Karanjia Auto College, Karanjia, Mayurbhanj

PHILOSOPHY QUESTION BANK
SYMBOLIC LOGIC
CC - 04

Unit-1

1. **Fill in the blanks.**

   a) Symbolic logic makes use of ………… rather than ………..

   b) Logical constants are also called as ………….

   c) The letters p, q, r, s etc. used as symbols for ropositions are called ………

   d) 'p = q' is a ………….. function.

   e) 'p ⊃ q' is a …………. function.

   f) 'p ∧ q' is a ………… function.

   g) 'p / q' is a ………… function.

   h) 'p v - p' is known as ………..

   i) 'p . – p' is known as ………….

   j) A tautology is always …………

   k) A contraicttion is always ………..

   l) A conjunctive function is true only when both the propositions are in conjunction are …………

   m) If the antecedent of an implicative function is false then the function must be ………..

   n) An equivalence function is …………. when the propositions in it are both true or false.

   o) A propositional variable has ………. Truth values.

   p) The truth value of 'p = q' is ……….. if p is true and q is true.

   q) The truth value of 'p = q' is ……… if p is true and q is false.

   r) The truth value of 'p = q' is ……….. if p is false and q is true.

   s) The truth value of 'p = q' is ……….. if p is false and q is false.

t) The truth value of 'p ⊃ q' is ……… if p is false and q is true.

u) The truth value of 'p ⊃ q' is ……… if p is false and q is false.

v) The truth value of 'p ⊃ q' is ……… if p is true and q is false.

w) The truth value of 'p ⊃ q' is ……… if p is true and q is true.

x) The truth value of 'p . q' is ……….. if p is true and q is true.

y) The truth value of 'p . q' is ……… if p is true and q is false.

z) The truth value of 'p . q' is ……….. if p is false and q is true. aa) The truth value of 'p . q' is ……….. if p is false and q is false. bb) The truth value of 'p v q' is ……… if p is false and q is true. cc) The truth value of 'p v q' is ……… if p is false and q is false. dd) The truth value of 'p v q' is ……… if p is true and q is false. ee) The truth value of 'p v q' is ……… if p is true and q is true. ff) The truth value of 'p ∧ q' is ……… if p is false and q is true. gg) The truth value of 'p ∧ q' is ……… if p is false and q is false. hh) The truth value of 'p ∧ q' is ……… if p is true and q is false. ii) The truth value of 'p ∧ q' is ……… if p is true and q is true. jj) The truth value of 'p / q' is ……… if p is false and q is true. kk) The truth value of 'p / q' is ……… if p is false and q is false. ll) The truth value of 'p / q' is ……… if p is true and q is false. mm) The truth value of 'p / q' is ……… if p is true and q is true.

nn) If p is true ………. is the value of - p

oo) If p is false ……….. is the value of - p

2. **Short Type Question (One or two senteces?**

   a) What is ideogram?

   b) What is symbol?

   c) What is symbolic logic?

   d) What is variable?

   e) What is logical constant?

   a) What is truth table?

   b) What is truth function?

   c) What is truth exression?

   d) What is conjuctive function?

   e) What is disjunctive function?

   f) What is implicative function?

   g) What is alternative function?

   h) What is tautology?

   i) What is contradiction?

   j) What is validity of an argument?

3. **Short Type Questions (75 words) a) What is disjunctive function?**

   b) What is implicative function?

   c) What is alternative function?

   d) What is tautology?

e) What is contradiction?
f) What is validity of an argument?
g) What is truth table?
h) What is truth function?
i) What is truth exression?
j) What is conjuctive function?
k) What is difference between inference and implication?
l) What is the difference between variables and constant?

4. Long Type Question (300 words)
   a) What is the difference between classical logic and traditional logic?
   b) What is difference between inference and implication?
   c) What is the difference between variables and constants?
   d) Discuss different truth functions.

