

**B. Voc Automotive Manufacturing/ Mechatronics****Subject: Applied Physics****Subject Code: BSC-103****Semester- 1<sup>st</sup> Semester, Re-appear (2017-20)****Theory (External): 35****Time: 03 hours****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 6 essay type questions out of which students need to do any 5. Each question carries 5 marks.
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					

**SECTION -A (OBJECTIVE TYPE QUESTIONS)****(10x1=10 Marks)**

- Q1 (a) What is unit and dimensional formula of Force. (1)
- (b) Explain relative velocity. (1)
- (c) From rest, a car accelerated at  $8 \text{ m/s}^2$  for 10 seconds. What is the position of the car at the end of the 10 seconds? (1)
- (d) What is difference between kinetic and potential energy? (1)
- (e) Calculate the force needed to speed up a car with a rate of  $5 \text{ ms}^{-2}$ , if the mass of the car is 1000 kg. (1)
- (f) A parallel plate air condenser has a capacity of  $4 \mu\text{F}$ . It is filled with two different dielectrics of constants 4 and 6 and they fill the upper and lower halves of the space as shown. The capacity now will be
- The diagram shows a parallel plate capacitor with two horizontal plates. The space between the plates is divided into two equal vertical regions. The left region is shaded with diagonal lines and labeled  $K=6$ . The right region is shaded with horizontal lines and labeled  $K=4$ .
- (g) How you define Power and its unit? (1)
- (h) Explain Rigid body. (1)
- (i) Calculate the combined capacitance in micro-Farads ( $\mu\text{F}$ ) of the following capacitors when they are connected together in a parallel combination if two capacitors each with a capacitance of  $47 \text{ nF}$ . (1)
- (j) A uniform magnetic field of magnitude  $1.5 \text{ T}$  is directed horizontally from west to east. (What is the magnetic force on a proton at the instant when it is moving vertically downward in the field with a speed of  $4 \times 10^7 \text{ m/s}$ ?) (1)

**SECTION -B (ESSAY TYPE QUESTIONS)****(5x5=25 Marks)**

- Q2 (a) Explain Principle of Homogeneity with example. (2.5)
- (b) How can a vector be resolved into its components? (2.5)
- Q3 (a) How will you describe uniformly accelerated motion? (2.5)
- (b) What is the work energy theorem? (2.5)
- Q4 (a) Explain Magnetic Field Intensity and Magnetic Lines of Force (2.5)
- (b) What is the law of the conservation of angular momentum? (2.5)
- Q5 (a) Explain inertia of rest, inertia of motion and inertia of direction. (2.5)
- (b) What are applications of Wheatstone Bridge? (2.5)
- Q6 What is Kirchhoff's second law? Explain with an Example. (5)
- Q7 Explain Biot Savart's Law. (5)

**\*\*\*\*\*END OF THE PAPER\*\*\*\*\***