ENGLISH MEDIUM — COMPLETE NOTES • eBook

UGC NET

NET | JRF | SET

PAPER 1

GENERAL PAPER • COMPULSORY

Teaching & Research Aptitude

Complete Notes for All 10 Units

As per the latest NTA syllabus

1. Teaching Aptitude
2. Research Aptitude
3. Comprehension
4. Communication
5. Mathematical Reasoning
6. Logical Reasoning
7. Data Interpretation
8. ICT
9. People, Development & Environment
10. Higher Education System

- Mind Map for Every Unit
- Tables, Charts & Flowcharts
- Practice MCQs with Explanations
- Exam-Oriented Revision Notes

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About This eBook

This eBook gives complete, exam-focused notes for **Paper 1 (General Paper on Teaching & Research Aptitude)** of the **NTA UGC NET / JRF** examination. The same General Paper pattern is followed in the State Eligibility Tests (**SET / SLET**), so the notes are useful for all three. Every one of the 10 syllabus units is covered in simple English with tables, diagrams, mind maps and practice questions.

Paper 1 at a Glance

Feature	Details
Questions	50 questions, all compulsory
Marks	100 marks (2 marks per question)
Duration	1 hour; Paper 1 and Paper 2 are held together in one 3-hour session
Mode	Computer-based test (CBT), objective multiple-choice questions
Negative marking	None
Syllabus	10 units; usually 5 questions are asked from each unit

What You Will Find in Every Unit

- **Syllabus structure** of the unit and how many questions are usually asked.
- **Concept notes** in short points, with tables, flowcharts and diagrams for quick revision.
- **Mind map** of the whole unit for last-minute recall.
- **Practice MCQs** in the UGC NET pattern, including multi-statement, assertion–reason and matching types, each with an explanation of the answer.
- **Full-length mock test** at the end: 50 questions (5 from each unit), an answer key with short explanations, and a self-evaluation table.

How to Use These Notes

1. Read one unit at a time and revise its mind map the same day.
2. Attempt the practice questions only after finishing the notes, and read every explanation, even for answers you got right.
3. Revise the tables and the “Quick Revision” pages again in the last week before the exam.

Use the Contents on the next pages to jump straight to any topic by its page number.

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Unit 1 : Teaching Aptitude

UGC NET Paper 1 • Usually 5 questions (10 marks) are asked from this unit

Syllabus Structure of this Unit (6 Parts)

- **Teaching:** concept, objectives, levels of teaching (memory, understanding and reflective), characteristics and basic requirements
- **Learner's characteristics:** characteristics of adolescent and adult learners (academic, social, emotional and cognitive); individual differences
- **Factors affecting teaching:** teacher, learner, support material, instructional facilities, learning environment and institution
- **Methods of teaching in institutions of higher learning:** teacher-centred vs. learner-centred methods; offline vs. online methods (SWAYAM, SWAYAM Prabha, MOOCs etc.)
- **Teaching support system:** traditional, modern and ICT-based
- **Evaluation systems:** elements and types of evaluation, evaluation in Choice Based Credit System in higher education, computer based testing, innovations in evaluation systems

1.1 Teaching : Meaning, Concept and Definitions

Teaching is a purposeful and well-planned process in which, through interaction among the teacher, the learner and the content, an effort is made to bring about desirable changes in the knowledge, skills, attitudes and values of the learner. The ultimate aim of teaching is not merely to give information but to make **learning** possible.

Basic Formula

Teaching = interaction of Teacher + Learner + Content → Result : **Learning**

Teaching is the means; learning is the end. Learning is possible even without teaching (self-study, experience), but teaching is considered effective only when learning takes place.

Definitions by Eminent Thinkers

Thinker	Essence of the Definition
H. C. Morrison	Teaching is an intimate contact between a more mature personality and a less mature one, designed to further the education of the latter.
W. H. Burton	Teaching is the stimulation, guidance, direction and encouragement of learning.
John Brubacher	Teaching is an arrangement and manipulation of a situation in which there are gaps and obstructions which an individual seeks to overcome, and from which he learns in the course of doing so.
N. L. Gage	Teaching is a form of interpersonal influence aimed at changing the behaviour potential of another person.
B. O. Smith	Teaching is a system of actions intended to induce learning.
Edmund Amidon	Teaching is an interactive process, primarily involving classroom talk between teacher and pupil.

The definitions are given in their essence; the exam usually asks you to match the thinker with the definition, not the exact wording.

