Symbolic Logic (HS 30068)

Dept of HSS, IIT Kharagpur

TEST 5

Test Date: 22.11.2020 **Total Marks: 80** **Duration: 90 Minute**

Section I: True/False (Negative Marking 0.25)

1. Where [Dx: x is a cyclone, Bxy: x is bigger than y, d1: The cyclone of 2017 d_3: The cyclone of 2018]

The correct symbolization of ‘The cyclone of 2018 is bigger than the cyclone of 2017’ is $(\forall x)\ ((Dd_1 \bullet Dd_3) \supset Bd_3d_1)$

Ans: False
Solution: No need for a quantifier to rule over constants. No need to qualify the d_1 or d_3, which already are cyclones, as being a cyclone.

2. Where [U.D.: Living creatures, Bx: x is a bee-eater, Mx: x is a mammal, Tx: x is with tail]

The correct translation of ‘If any bee-eater is a mammal, then if all bee-eaters are creatures with tails, then it too will be with a tail’ is $(\forall y)$ [$(\exists z)$ $(Bz \bullet Mz) \supset (\forall x)$ ($Bx \supset Ty$]

Ans: False
Solution: ‘y’ is not qualified as being a bee-eater. Also, wrong translation of If any bee-eater is a mammal, and of all bee-eaters are creatures with tails.

3. Where [Tx: x is a time, Sx: x is sunny, Rxy: x is ripe at y, p: Paddy]

The correct, idiomatic symbolization of $\sim [(\forall z)\ (Tz \bullet Rpz) \supset Sz)]$ is ‘It is not always sunny when the paddy is ripe’

Ans: True
Solution: The given statement is true because the symbolized statement reads as ‘it is not the case that all times when paddy ripens are sunny’. It idiomatically translates as ‘It is not always sunny when the paddy is ripe’.

4. First Order Predicate logic uses predication to understand properties as components of things.

Ans: False
Solution: The given statement is false because First Order Predicate logic uses predication to understand the properties of individuals or things.

5. In (∀y) ((∃z) (Ly • Bzy) ⊃ (∀x) (Ky ⊃ Mxy)), every occurrence of each variable is a bound occurrence.

Ans: True
Solution: An occurrence of a variable is bound if it is part of a quantifier or comes under the scope of a quantifier then the variable is considered as bound variable. In the given statement occurrence of each variable is a bound occurrence because all variables are fall within the scope of the universal quantifier '(∀y)'.

6. In a predicate logic statement, the sequence of multiple quantifiers '(∀y) (∃z)…' is to be read as 'For every y, there is some z or other such that…'.

Ans: True
Solution: The given statement is true. In the given situation '(∀y) (∃z)…' is to be read as 'For every y, there is some z or other such that…'.

7. The statement 'Electricians and carpenters are union members' is correctly translated in Predicate Logic as: (∀z) (Ez • Cz) ⊃ Uz)), where Ez: x is an Electrician, Cx: x is a Carpenter, Mx: x is a union member.

Ans: False
Solution: The given statement is false. Serious translation mistake to symbolize Electricians and carpenters as (∀z) (Ez • Cz). For, it claims that all ys which are <u>both</u> electrician and carpenter….., which is a mistake. Moreover, in the given symbolization key, union member is symbolised by predicate letter M and not by U.

8. With regards to the problem of Existential Import, the term 'blanket existential presupposition' technically means to allow only I and O to have existential commitment.

Ans: False
Solution: The given statement is false because 'blanket existential presupposition' technically means to allow existential import to all categorical statements without any restriction.

9. '~ (∃y) (By • (∃z) Mzay)' is a truth-functional statement in First Order Predicate Logic.

Ans: True
Solution: The statement is within the scope of the truth-functional connective '~' (tilde).

