

Sem III

SHRI MATA VAISHNO DEVI UNIVERSITY, KATRA

School of Philosophy & Culture

B. Tech. (CSE, ECE, ME) Minor – I Examination (Odd) 2018-19

Entry No: 17BCS045

Date: 30-08-2018

Total Number of Pages: [02]

Total Number of Questions: [05]

Course Title: Introduction to Logic

Course Code: PCL 2042

Time Allowed: 1.5 Hours

Max Marks: [20]

Instructions

- Attempt All Questions.
- Do not use Pencil in writing your answers.

Indicate which of the following are *true* or *false* by writing True or False against the statements [e.g. 5(b) True]. For every correct answer you will score $\frac{1}{2}$ marks and for every incorrect response, you lose $\frac{1}{4}$ marks additionally. No marks will be given for unattempted statement. ($\frac{1}{2} \times 10 = 5$)

Q1.	(a) Validity is a sufficient condition for soundness of an argument.	[$\frac{1}{2}$]	CO1	
	(b) An argument is valid, if its premise(s) and conclusion are true.	[$\frac{1}{2}$]	CO2	- false.
	(c) Rules of inferences are valid argument forms.	[$\frac{1}{2}$]	CO2	
	(d) Contingent propositions are contradictory propositions.	[$\frac{1}{2}$]	CO1	
	(e) A-priori propositions are always true.	[$\frac{1}{2}$]	CO1	false.
	(f) Invalid arguments are either strong or weak.	[$\frac{1}{2}$]	CO2	true
	(g) Contradiction is an a-priori proposition.	[$\frac{1}{2}$]	CO1	
	(h) The negation of [$P \supset (P \supset P)$] is a tautology.	[$\frac{1}{2}$]	CO1	
	(i) An argument is invalid, if its premise(s) and conclusion are both false.	[$\frac{1}{2}$]	CO2	
	(j) The notions of truth or falsity are associated with statements.	[$\frac{1}{2}$]	CO1	
Q2.	(Explain the difference between the following with the help of suitable examples: $(1\frac{1}{2} \times 2 = 3)$			
	(a) A-priori and A-posteriori propositions	[02]	CO1	
	(b) Validity and Soundness of an argument	[02]	CO2	

Q3.	Draw truth tables to show: (2+1=3)	[02]	CO2
	(a) Hypothetical Syllogism is a valid argument form. <i>P → Q</i> and <i>Q → P</i> \vdash <i>P</i>		
Q4.	Symbolize the following using your own scheme of abbreviation: ($\frac{1}{2} \times 6 = 3$)	[$\frac{1}{2}$]	CO3
	(a) Junk food is <u>unhealthy</u> besides, being fattening.	[$\frac{1}{2}$]	CO3
	(b) Either it will rain today or it will not.	[$\frac{1}{2}$]	CO3
	(c) Renil will go to Japan provided that he obtains a Japanese visa.	[$\frac{1}{2}$]	CO3
	(d) Sanil will top the examination if and only if he works hard.	[$\frac{1}{2}$]	CO3
	(e) Karen can win a match <u>unless</u> he faces Daryl.	[$\frac{1}{2}$]	CO3
	(f) Neither Carlyle nor Sigmund attended the party.	[$\frac{1}{2}$]	CO3
Q5.	Prove the following: (2+4)		CO3
	(a) Prove the following invalid.	(b) Prove the following valid using both rules of inference and replacement.	
	$1. (O \vee P) \supset Q$ $2. Q \supset (P \vee R)$ $3. O \supset (\sim S \supset P)$ $4. (S \supset O) \supset \sim R$ $\therefore P \equiv Q$	$1. (H \supset I), (J \supset K)$ $2. H \vee J$ $3. (H \supset \sim K), (J \supset \sim I)$ $4. (I, \sim K) \supset L$ $5. K \supset (I \vee M) / \therefore L \vee M$	

SHRI MATA VAISHNO DEVI UNIVERSITY, KATRA
School of Philosophy & Culture

B. Tech. (BME, BEC, BCS) Minor-II Examination (Odd Semester) 2018-19

Entry No: **11BCS045**

Total Number of Pages: [02]

Date: 13-10-2018

Total Number of Questions: [06]

Course Title: Introduction to Logic

Course Code: PCL 2042

Time Allowed: 1.5 Hours

Max Marks: [20]

Instruction:

Attempt All Questions.