Nature and Characteristics of Teaching

- **Purposeful process:** every act of teaching has a clear objective behind it.
- **Interactive:** there is two-way communication between the teacher and the learner.
- **Tri-polar:** the teacher, the learner and the curriculum/content are all equally important.
- **Both an art and a science:** a science because it rests on principles and evidence, and an art because of creativity and presentation skills.
- **Communication-based:** successful communication is the foundation of effective teaching.
- **Formal and informal:** formal in schools/colleges; informal in the family and society.
- **Diagnostic and remedial:** identifying difficulties and resolving them is a part of teaching.
- **Continuous and developmental:** a process that changes according to the needs and context of the learner.

Teaching, Instruction, Training, Conditioning and Indoctrination

Concept	Nature	Key Points
Teaching	Broad	Development of knowledge, skills, attitudes and values; teacher-learner interaction; encourages thinking.
Instruction	Relatively narrow, well-structured	Systematic presentation of material as per pre-determined objectives; emphasis mainly on the cognitive aspect.
Training	Skill-centred	Practice of practical skills for a task or profession; emphasis on performance.
Conditioning	Mechanical / involuntary	Behaviour is shaped through stimulus–response bonds; the role of thinking is minimal.
Indoctrination	One-way	Imposing ideas/beliefs without questioning or examination; contrary to the spirit of teaching.

Phases of Teaching (Philip Jackson, 1968)

Philip W. Jackson, in his book **Life in Classrooms (1968)**, divided teaching into three phases. This classification is very frequently asked in the exam.

Pre-active Planning → **Interactive** Classroom teaching → **Post-active** Evaluation

Phase	What happens?
Pre-active	Setting objectives, selecting content, deciding the method and teaching aids, preparing the lesson plan — all preparation before entering the classroom.
Interactive	Actual teaching in the classroom: presentation, questioning, motivation, feedback and classroom management.
Post-active	Evaluation, analysis of results, remedial teaching and improvement in the next plan.

1.2 Objectives of Teaching

Objectives determine the direction, method and evaluation of teaching. Objectives operate at two levels: **general objectives** (broad aims of education) and **specific/instructional objectives** (for a lesson or unit, stated in behavioural terms). The main objectives of teaching in higher education are:

- acquiring knowledge and developing its understanding;
- enhancing the ability of analysis, critical thinking and problem-solving;
- developing a research aptitude, curiosity and creativity;
- building professional/life skills and communication skills;
- developing values, ethics, social responsibility and democratic attitudes;
- building the habit of lifelong and autonomous learning.

Behavioural Objectives (Robert Mager, 1962)

According to Mager, a good instructional objective has three components: **Performance** — what the learner will do; **Condition** — under what conditions; **Criterion** — what level of success will be acceptable.

Example: "Without looking at the book (condition), the student will prepare a comparison table of the three levels of teaching (performance), in which at least 80% of the points are correct (criterion)."

Bloom's Taxonomy of Educational Objectives

Benjamin Bloom and his associates divided objectives into three **domains**. The original taxonomy of the cognitive domain was published in **1956**.

Domain	Related Aspect	Classified by	Levels (Lower → Higher)
Cognitive	Knowledge, intellect, thinking	Bloom and associates (1956)	Knowledge → Comprehension → Application → Analysis → Synthesis → Evaluation
Affective	Interests, attitudes, values	Krathwohl, Bloom, Masia (1964)	Receiving → Responding → Valuing → Organisation → Characterisation by a value
Psychomotor	Physical skills, action	Simpson (1972); Dave (1970); Harrow (1972)	Simpson: Perception → Set → Guided Response → Mechanism → Complex Overt Response → Adaptation → Origination

Revised Bloom's Taxonomy (Anderson and Krathwohl, 2001)

In 2001, Lorin Anderson and David Krathwohl revised the cognitive domain: the names of the levels were changed from nouns to verbs, **"Synthesis" was replaced by "Create"**, and Create became the highest level. Four dimensions of knowledge were also added — **factual, conceptual, procedural and metacognitive**.

Create — designing, constructing
Evaluate — judging, justifying
Analyze — breaking into parts, finding relationships
Apply — using in a new situation
Understand — explaining, summarising
Remember — recalling facts

Original (1956)	Revised (2001)	Suitable Action Verbs (Examples)
Knowledge	Remember	define, list, name
Comprehension	Understand	explain, summarise, give examples
Application	Apply	solve, use, demonstrate
Analysis	Analyze	compare, classify, differentiate
Synthesis	Create	design, compose, plan
Evaluation	Evaluate	criticise, justify, judge

Exam Point

In the revised taxonomy the highest level = **Create**; in the original taxonomy the highest level = **Evaluation**. This difference is asked most often.

