LRO · Original Practice Content

Class 10 | Logical Reasoning Olympiad

40 Questions · With Answer Key
Syllabax Olympiad Series
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Instructions: Each question has one correct answer. Choose the best option (A/B/C/D). Answer key is provided at the end. This paper is for practice only — not an official exam paper. Recommended time: **45 minutes**.

Q1. What is 'reverse mathematics'?

A. solving problems backwards

B. a programme determining which axioms are needed to prove theorems of ordinary mathematics

C. a method to find contradictions in mathematics

D. mathematics conducted without symbols

Q2. The 'semantic paradox' of the 'Strengthened Liar' ('This sentence is not true') is more problematic than the basic Liar because:

A. it involves more complex syntax

B. it blocks even 'truth gap' solutions — if the sentence lacks truth value, it is 'not true', making it true

C. it involves multiple self-references

D. it uses modal operators

Q3. What is 'ontological dependence' in metaphysics?

A. things that exist only in conceptual frameworks

B. a relation where x ontologically depends on y if x cannot exist without y (e.g. a hole depends on the material around it)

C. mathematical dependence between sets

D. causal dependence in physics

Q4. 'Supervenience physicalism' holds that:

A. mental states are identical to physical states

B. mental states supervene on physical states without reduction — no mental difference without physical difference

C. physical states are reducible to mental states

D. mental states can exist without physical states

Q5. The 'Halting Problem' (Turing 1936) proves that:

A. all programs eventually halt

B. no program can determine its own halting

C. there is no general algorithm that determines whether an arbitrary program halts on a given input

D. polynomial algorithms cannot solve undecidable problems

Q6. 'Diagonalisation argument' (Cantor) proves that:

A. there is no largest natural number

B. the integers are uncountable

C. the real numbers are uncountable — their cardinality exceeds that of natural numbers

D. there are more rational numbers than integers

Q7. What is 'mereological nihilism'?

A. objects have no intrinsic value

B. nothing exists

C. there are no composite objects — only mereological simples (fundamental parts)

D. parts do not determine the whole

Q8. The 'functionalist' theory of mind holds that mental states are defined by:

A. their physical substrate

B. their phenomenal character

C. their causal-functional role in relation to inputs, outputs, and other mental states

D. their neural correlates

Q9. 'Logical omniscience' is a problem in epistemic logic because:

A. agents would know all logical truths instantly

B. it implies that agents who know all premises know all consequences, which real agents cannot do

C. it requires infinite processing speed

D. it creates paradoxes of self-knowledge

Q10. The 'Chinese Room' argument (Searle) concludes that:

A. machines can truly understand language

B. syntax alone is sufficient for semantics

C. a system can manipulate symbols according to rules without understanding — formal symbol manipulation is not understanding

D. AI is fundamentally impossible

Q11. What is 'formal ontology'?

A. the formal study of existence using mathematics

B. the application of logical and mathematical methods to ontological questions about the most general features of reality

C. ontology described in formal language

D. the study of formal institutions

Q12. 'Indefinite extensibility' (Dummett) in philosophy of mathematics refers to:

A. sets that can grow indefinitely

B. the phenomenon where any definite totality generates a new entity outside it, preventing definite collection of all mathematical objects

C. the incompleteness of formal systems

D. the indefinite nature of mathematical proof

Q13. The 'problem of induction' (Hume) shows that:

A. inductive conclusions are always false

B. induction is irrational

C. the justification of induction from past experience is circular — it assumes the regularity of nature, which is itself an inductive conclusion

D. science cannot make predictions

Q14. In decision theory, 'Newcomb's Problem' creates a paradox because:

A. the predictor is always wrong

B. two decision theories (evidential and causal) recommend different actions: take one box or two

C. the payoffs are unknown

D. the predictor's accuracy is irrelevant

Q15. What is 'truthmaker maximalism'?

A. maximising the number of true statements

B. the view that every true proposition has a truthmaker — an entity in reality that makes it true

C. the view that truth is always maximal

D. seeking the most probable truth

Q16. 'Ramsey sentences' in philosophy of science eliminate:

A. empirical content

B. theoretical terms by replacing them with existential quantifiers, preserving empirical content without ontological commitment

C. observational predicates

D. mathematical vocabulary

Q17. What is the 'semantic conception of truth' (Tarski)?

A. truth is defined by social consensus

B. truth is defined by pragmatic success

C. truth is defined in a metalanguage: 'S is true' iff what S says is the case

D. truth is undefinable

Q18. In formal verification, 'temporal logic model checking' verifies:

A. that programs terminate in linear time

B. whether a finite-state system satisfies a temporal logic specification

C. the correctness of type systems

D. runtime complexity of algorithms

Q19. The 'anthropic principle' in cosmology (Carter) states:

A. humans are the purpose of the universe

B. observations of the universe must be compatible with the conscious observers making those observations

C. the universe is fine-tuned for human life

D. all universes contain observers

Q20. 'Moral particularism' (Dancy) holds that:

A. all moral claims are universal principles

B. moral reasoning cannot use principles at all

C. the same feature that makes an act wrong in one context might make it right in another — context determines moral relevance

D. particular cases must always be decided by universal rules

Q21. What is 'coherence theory of truth'?

