BOARD OF INTERMEDIATE AND SECONDARY EDUCATION, MULTAN.

OBJECTIVE KEY FOR ITERMEDEAT ANNUAL/SUPPLY EXAMINATION, 2019

Name of Subject: Mathematics Paper-II Session: _____

Q.Nos	Paper Code 4191	Paper Code 4193	Paper Code 4195	Paper Code 4197
1	D	A	B	C
2	B	B	A	B
3	C	A	D	A
4	D	B	C	D
5	A,B,C,D	A	C	C
6	C	D	A	B
7	B	B	B	A
8	A	C	A	D
9	D	D	B	C
10	C	A,B,C,D	A	C
11	B	C	D	A
12	A	B	B	B
13	D	A	C	A
14	C	D	D	B
15	C	C	A,B,C,D	A
16	A	B	C	D
17	B	A	B	B
18	A	D	A	C
19	B	C	D	D
20	A	C	C	A,B,C,D

Note: ABCD means full credit

Key سرٹیفکیٹ بابت تصحیح سوالیہ پرچہ/مارکنگ

ہم نے مضمون ریاضی پرچہ II گروپ _____ سیشن _____ انٹرمیڈیٹ امتحان 2019ء کا سوالیہ پرچہ انشائیہ ومعروضی (Subjective & Objective) کو بنظر عمیق چیک کرلیا ہے یہ پرچہ Syllabus کے عین مطابق Set کیا گیا ہے۔ اس سوالیہ پرچہ میں کسی قسم کی کوئی غلطی نہ ہے۔ ہم نے سوالیہ پرچہ کا اردو اور انگریزی Version بھی چیک کرلیا ہے۔ یہ Version آپس میں مطابقت رکھتے ہیں۔ نیز اس پرچہ کی معروضی (MCQs) Key کی بابت تصدیق کی جاتی ہے کہ اس میں بھی کسی قسم کی کوئی غلطی نہ ہے۔ مزید یہ کہ ہم نے Key بنانے سے متعلق فنی جانب سے تیار کردہ ہدایات وصول کر کے ان کا بغور مطالعہ کرلیا ہے اور ان کی روشنی میں Key بنائی ہے۔ نیز سب ایگزامینرز کیلئے تفصیلی مارکنگ ہدایات / مارکنگ سکیم/Rubrics بھی تیار کر دی گئی ہیں۔

Prepared & Checked By: Dated: 24-10-19

S.#	Name	Designation	Institution	Mobile No	Signature
1	JAVED IQBAL ANSARI	Associate Prof.	G.E.C Multan	03006364668	
2	Noorullah	Associate Professor	G.C. Civil Lines Multan.	0333 7649118	
3	Ikram Ali Tahir	Assoc. Prof.	Govt. Millat College Multan	0300-6510675	
4	HAQ NAWAZ	SSS	GHSS LAR Multan	0300-7187736	

2019 (S) Roll No: _____

INTERMEDIATE PART-II (12th CLASS)

MATHEMATICS PAPER-II TIME ALLOWED: 2.30 Hours

SUBJECTIVE MAXIMUM MARKS: 80

NOTE: Write same question number and its part number on answer book, as given in the question paper.

SECTION-I

2. Attempt any eight parts. **8 × 2 = 16**

(i) Define domain and range of a function.

(ii) For a real valued function $g(x) = \frac{1}{x^2}$ find $g[g(x)]$.

(iii) Evaluate $\lim_{x \to 2} \frac{x^3 - 8}{x^2 + x - 6}$

(iv) Find $\frac{dy}{dx}$ if $y = \sqrt{x + \sqrt{x}}$

(v) Find $\frac{dy}{dx}$ if $x = y \sin y$

(vi) Find $\frac{dy}{dx}$ if $y = \ell n \sqrt{\frac{x^2 - 1}{x^2 + 1}}$

(vii) Find $f'(x)$ if $f(x) = \sqrt{\ell n\,(e^{2x} + e^{-2x})}$

(viii) Find $\frac{dy}{dx}$ if $4x^2 + 2hxy + by^2 + 2gx + 2fy + c = 0$

(ix) Find y_2 if $y = (2x + 5)^{3/2}$

(x) Prove that $\frac{d}{dx}(\cot h\, x) = -\operatorname{cosec} h^2 x$

(xi) Define dependent variable.