10. Where {U.D : The set of positive integers, Bx: x is an even number, Gxy: x is greater than y, Mxyz: x minus y equals z, a: 1, b: 2, c:3}; what is the truth-value of '**~ [(∀w) (∃ y) Gwy ⊃ Mcba]'?**

Ans: False

Solution: Mcba is 3-2=1, and Mcba is true. That makes (∀w) (∃ y) Gwy ⊃ Mcba true. Hence, '~ [(∀w) (∃ y) Gwy ⊃ Mcba] must be false.

11. The correct translation of 'not every father has a son' [Px: x∃ is a person, Mx: x is a male, Pxy: x is a parent of y] is '(∃y) [(Py • My) • ((∃x) (Pyx • ~Mx))]

Ans: True
Solution: The translation is correct.

12. On Boolean interpretation, to infer the falsity of 'No Germans are shepherds' from the falsity of 'A few Germans are not shepherds' is an instance of existential fallacy.

Ans: True
Solution: On Boolean interpretation, from falsity of the particular, such as an 'O' statement, the falsity of the universal does not follow. Subalternation relation had to be given up on Boole's suggestion that existential import should be restricted only to I and O. To think that from the falsity of the particular one can infer the falsity of the universal is to go back to the Traditional Square of Opposition and to the existential fallacy that the Traditional Square of Opposition carried with it.

13. Boolean solution to the problem of existential import restricts the Categorical statements to a special kind.

Ans: False
Solution: The given statement is false because Boolean solution to the problem of existential import allows <u>all kinds</u> of Categorical statements but restricts existential import only to I and O.

14. The statements '(∃y) (Hy • Kya) ≡ (∃x) Lxb' and '(∃y) (Hy • Kya) ≡ (∃x) Lxy' are both well-formed statements of Predicate Logic.

Ans: False

Solution: '(∃y) (Hy • Kya) ≡ (∃x) Lxb is well-formed, but '(∃y) (Hy • Kya) ≡ (∃x) Lxy' is not. The 'y' in Lxy is free. Hence, both are not well-formed statement of Prediacte Logic.

15. ' (∀z) (∃y) (Cxy ⊃ By) v (Rad v Raa)' is a truth-functional compound statement.

Ans: True
Solution: The given statement is true because the given statement is under the scope of v, which is a truth-functional connective.

16. Using multiple quantifiers in a sentence indicates that there are more than one kind of things are being referred to.

Ans: True
Solution: If a sentence contains more than one quantifier then it is known as multiply quantified statements. We use multiple quantifiers in a statement when there are more than one group of individuals to refer to. Hence, the given statement is true.

17. The statement ‘Any doctor who does not treat some of his patients well is not liked by anyone’, where [Dx: x is a doctor, Px: x is a patient, Hx: x is a human, Lxy: x likes y, Txy: x is treated well by y] will require three quantifiers for proper translation into First Order Predicate Logic.

Ans: True
Solution: Three groups of people are being referred to: Doctors, patients, and others. Hence, need three quantifiers.

18. For translation of ‘If someone did not hear what Tintin said, it was either Professor Calculus or Captain Haddock’, the given translation key is adequate [Px: x is a person, Sxy: x says y, c: Professor Calculus, h: Captain Haddock, t: Tintin]

Ans: False
Solution: The given statement is false because we need Hxy: x hears y as translation key to translate the given statement.

19. The statement ‘$(\exists x)\ (\exists y)\ ((Mx \bullet My) \supset Nxz))$’ is not a syntactically correct statement of First Order Predicate Logic.

Ans: True
Solution: The given statement is syntactically incorrect. Occurrence of ‘z’ is free and propositions with free variables are not syntactically acceptable in First Order Predicate Logic.

20. For ‘$(\forall z)\ [\ (Oz \bullet Fz) \supset \{(\forall w)\ ((Fw \bullet Ow) \supset Rw) \supset Rz\}]$’, where
[Fx: x is found Ox: x is an object Rx: x is returned], the correct translation is ‘If all found objects are found, then it will be returned.