1. Choose the most appropriate alternative by putting a (✓) mark. For every correct answer you will score $\frac{1}{2}$ marks and for every incorrect response you lose $\frac{1}{4}$ marks additionally. ($0.5 \times 10 = 05$)

1 A Universal proposition necessarily distributes its _____ term.			
a Subject	b Predicate	c Both a and b	d None of the above

2 A Particular proposition distributes its _____ term.			
a Subject	b Predicate	c Both a and b	d None of these

3 _____ propositions are vacuously true.			
a Universal	b Particular	c Affirmative	d Negative

4 _____ propositions are also known as existential propositions.			
a Universal	b Particular	c Affirmative	d Negative

5 In the Traditional Square of Opposition , if A is false, then the value of I is _____ .			
a True	b False	c Undetermined	d None of these

6 In the Modern Square of Opposition, if I is false, then the value of E is _____ .			
a True	b False	c Undetermined	d None of these

7 In the Traditional Square of Opposition , if E is true, then the value of O is _____ .			
a True	b False	c Undetermined	d None of these

8 In the Modern Square of Opposition, if O is false, then the value of E is _____ .			
a True	b False	c Undetermined	d None of these

9 'Some S is P' and 'Some P is not S' are logically equivalent expressions.			
a True	b False	c Not always	d None of these

10 In the Traditional Square of Opposition, a superaltern is always a universal proposition.			
a True	b False	c Both a and b	d None of these

2. Explain the difference between Illicit Major and Illicit Minor with the help of examples. (2)

3. Prove the following w.u. M.I. (Use SCP) (4)

$$\sim P \supset \sim Q \equiv P \vee \sim Q$$

4. Prove the following using IP (2)

1. $A \equiv W$
2. $\sim A \vee \sim W$
3. $R \supset A \therefore \sim (W \vee R)$

5. Prove that '*no conclusion follows from two particular premises*' in a standard form categorical syllogism. (4) (Use Formal rules)

6. Construct, schematize and prove the validity/ invalidity of the given categorical syllogism with the help of Venn Diagrams. (3)

"*some women are not strong persons because all mothers are strong persons and some women are not mothers*".

COURSE OUTCOMES

After successful completion of this course, students shall be able to:

1. Decode the notion of truth and falsity with the help of contingent, contradictory and tautological propositions.
2. Understand the notion of validity, invalidity and soundness of arguments.
3. Symbolize propositions and construct proofs using rules of inference, replacement, indirect proof, conditional proofs, etc.
4. Cognize categorical propositions, squares of opposition and syllogisms along with rules to test their validity.
5. Symbolize and construct proofs using quantifiers.

CO	Questions Mapping	Total Marks	Total Number of Students (to be appeared in Exam)
CO4	Q1, Q2, Q5 and Q6	5+2+4+3=14	160
CO3	Q3, Q4	4+2=6	160

SHRI MATA VAISHNO DEVI UNIVERSITY, KATRA
School of Philosophy & Culture
B. Tech. (CSE, ECE, ME) Major Examination (Odd) 2018-19

Entry No: 17 BCSO 45

Total Number of Pages: [03]

Date: 26-11-2018

Total Number of Questions: [10]

Course Title: Introduction to Logic

Course Code: PCL 2042

Time Allowed: 3 Hours

Max Marks: [50]

Instructions

- i. Attempt All Questions.