Dave's (1970) psychomotor levels (lower to higher): Imitation → Manipulation → Precision → Articulation → Naturalisation

1.3 Levels of Teaching

The level of teaching is determined by the kind of cognitive expectation placed on the learner. The three levels popular in Indian education literature and given in the UGC NET syllabus are:

Memory Level (Herbart) → **Understanding Level** (Morrison) → **Reflective Level** (Hunt)

Basis	Memory Level	Understanding Level	Reflective Level
Proponent	Herbart	Morrison	Hunt
Objective	Memorisation and recall of facts; collection of information	Understanding of relationships among facts, principles and generalisations	Development of problem-solving, critical and creative thinking
Order of teaching	Lowest level	Higher than memory level; includes it	Highest; includes both memory and understanding
Centre	Teacher-centred; learner passive	Both teacher and learner active	Learner-centred; teacher as guide
Main steps	Herbart's five steps: preparation, presentation, comparison (association), generalisation, application	Morrison's five steps: exploration, presentation, assimilation, organisation, recitation	Feeling the problem → defining the problem → hypothesis → testing → conclusion
Usual method	Lecture, rote learning, drill	Discussion, question-answer, unit teaching	Problem-solving, project, inquiry, research-based
Evaluation	Memory-based / objective tests	Essay, short-answer and understanding-based tests	Essay, project, open-ended questions, research work

Morrison's Mastery Formula

Pre-test → Teach → Test the result → Adapt the procedure → Teach and test again, until actual learning takes place.

Remember

- Order: Memory (lowest) < Understanding < Reflective (highest).
- Teaching at the reflective level is the most demanding in effort and time, but it is the goal of higher education.
- Broad comparison: memory level ≈ Bloom's "Remember"; understanding level ≈ "Understand/Apply"; reflective level ≈ "Analyze/Evaluate/Create".

1.4 Characteristics and Basic Requirements of Teaching

Requirements of Effective Teaching

4. **Clarity of objectives:** the teacher should know clearly what the learner will be able to do at the end of the lesson.
5. **Mastery of content:** deep, up-to-date and contextual knowledge of the subject.
6. **Understanding the learner:** knowledge of prior knowledge, interests, abilities and learning style.
7. **Suitable method and material:** teaching method and aids suited to the objective, subject and learner.
8. **Communication skills:** clarity of language, examples, the art of questioning, active listening.
9. **Motivation:** arousing interest, giving encouragement, providing experiences of success.
10. **Favourable environment:** a fear-free, democratic and participatory classroom.
11. **Feedback and evaluation:** continuous evaluation and timely, constructive feedback.

Maxims of Teaching

Maxim	Meaning	Example
From known to unknown	From prior knowledge to new knowledge	From the map of India to the world map
From simple to complex	Gradually increasing the level of difficulty	Addition, then multiplication, then algebra
From concrete to abstract	From objects/pictures to concepts	From a ball to the concept of a "sphere"
From whole to detail (general outline to finer points)	From the general outline to the details	First a general introduction to the plant, then cell structure
From particular to general	Inductive method: from examples to the rule	From examples of many metals expanding on heating to "metals expand on heating"
From whole to part	First the whole topic, then its parts	First the central idea of a whole poem, then analysis of its lines
From seen to unseen (direct to indirect)	From what can be experienced to inference	From present events to history

Maxim	Meaning	Example
From psychological to logical order	From the learner's interest and mental level to the logic of the subject	Starting with a question of interest and moving to the theory
From analysis to synthesis	Understanding the parts and constructing the whole	From sentence analysis to composition skills
From indefinite to definite	From a vague idea to a clear concept	From common experience to a scientific definition

Qualities of an Effective Teacher (in brief)

- **Academic:** subject knowledge, knowledge of pedagogy, research aptitude.
- **Professional:** punctuality, ethical conduct, continuous professional development.
- **Personal:** patience, empathy, impartiality, a positive outlook, self-control.
- **Communicative:** clear speech, active listening, the art of questioning and giving feedback.
- **Technical:** competence in using ICT and digital tools.

1.5 Learner's Characteristics

Knowing the learner is essential for effective teaching. In higher education we mainly meet **adolescent** learners (about 12–19 years; 10–19 years in some contexts) and **adult** learners. The syllabus expects these to be discussed from four aspects: **academic, social, emotional and cognitive**.