Ans: False
Solution: Wrong translation. The right translation should be: If any objects are found, then if all found objects are returned, then it will be returned.

Section I: Multiple Choice **Total: 3x20=60**

21. Where Kx: x is a South Korean, Fx: x is a football player, Tx: x is tall, the correct English translation of ‘$\sim(\exists z)\ [(Kz \bullet Fz) \bullet Tz]$’ is:

(a) There is no such thing as a tall South Korean football player.

(b) All South Korean football players are not tall
(c) A few South Korean football players are tall.
(d) Some tall South Koreans are not football players.

Ans: (a)
Solution: In this question option (a) is the right choice. It reads the symbolized statement correctly as 'there is not even one thing which is a tall South Korean footballer.' Option (b) is not the right choice because (b) says some South Korean footballers are not tall. (c) is wrong, as it affirms the existence of such a footballer. (d) is wrong for the same reason as (b).

22. [Px: x is a painting, Pxy: x is painted by y, Cx: x is a critic, Axy: x appreciates y, d: Degas]

The correct symbolization of 'Some paintings of Degas are appreciated by all critics' is: ●

(a) (∃y) [(Py ● Pdy) ● (∀z) (Cz⊃Azy)]
(b) (∃y) [(Py ● Pyd) ● (∀z) (Cz⊃Azy)]

(c)(∃y) [(Py⊃Pyd) ● (∀z) (Cz⊃Azy)]

(d)(∃y) [(Py ● Pyd ●Azy) ● (∀z) Cz]

Ans: (b)
Solution: Option (b) is the correct symbolization of the given statement. In option (a), wrong sequence, d is not painted by y. In option (c), wrong connective in Py⊃Pyd, **it is not an if-then statement. In option (d), z is a free variable in first conjunct.**

23. Which of the following claims is incorrect?
(a) The Predicate Logic statement '(∃x) Bxx v Gd' does not contain a free variable.
(b) The Predicate Logic statement '(∃x) (Kx • Dxb) ≡ (∃y) Cxy' contains a free variable.
(c) The Predicate Logic statement '(∀x) (Ax ⊃ (∃z) Bz) is a truth-functional compound.
(d) The Predicate Logic statement '(∃x) (Lx • (∀y) (My ⊃ Dy)' is a quantified statement.

Ans: (c)
Solution: In this question only option (c) is incorrect, because statement '(∀x) (Ax ⊃ (∃z) Bz)' is not a truth-functional compound because (Ax ⊃ (∃z) Bz) comes under the scope of universal quantifier (∀x). Rest are all correct.

24. Correctly identify all the erroneous lines in the following proof:

1. $(\forall y)\ ((Xy \vee Yy) \supset (Zy \bullet Ay))$
2. $(\exists x)\ [\ (Zx \vee Ax) \bullet (Xx \bullet Yx)]\ \ /\ \ \therefore\ (\exists x)\ (\ Xx \equiv Zx)$

► 3. Xk	
4. Xk v Yk	3,Add
5.(Xk v Yk) ⊃ (Zk • Ak)	1,UI
► 6. (Zk v Ak)• (Xk • Yk)	
7. Zk • Ak	5,4, M.P
8. Zk	7,Simp
9. Zk	2,6-8, EI
10. Xk ≡ Zk	3-9, CP
11. (∃x) (Xx ≡ Zx)	10, EG

Your options:

(a) On Line 3, Line 6, and Line 8
(b) On Line 6, Line 8, Line 9 and Line 11
(c) On Line 5, Line 6, Line 9, and Line 10
(d) On Line 6, Line 8, Line 9, and Line 10

Ans: (d)
Solution: In the given proof the erroneous lines are Line 6, 8, 9, and 10. On line 6 k cannot be used, as it is a constant, moreover it is a previously used constant. On line 8 and 9 k is a free variable. On line 10 Xk ⊃ Zk would be the correct conclusion. Hence option (d) correctly identifies all the erroneous line, so (d) is the right choice.
There is no mistake on Line 3, as it is the beginning of a CP proof; hence option (a) is wrong. On Line 11, there is no error for application of EG; hence option (b) is wrong. There is nothing wrong in UI application in Line 5; hence option (c) is wrong.

