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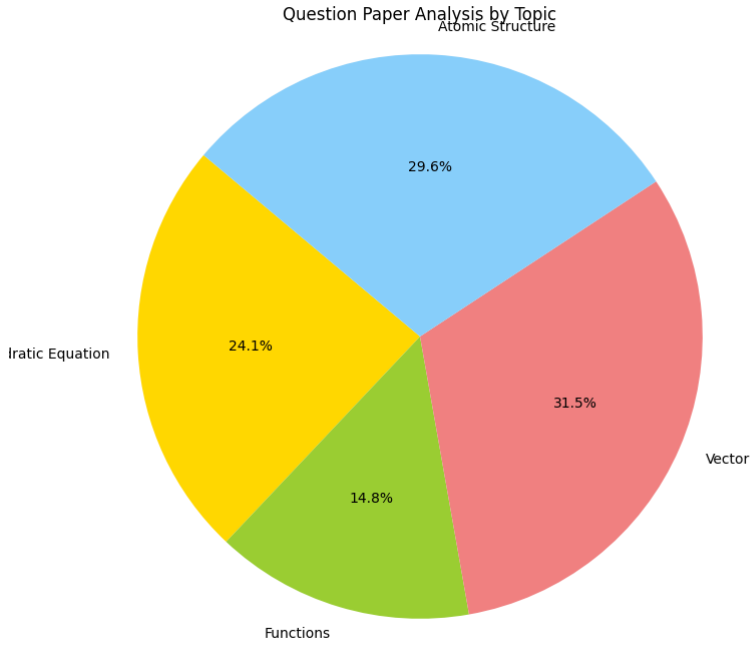
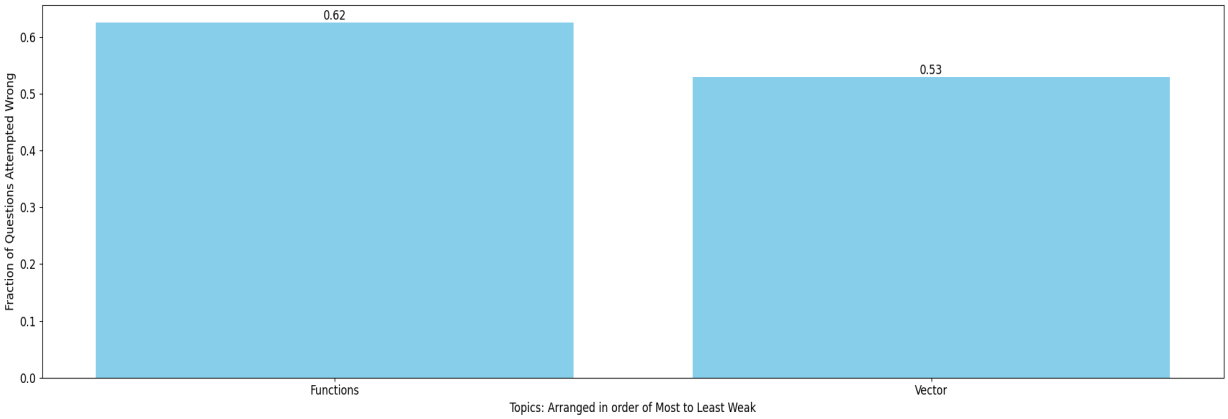
MLAssist - Personalised DPP

Question Paper Analysis:



Weak Topic Analysis:



Practice Questions:

Functions:

10. Let f: R → R and g: R → R be two non-constant differentiable functions.

If $f'(x) = \left(e^{(f(x))-g(x)}\right)g'(x)$ for all $x \in R$, and $f(1) = g(2) = 1$, then which of the following statement(s) is (are) TRUE ? **[JEE Ad. 2018]**

(A) $f(2) < 1 - \log_e 2$ (B) $f(2) > 1 - \log_e 2$

(C) $g(1) > 1 - \log_e 2$ (D) $g(1) < 1 - \log_e 2$

6. If $x = \frac{4l}{1+l^2}$ and $y = \frac{2-2l}{1+l^2}$ where ' l ' is a parameter and range of $f(x, y) = x^2 - xy + y^2$ is [a, b] then (a + b) is equal to

(A) 4 (B) 6 (C) 8 (D) 12

5. Solve the following problems from (a) to (e) on functional equation.

(a) The function f(x) defined on the real numbers has the property that $f(f(x)) \cdot (1 + f(x)) = -f(x)$ for all x in the domain of f. If the number 3 is in the domain and range of f, compute the value of f(3).