(A) Adolescent Learners

Adolescence — Main Views

- **Stanley Hall:** adolescence is a period of **"Storm and Stress"**.
- **Erikson:** the psychosocial crisis of this stage — **Identity vs Role Confusion**.
- **Piaget:** formal operational stage (after about 11–12 years): abstract, logical and hypothetical thinking.
- **David Elkind:** adolescent egocentrism — **"Imaginary Audience" and "Personal Fable"**.

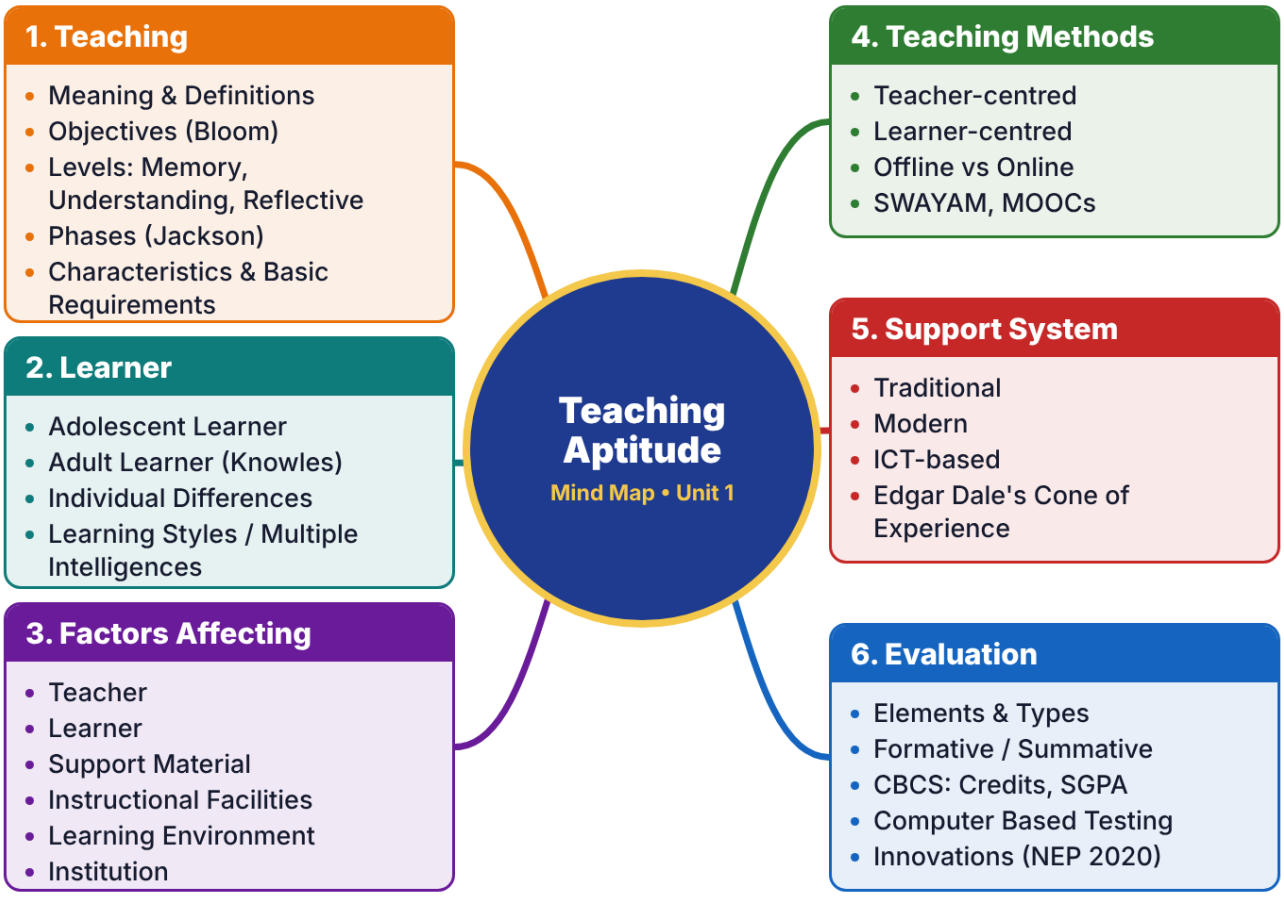
Aspect	Characteristics of the Adolescent Learner	Implications for Teaching
Academic	Differentiation of interests; anxiety about career and exams; growing capacity for independent study, but also distraction (especially digital).	Career guidance, offering choices, short-term goals, teaching study skills.
Social	Strong influence of the peer group; desire for independence; disagreements with parents/authorities; search for identity and acceptance.	Group work, collaborative learning, positive role models, respectful dialogue.
Emotional	Emotional instability, intense emotions, self-consciousness, anxiety, stress; struggle for self-identity.	Counselling, a safe and empathetic classroom, emphasis on emotion management.
Cognitive	Abstract and logical thinking; forming hypotheses; critical questioning; but impatience and egocentrism in decisions.	Problem-solving, discussion, projects, discovery-based learning.