25. Where [Dx: x is damaged, Px: x is a person, Bx: x will be blamed Lx: x is in the house]. Which of these is the correct translation of: 'If anything in the house is damaged, everyone in the house will be blamed'?

Your choices:

(a) $(\forall x)\ [\ Dx \supset (\forall y)\ (\ (\ Py \bullet Ly) \supset By)]$
(b) $(\exists x)\ [(Dx \bullet Lx) \supset (\forall y)\ (\ (\ Py \bullet Ly) \supset By)]$
(c) $(\exists x)\ [(Dx \bullet Lx) \bullet (\forall y)\ (\ (\ Py \bullet Ly) \supset By)]$
(d) $(\forall x)\ [\ Dx \supset Lx) \supset (\forall y)\ (\ (\ Py \bullet Ly) \supset By)]$

Ans: (b)
Solution: Option (b) is the correct symbolization of the given statement. Option (a) and (d) are not the correct translation because both use (∀x) as main quantifier. Option (c) is not the correct translation because it unnecessarily turns it into a quantified statement which reads: There exists a damaged thing in the house.

26. 'Existence is not a predicate' implies:

(a) Existential quantifier is never to be used with a predicate
(b) Predicates in existentially quantified statements must not be used without a conjunctive form
(c) Existence is not a property that can be attributed to things.
(d) Existence of a thing cannot be determined by a quantifier.

Ans: (c)
Solution: 'Existence is not a predicate' implies existence indicates a place in reality; hence, it is not a property that can be attributed to things. Option (c) is the right choice here. Rest are all wrong.

27. Which among these is *not* a limitation of Categorical Logic?
(a) Categorical Logic cannot adequately express the validity and invalidity of the arguments.
(b) Categorical Logic cannot do justice to relational predicates.
(c) Categorical Logic cannot understand subject-predicate relation as other than class-membership relation.
(d) Categorical Logic does not have a mechanism to deal with identity as a predicate.

Ans: (a)
Solution: Option (a) is not a limitation of Categorical Logic because Aristotle had his own mechanism with a combination of Mood, Figure, and distribution of the terms to predict correctly validity and invalidity of Syllogims. In class, Venn diagram was used to express the validity and invalidity of the arguments in Categorical Logic. So, (a) is not a limitation of Categorical logic. Other options are limitations of Categorical Logic.

28. Syntactically correct translation of 'There are exactly two biscuits in the packet' in First Order Predicate Logic language is:
[Bx: x is a biscuit, p_1 : packet, Nxy: x is in y, Ixy: x is identical with y]

Your options:
(a) $(\exists w)\ [(Bw \bullet Nwp_1) \bullet (\exists z)\ (Bz \bullet Nzp_1) \bullet \sim Iwz]$
(b) $(\exists w)\ (\exists z)\ [((((Bw \bullet Bz) \bullet (Nwp_1 \bullet Nzp_1)) \bullet \sim Iwz) \bullet (\forall y)\ ((By \bullet Nyp_1) \supset (Iyw \vee Iyz))]$
(c) $(\exists w)\ (\exists z)\ (((Bw \bullet Bz) \bullet (Nwp_1 \bullet Nzp_1)) \bullet (\forall y)\ ((By \bullet Nyp_1) \bullet \sim Iwz) \supset (Iyw \vee Iyz))$
(d) $(\exists w)\ (\exists z)\ [(((Bw \bullet Bz) \bullet \sim Iwz) \bullet (\forall y)\ ((By \bullet Nyp_1) \supset (Iyw \vee Iyz))]$

Ans: **(b)**
Solution: (b) is the right choice. It righty states: There exists two biscuits in the packet, and any biscuit in the packet is identical to either one of them. Option (a0 is wrong as it says there are at least two biscuits. (c) is wrong, as it wrongly says ' all biscuits in the packet are not identical to the 'w' and 'z'. (d) is wrong, because its 'w' and 'z' are not predicated as being in the packet.