(xii) If $y = \tan\left(2 \tan^{-1} \frac{x}{2}\right)$, show that $\frac{dy}{dx} = \frac{4(1 + y^2)}{4 + x^2}$

3. Attempt any eight parts. **8 × 2 = 16**

(i) Define anti-derivation or integration.

(ii) Evaluate $\int\left(\sqrt{x} + \frac{1}{\sqrt{x}}\right) dx$, $x > 0$

(iii) Integrate by substitution $\int \frac{x + b}{(x^2 + 2bx + c)^{1/2}} dx$

(iv) Find the integral $\int \frac{\sin\theta}{1 + \cos^2\theta} d\theta$ by substitution $t = \cos\theta$

(v) Evaluate integral by parts $\int x \,.\, \ell nx\, dx$

(vi) Find indefinite integral $\int e^x (\cos x + \sin x)\, dx$

(vii) Evaluate $\int \frac{2x}{x^2 - a^2} dx$, $x > a$

(viii) Define definite integral.

(ix) Calculate the definite integral $\int_{-1}^{3} (x^3 + 3x^2)\, dx$

(x) If $\int_{-2}^{1} f(x)dx = 5$, $\int_{-2}^{1} g(x)dx = 4$ then evaluate $\int_{-2}^{1} [2f(x) + 3g(x)]\, dx$

(xi) If a vertical line divides the plane into two, then name that two planes.

(xii) Graph the inequality $x + 2y < 6$

P.T.O.

4. **Attempt any nine parts.** **$9 \times 2 = 18$**

(i) Find 'h' such that the points $A(-1, h)$, $B(3, 2)$ and $C(7, 3)$ are collinear.

(ii) Write an equation of line which cuts $x-$axis at $(2, 0)$ and $y-$axis at $(0, -4)$.

(iii) Transform $5x - 12y + 39 = 0$ into normal form.

(iv) Find area of region bounded by the triangle with vertices $(a, b+c)$, $(a, b-c)$ and $(-a, c)$.

(v) Write equation of parabola whose focus is $(2, 5)$ and directrix $y = 1$.

(vi) Find foci and eccentricity of the ellipse $9x^2 + y^2 = 18$.

(vii) Find equation of ellipse if its foci $(0, -1)$ and $(0, -5)$ and major axis of length 6.

(viii) Find equation of tangent to the circle $x^2 + y^2 = 25$ at $(5\cos\theta, 5\sin\theta)$

(ix) Find a vector of magnitude 4 along $2\underline{i} - 3\underline{j} + 6\underline{k}$.

(x) Find cosine of angle θ between $\underline{u} = \underline{i} - 3\underline{j} + 4\underline{k}$ and $\underline{v} = 4\underline{i} - \underline{j} + 3\underline{k}$.

(xi) Find a unit vector perpendicular to the plane of $\underline{a}$ and $\underline{b}$ if $\underline{a} = \underline{i} + \underline{j}$, $\underline{b} = \underline{i} - \underline{j}$

(xii) Find value of α if vectors $\underline{i} - 2\alpha\underline{j} - \underline{k}$, $\underline{i} - \underline{j} + 2\underline{k}$, $\alpha\underline{i} - \underline{j} + \underline{k}$ are coplaner.

(xiii) Position vectors of two points E and F are $5\underline{j}$ and $4\underline{i} + \underline{j}$ respectively. Find position vector of a point which divide join of E, F in ratio $2 : 5$.

