

Functions and their Graphs-2
Model Exam Question paper - 2

11th Standard

Business Maths

Reg.No. :

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I. Answer all the questions

Time : 00:45:00 Hrs

Total Marks : 35

Part-A

9 x 2 = 18

- 1) Prove that $f(x) = 2x^3 + 3x$ is an odd function
- 2) Draw the graph of the function $f(x) = 3x - 1$
- 3) Draw the graph of $f(x) = x^2 - 5$.
- 4) Given the function $f(x) = x^2 - x + 1$ find (i) $f(0)$ (ii) $f(-1)$ (iii) $f(x+1)$
- 5) Let $f: \mathbb{R} \rightarrow \mathbb{R}$ defined by $f(x) = \begin{cases} x^2 - 4x & \text{if } x \geq 2 \\ x + 2 & \text{if } x < 2 \end{cases}$ find (i) $f(-3)$ (ii) $f(5)$ (iii) $f(0)$
- 6) If $f(x) = \sin x$; $g(x) = \cos x$, show that: $f(\alpha + \beta) = f(\alpha)g(\beta) + g(\alpha)f(\beta)$ when $x, \alpha, \beta \in \mathbb{R}$.
- 7) If $A = \{-2, -1, 0, 1, 2\}$ and $f: A \rightarrow \mathbb{R}$ be defined by $f(x) = x^2 + 3$ find the range of f .
- 8) If $f(x) = \frac{1-x}{1+x}$ show that $f(-x) = \frac{1}{f(x)}$
- 9) If $f(x) = x^2 + 3$, for $-3 \leq x \leq 3$, $x \in \mathbb{R}$
 - (i) For which values of x , $f(x) = 4$?
 - (ii) What is the domain of f ?

Part-B

4 x 3 = 12

- 10) Find the domain and range of the function given by $f(x) = \log_{10}(1 + x)$
- 11) Find the domain of the function $f(x) = \sqrt{x^2 - 7x + 12}$
- 12) If $f(x) = \frac{1+x^2+x^4}{x^2}$ prove that $f\left(\frac{1}{x}\right) = f(x)$
- 13) If $f(x) = x^2 + 3x + 7$ find $\frac{f(x+h) - f(x)}{h}$

Part-C

1 x 5 = 5

- 14) A travel agency offers a tour. It charges Rs. 100/- per person if fewer than 25 people go. If 25 people or more, upto a maximum of 110, take the tour, they charge each person Rs. 110 less $\frac{1}{5}$ times the number of people who go. Include the domain of each formulae.