29. In formal proof of validity for the following argument, which of the options is a correct and feasible way to solve?

1. $(\exists z)$ Mz v $(\exists w)$ Nw

2. $(\forall y)$ (My $\supset$ Ny) / $\therefore$ $(\exists w)$ Nw

<u>Your options:</u>

(a) Line 3: EI on Line 1, Line 4: UI on Line 2, Line 5: 4,3, MP
(b) Line 3: DS on Line 1, Line 4: UI on Line 2, Line 5: Impl on Line 4
(c) Line 3: De M on Line 1, Line 4: Simp on Line 3, Line 5: UI on Line 2
(d) Line 3: Start an IP proof by negation of conclusion, Line 4, DS on Line 1, Line 5: EI on $(\exists z)$ Mz

Ans: (d)
Solution: Option (a) is wrong; EI cannot be done on Line 1, as it is not a standalone Existentially quantified line. Option (b) is wrong, because DS cannot be on Line 1, as DS requires two lines, and the negated disjunct is nowhere in the proof. Option (c) is wrong, because even if De M is done on Line 1 to obtain Line 3 as '~ (~ $(\exists z)$ Mz • ~ $(\exists w)$ Nw), Simp cannot be done on it on Line 4. Only correct possibility is Option (d).

30. After the Boolean revision of the Square of Opposition and existential import of the categorical statements, the statement 'Some Mermaids are very good singers' would be:

(a) False
(b) Vacuously true
(c) A statement whose truth-value cannot be determined.
(d) Sometimes false.

Ans: (a)
Solution: After the Boolean revision of the Square of Opposition and existential import of the categorical statements, the statement 'Some Mermaids are very good singers' would be false because it will carry an existential claim as default. Since there is no evidence of existence of Mermaids, it will be false. Rest are all wrong.

31. Consider the argument:

1. ~ $(\forall x)$ (~Fx v ~Gx) $\supset$ $(\forall x)$ [Kx • $(\forall y)$ (My $\supset$ Nxy)]
2. $(\exists x)$ [Kx • $(\forall y)$ (My $\supset$ Nxy)] $\supset$ $(\forall x)$ (Rx • $(\forall y)$ Sxy)

/ $\therefore$ ~ $(\forall x)$ $(\forall y)$ Sxy $\supset$ $(\forall x)$ (~Fx v ~Gx)   MP

Which among the following is a correct way to start this proof? Your options:

(a) Use UI on Line 1
(b) Use EI on Line 2
(c) Assume ~ $(\forall x)$ $(\forall y)$ Sxy, start a CP on Line 3, and apply MT on Line 2 to get ~ $(\exists x)$ [Gx • $(\forall y)$ (My $\supset$ Nxy)]
(d) Assume ~ $(\forall x)$ (~Fx v ~Gx), and start a CP on Line 3, and apply MP on Line 1 to get $(\forall x)$ [Kx • $(\forall y)$ (My $\supset$ Nxy)]

Ans: (d)

Solution: (d) alone is the correct way. (a) is wrong, as UI cannot be partially applied on Line 1. Option (b) is wrong; EI cannot be partially applied on Line 2. Option (c) is wrong, as ~ $(\forall x)(\forall y)$ Sxy, MT canno be applied on Line 2.

