

**Scottish Church College**  
**Mathematics Honors**  
**Semester 2 General Elective**  
**Internal Examination 2021**

Please use the Google form provided for answers

**Answer all questions. All questions carry 2 marks.**

**Full Marks 10**

**Time: 30 Mins**

1. The sequence  $\{x_n\}_n$  where  $x_n = (-1)^n \frac{\cos n^4}{n}$  is  
(a) Converges (b) Oscillates finitely  
(c) Monotone and bounded (d) none of these
2. The series  $\frac{1}{1 \cdot 2} + \frac{1}{2 \cdot 3} + \frac{1}{3 \cdot 4} + \dots$   
(a) Converges with sum 0 (b) Converges with sum 1  
(c) Diverges (d) None of these.
3. Solution of  $\vec{r} \times \vec{a} = \vec{b}$  and  $\vec{r} \cdot \vec{c} = d$  where  $\vec{a}, \vec{b}, \vec{c}$  are known vectors and d is a known scalar can be put in the form  
(a)  $\vec{r} = \frac{\vec{c} \times \vec{b} + d\vec{a}}{\vec{c} \cdot \vec{a}}$  (b)  $\vec{r} = \frac{\vec{c} \times \vec{a} + d\vec{b}}{\vec{c} \cdot \vec{a}}$  (c)  $\vec{r} = \frac{\vec{c} \times \vec{b} + d\vec{c}}{\vec{c} \cdot \vec{c}}$  (d) None of these
4. The particular Integral of  $\frac{d^2 y}{dx^2} - \frac{dy}{dx} - 2y = 4x$  is given by  
(a)  $\frac{1}{2}(2 + 4x)$  (b)  $-\frac{1}{2}(4x - 2)$  (c)  $-\frac{1}{2}(4x + 2)$  (d) None of these
5. For every integer  $a$  gcd  $(a, a + 2)$  is equals to  
(a) 1 (b) 2 (c) 1 or 2 (d) None of these