KING FAHD UNIVERSITY OF PETROLEUM AND MINERALS
DEPARTMENT OF MATHEMATICS AND STATISTICS

MATH 132 - FINAL EXAM
Saturday - May 21, 2016
Test Code: 1

Dr. Mohammad Z. Abu-Sbeih TIME: 7:00 -10:00 P.M.

Name:
ID No:
Serial No:

Important Notes

DO NOT USE CALCULATORS OF ANY TYPE

1. Write your serial number, student number, section number and name
2. When bubbling, make sure that the bubbled space is fully covered.
3. Check that the exam paper has 25 different questions.

1	**a**	**b**	**c**	**d**	**e**		**14**	**a**	**b**	**c**	**d**	**e**
2	**a**	**b**	**c**	**d**	**e**		**15**	**a**	**b**	**c**	**d**	**e**
3	**a**	**b**	**c**	**d**	**e**		**16**	**a**	**b**	**c**	**d**	**e**
4	**a**	**b**	**c**	**d**	**e**		**17**	**a**	**b**	**c**	**d**	**e**
5	**a**	**b**	**c**	**d**	**e**		**18**	**a**	**b**	**c**	**d**	**e**
6	**a**	**b**	**c**	**d**	**e**		**19**	**a**	**b**	**c**	**d**	**e**
7	**a**	**b**	**c**	**d**	**e**		**20**	**a**	**b**	**c**	**d**	**e**
8	**a**	**b**	**c**	**d**	**e**		**21**	**a**	**b**	**c**	**d**	**e**
9	**a**	**b**	**c**	**d**	**e**		**22**	**a**	**b**	**c**	**d**	**e**
10	**a**	**b**	**c**	**d**	**e**		**23**	**a**	**b**	**c**	**d**	**e**
11	**a**	**b**	**c**	**d**	**e**		**24**	**a**	**b**	**c**	**d**	**e**
12	**a**	**b**	**c**	**d**	**e**		**25**	**a**	**b**	**c**	**d**	**e**
13	**a**	**b**	**c**	**d**	**e**							

(1) $\lim_{x \to 3} \frac{x^2 - 9}{x^2 - x - 6}$ is equal to:

(a) 1
(b) 4/5
(c) 0
(d) 6/5
(e) ∞

(2) $\lim_{x \to \infty} \frac{(1-2x^2)(3x^2-6)^2}{x^4(3x^2+x-9)}$ is equal to:

(a) -2
(b) 3
(c) 9
(d) -6
(e) ∞

(3) The function $f(x)=\begin{cases}\dfrac{2\sin(3x)}{x} & \text{if } x\neq 0\\ k & \text{if } x=0\end{cases}$ is continuous for $k =$

(a) 2
(b) 3
(c) 1
(d) 0
(e) 6

(4) The rate of change of the function $f(x)=\dfrac{x^2+1}{x-1}$ at $x=2$ is

(a) 2
(b) -1
(c) 1
(d) -2
(e) 3

(5) A metal sphere of radius 5 cm is to be coated by paint of thickness 0.1 cm. Using differentials to approximate the amount of paint needed we get:

(The volume V of the sphere of radius r is $V = \frac{4}{3}\pi r^3$)

(a) $100\,\pi\, cm^3$

(b) $50\,\pi\, cm^3$

(c) $20\,\pi\, cm^3$

(d) $5\,\pi\, cm^3$

(e) $10\,\pi\, cm^3$

(6) If $f(x) = 2^x + x^2$ then $f'(1) =$ is:

(a) $\ln 4 + 4$
(b) $\ln 4$
(c) $\ln 4 + 2$
(d) 3
(e) 4

(7) The area bounded by the graphs of $y = x + 1$ and $y = x^2 - 1$ is equal to:

(a) $\frac{1}{3}$

(b) $\frac{9}{2}$

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

(d) $\frac{2}{3}$

(e) 1

(8) The slope of the tangent line to the curve $xy^2 + x^2y = 2$ at the point (1, 1) is

(a) -1
(b) -1/2
(c) 1
(d) 1/2
(e) 2

(9) Let $f(x) = \frac{x}{x^2 - x}$, which of the following is **true**:

(a) The graph has one relative minimum.
(b) The graph has two vertical asymptotes.
(c) The graph has one relative maximum.
(d) The graph has one inflection point.
(e) The graph has only one vertical asymptote and only one horizontal asymptote.