Innovation	Characteristic
On-demand/online examination	Exam as per the learner's readiness; e-assessment.
Rubric-based evaluation	Transparent scoring with clear criteria and levels.
e-Portfolio	Digital collection of the learner's work; a long-term picture of progress.
Self and peer assessment	Promotes self-reflection and collaborative learning.
On-Screen Marking (OSM)	Digital marking of scanned answer books.
Learning analytics	Identifying weak areas through data-based analysis.
Plagiarism-detection software	Checking the originality of research work/assignments.

Direction of NEP 2020

- A shift away from rote learning and high-stakes exams towards competency-based, regular formative assessment.
- **PARAKH** (Performance Assessment, Review and Analysis of Knowledge for Holistic Development) — set up on **8 February 2023** as an independent unit under **NCERT**; it sets norms for assessment, develops the 360° **Holistic Progress Card (HPC)** and conducts large surveys like NAS.
- In higher education: ABC, NCrF and multiple entry/multiple exit.

1.14 Quick Revision : Mind Map



Quick Recall Table (Name — Concept)

Thinker	Associated Concept	Thinker	Associated Concept
Herbart	Memory level; five steps	Kilpatrick	Project method
Morrison	Understanding level; mastery formula	Armstrong	Heuristic method
Hunt	Reflective level	John Dewey	Steps of problem-solving
Philip Jackson	Three phases of teaching	Alex Osborn	Brainstorming
Bloom (1956)	Taxonomy of objectives	Skinner / Crowder	Linear / branching programmed instruction
Anderson–Krathwohl (2001)	Revised Bloom; highest: Create	Dwight Allen	Microteaching (1963)
Krathwohl, Bloom, Masia	Affective domain (1964)	Gagné	Nine events of instruction
Simpson / Dave / Harrow	Psychomotor domain	Edgar Dale	Cone of Experience (1946)
Robert Mager	Behavioural objectives (1962)	Flanders	FIAC — 10 categories
Malcolm Knowles	Andragogy	Michael Scriven	Formative/summative (1967)
Howard Gardner	Multiple intelligences (1983)	Robert Glaser	Criterion-referenced (1963)
David Kolb	Experiential learning cycle	Stanley Hall	Adolescence — storm and stress

1.15 Practice Questions (Based on PYQ Pattern)

These practice questions have been prepared keeping in mind the pattern and level of previous years' UGC NET questions. Do compare them with NTA's official previous-year papers before the exam.

Q.1 Who is regarded as the proponent of the 'memory level' of teaching?

(A) Morrison
(B) Herbart
(C) Hunt
(D) Bruner

Answer: (B) — Memory level — Herbart; understanding level — Morrison; reflective level — Hunt.

Q.2 In the revised Bloom's taxonomy (2001), which is the highest level of the cognitive domain?

(A) Evaluate
(B) Analyze
(C) Create
(D) Apply

Answer: (C) — In the revision, 'Synthesis' was replaced by 'Create', which became the top level.

Unit 2 : Research Aptitude

UGC NET Paper 1 • Usually 5 questions are asked from this unit

Exam Focus

Types of research, steps, hypothesis, sampling, variables, research tools, basic concepts of statistics, research ethics and writing of research papers/theses are asked most often.

2.1 Research : Meaning, Definitions and Characteristics

Research is a systematic, objective and controlled process of inquiry carried out to solve a problem or to discover new knowledge. The English word **Research = Re (again) + Search (to look for)** — a repeated, careful search.

Thinker	Definition / Statement of Research
Redman and Mory	Research is a systematised effort to gain new knowledge.
John W. Best	Research is the systematic and objective analysis and recording of controlled observations that may lead to valid conclusions about a problem.
Clifford Woody	Research comprises defining problems, formulating hypotheses, collecting, organising and evaluating data, and testing conclusions.
Fred Kerlinger	Research is a systematic, controlled, empirical and critical investigation of hypothetical propositions about the presumed relations among natural phenomena.
Creswell	Research is a process of posing questions, collecting data and interpreting them in order to increase understanding of a topic.