Answer whether the following statements are *True* or *False*. There is NO NEGATIVE marking. ($\frac{1}{2} \times 20 = 10$)

Attempt All Questions.			
Answer whether the following statements are True or False. There is NO NEGATIVE marking. ($\frac{1}{2} \times 20 = 10$)			
Q1.	(1) Poisoning the well is associated with fallacy of <i>Ad hominem</i> . (2) <i>Ignoratio Elenchi</i> is another name for the Argument from Ignorance. (3) Begging the Question falls under the Fallacies of Presumption. (4) An informal fallacy in which two or more meanings of the same word or phrase have been confused is called the Fallacy of <i>Amphiboly</i> . (5) The Fallacy of Division resembles the Fallacy of Accident. (6) <i>Ad Verecundiam</i> is also known as Appeal to Inappropriate Authority. (7) <i>Non causa pro causa</i> is also called Hasty Generalization. (8) Mill's method is a deductive inference. (9) "Only P is Q" means "All P is Q". (10) <i>BRAMANTIP</i> is a valid mood in the fourth figure. (11) There are 15 valid moods in four figures. (12) <i>FESAPO</i> is a valid mood in the third figure. (13) <i>FERIO</i> is a valid mood in the second figure. (14) <i>CELARENT</i> is a valid mood in the first figure. (15) There are no restrictions on UI and UG. (16) There are no restrictions on EI and EG. (17) There are no restrictions on UI and EG. (18) There are no restrictions on EI and UG. (19) "Some politicians are honest" logically entails "Some politicians are not honest". (20) "Children are absent" is a universal proposition.	[½] [½]	CO1
Q2.	Write short notes on the following in not more than 50 words each:		CO4
	(1) Categorical Syllogism (2) Mill's Method of Concomitant Variation (3) Straw Man fallacy (4) Fallacy of Accent (5) Existential Fallacy (6) Subaltern relation	(OR) (2) Distribution of Terms in Categorical Propositions [1.5] [1.5] [1.5] [1.5] [1.5] [1.5]	
Q3.	Warden asked a hostel resident, "Have you sold the pen-drive you have stolen?" The hostel resident answered "No," and before he could say anything more, he was proved guilty of the crime that he has stolen the pen-drive and it is there with him. Detect an informal fallacy of presumption in the given argument and substantiate your claim.	[03]	CO4

Q4.	<p>(a) Symbolize the following using your own scheme of abbreviation as per Propositional logic:</p> <p>(1) Neither Ram is intelligent nor is he hardworking. (2) No sentence can start with ‘because’, because ‘because’ is a conjunction. (3) The school will reopen after Christmas holidays unless it is a weekend. (4) Underarm bowling is disallowed in International Cricket. (5) Sigmund will pass exactly on the condition that he scores more than 36 marks.</p> <p>(b) Symbolize the following using your own scheme of abbreviation as per Quantification theory:</p> <p>(1) None but a criminal is in penitentiary. (2) Not every visitor stayed for dinner. (3) Frogs and Toads are amphibians. (4) Politicians all have personal assistants. (5) There are no uniforms that are not washable.</p>	[0.5] [0.5] [0.5] [0.5] [0.5]	CO3 CO5
Q5.	<p>Prove the following valid:</p> <ol style="list-style-type: none"> 1. $(x)[(Wx \vee Tx) \supset Hx]$ 2. $(x)[(Hx \vee Lx) \supset Dx]$ 3. $(x)[Dx \supset (Gx \cdot Ux)]$ 4. $(\exists x)[(Wx \cdot \sim(Gx \vee Sx)) \quad / \therefore (\exists x)[(Tx \cdot Sx) \cdot \sim Gx]]$ 	[4]	CO5
Q6.	<p>Symbolize and prove the following invalid as per the Quantification theory:</p> <p><i>No judges are idiots. Langer is an idiot. Therefore, Langer is a judge.</i></p>	[4]	CO5
Q7.	<p>Prove the following using CP (not SCP)</p> <ol style="list-style-type: none"> 1. $Q \vee (R \supset S)$ 2. $[R \supset (R, S)] \supset (T \vee U)$ 3. $(T \supset Q) \cdot (U \supset V) \quad \therefore \sim Q \supset V$ 	[4]	CO3
Q8.	<p>Prove the following using SCP and without using the Rule of Distribution:</p> $[P \cdot (Q \vee R)] \equiv [(P \cdot Q) \vee (P \cdot R)]$	[4]	CO3
Q9.	<p>Prove the following using rules of inference and replacement only:</p> <ol style="list-style-type: none"> 1. $E \supset S$ 2. $E \supset (S \supset N)$ 3. $S \supset (N \supset F) \quad / E \supset F$ 	[4]	CO3
Q10.	<p>Cheeku planted a lovely garden with flowers. He has not been able to enjoy it, though, because deer from the forest nearby have been nibbling on his plants, killing some of them. He would like to keep the deers out of his garden. His grandmother said that in old days, she kept deer away by spraying a secret herb in her garden. She said: “<i>If you spray the Secret herb on your flowers, deer will stay out of your yard.</i>” Cheeku convinced some of his neighbors to spray the Secret herb, to see the result. We are interested in seeing whether any of the results of this experiment violate Grandma's rule. The cards below represent four yards near Cheeku's house. Each card represents one yard. One side of the card tells whether or not Secret herb was sprayed on the flowers in a</p>	[3]	CO2