(10) A stone is thrown vertically upward so that its equation of motion is $s(t) = 64t - 16t^2$, where s is in feet and t is in seconds. The highest altitude reached by the stone and its velocity when it hits the ground are

(a) Altitude is 64 ft. and velocity 64 ft/sec
(b) Altitude is 64 ft. and velocity - 64 ft/sec
(c) Altitude is 32 ft. and velocity 32 ft/sec
(d) Altitude is 32 ft. and velocity - 32 ft/sec
(e) Altitude is 32 ft. and velocity 64 ft/sec

(11) The slope of the curve tangent to the curve $y = (2x - 1)^{3x}$ at (1,1) is:

(a) 2
(b) 5
(c) 6
(d) 3
(e) 4

(12) On the interval [0,4], the function $f(x) = \ln(x^2 - 2x + 8)$ has

(a) Absolute maximum value $\ln 16$ and absolute minimum $\ln 7$
(b) Absolute maximum value $\ln 16$ and absolute minimum $\ln 8$
(c) Absolute maximum value $\ln 8$ and absolute minimum $\ln 6$
(d) Absolute maximum value 8 and absolute minimum 7
(e) Absolute maximum value $\ln 16$ and absolute minimum 0

(13) Which of the following is **false** about the graph of the function $f(x) = x^3 - 3x - 1$.

(a) The graph is decreasing on the interval (-1, 1).
(b) The graph has absolute minimum on the interval (-1, 1).
(c) The graph has local max. at the point (-1, 1) and local min. at the point (1, -3).
(d) The graph is concave down on $(-\infty, 0)$ and concave up $(0, \infty)$.
(e) The graph has only one inflection point (0, -1).

(14) If $f''(x) = e^x + 4$, $f'(0) = 2$ and $f(0) = 3$, then $f(1) =$

(a) $e + 1$
(b) $e + 4$.
(c) $e + 3$
(d) $e + 2$
(e) $e + 5$

(15) $\int \sqrt{2x+1}\,dx$ is equal to:

(a) $\frac{1}{3}(2x+1)^{2/3}+C$

(b) $(2x+1)^{3/2}+C$

(c) $\frac{1}{12}(2x+1)^{3/2}+C$

(d) $\frac{1}{3}(2x+1)^{3/2}+C$

(e) $\frac{1}{2}(2x+1)^{1/2}+C$

(16) The area bounded by the two graphs $f(x)=x^3+1$ and $g(x)=x+1$ is equal to:

(a) $1/4$

(b) $1/12$

(c) 1

(d) 2

(e) $1/2$

(17) $\int_0^1 \frac{2^x}{3^{1-x}}\,dx$ is equal to

(a) $\frac{5}{3\ln 5}$

(b) $\frac{2}{\ln 6}$

(c) $\frac{5}{3\ln 6}$

(d) $\frac{6}{3\ln 5}$

(e) $\frac{5}{\ln 6}$

(18) The integral $\int_0^2 \frac{x\,dx}{x^2+1}$ is equal to

(a) $\frac{\ln 10}{2}$

(b) $\ln 5$

(c) $\frac{1}{2}\ln 5$

(d) $\frac{1}{2}\ln\frac{5}{2}$

(e) $\ln\frac{5}{2}$

(19) $\int \frac{\sin x \, dx}{5+\cos x}$ is equal to

(a) $\frac{1}{(5+\cos x)^2}+C$

(b) $\frac{-1}{(5+\cos x)^2}+C$

(c) $\cot x-\csc x+C$

(d) $\ln|5+\cos x|+C$

(e) $-\ln|5+\cos x|+C$

(20) If $\int \frac{du}{[u^2 \pm a^2]^{\frac{3}{2}}}=\frac{\pm u}{a^2\sqrt{u^2 \pm a^2}}+C$, then $\int_0^2 \frac{dx}{(4x^2+9)^{\frac{3}{2}}}$ is equal to:

(a) $\frac{4}{45}$

(b) $\frac{2}{9}$

(c) $\frac{2}{5}$

(d) $\frac{4}{15}$

(e) $\frac{2}{45}$

(21) $\int x \sec^2 x \, dx$ is equal to

(a) $x \tan x - \ln \tan x + C$
(b) $x \tan x + \ln|\cos x| + C$
(c) $x \tan x - \ln|\cos x| + C$
(d) $x \tan x + \ln \csc x + C$
(e) $x \tan x + \ln|\sin x| + C$

(22) A company currently sells 850 radios monthly at a price of 75 dollars each. For each additional dollar the company charges, the public will buy 10 fewer radios monthly. What price should the company charge for each radio to maximize the monthly revenue?

(a) $70
(b) $75
(c) $80
(d) $85
(e) $90

(23) If $f(x,y)=e^{x+y}+x^2+y^2$, then $f_{xx}-f_{yy}=$

(a) 0
(b) 1
(c) 2
(d) 4
(e) e + 4

(24) If $y=\ln(\tan x-\sec x)$ then y' is:

(a) $\sec x$
(b) $-\tan x$
(c) $\tan x$
(d) $-\sec x$
(e) $\sec x\ \tan x$

(25) The function $P(x,y) = 8500 - 2x^2 + xy - y^2 + 49y$ has

(a) Local maximum at the point (7,14)
(b) Local maximum at the point (7,28)
(c) Local minimum at the point (7,14)
(d) Local minimum at the point (7,28)
(e) Saddle point at (7,14)

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11	a	b	c	d	e		24	a	b	c	d	e
12	a	b	c	d	e		25	a	b	c	d	e
13	a	b	c	d	e		26	a	b	c	d	e