TB144270B **Reg. No: ……..**

Name: ……..

B. A. DEGREE (C.B.C.S.S.) EXAMINATION, MARCH 2017

(Supplementary – 2014 Admission)

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. The language used to affirm or deny proposition is serving _____function.
   a) Informative b) Expressive c) Directive d) None of the above
2. Validity and invalidity is attributed to a
   a) Sentence b) Proposition c) Argument d) All the above
3. The statement that contains another statement as its component is called _____.
   a) Simple b) Compound c) declarative d) Assertive
4. The symbol *curl*is used to represent_____
   a) Conjunction b) Disjunction c) Negation d) Implication
5. The argument form p⊃ q,~q, therefore ~p is known as_____.
   a) Modus Ponens b) Modus Tollens c) Hypothetical d) Disjunctive
6. The statement form P **v**~P is a _____.
   a) Tautology b) Contradiction c) Contingent d) None of the above
7. A contingent statement form has _____substitution instances.
   a) only true b) only false c) both a and b d) neither a nor b
8. Name the rule of inference.
   a) p⊃q
   q⊃r
   ∴ p⊃r
   a) Constructive Dilemma b) Destructive Dilemma c)Hypothetical Syllogism
   d) Disjunctive Syllogism
9. If either medicine is required or exercise is required, then all people will gain good health is symbolized as _____.
   a) (MvE) ⊃ P b) M v(E⊃P) c) M vE⊃P d) None of the above
10. The expression (pvq) ≡ **(**qvp**)** is called_____
    a) Association b) Distribution c) Commutation d) Transposition

(10x1=10)

PART B

II. Answer any eight questions. Each question carries 2 marks.

11. Write a note on informative function of language.
12. 'Logical language is emotively neutral language'. Substantiate.
13. Symbolize the following.
    a) It is not the case that p then q.
    b) P implies q if and only if q implies p.

14. State the rule of Distribution.
15. Write a note on constants and variables.
16. Define a statement form.
17. Use truth table technique and characterize the statement form.
    (p •q)⊃p
18. What is the specific form of B v ~B? Prove it as a tautology by means of the truth table.
19. State the rule of inference by which the conclusions follow from the premises.
    a) (A⊃ ~B)
       ∴ (A⊃ ~B) v (~C ⊃ D)
    b) (~A⊃B) • (Cv~D)
       ∴ (~A⊃B) • (~DvC)
20. State the rule of Association.
21. Define an elementary valid argument.
22. Define Material equivalence.

(8x2=16)

PART C

III. Answer any six questions. Each question carries 4 marks.

23. Construct formal proof of validity.
    Av(B⊃D)
    ~C ⊃ (D⊃E)
    A⊃C
    ~C / ∴ B⊃E
24. State the justification for each line that are not premises.
    a)
    1. (A•B)⊃ [A⊃ (D•E)]
    2. (A•B) •C/ ∴ DvE
    3. A•B
    4. A⊃ (D•E)
    5. A
    6. D•E
    7. D
    8. D v E

    b)
    1. F v (G v H)
    2. (G⊃I)•(H⊃J)
    3. (IvJ) ⊃ (FvH)
    4. ~F/ ∴ H
    5. GvH
    6. IvJ
    7. FvH
    8.H
25. Differentiate between constants and variables.
26. Is negation a truth functional connective? Examine.
27. Define disjunction with the help of truth table.
28. If P and Q are true and X and Y are false, determine the truth value of the following statements.
    a) (P⊃Q) ⊃Y
    b) ~Y⊃ (P⊃X)
    c) (P vX) ⊃Y
    d) (P•Q) v (X•Y)
29. Use truth tables to decide which of the following a logical equivalence is.
    a) (p⊃q) ≡ (~p⊃~q)
    b) [p. (q v r)] ≡ [(p • q)v(p • r)]
30. Prove the invalidity of the following arguments.
    a) P⊃Q
       R⊃Q
       ∴ P⊃R
    b) A⊃B
       C⊃D
       B v C
       ∴ A v D
31. Explain contingent statement forms with example.

(6x4=24)

PART D

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

32. What are the three basic functions of languages? Explain.
33. Describe truth functional compound statement. Construct truth table for the three Compound statements.
34. Use truth tables to characterize the following statement forms as tautologous, Contradictory or contingent.

    1. p⊃(p •p) 2. (p ⊃p) • (~p ⊃p) 3. (p v p) • (p⊃p)

35. List the nine rules of inference and construct formal proof of validity for the given argument.

    1. P v (qvr)
    2. (q⊃s)•(r⊃t)
    3. (svt)⊃(pvr)
    4. ~p/ ∴ r

(2x15=30)