yard, and the other side tells whether or not deer stayed out of that yard. Which **two** of the following cards would we definitely need to turn over to see if what happened in any of these yards violated Grandma's rule and why? Don't turn over any more cards than are absolutely necessary.

Explain your answer.

- Card A – Sprayed with the secret herb
- Card B – Not sprayed with the secret herb
- Card C – Deer stayed away
- Card D – Deer did not stay away

COURSE OUTCOMES

After successful completion of this course, students shall be able to:

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2. Understand the notion of validity, invalidity and soundness of arguments.
3. Symbolize propositions and construct proofs using rules of inference, replacement, indirect proof, conditional proofs, etc.
4. Cognize categorical propositions, squares of opposition and syllogisms along with rules to test their validity.
5. Symbolize and construct proofs using quantifiers.

CO	Questions Mapping	Total Marks	Total Number of Students (to be appeared in Exam)
CO1	Q1	10	160
CO2	Q10	3	160
CO3	Q4(a), Q7, Q8, Q9	$2.5+4+4+4=14.5$	160
CO4	Q2, Q3	$9+3=12$	160
CO5	Q4(b), Q5, Q6	$2.5+4+4=10.5$	160

SHRI MATA VAISHNO DEVI UNIVERSITY, KATRA

School of Philosophy & Culture

B. Tech. (CSE, ECE, ME, EE and CE) Major Examination (Odd) 2019-20

Entry No: []

Total Number of Pages: [02]

Date: 03-12-2019

Total Number of Questions: [10]

Course Title: Introduction to Logic

Course Code: PCL 2042

Time Allowed: 3 Hours

Max Marks: [50]

Instructions: Attempt All Questions.

Answer whether the following statements are *True* or *False*. There is NO NEGATIVE marking. ($\frac{1}{2} \times 20 = 10$)