Characteristics of Research

- **Systematic** — planned work carried out in pre-determined steps.
- **Objective** — verifiable facts free from the researcher's bias.
- **Empirical** — based on evidence from observation and experience.
- **Controlled** — control of extraneous/interfering variables.
- **Replicable** — other researchers can obtain the same results by following the same procedure.
- **Generalisable** — conclusions can be applied to similar situations.
- **Theoretical base and logical** — research without theory is directionless.

Research vs. Ordinary Inquiry

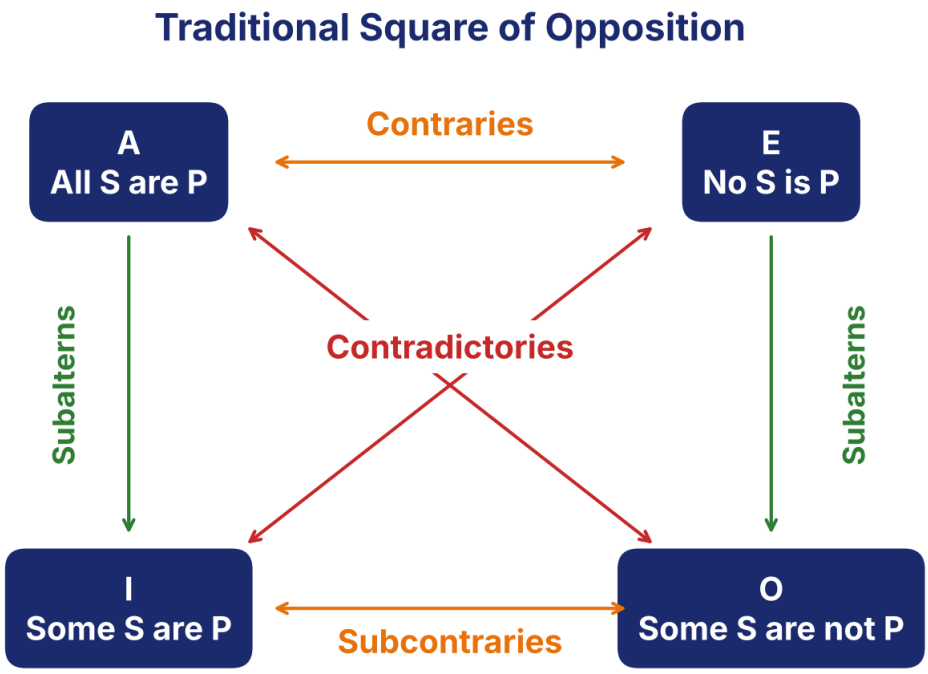
Ordinary search = unsystematic, based on personal experience. **Research** = well-planned, tool-based, evidence-backed and publishable/testable.

Objectives of Research

Description (What is it?) → **Explanation** (Why is it?) → **Prediction** (What will happen?) → **Control** (How to change it?)

The objectives of research are generally taken as **exploration, description, explanation, prediction** and **control/improvement**.

