

B. A. DEGREE (C.B.C.S.S.) EXAMINATION, APRIL 2018
(2014 Admission Supplementary)
SEMESTER IV - COMPLEMENTARY COURSE (ECONOMICS)
ECO4SL - SYMBOLIC LOGIC

Time: Three hours

Maximum Marks: 80

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

1. A proposition is a statement which is either_____.
2. If the earth is round, then Mass is round is an example for _____statement.
3. Either whales are mammals or they are very large fish is an example for _____ statement.
4. In symbolic logic, letter, p, q, r etc are called_____.
5. Name the rule of inference for this equation $p \cdot p / \therefore p$.
6. A statement from that has only false substitution instances are called_____
- If A is true, X is false which if the following are true.
7. $\sim A \vee X$
8. $\sim X \cdot A$
9. $A \cdot X$
10. $X \supset A$

(10x1=10)

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

11. Define compound statements.
12. Write the Law of distribution.
13. What are logical variables?
14. Define Truth-value.
15. Define Truth-functional compound statements?
16. Define Tautology.
17. Define conjunction.
18. Symbolise the following statements:
 1. Iran and Libya both raise the price of oil.
 2. Iran raises the price of oil but Libya does not raise the price of oil.
19. Define conditional statement.
20. Define valid argument.
21. Define negation.
22. If p is true and q is true what will you infer about p q

(8x2 =16)

PART C**III Answer any six questions. Each question carries 4 marks.**

23. Describe the role of Language in logic.
24. Differentiate between truth, validity and soundness of argument.
25. Differentiate between traditional Logic and symbolic logic.
26. Use truth-table to decide which of the following bi-conditionals are tautologies:
 - (i) $p \cdot (q \vee r) \quad (p \cdot q) \vee (p \cdot r)$

(ii) $[p \supset (q \supset r)] \equiv [q \supset (p \supset r)]$

27. Construct formal proof of validity:

$$\begin{aligned} & M \vee N \\ & \sim M \cdot \sim O / \therefore N \\ & X \vee Z \end{aligned}$$

28. Check the validity of the following argument using truth-table method:

$$\begin{aligned} & (P \vee q) \quad (p \cdot q) \\ & \sim(p \vee q) / \therefore \sim(p \cdot q) \end{aligned}$$

29. Give justification for the following premises.

1. $w \supset x$
2. $(w \supset y) \supset (z \vee x)$
3. $(w \cdot x) \supset y$
4. $\sim z / \therefore x$
5. $w \supset (w \cdot x)$
6. $w \supset y$
7. $z \vee x$
8. X .

30. Construct formal proof of validity.

$$\sim B \vee (C \cdot D) / \therefore B \supset C$$

31. Prove the invalidity of the following argument by the method of arguing truth-values.

$$\begin{aligned} & x \supset y \\ & Q \supset Z \\ & X \vee Z \end{aligned}$$

(6x4=24)

PART D

IV Answer any two questions. Each question carries 15 marks

32. Construct the formal proof of validity.

1. $A \supset B$
2. $A \vee (C \cdot D)$
3. $\sim B \cdot \sim E / \therefore C$

33. Prove the invalidity of the following argument by the method of assigning truth-values.

$$\begin{aligned} & A \supset (B \vee C) \\ & B \supset (C \vee A) \\ & C \supset (A \vee B) \\ & \sim A / \therefore B \vee C \end{aligned}$$

34. Symbolise and determine the validity of the argument.

If oil consumption continues to grow, then oil imports will increase and domestic oil reserves will be depleted. If either oil imports increase or domestic oil measures are depleted, then the nation will soon be bankrupt. Therefore, if oil consumption continues to grow, then the nation will soon be bankrupt.

35. Use truth-table to determine the validity of the argument.

$$\begin{aligned} & (R \vee S) \supset T \\ & T \supset (R \cdot S) / \therefore (R \cdot S) \supset (R \vee S) \end{aligned}$$

(2x15=30)