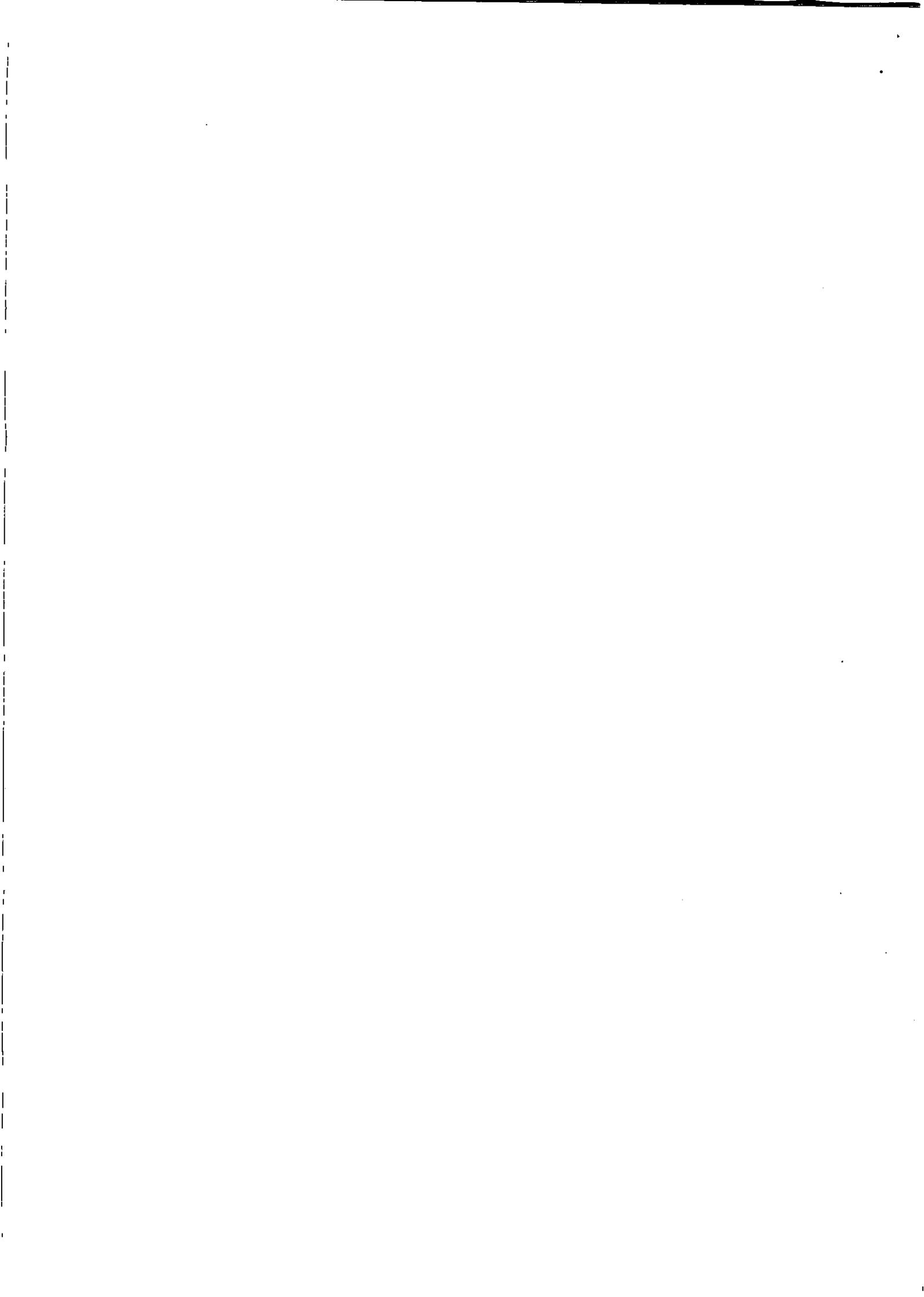
	A) Directional hypothesis	B) Null hypothesis	
	C) Research question	D) Alternative hypothesis	
Q. 23)	Operational definition in research helps to:		B
	A) Theorize constructs	B) Define variables in measurable terms	
	C) Write conclusions only	D) Ignore literature	
Q.24)	Cognitive pretesting in survey research is used to:		B
	A) Test hypotheses statistically	B) Evaluate questionnaire quality before full survey	
	C) Replace pilot studies	D) Analyze final results	
Q. 25)	In qualitative research, "member checking" is used to ensure:		C
	A) Internal validity	B) External validity	
	C) Credibility	D) Reliability	
Q.26)	Loss of prestress due to elastic shortening is		B
	A) Independent of tendon profile	B) Greater in post-tensioned members	
	C) Greater in pre-tensioned members	D) Zero in statically determinate structures	
Q. 27)	The strain energy stored in a bar under axial load is proportional to		C
	A) load	B) length	
	C) square of load	D) inverse of area	
Q.28)	In a thin cylindrical pressure vessel, hoop stress is		C
	A) half of longitudinal stress	B) equal to longitudinal stress	
	C) twice longitudinal stress	D) four times longitudinal stress	
Q. 29)	In the moment distribution method, distribution factors depend on		D
	A) span length only	B) flexural rigidity only	
	C) support condition only	D) relative stiffness	
Q.30)	Effective stress principle is strictly valid for		A
	A) saturated soil	B) dry soil	
	C) partially saturated soil	D) cohesive soil only	
Q. 31)	Terzaghi's bearing capacity theory assumes		A
	A) general shear failure	B) local shear failure	
	C) punching shear failure	D) slope failure	