Traditional Square of Opposition

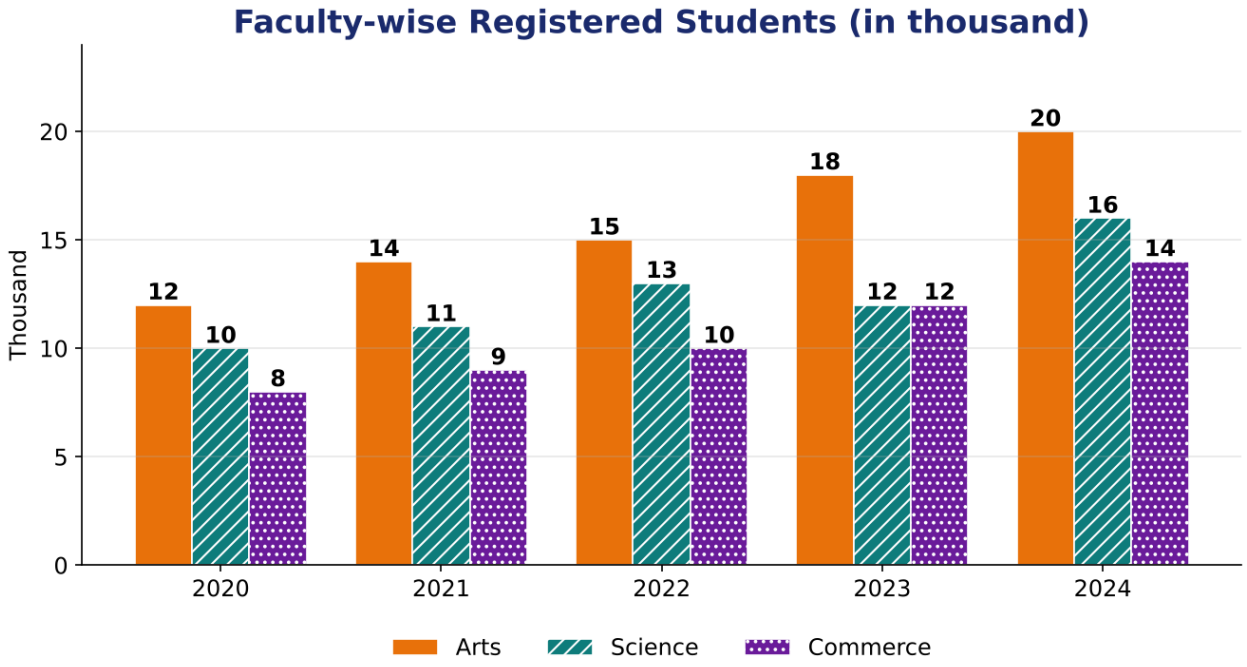


Relation	Pair of Propositions	Rule
Contradictory	A–O, E–I	Cannot both be true or both be false — if one is true, the other is false.
Contrary	A–E	Cannot both be true, but both can be false.
Subcontrary	I–O	Cannot both be false, but both can be true.
Subalternation	A → I, E → O	Universal true ⇒ particular true; particular false ⇒ universal false.

If …	A	E	I	O
A true	—	False	True	False
A false	—	Undetermined	Undetermined	True
E true	False	—	False	True
E false	Undetermined	—	True	Undetermined
I true	Undetermined	False	—	Undetermined
I false	False	True	—	True
O true	False	Undetermined	Undetermined	—
O false	True	False	True	—

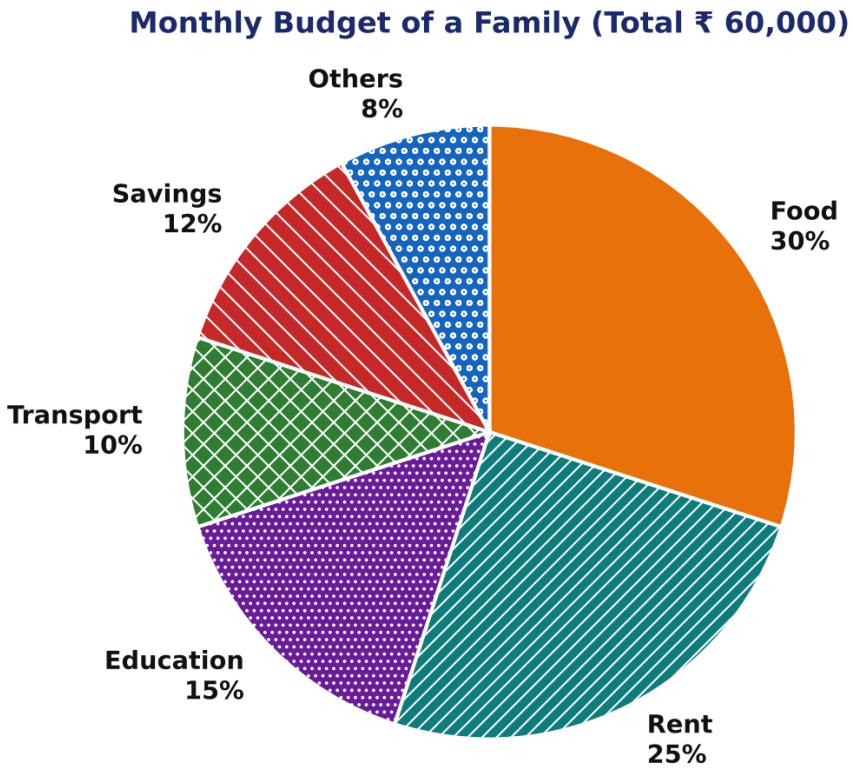
7.5 Solved Data Sets (Four Formats)

Set 1 : Multiple Bar Chart



Question	Solution	Answer
Total registered students in 2022?	15 + 13 + 10	**38 thousand**
Percentage growth in Arts from 2020 to 2024?	(20 − 12)/12 × 100	**66.67%**
Science : Commerce ratio in 2022?	13 : 10	**13 : 10**
In which year was the annual growth in total registration the highest?	Totals: 30, 34, 38, 42, 50 ⇒ growth 4, 4, 4, 8	**2024**
Average of Science over five years?	(10 + 11 + 13 + 12 + 16)/5 = 62/5	**12.4 thousand**

