Course's Name :Calculus 1	**Palestine Technical University - Kadoorie**	**Instructor's Name :**
Course's Number :15010101	**Incomplete Second Exam** **Second Semester 2016/2017**	**Student'sName:** .....
Exam's Period : 1 hour		**Student'sNumber:** .....
Questions' Number : 4		**Section'sNumber:** .....
Total Mark : 60		**Exam's Date :20 / 4 / 2017**
Pages' Number : 4		**Form : A**

Q1) 20 pts (2 pts each)

Choose the correct answer :

1) If $f'(x)=(1-x)(x+3)$, then $f(x)$ is increasing on :

a) $(-\infty,\infty)$ b) $(-3,1)$

c) $(1,3)$ d) $(-\infty,-3)\cup(1,\infty)$

2) Let f and g be differentiable functions such that $f(3)=2$, $f'(3)=1$, , $g(3)=-3$, $g'(3)=3$, then $(\frac{f}{g})'(3)=$

a) 1 b) -3

c) 3 d) -1

3) If $y=\cos^2(x^3)$, then $\frac{dy}{dx}=$

a) $6x^2\sin(x^3)\cos(x^3)$ b) $6x^2\cos(x^3)$

c) $\sin^2(x^3)$ d) $-6x^2\sin(x^3)\cos(x^3)$

4) For the function $f(x)=x^2+x+2$ on $[1,2]$, the value of c that satisfies the conditions of the Mean Value Theorem for derivatives is :

a) 0.5 b) 1.25

c) 2.25 d) 1.5

5) The function $f(x)=x^3+6x^2+9x+4$ has an absolute max. value on $[-4,0]$ at x = :

a) -1 b) -3

c) 0 d) -4

6) The slope of the tangent line to the curve of $x^2 + y^2 = 25$ at $(4,3)$ is :

a) $\frac{-4}{3}$ b) $\frac{-3}{4}$

c) $\frac{4}{3}$ d) $\frac{3}{4}$

7) At what value of x does the graph of $f(x) = x^4 + x^2$ have a point of inflection

a) $\frac{1}{6}$ b) 6

c) 0 d) At no value of x

8) If $y = 3\cos t$ and $x = 3\sin t$, then $\frac{dy}{dx}$ is :

a) $\tan t$ b) $\cot t$

c) $-\cot t$ d) $-\tan t$

9) A particle moves along the x- axis , the position at time t is given by $x(t) = t^2 - 6t + 5$
Then the particle stops at $t =$:

a) 1 b) 2

c) 3 d) 4

10) If $f(x) = 3 + |1 - x|$, then $f'(1)$ is :

a) 0 b) 3

c) 1 d) not defined

Q2) 10pts

Find a parametrization for the line segment with endpoints $(1,2)$ and $(4,6)$

Q3) 10 pts

A rectangle (مستطيل) has both a changing height and a changing width, but both change so that the area of the rectangle is always 20 cm^2. If the height is decreasing at a rate of $\frac{1}{2} cm/\sec$, find the rate of change of the width when the height is 5 cm.

Q4) 20 pts

If $f(x) = x^4 + \frac{4}{3}x^3 - 6$ on the interval $[-2,2]$, then find the following :

1) The critical points of f (3 pts)

2) The intervals on which f is increasing and decreasing (4 points)

3) Local and absolute extrema (4 pts)

4) Determine concavity (6 pts)

5) The points of inflection (3 pts)

Good luck