Mathematics | D | L.K.No - 919 | Paper Code No. 8197

Paper II (Objective Type) | Inter - A- 2018

Time Allowed : 30 Minutes | Inter (Part - II)

Maximum Marks : 20 | Session (2014 - 16) to (2016 - 18)

BWP-12-18

Note : Four possible choices A , B , C , D to each question are given. Which choice is correct , fill that circle in front of that question number.Use marker or pen to fill the circles. Cutting or filling two or more circles will result in zero mark in that question.

Q. (1)

(1) If $x = at^2$ and $y = 2at$ are equations of a Curve then " t " is called :
(A) Variable (B) Constant (C) Parameter (D) Coefficient

(2) If $y = e^{ax}$, then y_4 is : (A) a^4e^{ax} (B) $\frac{2e^{ax}}{a}$ (C) $3e^{ax}$ (D) xe^{ax}

(3) $\frac{d}{dx}(-\text{Cotx})$: (A) Sec^2x (B) Cosec^2x (C) $-\text{Cosec}^2x$ (D) $-\text{Sec}^2x$

(4) $x = a\,\text{Cost}$ and $y = a\,\text{Sint}$ are the Parametric Equations of a :
(A) Circle (B) Parabola (C) Ellipse (D) Line

(5) $\frac{d}{dx}(\sqrt{\text{Tanx}}) =$ (A) $\sqrt{\text{Sec}^2x}$ (B) $\frac{1}{2\sqrt{\text{Tanx}}}\text{Sec}^2x$ (C) $\frac{1}{2\sqrt{\text{Tanx}}}$ (D) $\frac{1}{2}(\text{Sec}^2x)^{-\frac{1}{2}}$

(6) Slope of Line $ax - by + c = 0$ is : (A) $\frac{a}{b}$ (B) $\frac{b}{a}$ (C) $-\frac{a}{b}$ (D) $-\frac{b}{a}$

(7) If two lines are Perpendicular , then : (A) $\frac{m_1}{m_2} = -1$ (B) $\frac{m_1}{m_2} = 1$ (C) $m_1m_2 = -1$ (D) $m_1m_2 = 1$

(8) Both Relative Maximum and Relative Minimum are called in General :
(A) Greatest Value (B) Least Value (C) Relative Extrema (D) Maxima

(9) The Coordinates of a point $P(x,y)$ translated through the point $Q'(h,k)$ then the coordinate of P referred to new axes are :
(A) $(x-h, y-k)$ (B) $(x+h, y+k)$ (C) $(x-k, y-h)$ (D) $(x+k, y+h)$

(10) The Centre of the Circle $x^2 + y^2 = r^2$ is : (A) (1,1) (B) (2,0) (C) (0,0) (D) (0,2)

(11) A function which is to be maximized or minimized is called :
(A) Subjective Function (B) Objective Function (C) Qualitative Function (D) Quantitative Function

(12) x intercept and y intercept for the line $2x - y + 4 = 0$ are :
(A) (2, -4) (B) (-2, -4) (C) (-2, 4) (D) (2, 4)

(13) $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$ is the standard equation of : (A) Ellipse (B) Circle (C) Parabola (D) Hyperbola

(14) The Solution of the differential equation $\frac{dy}{dx} = -y$ is :
(A) $y = xe^{-x}$ (B) $y = ce^{-x}$ (C) $y = e^x$ (D) $y = ce^x$

(15) $\int_0^{\frac{\pi}{4}} \frac{\text{Sec}^2x}{1+\text{tanx}}\,dx$ (A) 1 (B) 2 (C) ln2 (D) $\ln\sqrt{2}$

(16) The length of the Latusrectum of Parabola $y^2 = 4ax$ is : (A) 2a (B) 4a (C) 4ax (D) $\frac{y}{2a}$

(17) $\int\sqrt{2x+3}\,2\,dx =$
(A) $\frac{2}{3}(2x+3)^{\frac{3}{2}} + c$ (B) $\frac{3}{2}(2x+3)^{\frac{3}{2}}$ (C) $-\frac{2}{3}(2x+3)^{\frac{3}{2}}$ (D) $-\frac{3}{2}(2x+3)^{\frac{3}{2}}$

(18) Area of the Triangle with $\underline{u}$ and $\underline{v}$ its side is : (A) $\underline{u} \times \underline{v}$ (B) $\frac{1}{2}|\underline{u} \times \underline{v}|$ (C) $\underline{u} \cdot \underline{v}$ (D) $\underline{uv}$

(19) A Unit Vector perpendicular to both $\underline{u}$ and $\underline{v}$ is given by :
(A) $\underline{u} \times \underline{v}$ (B) $\underline{u} - \underline{v}$ (C) $\frac{\underline{u} \times \underline{v}}{|\underline{u} \times \underline{v}|}$ (D) $|\underline{u} \times \underline{v}|$

(20) $\int \frac{1}{x}\,dx =$ (A) $\frac{1}{x^2}$ (B) $\frac{-1}{x^2}$ (C) $\frac{1}{x}$ (D) $\ln x + c$

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Roll No.	919 - 20000	
Mathematics (Subjective)	Inter-A-2018	Inter Part - II
Time : 2 : 30 Hours	Session (2014 - 16) to (2016 -18)	Total Marks : 80

Note : It is compulsory to attempt (8 – 8) parts each from Q.No.2 and 3 while attempt any 9 parts from Q. No.4 . Attempt any (03) questions from Part II. Write same Question No. and its Part No. as given in the question paper.

