

Exam. Code : 109502

Subject Code : 3380

Bachelor of Vocation (Automobile Technology)

2nd Semester

PHYSICS

Paper—V

Time Allowed—Three Hours] [Maximum Marks—75

Note :— (1) Section A is compulsory.

(2) Attempt any FIVE questions from Section B.

(3) Attempt any THREE questions from Section C.

SECTION—A

Define equal vectors. (1)

Define position vector. (1)

Define collinear vectors. (1)

Define a scalar quantity and a vector quantity. (2)

What is acceleration? (2)

Explain the difference between distance and displacement. (2)

(Contd.)

7. Explain OR gate and its truth table. (2)
8. Explain NAND gate and its truth table. (2)
9. Convert $(101101)_2$ to an equivalent decimal. (2)
10. Explain binary number system. (2) $2 \times 10 = 20$

SECTION—B

11. Subtract 0110 from 1001.
12. Add the following binary numbers :
- (i) 1011 and 1101 (5)
- (ii) 1010.11 and 1011.10
13. Produce AND, OR and NOT gates using NAND gates. (3)
14. Explain X-NOR gate and its truth table. (3)
15. Explain the commutative property of vectors addition.
16. Explain the dot and Scalar product of vectors.
17. Derive the relation $v = u + at$. (4)
18. Define positive and negative acceleration. $5 \times 5 = 25$

SECTION—C

19. Derive the relations :—

(i) $v^2 - u^2 = 2as$

(ii) $s = ut + \frac{1}{2}at^2$

- 20. Explain parallelogram law of vector addition.
- 21. A force of 4N makes an angle 30° with x-axis. Find the x and y components of the force.
- 22. Write and explain the truth tables of NAND, NOR, XOR and XNOR gates.
- 23. Explain triangle law of vector addition.
- 24. Show that NAND gate and NOR gate are universal gates. 3×10=30

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 5 + 24 \\
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 29 \\
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 50 \\
 24 \\
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 74
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