SECTION-II

NOTE: Attempt any three questions. **$3 \times 10 = 30$**

5.(a) For the real valued function $f(x) = 3x^3 + 7$, find $f^{-1}(x)$.
Also verify $f\left(f^{-1}(x)\right) = f^{-1}\left(f(x)\right) = x$

(b) Find the length of the sides of a variable rectangle having area $36cm^2$ when its perimeter is minimum.

6.(a) Evaluate $\int \sqrt{a^2 - x^2}\, dx$

(b) Find an equation of the perpendicular bisector of the segment joining the points $A(3, 5)$ and $B(9, 8)$.

7. (a) Evaluate $\int_0^1 \frac{3x}{\sqrt{4 - 3x}}\, dx$

(b) Maximize $z = 2x + 3y$ subject to the constraints

$3x + 4y \leq 12$

$2x + y \leq 4$

$2x - y \leq 4$

$x \geq 0, \quad y \geq 0$

8. (a) Find the area of the region bounded by the triangle whose sides are
$7x - y - 10 = 0, \quad 10x + y - 41 = 0, \quad 3x + 2y + 3 = 0$

(b) Find an equation of the circle passing through the point $(-2, -5)$ and touching the line $3x + 4y - 24 = 0$ at the point $(4, 3)$.

9.(a) Find the centre, foci, eccentricity, vertices of ellipse. $9x^2 + y^2 = 18$

(b) Use vectors, to prove that the diagonals of a parallelogram bisect each other.

Paper Code Number: 4191	2019 (S)	Roll No: _____
MATHEMATICS PAPER-II	**INTERMEDIATE PART-II (12th CLASS)**	TIME ALLOWED: 30 Minutes
	OBJECTIVE	MAXIMUM MARKS: 20

Note: You have four choices for each objective type question as A, B, C and D. The choice which you think is correct, fill that bubble in front of that question number, on bubble sheet. Use marker or pen to fill the bubbles. Cutting or filling two or more bubbles will result in zero mark in that question. No credit will be awarded in case BUBBLES are not filled. Do not solve question on this sheet of OBJECTIVE PAPER.

Q.No.1

(1) If $f(x) = x^2$, then the range of f is:
(A) $(-\infty, +\infty)$ (B) $(-\infty, 0)$ (C) $(0, \infty)$ (D) $[0, \infty)$

(2) $x = at^2$, $y = 2at$ are the parametric equations of:
(A) Ellipse (B) Parabola (C) Circle (D) Hyperbola

(3) $\lim\limits_{\delta x \to 0} \dfrac{f(x+\delta x) - f(x)}{\delta x} =$ (A) $f'(a)$ (B) $f'(\delta x)$ (C) $f'(x)$ (D) $f'(0)$

(4) If $y = 5e^{3x-4}$ then $\dfrac{dy}{dx}$ is equal to: (A) $\dfrac{5}{3}e^{-3x+4}$ (B) $-5e^{3x-4}$ (C) $20e^{3x-4}$ (D) $15e^{3x-4}$

(5) If $f(x) = cox\,x$ then $f'(0) =$ (A) 1 (B) -1 (C) ∞ (D) 0

(6) $x\dfrac{d}{dx}(\ell nx) =$ (A) x (B) 0 (C) 1 (D) ℓnx

(7) $\int e^{\sin x} \cos x\, dx =$ (A) $In \sin x + C$ (B) $e^{\sin x} + C$ (C) $e^{\cos x} + C$ (D) $In \cos x + C$

(8) $\int \dfrac{\sec^2 x}{\tan x}\, dx =$ (A) $In \tan x + C$ (B) $In \cot x + C$ (C) $\cot x + C$ (D) $\tan x + C$

(9) $\int_1^2 3x^2\, dx =$ (A) 1 (B) 3 (C) 5 (D) 7

(10) $\int (e^x + 1)\, dx =$ (A) $e^x - 1$ (B) $e^x - x$ (C) $e^x + x$ (D) $e^x + 1$

(11) If m_1 and m_2 are slopes of two perpendicular lines then:
(A) $m_1 = -m_2$ (B) $m_1 m_2 = -1$ (C) $m_1 m_2 = 1$ (D) $m_1 = m_2$