Q1.	(1) "Poisoning the Well" is also associated with <i>Ad Baculum</i> .	[½]	CO1
	(2) "Begging the Question" falls under the <i>Fallacies of Presumption</i> .	[½]	
	(3) "Appeal to Pity" falls under the <i>Fallacies of Relevance</i> .	[½]	
	(4) Informal fallacies pertain to Deductive logic.	[½]	
	(5) The <i>Fallacy of Division</i> resembles the <i>Fallacy of Accident</i> .	[½]	
	(6) A valid argument can have a false conclusion.	[½]	
	(7) An invalid argument cannot have a true conclusion.	[½]	
	(8) A sound argument is always valid.	[½]	
	(9) "Only citizens can vote" means "All citizens can vote".	[½]	
	(10) The subject term is distributed in an affirmative proposition.	[½]	
	(11) The predicate term is distributed in a universal proposition.	[½]	
	(12) <i>BARBARA</i> is a valid mood in the third figure.	[½]	
	(13) <i>EIO</i> is a valid mood only in the 2 nd figure.	[½]	
	(14) <i>DARII</i> is a valid mood in the first figure.	[½]	
	(15) Contradictory propositions cannot be true or false together.	[½]	
	(16) There are no restrictions on EI and EG.	[½]	
	(17) There are no restrictions on UI and EG.	[½]	
	(18) There are no restrictions on EI and UG.	[½]	
	(19) " <i>An elephant is a mammal</i> " is an existential proposition.	[½]	
	(20) " <i>Children are present</i> " is a universal proposition.	[½]	
Q2.	Write short notes on any FOUR of the following in around 50 words each: ($2 \times 4 = 8$)		CO4
	(1) Sound Argument	[2]	
	(2) Mill's Joint Method of Agreement & Difference	[2]	
	(3) Ad Hominem	[2]	
	(4) Fallacy of Accent	[2]	
	(5) Existential Fallacy	[2]	
	(6) Sub-contrary relation	[2]	
Q3.	Consider the following argument: <i>General:</i> "If we capitulate, the enemy will take the chance to slaughter us all." <i>Colonel:</i> "So far they have treated captives adequately." <i>General:</i> "This time they won't. And you better believe me if you don't want to find yourself rotting in a mass grave." Detect an informal fallacy of relevance in the given argument and substantiate your claim.	[4]	CO4

Q4.	(a) Symbolize the following using your own scheme of abbreviation as per Propositional logic :	[½] [½] [½] [½] [½]	CO3
	(1) Neither Steve nor Rachel is an avid or a voracious reader. (2) Daksh and Sanjeev are both good chefs and human beings. (3) University will reopen after winter vacation unless it is a Sunday. (4) SMVDU is an AICTE approved University. (5) Adam will fail in the examination iff he fails to submit assignment.		
Q5.	(b) Symbolize the following using your own scheme of abbreviation as per Quantification theory :	[½] [½] [½] [½] [½]	CO5
	(1) Only Gentle Horses are well-trained. (2) Not every student is talented who is a topper. (3) Among Birds, Kiwis, Penguins and Ostrich cannot fly. (4) It is not true that Abbots and Bishops are honest churchmen. (5) Only a pacifist is either a gentleman or not a fighter.		
Q5.	Construct the proof of validity for the following argument:	[4]	CO5
	1. $(x) \{ [Ax \cdot (Ix \vee Lx)] \supset \sim (Hx \vee Cx) \}$ 2. $(\exists x) [Ax \cdot (Ix \cdot Bx)]$ 3. $(x) [(Ax \cdot Wx) \supset (\sim Hx \supset Dx)]$ 4. $(x) [Ax \supset Wx]$ 5. $(\exists x) [Wx \cdot Hx] / : (\exists x) [Ax \cdot Dx]$		
Q6.	Symbolize and prove the following invalid as per the Quantification theory: <i>All Novelists are observant. Some poets are not observant. Therefore, no novelists are poets.</i>	[3]	CO5
Q7.	Prove the following using CP (not SCP) 1. $Q \vee (R \supset S)$ 2. $[R \supset (R \cdot S)] \supset (T \vee U)$ 3. $(T \supset Q) \cdot (U \supset V) \therefore \sim Q \supset V$	[4]	CO3
Q8.	Prove the following using SCP and without using the De Morgan's Law: $\sim [(A \vee B) \vee C] \equiv [(\sim A \cdot \sim B) \cdot \sim C]$	[4]	CO3
Q9.	Construct, schematize and prove the validity/ invalidity of the given Categorical Syllogism with the help of Venn Diagrams. <i>"No musicians are astronauts; all musicians are baseball fans; consequently, no astronauts are baseball fans".</i>	[3]	CO4
Q10.	Write a proposition consisting of p, q, and r such that it is true if and only if at most one amongst p, q and r is true. [Hint: Use truth tables]	[5]	CO2