Q.32)	Reynolds number represents the ratio of		B
	A) inertia to gravity forces	B) inertia to viscous forces	
	C) viscous to surface tension forces	D) pressure to inertia forces	
Q. 33)	In laminar flow through a circular pipe, maximum velocity is		B
	A) equal to average velocity	B) twice average velocity	
	C) half average velocity	D) three times average velocity	
Q.34)	In activated sludge process, sludge age primarily affects		D
	A) oxygen transfer	B) MLSS concentration	
	C) effluent quality	D) both B and C	
Q. 35)	In sedimentation, overflow rate is independent of		C
	A) particle size	B) settling velocity	
	C) tank depth	D) flow rate	
Q.36)	Super elevation is primarily provided to counteract		C
	A) rolling resistance	B) tractive effort	
	C) centrifugal force	D) wind load	
Q. 37)	In signal design, Webster's method minimizes		B
	A) queue length	B) delay	
	C) fuel consumption	D) accidents	
Q.38)	Critical path in a network represents		C
	A) minimum cost path	B) maximum float path	
	C) longest duration path	D) least risky path	
Q. 39)	The angle of repose is maximum for		A
	A) Clay	B) Silt	
	C) Sand	D) Gravel	
Q.40)	Bernoulli's equation is based on the law of		A



	A) Energy conservation	B) Momentum conservation	
	C) Mass conservation	D) Thermodynamics	
Q. 41)	Which bacteria are used in secondary wastewater treatment?		C
	A) Pathogenic	B) Anaerobic only	
	C) Aerobic	D) Facultative only	
Q.42)	Breakpoint chlorination occurs when		D
	A) All ammonia is oxidized	B) Free chlorine appears	
	C) Chlorine demand is satisfied	D) All of the above	
Q. 43)	The design speed of a highway mainly depends on		B
	A) Traffic volume	B) Road classification	
	C) Axle load	D) Pavement thickness	
Q. 44)	Temporary adjustments of a theodolite include		A
	A) Centering, leveling, focusing	B) Ranging, chaining	
	C) Traversing	D) Contouring	
Q. 45)	PERT analysis is most suitable for		B
	A) Repetitive projects	B) Uncertain time estimates	
	C) Small projects	D) Linear projects	
Q. 46)	The S-curve in project management represents		B
	A) Labor productivity	B) Cash flow	
	C) Resource leveling	D) Network logic	
Q. 47)	A benchmark whose elevation is known with respect to mean sea level is		A
	A) GTS benchmark	B) Arbitrary benchmark	
	C) Temporary benchmark	D) Permanent benchmark	
Q. 48)	In a simply supported beam carrying a central point load, the maximum bending moment occurs at:		C



	A) One-fourth span	B) One-third span	
	C) Mid-span	D) Support	
Q. 49)	The slenderness ratio of a compression member is defined as:		B
	A) Length / area	B) Effective length / least radius of gyration	
	C) Load / area	D) Stress / strain	
Q. 50)	Critical flow in an open channel occurs when:		C
	A) Velocity is maximum	B) Depth is minimum	
	C) Specific energy is minimum	D) Discharge is maximum	