(12) Slope of the line with inclination 30^o is equal to: (A) $\dfrac{1}{\sqrt{3}}$ (B) $\sqrt{3}$ (C) 0 (D) 1

(13) If $a \neq 0$ and $b \neq 0$ then y – intercept of the line $ax + by + c = 0$ is:
(A) $\dfrac{b}{a}$ (B) $\dfrac{-b}{a}$ (C) $\dfrac{c}{b}$ (D) $\dfrac{-c}{b}$

(14) Lines lying in the same plane are:
(A) Collinear (B) Non-collinear (C) Coplanar (D) Non-coplanar

(15) $x = -5$ is in the solution of inequality:
(A) $2x - 3 > 0$ (B) $2x + 3 > 0$ (C) $x + 4 < 0$ (D) $x > 0$

(16) The major axis of the ellipse $\dfrac{x^2}{b^2} + \dfrac{y^2}{a^2} = 1$ if $a > b$ is:
(A) $x = 0$ (B) $y = 0$ (C) $x = 1$ (D) $y = 1$

(17) The end points of major axis of ellipse are called:
(A) Foci (B) Vertices (C) Co-vertices (D) Directrix

(18) If the circle $x^2 + y^2 - x - 2y + C = 0$ passes through $(1, 1)$ then:
(A) $C = 1$ (B) $C = -1$ (C) $C = 2$ (D) $C = -2$

(19) If $P = (0, 5)$ and $Q = (-1, -6)$ then $\overrightarrow{PQ} =$
(A) $\underline{i} + 11\underline{j}$ (B) $-\underline{i} - 11\underline{j}$ (C) $\underline{i} - 11\underline{j}$ (D) $-\underline{i} + 11\underline{j}$

(20) If vectors $2\underline{i} + \underline{j} + \underline{k}$ and $\underline{i} - 4\underline{j} + \lambda\underline{k}$ are perpendicular then $\lambda =$
(A) 2 (B) 1 (C) 4 (D) 3

Paper Code Number: 4193	2019 (S) INTERMEDIATE PART-II (12th CLASS)	Roll No: _____
MATHEMATICS PAPER-II		TIME ALLOWED: 30 Minutes
	OBJECTIVE	MAXIMUM MARKS: 20

Note: **You have four choices for each objective type question as A, B, C and D. The choice which you think is correct, fill that bubble in front of that question number, on bubble sheet. Use marker or pen to fill the bubbles. Cutting or filling two or more bubbles will result in zero mark in that question. No credit will be awarded in case BUBBLES are not filled. Do not solve question on this sheet of OBJECTIVE PAPER.**

Q.No.1

(1) The major axis of the ellipse $\frac{x^2}{b^2}+\frac{y^2}{a^2}=1$ if $a>b$ is:
(A) $x=0$ (B) $y=0$ (C) $x=1$ (D) $y=1$

(2) The end points of major axis of ellipse are called:
(A) Foci (B) Vertices (C) Co-vertices (D) Directrix

(3) If the circle $x^2+y^2-x-2y+C=0$ passes through $(1,1)$ then:
(A) $C=1$ (B) $C=-1$ (C) $C=2$ (D) $C=-2$

(4) If $P=(0,5)$ and $Q=(-1,-6)$ then $\overrightarrow{PQ}=$
(A) $\underline{i}+11\underline{j}$ (B) $-\underline{i}-11\underline{j}$ (C) $\underline{i}-11\underline{j}$ (D) $-\underline{i}+11\underline{j}$

(5) If vectors $2\underline{i}+\underline{j}+\underline{k}$ and $\underline{i}-4\underline{j}+\lambda\underline{k}$ are perpendicular then $\lambda=$
(A) 2 (B) 1 (C) 4 (D) 3

(6) If $f(x)=x^2$, then the range of f is:
(A) $(-\infty,+\infty)$ (B) $(-\infty,0)$ (C) $(0,\infty)$ (D) $[0,\infty)$