COURSE OUTCOMES

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CO	Questions Mapping	Total Marks	Total Number of Students (to appear in Exam)
CO1	Q1	10	315
CO2	Q10	5	
CO3	Q4(a), Q7, Q8	2.5+4+4=10.5	
CO4	Q2, Q3, Q9	8+4+3=15	
CO5	Q4(b), Q5, Q6	2.5+4+3=9.5	

SHRI MATA VAISHNO DEVI UNIVERSITY, KATRA
School of Philosophy & Culture
B. Tech. (CSE, ECE, ME, EE, CE) Minor Examination (Odd) 2019-20

Entry No: **1 8 8 € € 0 2 1**
Date: 28-09-2019

Total Number of Pages: [02]

Total Number of Questions: [05]

Course Title: Introduction to Logic
Course Code: PCL 2042

Time Allowed: 1.5 Hours

Max Marks: [30]

Instructions

- Attempt All Questions.
- Do not use Pencil.

Indicate which of the following are *true* or *false* by writing True or False. For every correct answer you will score 1 mark and for every incorrect response, you lose $\frac{1}{2}$ marks additionally. (1X08=8)

Q1. (a) "The sun rises in the east" is an a-priori proposition. (b) "I believe that Dhoni is a good batsman" is a statement. (c) Rules of inference are valid argument forms. (d) A factually true proposition is a contingent proposition. (e) All sentences are statements. (f) Statements can be valid or invalid. (g) Arguments can be true or false. (h) $[P \supset (P \supset P)]$ is a tautology.	[1] CO1 [1] CO1 [1] CO1 [1] CO1 [1] CO1 [1] CO1 [1] CO1 [1] CO1
Q2. (Explain the difference between the following with the help of suitable examples: $(2 \times 2 = 4)$) (a) Valid and Sound arguments (b) Deductive and Inductive arguments	[2] CO2 [2] CO2
Q3. Draw truth tables to show: $(2+2=4)$ (a) Fallacy of affirming the consequent (b) $\{(P \supset Q) \supset P\} \supset P$ is a tautology	[02] CO2 [02] CO2
Q4. Symbolize the following using your own scheme of abbreviation: $(1 \times 5 = 5)$ (a) Neither England nor Australia will win the world cup. (b) Iphone X was launched in 2018. (c) John will fail in the exam only if he fails to concentrate. (d) Even if Harry is intelligent, he is a not hardworking student. (e) The cricket match will be abandoned if and only if it rains.	[1] CO3 [1] CO3 [1] CO3 [1] CO3 [1] CO3

Q5.	(a) Prove the following invalid by assigning truth values to the statements (3)	(b) Construct the proof of validity using any method introduced to you in this course. (6)	CO3
	1. $T \equiv U$ 2. $U \equiv (V \cdot W)$ 3. $V \equiv (T \vee X)$ 4. $T \vee X$ $\therefore T \cdot X$	1. $[P \supset (Q \cdot L)] \cdot (R \supset S)$ 2. $(S \supset \neg L) \cdot (J \supset N)$ 3. $R \vee S$ $\therefore (P \vee J) \supset N$	CO3

COURSE OUTCOMES

After successful completion of this course, students shall be able to:

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4. Cognize categorical propositions, squares of opposition and syllogisms along with rules to test their validity.
5. Symbolize and construct proofs using quantifiers.

CO	Questions Mapping	Total Marks	Total Number of Students (to be appeared in Exam)
CO1	Q1	8	
CO2	Q2 and Q3	4+4=8	
CO3	Q4 and Q5	5+9=14	300 + backlogs/improvement