Part - I BWP-12-18 25 x 2 = 50

Q.No.2 (i) Define Linear Function. (ii) $f(x) = x^2$ differentiate by First Principle.

(iii) Find Derivative of $y = (x^2 + 5)(x^3 + 7)$ (iv) Differentiate Sin x with respect to Cot x

(v) Find Extreme Values of $f(x) = x^2 - x - 2$ (vi) Expand a^x in Maclaurin Series.

(vii) Differentiate $(\ln x)^x$ w.r.t. x. (viii) Find y_2 if $y = \sqrt{x} + \frac{1}{\sqrt{x}}$

(ix) Evaluate the limit $\lim_{\theta \to 0} \frac{1 - \cos\theta}{\sin^2\theta}$ (x) If $x = 1 - t^2$, $y = 3t^2 - 2t^3$ find $\frac{dy}{dx}$

(xi) Find $\frac{dy}{dx}$ if $y = \ln(x + \sqrt{x^2 + 1})$

(xii) Without finding $f^{-1}(x)$ state Domain and Range of $f^{-1}(x)$ if $f(x) = \sqrt{x + 2}$

Q.No.3 (i) Define the Convex Region. (ii) Use differential to approximate the value of $\sqrt{17}$

(iii) Graph the solution set of $2x + 1 \geq 0$. (iv) Solve the differential equation $xdy + y(x - 1)dx = 0$

(v) Evaluate $\int x e^x dx$ (vi) Evaluate $\int x \tan^{-1} x \, dx$

(vii) Evaluate $\int_0^3 \frac{dx}{x^2 + 9}$ (viii) Evaluate $\int \frac{\cos 2x - 1}{1 + \cos 2x} dx$

(ix) Evaluate $\int \frac{1}{x \ln x} dx$ (x) Evaluate $\int \frac{x + 2}{\sqrt{x + 3}} dx$

(xi) Evaluate $\int \frac{(1 - \sqrt{x})^2}{\sqrt{x}} dx$ (xii) Evaluate $\int \frac{e^{m \tan^{-1} x}}{1 + x^2} dx$

Q.No.4 (i) Find the Coordinates of the point that divides the join of A(-6,3), B(5,-2) in the ratio 2 : 3

(ii) Find the Area of Triangle with vertices A(1,4), B(2,-3) and C(3,-10)

(iii) Check whether the given point (-7,6) lies above or below the given line $4x + 3y - 9 = 0$

(iv) Determine the value of "P" such that the lines $2x - 3y - 1 = 0$, $3x - y - 5 = 0$ and $3x + py + 8 = 0$ meet at a point.

(v) Find Foci of Ellipse whose equation is $x^2 + 4y^2 = 16$

(vi) Find "α" so that $|\alpha \underline{i} + (\alpha + 1)\underline{j} + 2\underline{k}| = 3$

(vii) If $\underline{v}$ is a vector for which $\underline{v} \cdot \underline{i} = 0$, $\underline{v} \cdot \underline{j} = 0$, $\underline{v} \cdot \underline{k} = 0$ find $\underline{v}$

(viii) Prove that $\underline{a} \times (\underline{b} + \underline{c}) + \underline{b} \times (\underline{c} + \underline{a}) + \underline{c} \times (\underline{a} + \underline{b}) = 0$

(ix) A force $\vec{F} = 7\underline{i} + 4\underline{j} - 3\underline{k}$ is applied at P(1, -2, 3). Find its Moment about the point Q(2,1,1)

(x) Define Rotation of Axes.

(xi) Define Vertex of Parabola.

(xii) Find Focus of Parabola $y^2 = -12x$.

(xiii) Define Latusrectum of Ellipse.

P.T.O.

Q.No.5 (a) Prove that $\lim_{x \to 0} \frac{a^x - 1}{x} = \log_e a$ (5)

(b) Differentiate from the Ist Principle $f(x) = \cos\sqrt{x}$ (5)

Q.No.6 (a) Show that $\int \sqrt{a^2 - x^2}\, dx = \frac{a^2}{2} \sin^{-1}\frac{x}{a} + \frac{x}{2}\sqrt{a^2 - x^2} + c$ (5)

(b) Find " h " such that the points $A(\sqrt{3}, -1)$, $B(0,2)$ and $C(h,-2)$ are vertices of a right triangle with right angle at the vertex " A ". (5)

Q.No.7 (a) Evaluate $\int_0^{\frac{\pi}{4}} \frac{\cos\theta + \sin\theta}{2\cos^2\theta}\, d\theta$ (5)

(b) Minimize $z = 3x + y$

Subject to the Constraints

$3x + 5y \geq 15$

$x + 6y \geq 9$

$x \geq 0 \; ; \; y \geq 0$ (5)

Q.No.8 (a) Find the Focus, Vertex and Directrix of the Parabola $y^2 = -8(x - 3)$ (5)

(b) By Vector Method, prove that in any triangle

$$\frac{a}{\sin\alpha} = \frac{b}{\sin\beta} = \frac{c}{\sin\gamma}$$ (5)

Q.No.9 (a) Find the Centre, Foci, Eccentricity, Vertices and Equations of Directrices of Hyperbola $x^2 - y^2 = 9$ (5)

(b) Find Volume of Tetrahedron with vertices

A(0,1,2), B(3,2,1), C(1,2,1), D(5,5,6) (5)

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17-4-2018