

MAT III

1) In an exam 18 students passed MAT III, 17 students passed PHY IIS, 11 students passed both subject.
 Find the number of students that passed MAT III only

ANS. 7

2) If $X = \{2, 4, 6\}$, determine the power set of X denoted by $n(P(X))$

ANS. 8

3) Let $f: X \rightarrow Y$ and $g: Y \rightarrow Z$ be mappings on the set of real numbers defined by $f(x) = x+1$ and $g(y) = y^2$

ANS. $x^2 + 4x + 4$

4) Given that $X = \{n: 3 < n < 6\}$ and $Y = \{n: 4 \leq n \leq 8\}$, find $X \cap Y$

ANS. $\{4, 5\}$

5) If set $F = \{2 \leq x \leq 5\} \cup \{9 < x < 12\}$, list the members of set F

ANS. $\{3, 4, 5, 10, 11\}$

6) Given that $P = \{1, 3, 5, 7\}$ and $Q = \{2, 5, 6, 8, 9\}$, find $P \cup Q$

ANS. $\{1, 2, 3, 5, 6, 7, 8, 9\}$

7) Determine the domain D of the mapping $f: x \rightarrow 2x-3$ if $C = \{-3, -1, 5\}$ is the range and F is defined on D .

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ANS. $\{0, 1, 4\}$

8) What is the coefficient of x^2 in $(1+5x)^2$

ANS. 25

9) What is the coefficient of x^2 in $(1+x)^{-2}$

ANS. 3

10) What is the coefficient of the 4th term in $(1+x)^{-p}$

ANS. $\frac{p(p-1)(p-2)}{3!}$

11) Write out the first three terms in $(x+2)^p$

ANS. $x^p + 16x^{p-1} + 112x^{p-2}$

12) What is the factorial expression of $\frac{(n+2)!}{n!}$

ANS. $n^2 + 3n + 2$

13) What is the third term of $(1+x)^m$

ANS. $\frac{m(m-1)x^2}{2!}$

(14) What is the coefficient of x^7 in $(1+2x)^5$

ANS. 80

(15) What is the coefficient of the sixth term $(3x-2y)^7$

ANS. $-6048x^2y^5$

(16) What is the coefficient of the fourth term $(x + \frac{1}{2})^p$

ANS. $\frac{7p^3}{8}$

(17) What is the coefficient of the 8th term in $(a+b)^{10}$

ANS. 120

(18) Evaluate the 5th term in $(2x-y)^5$

ANS. $10xy^5$ ($10xy^4$)

(19) Express $\frac{n!}{n+1!}$

ANS. $\frac{1}{n+1}$

(20) Resolve $\frac{n+3}{x^2+x-6}$

ANS. $\frac{A}{x+3} + \frac{B}{x-2}$

(21) Write $\frac{14x}{6x^2-3x-2}$ in partial fraction.

ANS. $\frac{4}{3x-2} + \frac{2}{2x+1}$

(22) Find the value of $A+B$ in $\frac{8x-28}{(x-2)(x-4)(x-2)(x-4)}$

ANS. 8

(23) Resolve into partial fraction $\frac{35x-14}{(7x-2)^2}$

ANS. $\frac{5}{7x-2} + \frac{4}{(7x-2)^2}$

(24) Resolve into partial fractions $\frac{x^2-7x+10}{x^2-7x+10}$

ANS. $\frac{5}{3(x-2)} - \frac{2}{3(x-5)}$

(25) Solve $\frac{(2x+1)!}{2x!} = 9$

ANS. 4

(26) Resolve $\frac{10-2x}{(x-3)(x-1)}$ into partial fraction.

ANS. $\frac{2}{x-3} - \frac{4}{x-2}$

(27) Resolve $\frac{8x-6}{x+3(x-7)}$ into partial fraction

ANS. $\frac{3}{x+3} + \frac{5}{x-7}$

(28) A subset of the co-domain, which is a collection of all the images of the elements of the domain is called

ANS. RANGE

(29) Resolve $\frac{1}{x(x-1)}$

ANS. $\frac{1}{x} + \frac{1}{2(x-1)}$

20) $6x^2 + 17x + 6 = \frac{A}{x} + \frac{B}{x+2} + \frac{C}{x+3}$

Find the value of $2A+B-C$.

ANS: 1

21) Resolve $\frac{10-2x}{x(x-3)(x-1)}$ into partial fraction.

ANS: $\frac{2}{x-3} - \frac{4}{x-1}$

22) Resolve $\frac{2x^3 + 3x^2 - 54x + 50}{x^2 + 2x - 24}$ into partial fraction.

ANS: $2x - 1 + \frac{25}{6(x+6)}$

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