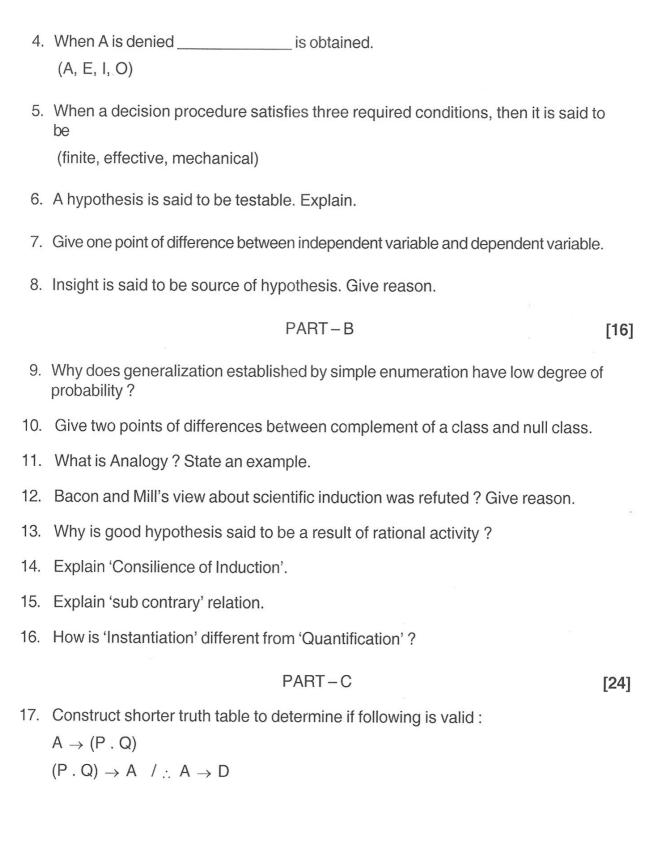
- **INSTRUCTIONS**: i) **All** questions are **compulsory**.
 - ii) Figures at the right indicate full marks.
 - iii) Part A is one mark each. For MCQ's in Part A, choose the correct alternative and write the answer.
 - iv) Part **B** is **two** marks **each**. They are short answers, **not** to exceed **30** words.
 - v) Part C is three marks each. Read instructions carefully and solve accordingly.
 - vi) Q. **25** and Q. **26** of Part **D** are to be symbolized **first** and then determine validity.
 - vii) Q. 27 and Q. 28 are to be solved carefully.
 - viii) Q. 29 to Q. 32 of Part D carries 4 marks each. Answers not to exceed 100 words.

PART-A [8]

- Rule of negation of implication in truth-tree method opens as a (branch, path, stem)
- 2. Small letters 'a to w' represent _____ in predicate logic. (individual variable, individual constant, predicate constant)
- 3. The condition in absence of which, event will not occur is (sufficient, necessary, prime)



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18. Construct Shorter Truth Table to determine if following is tautology:

$$[(p \bullet q) \bullet \sim p] \rightarrow \sim q.$$

19. Construct Truth Tree to determine if following is valid:

$$^{\sim} C \, \rightarrow \, (M \, \bullet \, N)$$

$$\sim M \rightarrow \sim C$$
 / $\therefore M$

20. Construct Truth Tree to determine if following is tautology:

$$[p \lor (q \bullet r)] \rightarrow (p \lor q)$$
.

21. Construct Conditional Proof (C.P.) of validity for the following:

$$P \rightarrow Q$$

$$P \vee \sim M$$
 /::~ $Q \rightarrow \sim M$

22. Construct Conditional Proof (C.P.) to determine if following is tautology:

$$[(A \lor B) \bullet \sim A] \rightarrow B$$

23. Construct Indirect Proof (I.P.) to determine if following is valid:

$$P \vee (Q.R)$$

$$P \rightarrow R / : R$$

24. Construct Indirect Proof (I. P.) to determine if following is tautology:

- 25. Determine validity of the following argument by Formal Proof Method:
 - 1) If it rains then we will have water to drink and if there is a drought then our animals may die.
 - 2) Either it will rain or there will be droughts. Therefore it is not the case that either we will get water to drink or **our** animals will die, then human life will get affected. [R, W, D, A, H]
- 26. Determine validity of the following by Formal Proof Method:

Picasso is a painter

Picasso is a chess player

Therefore some painters are chess players.

- 27. Translate the following into logical notations of propositional functions and quantifiers:
 - 1) All Indians practise Yoga.
 - 2) Some cricketers are famous.
 - 3) Some birds are not carnivorous.
 - 4) All flowers are not beautiful.
- 28. Symbolize the following using Venn diagram:
 - 1) Class with members
 - 2) Universal negative
 - 3) Particular affirmative
 - 4) Product of classes
- 29. Answer any one of the following:
 - 1) Solution to the problem of induction.
 - 2) Conditions of sound analogical arguments.
- 30. Explain any one of the following:
 - 1) Fallacy of Mal-observation.
 - 2) Law of functional dependence.
- 31. What is 'working hypotheses'?
- 32. Explain characteristics of experiment.

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