Unit - 2

1. Fill in the blanks.
   a) In the direct truth table method if all the values of an expression is 'true' then it is called …………….
   b) In the direct truth table method if all the values of an expression is 'false' then it is called …………….
   c) In the direct truth table method if all the values of an expression is both 'true' or 'false' then it is called …………….
   d) In indirect truth table method, if we find a contradiction at any step, then the expression is called ………..
   e) In indirect truth table method, if we d not find a contradiction at any step, then the expression is called ………..

2. Short Type Question (One or two sentences?
   a) What is direct truth table method?
   b) What is indirect truth table method?
   c) How the validity of an expression is determined by the direct truth table method?
   d) How the validity of an expression is determined by the indirect truth table method?
   e) What is propositional calculus?
   f) What is logical predicate in the predicate calculus?
   g) What is the logical subject in the predicate calculus?
   h) What is particular quantifier?
   i) What is universal quantifier?
   j) What is free variables
   k) What is bound variable?

3. **Short Type Questions (75 words)**
   a) **What is propositional calculus?**
   b) **What is logical predicate in the predicate calculus?**
   c) **What is the logical subject in the predicate calculus?**
   d) **What is particular quantifier?**
   e) **What is universal quantifier?**
   f) **What is free variables**
   g) **What is bound variable?**
   h) **Symbolize the expression in quantifier**
   i) **All men are mortal. ii)   No men are honest. iii)   Some men are honest**
      iv)   **Some men are not honest**

4. **Long Type Question (300 words)**
   a) **What is direct truth table method? Test the validity of the following expressions and determine if any of them is a tautology.**

   (p ⊃ q) ⊃ (- p v −q)
   (p ⊃ - q) ⊃ (- p v −q)
   (- p ⊃ q) v (- p . −q)
   {(p ⊃ - q) ⊃ (- p v −q)} ⊃ (- p v −q)
   {(p ⊃ (q . r)} ⊃ {(- p v (q .r)}
   {(p . q) ⊃ r} ⊃ {(- p . r) v (- q v r)}
   {(p ⊃ q) ⊃ r} ⊃ {(r ⊃ p) ⊃ (- q v p)}

   b) **What is direct truth table method? Test the validity of the following expressions and determine if any of them is a tautology.**

   (p ⊃ q) ⊃ (- p v −q)
   (p ⊃ - q) ⊃ (- p v −q)
   (- p ⊃ q) v (- p . −q)
   {(p ⊃ - q) ⊃ (- p v −q)} ⊃ (- p v −q)
   {(p ⊃ (q . r)} ⊃ {(- p v (q .r)}
   {(p . q) ⊃ r} ⊃ {(- p . r) v (- q v r)}
   {(p ⊃ q) ⊃ r} ⊃ {(r ⊃ p) ⊃ (- q v p)}

Unit – 3

   1. Fill in the blanks.
   a) **According to Reference Formula, - - p = …………**
   b) **According to Reference Formula, p ⊃ q = …….. v q**
   c) **According to Reference Formula, - p ⊃ q = …….. v q**
   d) **According to Reference Formula, - p ⊃ - q = ……. v − q**
   e) **According to Reference Formula, p v q = …….. (-p . − q)**
   f) **According to Reference Formula, - p v q = …….. (p . − q)**
   g) **According to Reference Formula, p ⊃ q = - (p . ……)**

h) According to Reference Formula, { (p ⊃ q) . (q ⊃ r) } ⊃ ………..
i) According to Reference Formula, { (p ⊃ q) . p = …………
j) The full form of CNF is …………..

2. Short Type Question (One or two sentences?

a) What is the rule of Detachment or the Ponendo Ponns?
b) What is the rule of transitivity of implication?
c) What is the law of contraposition?
d) What is de Morgan's rule?
e) What is the Communicative law of Conjunction?
f) What is the Communicative law of Disjunction?

3. Short Type Questions (75 words)
a) What is C N F?
b) What is derivation by substitution?
c) What are the steps of CNF?
d) What is the use of Reference Formula?
e) What is the law of Identity and the law of Contradiction?
f) What is the rule of Detachment or the Ponendo Ponns?
g) What is the rule of transitivity of implication?
h) What is the law of contraposition?
i) What is de Morgan's rule?
j) What is the Communicative law of Conjunction?
k) What is the Communicative law of Disjunction?