Set 3 : Pie Chart



Question	Solution	Answer
Expenditure on education?	15% × 60,000	**₹ 9,000**
Difference between savings and transport expenditure?	(12 − 10)% × 60,000	**₹ 1,200**
Central angle of the rent sector?	25 × 3.6°	**90°**
Food : Education ratio?	30 : 15	**2 : 1**

Set 4 : Table

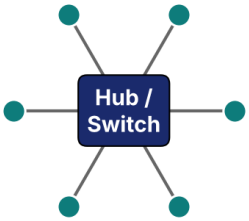
College	Appeared	Passed	Pass %
A	400	340	85%
B	500	375	75%
C	300	276	92%
D	250	175	70%
Total	**1450**	**1166**	**≈ 80.41%**

Question	Solution	Answer
Which has the highest pass percentage?	276/300 = 92%	**College C**
Combined pass percentage of all four?	1166/1450 × 100	**≈ 80.41%**
Total number failed in B and D together?	(500 − 375) + (250 − 175) = 125 + 75	**200**

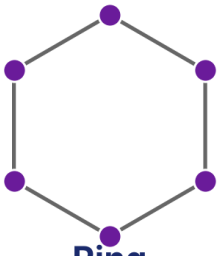
Network Topology



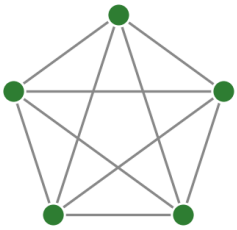
Bus
One shared cable / backbone



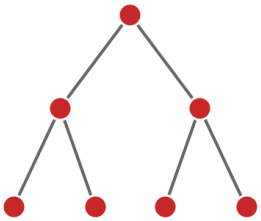
Star
Central hub / switch



Ring
Each node linked to two neighbours



Mesh
Every node connected to every other



Tree
Hierarchical structure

Hybrid
Combination of two or more topologies

Topology	Advantage	Disadvantage
Bus	Cheap, simple, less cable	If the main cable fails the whole network stops; collisions
Star	Failure of one node has no effect; easy management	If the central hub/switch fails, all stop; more cable
Ring	Organised data flow; token passing	Failure of one node/cable affects the whole ring (in a unidirectional ring)
Mesh	Most reliable; multiple paths	Very high cabling and cost; n(n−1)/2 links for n nodes
Tree	Expandable; hierarchical	Depends on the root
Hybrid	Flexible	Complex

Network Devices

Device	Function	OSI Layer
Hub	Broadcasts data to all ports (less intelligent)	Physical
Switch	Sends data only to the destination port using the MAC address	Data link
Bridge	Connects two LAN segments	Data link
Router	Chooses the best path between different networks using the IP address	Network
Gateway	Connects networks with different protocols	All layers

Full-Length Mock Test

UGC NET Paper 1 — 50 Questions • 100 Marks • About 60 Minutes

Instructions

- Each question carries 2 marks; there is no negative marking (check the latest NTA notice).
- There are 5 questions from every unit: Q.1–5 from Unit 1, Q.6–10 from Unit 2, and so on in order.
- Solve with a timer on. Write down your answers first, then check them with the answer key on the following pages.
- Score guide: 80+ excellent • 60–80 good • 40–60 needs improvement.

Question Paper

Q.1 In Vygotsky's theory, the "supporting" help that makes learning possible is called —

(A) Reversal
(B) Motivation
(C) Scaffolding
(D) Modelling

Q.2 "Measuring exactly what is meant to be measured" is which quality of a test?

(A) Validity
(B) Objectivity
(C) Practicality
(D) Reliability

Q.3 In micro-teaching, the duration of one lesson is generally about —

(A) 30 minutes
(B) 45 minutes
(C) 60 minutes
(D) 5–10 minutes

Q.4 In an achievement test, if the difficulty value of an item is 0.9, the item is —

(A) very difficult
(B) very easy
(C) of medium difficulty
(D) invalid

Q.5 The innovative teaching method in which students learn by discovering on their own is —

(A) Lecture
(B) Inductive discovery method
(C) Dictation
(D) Textbook reading

Q.6 The most essential quality of a research hypothesis is —

(A) vagueness
(B) exaggeration
(C) lack of control
(D) testability

Q.7 The suitable test for comparing the means of three or more groups is —

(A) ANOVA
(B) Correlation
(C) χ^2
(D) t-test

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