32. Consider the following proof:

1. $(\forall y)(By \supset Gy)$
2. $(\exists x)$ Bx   / $\therefore$ $(\exists z)$ Gz

3. Bd	
4. Bd $\supset$ Gd	1, UI
5. Gd	3, 4, MP
6. $(\forall y)$ Gy	5, UG
7. $(\forall y)$ Gy	2, 3, 6, EI
8. Ga	7, UI
9. $(\exists z)$ Gz	8, EG

Which of these claims is fully correct? Your options:

(a) There are mistakes only on Line 3, and Line 7
(b) There are mistakes only on Line 6, an Line 8
(c) There are mistakes only on Line 3, Line 6, and Line 7.
(d) There are mistakes only on Line 3, Line 4, Line 6 and Line 9.

Ans: (c)

Solution: (c) alone captures the errors completely. Option (a) misses many other mistakes. Option (b) is wrong, as it is incomplete, and also incorrectly identifies Line 8 which has no error. Option (d) is wrong, as it wrongly identifies Line 4, and 9, which do not contain any error.

33. Consider this argument:

1. ~ $(\forall w)$ (Gw v Mw)
2. $(\exists x)$ ~ Gx $\supset$ $(\forall y)$ (Ly $\supset$ My)   / $\therefore$ ~ $(\forall z)$ Lz

If we are to construct a formal of proof of validity for this argument, which of the following claims is *not* true?

(a) QN on Line 1 will yield $(\exists w)$ ~ (Gw v Mw)
(b) UI on Line 1 will yield ~ (Gy v My)
(c) IP strategy will allow us to start with ~~ $(\forall z)$ Lz
(d) QN on Line 2 will yield ~ $(\forall x)$ Gx $\supset$ $(\forall y)$ (Ly $\supset$ My)

Ans: (b)
Solution: In the given options only option (b) is not true because UI on Line 1 cannot even be applied. It is not a quantified statement. Rest are true.

34. Consider the argument:

1. $(\exists z)(\exists w)(Mzw \vee Nzw) \supset (\exists y) Oy$
2. $(\forall z)(\forall w)(Oz \supset \sim Ow)$ $\quad / \therefore (\forall z)(\forall w) \sim Mzw$

Which among the following claims is true?

(a) Line 1 should be instantiated before any operation on Line 2.
(b) On Line 2, UI cannot be done.
(c) The first line in this proof may be UI on Line 2.
(d) We can start the proof by assuming $(\forall z)(\forall w) \sim Mzw$.

Ans: (c)
Solution: The correct choice is option (c). Option (a) is wrong, as EI cannot be applied on Line 1. Option (b) is wrong, as UI can be applied. (d) is completely wrong, because the conclusion is what is to be proved, it certainly cannot be assumed in the proof.

35**.** Consider this:[Ax: x is an after-image, Px: x is in physical space, Bx: x is a brain process]. Here is an argument:

The after-image is not in physical space.

But, the brain-process is.

Therefore, the after-image is not a brain process.

The correct translation of this argument in Predicate Logic is:

(a) $(\exists x)(\sim Ax \bullet Px)$
$(\forall x) Bx$

$\therefore (\exists x)(Ax \bullet \sim Bx)$

(b) $(\forall x)(Ax \bullet \sim Px)$

$(\exists x)(Bx \bullet Px)$

$\therefore (\forall x)(Ax \supset \sim Bx)$

(c) $(\forall x)$ **$(\forall y)$ (Ax $\supset$ ~Py)**

$(\forall x)$ Bx

$\therefore (\forall x)$ Ax $\supset (\forall y)$ ~By

(d) Neither (a) nor (b) nor (c)

Ans: (d)

Solution: The correct translation of the argument is:

$(\forall x)$ (Ax$\supset$ ~Px)

$(\forall x)$ (Bx$\supset$ Px) / $\therefore$ $(\forall x)$ (Ax $\supset$~Bx)

None of (a), (b), (c) is a match.