4. Long Type Questions (300 words)

Test the validity of the following expressions and find if they are tautology or not by converting into CNF. a) (p ⊃ q) ⊃ (- p v −q)
b) (p ⊃ - q) ⊃ (- p v −q)
c) (- p ⊃ q) v (- p . −q)
d) {(p ⊃ - q) ⊃ (- p v −q)} ⊃ (- p v −q)
e) {(p ⊃ (q . r)} ⊃ {(- p v (q .r)}
f) {(p . q) ⊃ r} ⊃ {(- p . r) v (- q v r)}
g) {(p ⊃ q) ⊃ r} ⊃ {(r ⊃ p) ⊃ (- q v p)}

Test the validity of the following arguments by the method of equivalent substitutions.
a) If the cost of living rises or government revenues increases, then salary increases will be granted. No salary increases will be granted. Therefore, government revenues will not increase.

b) If the police do not catch the murderer within a week, there will be a public outcry. If there is a public outcry, then the chief of police will resign. The chief of police will not resign. Therefore, the police will catch the murderer within a week.

c) If the picture is not a forgery, then it is valuable, it is not the case that either it is a forgery or that it is not sought after by collectors. If the picture is not by Vermeer, then it is not sought after by collectors. Therefore, the picture is valuable and it is by Vermeer.

Unit - 4

1. Fill in the blanks.

   a) In figure 1, there are ………. valid moods.
   b) In figure 2, there are ……….. valid moods.
   c) In figure 3, there are ………… valid moods.
   d) In figure 4, there are …………. valid moods
   e) ………… introduced Boolean Alzebra.
   f) The book "The Mathematical Analysis of Logic" is written by ……….
   g) According to Boolean Alzebra, $(AB)'' = A' + \ldots\ldots..$
   h) According to Boolean Alzebra, $(A + B)'' = A'\, B'$
   i) According to Boolean Alzebra, $(A'\,')'' = A$
   j) According to Boolean Alzebra, $(A + B')'' = A' \ldots\ldots$
   k) According to Boolean Alzebra, $(A + B')'' = A' \ldots\ldots$
   l) According to Boolean Alzebra, $(A + A')'' = \ldots\ldots$
   m) According to Boolean Alzebra, $(A\, A' = \ldots\ldots..$
   n) According to Boolean Alzebra, $1 + A = \ldots\ldots\ldots$

2. Short Type Questions (One or two sentences)

   a) What is Boolean Alzebra?
   b) What is Appendix?
   c) What are the valid moods in syllogism?
   d) Which moods cannot be tested as valid or invalid by Boolean Alzebra?
   e) Which moods of the 3rd figure cannot be tested as valid or invalid by Boolean Alzebra?
   f) Which moods of the 4th figure cannot be tested as valid or invalid by Boolean Alzebra?

3. **Short Type Questions (75 words)**

   a) What is Boolean Alzebra?
   b) What is Appendix?
   c) What are the valid moods in syllogism?
   d) Which moods cannot be tested as valid or invalid by Boolean Alzebra?
   e) Which moods of the 3rd figure cannot be tested as valid or invalid by Boolean Alzebra?
   f) Which moods of the 4th figure cannot be tested as valid or invalid by Boolean Alzebra?

4. Long Type Question (300 words)

   Test the validity of the following moods by Boolean Algebra.

   a) BARBARA
   b) CELARENT
   c) DARII
   d) FERIO
   e) CESARE
   f) CAMESTRES
   g) FESTINO
   h) BAROCO
   i) DISAMIS
   j) DATISI
   k) BOCARDO
   l) FERISON
   m) CAMENES
   n) DIMARIS
   o) FRESISON

   Put the following Boolean expressions into normal form.

   a) $A B' + A'$
   b) $A' + AC + ABC' + A B' C'$
   c) $AB + A'C + C'$
   d) $AB + A'C + C'$
   e) $(AB + A'C') + B$
   f) $(A + D)' (B + C')' + AD$

g) $(AB + BC')' + B'C$

h) $(A + BC + A'D)' + A'C'$