(7) $x=at^2$, $y=2at$ are the parametric equations of:
(A) Ellipse (B) Parabola (C) Circle (D) Hyperbola

(8) $\lim\limits_{\delta x\to 0}\frac{f(x+\delta x)-f(x)}{\delta x}=$ (A) $f'(a)$ (B) $f'(\delta x)$ (C) $f'(x)$ (D) $f'(0)$

(9) If $y=5e^{3x-4}$ then $\frac{dy}{dx}$ is equal to: (A) $\frac{5}{3}e^{-3x+4}$ (B) $-5e^{3x-4}$ (C) $20e^{3x-4}$ (D) $15e^{3x-4}$

(10) If $f(x)=cox\,x$ then $f'(0)=$ (A) 1 (B) -1 (C) ∞ (D) 0

(11) $x\frac{d}{dx}(\ell nx)=$ (A) x (B) 0 (C) 1 (D) ℓnx

(12) $\int e^{\sin x}\cos x\,dx=$ (A) $In\sin x+C$ (B) $e^{\sin x}+C$ (C) $e^{\cos x}+C$ (D) $In\cos x+C$

(13) $\int\frac{\sec^2 x}{\tan x}dx=$ (A) $In\tan x+C$ (B) $In\cot x+C$ (C) $\cot x+C$ (D) $\tan x+C$

(14) $\int_1^2 3x^2\,dx=$ (A) 1 (B) 3 (C) 5 (D) 7

(15) $\int(e^x+1)\,dx=$ (A) e^x-1 (B) e^x-x (C) e^x+x (D) e^x+1

(16) If m_1 and m_2 are slopes of two perpendicular lines then:
(A) $m_1=-m_2$ (B) $m_1m_2=-1$ (C) $m_1m_2=1$ (D) $m_1=m_2$

(17) Slope of the line with inclination 30^o is equal to: (A) $\frac{1}{\sqrt{3}}$ (B) $\sqrt{3}$ (C) 0 (D) 1

(18) If $a\neq 0$ and $b\neq 0$ then y – intercept of the line $ax+by+c=0$ is:
(A) $\frac{b}{a}$ (B) $\frac{-b}{a}$ (C) $\frac{c}{b}$ (D) $\frac{-c}{b}$

(19) Lines lying in the same plane are:
(A) Collinear (B) Non-collinear (C) Coplanar (D) Non-coplanar

(20) $x=-5$ is in the solution of inequality:
(A) $2x-3>0$ (B) $2x+3>0$ (C) $x+4<0$ (D) $x>0$

Paper Code Number: 4195	2019 (S)	Roll No: _____
MATHEMATICS PAPER-II	**INTERMEDIATE PART-II (12th CLASS)**	TIME ALLOWED: 30 Minutes
	OBJECTIVE	MAXIMUM MARKS: 20

Note: You have four choices for each objective type question as A, B, C and D. The choice which you think is correct, fill that bubble in front of that question number, on bubble sheet. Use marker or pen to fill the bubbles. Cutting or filling two or more bubbles will result in zero mark in that question. No credit will be awarded in case BUBBLES are not filled. Do not solve question on this sheet of OBJECTIVE PAPER.

Q.No.1

(1) If m_1 and m_2 are slopes of two perpendicular lines then:
(A) $m_1 = -m_2$ (B) $m_1 m_2 = -1$ (C) $m_1 m_2 = 1$ (D) $m_1 = m_2$

(2) Slope of the line with inclination 30^o is equal to: (A) $\frac{1}{\sqrt{3}}$ (B) $\sqrt{3}$ (C) 0 (D) 1

(3) If $a \neq 0$ and $b \neq 0$ then y – intercept of the line $ax + by + c = 0$ is:
(A) $\frac{b}{a}$ (B) $\frac{-b}{a}$ (C) $\frac{c}{b}$ (D) $\frac{-c}{b}$