36. Read the following and identify which of the following must be tautology?

(a) $(\exists x)$ ~Fx $\supset (\forall x)$ Fx
(b) $(\forall x)$ Fx $\supset (\forall x)$ (Ga $\supset$~Fx)
(c) ~$(\exists x)$ ~Fx $\supset (\forall x)$ Fx
(d) $(\exists y)$ $(\forall x)$ (Gy $\supset$ Fx)

Ans: (c)

Solution: In this question only option (c) is a tautology. It follows directly from the Square of Opposition. Option (a) is not a tautology, as it is false. 'Some x is not F' cannot entail 'all x are F'. Option (b) is not a tautolofy, it at most is contingent based upon the interpretation. Option (d) also is contingent dependent upon the interpretation.

37. Consider the statement: [~P ≡~ (Maa v Mab)]. Where { Mxy: x manages y, P: Plato's Akademi is rebuilt by Athenian Government, a: Aristotle, b: Alexander}

Which of the following is its correct and idiomatic translation in English?

(a) Plato's akademi is rebuilt by Athenian Government if and only if either Aristotle does not manage himself or does not manage Alexander.
(b) Plato's akademi does not get rebuilt by Athenian Government if and only if neither Aristotle manages himself nor does he manage Alexander.
(c) The fact of Plato's Akademi being not rebuilt by Athenian Government is the necessary and sufficient condition for management failure on the part of Aristotle.
(d) Aristotle and Alexander both have a responsibility to see to it that Plato's Akademi gets rebuilt by the Athenian Government.

Ans: (b)

Solution: Option (b) is the correct and idiomatic translation of given symbolised statement. In option (a) translation of ~P is not present. In option (c) Alexander's name is not mentioned and option (d) is incorrect translation.

38. A pronominal cross-reference is:

(a) When the reference to the same individual is carried over by a pronoun, indicating the extended scope of the quantifier ruling over the individual
(b) When the reference to the same property is carried over by a pronoun, indicating the extended scope of the quantifier ruling over the variable
(c) When the reference to the same individual symbol is carried over by a pronoun, indicating the extended scope of the noun and the verb.
(d) When the reference to the same symbol is carried over by a pronoun, indicating the shared scope of the quantifier between two variables

Ans: (a)
Solution: In predicate logic, pronominal cross-reference is indicated by a pronoun, referring to a variable. Hence, option (a) is the right choice. Option (b) is wrong, because the pronoun cannot carry the reference to a property. Option (c) is wrong, as a noun and a verb do not have extended scope. A quantifier's scope can be extended.

39. Ziko met two guys from Hall ABC; and he found that both are heavy smokers. Ziko thought Hall ABC is full of heavy smokers. This conclusion is an example of:

(a) Existential Generalization
(b) Illicit generalization
(c) Existential Instantiation
(d) Existential fallacy.

Ans: (b)
Solution: The given conclusion is an example of illicit generalization because Ziko made this claim based on only two samples. Option (a) is wrong, as it is not a case of existential generalization. Option (c) is wrong, as there is no instantiation done in this case. Option (d) is wrong, as no unwarranted presumption of existence has been claimed here.

40. For the statement, 'There is no place safer than Antarctica, but weird people are everywhere', the correct and complete translation key is:

(a) [Px: x is a place, Hx: x is human, Sxy: x is safer than y, Axy: x is at y, Antarctica: a]
(b) [Px: x is a place, Hx: x is human, Wx: x is weird, Sxy: x is safer than y, Axy: x is at y]

(c) [Px: x is a place, Hx: x is human, Wx: x is weird, Axy: x is at y, Antarctica: a]

(d) [Px: x is a place, Hx: x is human, Wx: x is weird, Sxy: x is safer than y, Axy: x is at y, Antarctica: a]

Ans: (d)

Solution: In option (a) translation key for weird is not given. In option (b) translation key for Antarctica is not given. In option (c) translation key for x is safer place than y is not given. Only in option (d) the correct and complete translation key is provided. Hence, (d) is the right choice.

-End-