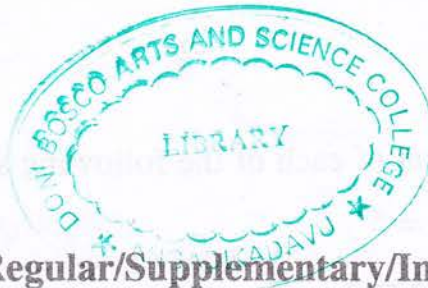




M 8892

Reg. No. : .....

Name : .....



**First Semester B.Sc. (Regular/Supplementary/Improvement) Degree  
Examination, November 2010  
MATHEMATICS (Core)**

**Course No. – I : 1B01MAT : Methodology and Perspectives of Sciences**

Time : 3 Hours

Total Weightage : 30

1. Fill in the blanks :

(Weightage 2)

- If  $p$  is true and  $q$  is false then  $p \rightarrow q$  is \_\_\_\_\_
- A counter example for the statement  $\forall x \in \mathbb{R} x^2 > 0$
- By identify laws  $PVT =$  \_\_\_\_\_
- The negation of the proposition '1 + 5 = 6 and Kannur is in Kerala' is  
\_\_\_\_\_

Answer **any six** from the following :

(Weightage 1 each)

- Why should scientific tests be reproducible ?
- Explain the term variable in an experiment.
- Which are the different areas of science ?
- Why are samples used in research ?
- Write the truth table for the following proposition  $p \leftrightarrow q$ .
- Determine the inverse and contrapositive of the following proposition 'If  $5+3=10$  then Anil is intelligent'.

P.T.O.



8. Determine the truth value of each of the following statements.

a)  $6 + 2 = 10$  or  $2 + 3 = 5$

b)  $6 + 2 = 10$  and  $2 + 3 = 5$

c) If  $6 + 2 = 10$  then  $2 + 3 = 5$

9. Show that  $p \leftrightarrow \neg q$  does not logically imply  $p \rightarrow q$ .

10. Find the truth table for  $p \vee \neg q$ .

11. Verify that  $p \vee \neg(p \wedge q)$  is a tautology.

Answer **any seven** from the following :

(Weightage 2 each)

12. Define and distinguish between induction and deduction.

13. What is the difference between basic research and applied research ?

14. How does probability related to scientific statement ?

15. Test the validity of the following argument. If it rains, then John will be sick. It did not rain.

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John was not sick.

16. State and prove the law of detachment.

17. Prove that  $\neg(\forall x p(x)) \equiv \exists x \neg P(x)$ .

18. Negate each of the following statement :

a)  $\exists x \forall y, p(x, y)$

b)  $\forall x \forall y, p(x, y)$

19. Define fallacy. Illustrate it with an example.



- 20. State and prove the law of syllogism.
- 21. Prove that  $p \wedge (q \vee r) \equiv (p \wedge q) \vee (p \wedge r)$ .

Answer **any two** from the following :

(Weightage 4 each)

- 22. Write a note on 'Eureka intuition'.
  - 23. Why is a critical thinking is so important for the progress of science ?
  - 24. Explain proofs by contradiction. Illustrate it with an example.
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