

B. A. DEGREE (C.B.C.S.S.) EXAMINATION, MARCH 2017
SEMESTER IV - COMPLIMENTARY COURSE (ECONOMICS)
EC4C02B – SYMBOLIC LOGIC

Time: Three Hours

Maximum Marks: 80

PART A**I. Answer all questions. Each question carries 1 mark.**

1. The language used to express feeling, emotions, attitude etc. is serving _____function.
2. In logic, validity and invalidity is attributed to argument, whereas truth and falsehood is attributed to _____.
3. A statement form that has only false substitution instances is said to be _____.
4. Represent the rule of Double Negation.
5. The expression $p \bullet q, \neg p$ is called_____.
6. Translate the following statement by using quantification method.
All parrots are birds.

(6x1=6)

PART B**II. Answer any seven questions. Each question carries 2 marks**

7. Write a note on Directive function of language.
8. Define logic.
9. Define variable.
10. Differentiate between simple and compound statement.
11. Construct a truth table for tautological statement form.
12. Use truth table to determine the validity or invalidity of the following argument forms.
 - a) $p \bullet q$
 $\neg q$
 - b) p
 $\neg p \bullet q$
13. List any two rules of replacement.
14. State the justification for each line that is not a premise.
 1. $A \bullet B / \neg B$
 2. $B \bullet A$
 3. B
15. What is instantiation?
16. Symbolize the statement 'All men are mortal' and 'No men are mortal' by using Quantification theory.

(7x2=14)

PART C**III. Answer any five questions. Each question carries 6 marks.**

17. Is disjunction a truth functional compound statement? Examine with the help of a truth table.
18. Use truth tables to determine the following statement forms as tautologous, contradictory or contingent.
 - a) $(p \supset q) \vee p$
 - b) $p \supset (p \bullet q)$
 - c) $p. \sim p$
19. Is there any connection between truth and validity? Examine with examples.

20. Construct formal proof of validity for the following arguments.
- a) $(P \vee Q) \supset R$
 $P \cdot S / \therefore R$
- b) $P \supset Q$
 $P / \therefore P \cdot Q$
- c) $A \supset (C \cdot D)$
 $A / \therefore C$
21. Give justification for each line that is not a premise.
- a) 1 $A \supset C$
2 $\sim A \supset B / \therefore C \vee B$
3 $\sim C \supset \sim A$
4 $\sim C \supset B$
5 $\sim \sim C \vee B$
6 $C \vee B$
- b) 1 $(S \cdot G) \vee (W \cdot T)$
2 $\sim S / \therefore T$
3 $\sim S \vee \sim G$
4 $\sim (S \cdot G)$
5 $W \cdot T$
6 $T \cdot W$
7 T
22. If P and Q are true and X and Y are false, determine the truth value of the following Statements.
- a) $\sim (P \supset X) \vee Y$ b) $Q \supset (P \vee \sim X)$
c) $(Q \cdot X) \supset Y$ d) $(P \cdot Q) \supset (X \cdot Y)$
23. Symbolize the following propositions using quantifiers and suggested variables.
- a) Peacocks are beautiful. (Px- x is peacock; Bx- x is beautiful)
b) No donkeys are intelligent. (Dx- x is donkey; Ix- x is intelligent)
c) Some students are hardworking. (Sx- x is student; Hx- x is hardworking)
24. How universal and existential quantification is related? Explain with the help of a Square diagram.

(5x6=30)

PART D

IV. Answer any two questions. Each question carries 15 marks.

25. Briefly explain the implicative and bi-conditional function with the help of truth table.
26. Use truth table to determine the validity or invalidity of the following argument.
If Adithi is elected as UG representative, then either benny is elected as Association Secretary or Christy is elected as Joint Secretary.
Benny is elected as Association Secretary.
Therefore if Adithi is elected as UG representative, then Christy is not elected as Joint Secretary.
27. Define formal proof of validity and present any five rules of replacement.
28. Explain the preliminary quantification rules.

(2x15=30)