(b) Suppose f is a real function satisfying $f(x + f(x)) = 4\,f(x)$ and $f(1) = 4$. Find the value of f(21).

(c) Let ' f ' be a function defined from $R^+ \to R^+$. If $[f(xy)]^2 = x(f(y))^2$ for all positive numbers x and y and $f(2) = 6$, find the value of f(50).

(d) Let f be a function such that $f(3) = 1$ and $f(3x) = x + f(3x - 3)$ for all x. Then find the value of f(300).

10. If $h(x) = Ax^5 + B\sin x + C\ln\left(\frac{1+x}{1-x}\right) + 7$, where A, B, C are non-zero real constants and $h\left(\frac{-1}{2}\right) = 6$, then find the vale of $h\left(\frac{\text{sgn}\,(e^{-x})}{2}\right)$.

Daily Work Sheet-4

SINGLE CORRECTTYPE

(-4) (4) $4x$

3. If $f(x)$ is defined on $(0,1)$, then the domain of definition of $f(e^x) + f(\ln|x|)$ is

(A) $(-e,-1)$ (B) $(-e,-1) \cup (1,e)$

(C) $(-\infty,-1) \cup (1,\infty)$ (D) $(-e,e)$

$[2 + x \quad x \geq 0$

Vector:

10. If the three points with position vectors (1, a, b) ; (a, 2, b) and (a, b, 3) are collinear in space, then the value of a + b is

(A) 3 (B) 4 (C) 5 (D) none

5. Four points A(+1, –1, 1) ; B(1, 3, 1) ; C(4, 3, 1) and D(4, – 1, 1) taken in order are the vertices of

(A) a parallelogram which is neither a rectangle nor a rhombus

(B) rhombus

(C) an isosceles trapezium

(D) a cyclic quadrilateral.

26. The magnitude of the vector $(\vec{p}\cdot\vec{s})(\vec{q}\times\vec{r}) + (\vec{q}\cdot\vec{s})(\vec{r}\times\vec{p}) + (\vec{r}\cdot\vec{s})(\vec{p}\times\vec{q})$ is

(A) 4 (B) 8 (C) 18 (D) 2

MATRIX MATCH TYPE

7. **(a)** Let $\vec{a} = \hat{i}+\hat{j}+\hat{k}$, $\vec{b} = \hat{i}-\hat{j}+\hat{k}$ and $\vec{c} = \hat{i}-\hat{j}-\hat{k}$ be three vectors. A vector $\vec{v}$ in the plane of $\vec{a}$ and $\vec{b}$, whose projection on $\vec{c}$ is $\frac{1}{\sqrt{3}}$, is given by

(A) $\hat{i}-3\hat{j}+3\hat{k}$ (B) $-3\hat{i}-3\hat{j}-\hat{k}$ (C) $3\hat{i}-\hat{j}+3\hat{k}$ (D) $\hat{i}+3\hat{j}-3\hat{k}$

(b) The vector(s) which is/are coplanar with vectors $\hat{i}+\hat{j}+2\hat{k}$ and $\hat{i}+2\hat{j}+\hat{k}$, and perpendicular to the vector $\hat{i}+\hat{j}+\hat{k}$ is/are

(A) $\hat{j}-\hat{k}$ (B) $-\hat{i}+\hat{j}$ (C) $\hat{i}-\hat{j}$ (D) $-\hat{j}+\hat{k}$

(c) Let $\vec{a} = -\hat{i}-\hat{k}, \vec{b} = -\hat{i}+\hat{j}$ and $\vec{c} = \hat{i}+2\hat{j}+3\hat{k}$ be three given vectors. If $\vec{r}$ is a vector such that $\vec{r}\times\vec{b} = \vec{c}\times\vec{b}$ and $\vec{r}.\vec{a} = 0$, then the value of $\vec{r}.\vec{b}$ is **[JEE 2011, 3+4+4]**

5. Let O be an interior point of ΔABC such that $2\overrightarrow{OA} + 5\overrightarrow{OB} + 10\overrightarrow{OC} = \vec{0}$. If the ratio of the area of ΔABC to the area of ΔAOC is t, where 'O' is the origin. Find [t].
(where [ ] denotes greatest integer function)