A. truth is what the majority believe

B. truth is correspondence to reality

C. a proposition is true if it coheres with a consistent set of beliefs

D. truth is pragmatically useful

Q22. The 'problem of other minds' asks:

A. whether minds exist at all

B. how we can know that other humans have conscious experience, given we only have access to behaviour

C. whether animals have consciousness

D. how mental states are individuated

Q23. 'Possibilism' vs 'actualism' in modal metaphysics differs in that possibilism:

A. denies the existence of possible worlds

B. restricts quantifiers to only actual entities

C. holds that merely possible objects have genuine ontological status alongside actual entities

D. equates possibility with probability

Q24. What is 'semantic holism' (Quine)?

A. meaning of words is determined individually

B. meaning depends entirely on use

C. the unit of empirical meaning is not individual sentences but whole theories — 'the web of belief'

D. truth is relative to language

Q25. The 'generality problem' for reliabilism in epistemology is:

A. reliable processes cannot be identified

B. reliabilism applies only to general beliefs

C. it is unclear at what level of generality to specify the belief-forming process whose reliability is relevant

D. reliabilism applies to too few beliefs

Q26. 'Infinitism' about epistemic justification holds:

A. all justification must terminate at a basic belief

B. justification regresses in a circle

C. justification can proceed through an infinite, non-repeating chain without a base

D. no belief can be justified

Q27. What is 'abductive equilibrium' in scientific reasoning?

A. reaching a conclusion through deduction

B. the reflective balance between our inference-to-best-explanation practices and general epistemological principles

C. accepting all plausible hypotheses equally

D. a state of maximum entropy in belief systems

Q28. The 'no-false-lemmas' condition added to the JTB (Justified True Belief) analysis of knowledge was proposed in response to:

A. the problem of induction

B. Gettier counterexamples

C. sceptical scenarios

D. reliabilism

Q29. In 'dynamic epistemic logic', what does a 'public announcement' operation model?

A. broadcasting information over media

B. updating the knowledge of all agents when true information P is publicly announced, changing the model

C. private revelation of facts

D. belief revision in a single agent

Q30. The 'identity theory of mind' (Place, Smart) holds that:

A. mental events are identical to types of physical processes

B. mental states are defined by functional role

C. mind and body are distinct substances

D. consciousness is an emergent property only

Q31. What is 'mereological essentialism' (Chisholm)?

A. all objects are essentially physical

B. objects are essentially constituted by their parts — any change in parts produces a numerically distinct object

C. essential properties are mind-independent

D. essentialism applies only to biological kinds

Q32. 'Kripke's puzzle about belief' shows that:

A. all belief reports are true

B. a logically consistent believer can appear to have contradictory beliefs about the same thing due to opaque belief contexts

C. names do not refer to objects

D. belief is always justified

Q33. The 'Four-Dimensionalist' (perdurantism) view of persistence holds that:

A. objects exist in four-dimensional space-time by having temporal parts (stages) at different times

B. objects persist by having the same properties at every time

C. objects change by gaining and losing properties

D. identity over time is indeterminate

Q34. What is 'grounding' in contemporary metaphysics?

A. connecting abstract entities to concrete ones

B. a non-causal, explanatory relation of metaphysical dependence: y is grounded in x means y holds in virtue of x

C. the justificatory basis of moral claims

D. the empirical confirmation of theories

Q35. The 'conceivability argument' for dualism (Chalmers) holds that:

A. dualism is conceivable, therefore possible, therefore physicalism may be false if zombies are conceivable

B. minds are necessarily physical because we can conceive of physical brains

C. conceivability is not relevant to possibility

D. consciousness cannot be conceived of by machines

Q36. In the theory of computation, 'oracle machines' allow us to study:

A. machines with unlimited memory

B. undecidable problems

C. relative computability — what can be computed given access to a hypothetical subroutine for some problem

D. quantum computation

Q37. 'Structural realism' in philosophy of science holds that:

A. theories are merely useful instruments

B. we can know the structural relations described by science even if we cannot know the intrinsic nature of the entities

C. the structure of theories is more important than their content

D. scientific models are fictional constructs

Q38. What is the 'Ramsey-Lewis method' of defining theoretical terms?

A. replacing theoretical terms with their empirical correlates

B. defining theoretical terms implicitly by their role in a theory, via Ramsey sentences and Lewis's uniqueness condition

C. defining theoretical terms ostensively

D. eliminating all theoretical terms

Q39. 'Causal closure of the physical' holds that:

A. all physical events are caused by mental events

B. every physical event with a cause has a sufficient physical cause — leaving no room for non-physical mental causation

C. physics is a closed explanatory system only at the macro level

D. quantum indeterminacy allows mental causation

Q40. The 'Surprise Examination Paradox' is most deeply related to:

A. temporal logic

B. the impossibility of the examination

C. the interplay between knowledge and common knowledge in a game-theoretic/epistemic framework

D. probabilistic reasoning

Answer Key

Q1: B Q2: B Q3: B Q4: B Q5: C Q6: C Q7: C Q8: C Q9: B Q10: C

Q11: B Q12: B Q13: C Q14: B Q15: B Q16: B Q17: C Q18: B Q19: B

Q20: C Q21: C Q22: B Q23: C Q24: C Q25: C Q26: C Q27: B Q28: B

Q29: B Q30: A Q31: B Q32: B Q33: A Q34: B Q35: A Q36: C Q37: B

Q38: B Q39: B Q40: C