



HARYANA VISHWAKARMA SKILL UNIVERSITY

Course	:	B.Sc. (Automotive Manufacturing)
Subject	:	Applied Physics
Semester	:	First
Subject Code	:	BSC-103
Duration	:	3 Hours
Maximum Marks	:	35

Instructions to the Student:

This question paper consists of 2 Sections.

1. Section A comprises 10 questions of objective type in nature. All 10 questions are compulsory. Each question carries 1 mark.
2. Section B comprises 6 long answer type questions out of which students need to do any 5. Each question carries 5 marks.

SECTION-A (OBJECTIVE TYPE QUESTIONS)

Q1. SI unit of acceleration is

- A) m/s
- B) m^2/s
- C) m^2/s^2
- D) m/s^2

Q2. When two vectors are perpendicular, their

- A) Dot product is zero
- B) Cross product is zero
- C) Both are zero
- D) Both are not necessarily zero

Q3. Dimensional formula of Moment of inertia is

- A) $[M^2 L^{-1} T^{-2}]$
- B) $[M^1 L^2 T^0]$
- C) $[M^1 L^{-1} T^{-1}]$
- D) $[M^1 L^{-2} T^0]$

Q4. Rate at which angular displacement changes with time is called

- A) Angular displacement
- B) Angular velocity
- C) Angular acceleration
- D) Angular speed

Q5. Orbital angular momentum is associated with motion of body along

- A) Circular path
- B) Straight path
- C) Central point
- D) Pivot axis

Q6. If plates of capacitor are oppositely charged then total charge is equal to

- A) zero
- B) Negative
- C) Positive
- D) Infinite

Q7. The circuit in which current has a complete path to flow is called _____ circuit.

- A) Open
- B) Closed
- C) Short
- D) Open loop

Q8. Kirchoff's 2nd law deals with

- A) Current in circuit
- B) Voltage in circuit
- C) Electromotive force in circuit
- D) Both B and C

Q9. Two $10\ \Omega$ resistors are connected in parallel, their equivalent resistance is

- A) $5\ \Omega$
- B) $10\ \Omega$
- C) $15\ \Omega$
- D) $20\ \Omega$

Q10. Biot Savart law in magnetic field is analogous to which law in electric field?

- A) Gauss law
- B) Faraday law
- C) Coulomb's law
- D) Ampere law

SECTION-B (LONG ANSWER TYPE QUESTIONS)

Q11. (i) Find the value of t such that the vectors $A = i + t j - 3k$ and $B = 2ti - j$ are perpendicular to each other.

(ii) Explain vector and rectangular components of a vector.

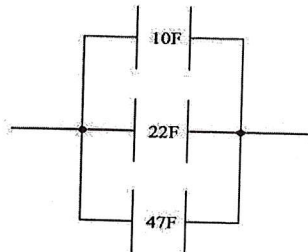
Q12. (i) Explain momentum and law of conservation of momentum.

(ii) Explain uniformly accelerated motion with example.

Q13. (i) Derive an expression for the relation between linear acceleration and angular acceleration.

(ii) Derive an expression for the rotational kinetic energy of rigid body.

Q14. Derive an expression to calculate the capacitance of series plate capacitor. Calculate the total capacitance for these three capacitors in the figure below:



Q15. (i) Write the principle and application of Wheatstone bridge. Also calculate the balancing condition of Wheatstone bridge

(ii) What is Kirchhoff's voltage and current laws?

Q16. Explain and derive the expression for the Biot Savart law.