(4) Lines lying in the same plane are:
(A) Collinear (B) Non-collinear (C) Coplanar (D) Non-coplanar

(5) $x = -5$ is in the solution of inequality:
(A) $2x - 3 > 0$ (B) $2x + 3 > 0$ (C) $x + 4 < 0$ (D) $x > 0$

(6) The major axis of the ellipse $\frac{x^2}{b^2} + \frac{y^2}{a^2} = 1$ if $a > b$ is:
(A) $x = 0$ (B) $y = 0$ (C) $x = 1$ (D) $y = 1$

(7) The end points of major axis of ellipse are called:
(A) Foci (B) Vertices (C) Co-vertices (D) Directrix

(8) If the circle $x^2 + y^2 - x - 2y + C = 0$ passes through $(1, 1)$ then:
(A) $C = 1$ (B) $C = -1$ (C) $C = 2$ (D) $C = -2$

(9) If $P = (0, 5)$ and $Q = (-1, -6)$ then $\overrightarrow{PQ} =$
(A) $\underline{i} + 11\underline{j}$ (B) $-\underline{i} - 11\underline{j}$ (C) $\underline{i} - 11\underline{j}$ (D) $-\underline{i} + 11\underline{j}$

(10) If vectors $2\underline{i} + \underline{j} + \underline{k}$ and $\underline{i} - 4\underline{j} + \lambda\underline{k}$ are perpendicular then $\lambda =$
(A) 2 (B) 1 (C) 4 (D) 3

(11) If $f(x) = x^2$, then the range of f is:
(A) $(-\infty, +\infty)$ (B) $(-\infty, 0)$ (C) $(0, \infty)$ (D) $[0, \infty)$

(12) $x = at^2$, $y = 2at$ are the parametric equations of:
(A) Ellipse (B) Parabola (C) Circle (D) Hyperbola

(13) $\lim_{\delta x \to 0} \frac{f(x + \delta x) - f(x)}{\delta x} =$ (A) $f'(a)$ (B) $f'(\delta x)$ (C) $f'(x)$ (D) $f'(0)$

(14) If $y = 5e^{3x-4}$ then $\frac{dy}{dx}$ is equal to: (A) $\frac{5}{3}e^{-3x+4}$ (B) $-5e^{3x-4}$ (C) $20e^{3x-4}$ (D) $15e^{3x-4}$

(15) If $f(x) = cox\,x$ then $f'(0) =$ (A) 1 (B) -1 (C) ∞ (D) 0

(16) $x\frac{d}{dx}(\ell nx) =$ (A) x (B) 0 (C) 1 (D) ℓnx

(17) $\int e^{\sin x} \cos x\, dx =$ (A) $In \sin x + C$ (B) $e^{\sin x} + C$ (C) $e^{\cos x} + C$ (D) $In \cos x + C$

(18) $\int \frac{\sec^2 x}{\tan x}\, dx =$ (A) $In \tan x + C$ (B) $In \cot x + C$ (C) $\cot x + C$ (D) $\tan x + C$

(19) $\int_1^2 3x^2\, dx =$ (A) 1 (B) 3 (C) 5 (D) 7

(20) $\int (e^x + 1)\, dx =$ (A) $e^x - 1$ (B) $e^x - x$ (C) $e^x + x$ (D) $e^x + 1$

Paper Code Number: 4197	2019 (S)	Roll No: _____
MATHEMATICS PAPER-II	**INTERMEDIATE PART-II (12th CLASS)**	TIME ALLOWED: 30 Minutes
	OBJECTIVE	MAXIMUM MARKS: 20

Note: You have four choices for each objective type question as A, B, C and D. The choice which you think is correct, fill that bubble in front of that question number, on bubble sheet. Use marker or pen to fill the bubbles. Cutting or filling two or more bubbles will result in zero mark in that question. No credit will be awarded in case BUBBLES are not filled. Do not solve question on this sheet of OBJECTIVE PAPER.

