

190006

**B.Voc. Automotive Mechatronics**

**Subject: Applied Physics**

**Subject Code: ZBSC103**

**Semester: 2<sup>nd</sup>**

**Batch: 2018-21**

**Theory (External): 35**

**Time: 03 hours**

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**Instructions to the Students**

1. This Question paper consists of two Sections. All sections are compulsory.
2. **Section A** comprises 10 questions of objective type in nature. All questions are compulsory. Each question carries 1 mark.
3. **Section B** comprises 8 essay type questions out of which students need to do any 5. Each question carries 5 mark.
4. Read the questions carefully and write the answers in the answer sheets provided.
5. Do not write anything on the question paper.
6. Wherever necessary, the diagram drawn should be neat and properly labelled

**Roll Number**

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**SECTION –A (OBJECTIVE TYPE QUESTIONS)**

**(10x1=10 Marks)**

- Q1 (a) What are the basic measuring systems? (1)
- (b) Find the pressure inside a water droplet having diameter of 0.5 mm at  $20^{\circ}\text{C}$  if the outside pressure is  $1.03\text{N/cm}^2$  and the surface tension of water at that temperature is  $0.0736\text{N/m}$ . (1)
- (c) What is the magnitude of the force required to stretch a 20 cm-long spring, with a spring constant of  $100\text{N/m}$ , to a length of 21 cm? (1)
- (d) What are the modes of heat transfer? (1)
- (e) Differentiate between specific weight and specific gravity. (1)
- (f) What is the meaning of reversible and irreversible process in thermodynamics? (1)
- (g) Define compound machine with an example. (1)
- (h) Explain types of optical fibers. (1)
- (i) What are applications of solar cell? (1)
- (j) What are the characteristics of Laser light? (1)

## SECTION –B (ESSAY TYPE QUESTIONS)

(5x5=25 Marks)

- Q2 (a) What is the principle of resistance thermometer? What is (2.5)  
resistance thermometers used for?
- (b) What is self-locking machine? Explain with an example. (2.5)
- Q3 (a) Differentiate between turbulent and laminar flow with (2.5)  
example.
- (b) The hydraulic lift has a large cross section and a small cross (2.5)  
section. Large cross-sectional area is 20 times the small  
cross-sectional area. If on the small cross section is given  
an input force of 25 N, then determine the output force..
- Q4 Describe the following: (5)
- (i) Ideal Machine (ii) Photoconductivity
- Q5 Explain principle of optical fibers and acceptance angle in (5)  
optical fibers.
- Q6 (a) Explain photovoltaic cell and its applications. (2.5)
- (b) Explain spontaneous and stimulated emission of radiation? (2.5)

- Q7 What is the working of solar cell? How much voltage does a solar cell produce? (5)
- Q8 How do jack screws work? Define the mechanical advantage of a screw? (5)
- Q9 How you explain Nanotechnology and what are the applications of nanotechnology? (5)

----- **End of Paper** -----