Q.No.1

(1) $x\frac{d}{dx}(\ell nx) =$ (A) x (B) 0 (C) 1 (D) ℓnx

(2) $\int e^{\sin x}\cos x\,dx =$ (A) $In\sin x + C$ (B) $e^{\sin x} + C$ (C) $e^{\cos x} + C$ (D) $In\cos x + C$

(3) $\int \frac{\sec^2 x}{\tan x}\,dx =$ (A) $In\tan x + C$ (B) $In\cot x + C$ (C) $\cot x + C$ (D) $\tan x + C$

(4) $\int_1^2 3x^2\,dx =$ (A) 1 (B) 3 (C) 5 (D) 7

(5) $\int (e^x + 1)\,dx =$ (A) $e^x - 1$ (B) $e^x - x$ (C) $e^x + x$ (D) $e^x + 1$

(6) If m_1 and m_2 are slopes of two perpendicular lines then:
(A) $m_1 = -m_2$ (B) $m_1 m_2 = -1$ (C) $m_1 m_2 = 1$ (D) $m_1 = m_2$

(7) Slope of the line with inclination 30^o is equal to: (A) $\frac{1}{\sqrt{3}}$ (B) $\sqrt{3}$ (C) 0 (D) 1

(8) If $a \neq 0$ and $b \neq 0$ then y – intercept of the line $ax + by + c = 0$ is:
(A) $\frac{b}{a}$ (B) $\frac{-b}{a}$ (C) $\frac{c}{b}$ (D) $\frac{-c}{b}$

(9) Lines lying in the same plane are:
(A) Collinear (B) Non-collinear (C) Coplanar (D) Non-coplanar

(10) $x = -5$ is in the solution of inequality:
(A) $2x - 3 > 0$ (B) $2x + 3 > 0$ (C) $x + 4 < 0$ (D) $x > 0$

(11) The major axis of the ellipse $\frac{x^2}{b^2} + \frac{y^2}{a^2} = 1$ if $a > b$ is:
(A) $x = 0$ (B) $y = 0$ (C) $x = 1$ (D) $y = 1$

(12) The end points of major axis of ellipse are called:
(A) Foci (B) Vertices (C) Co-vertices (D) Directrix

(13) If the circle $x^2 + y^2 - x - 2y + C = 0$ passes through $(1, 1)$ then:
(A) $C = 1$ (B) $C = -1$ (C) $C = 2$ (D) $C = -2$

(14) If $P = (0, 5)$ and $Q = (-1, -6)$ then $\overrightarrow{PQ} =$
(A) $\underline{i} + 11\underline{j}$ (B) $-\underline{i} - 11\underline{j}$ (C) $\underline{i} - 11\underline{j}$ (D) $-\underline{i} + 11\underline{j}$

(15) If vectors $2\underline{i} + \underline{j} + \underline{k}$ and $\underline{i} - 4\underline{j} + \lambda\underline{k}$ are perpendicular then $\lambda =$
(A) 2 (B) 1 (C) 4 (D) 3

(16) If $f(x) = x^2$, then the range of f is:
(A) $(-\infty, +\infty)$ (B) $(-\infty, 0)$ (C) $(0, \infty)$ (D) $[0, \infty)$

(17) $x = at^2$, $y = 2at$ are the parametric equations of:
(A) Ellipse (B) Parabola (C) Circle (D) Hyperbola

(18) $\lim_{\delta x \to 0} \frac{f(x + \delta x) - f(x)}{\delta x} =$ (A) $f'(a)$ (B) $f'(\delta x)$ (C) $f'(x)$ (D) $f'(0)$

(19) If $y = 5e^{3x-4}$ then $\frac{dy}{dx}$ is equal to: (A) $\frac{5}{3}e^{-3x+4}$ (B) $-5e^{3x-4}$ (C) $20e^{3x-4}$ (D) $15e^{3x-4}$

(20) If $f(x) = cox\,x$ then $f'(0) =$ (A) 1 (B) -1 (C) ∞ (D) 0