









## SECTION - B

II. Answer any ten questions :

$10 \times 2 = 20$

21. Find the middle term of an A.P.  $-3, -1, 1, \dots, 33$ .
22. Find the sum of  $21^2 + 22^2 + \dots + 35^2$ .
23. Which term of the progression  $1, 2, 4, 8, \dots$  is 512 ?
24. The radii of two cylinders are in the ratio  $2 : 3$ . Find the ratio of their volumes if their heights are in the ratio  $5 : 3$ .
25. The curved surface area of a cone is 550 sq.cm. and the total surface area is 704 sq.cm. Find its radius.
26. The volume of a sphere is numerically equal to its surface area. Find its diameter.
27. If  $(-6, a), (b, 4), (2, c), (d, 7)$  is an identity function, find the values of  $a, b, c$  and  $d$ .
28. If  $P = \{-2, -1, 0, 1\}$ ,  $Q = \{1, -2, 6, -3\}$  and  
 $R = \{(x, y) / y = x^2 - 3, x \in P, y \in Q\}$ , list the elements of  $R$  and identify the function.
29. If  $f: R \rightarrow R$  is defined by  $f(x) = ax + 3$  and  $g: R \rightarrow R$  is defined by  $g(x) = 4x - 3$ , find  $a$  so that  $f \circ g = g \circ f$ .
30. If the difference between S.I. and C.I. for 3 years at 5% per annum is Rs. 61, find the principal.
31. A person opens an R.D. account paying Rs. 150 per month for 3 years. If the rate of interest is 12% per annum, what is the amount of interest he gets at the end of 3 years ?

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32. Find the value of  $k$ , if the division of  $kx^3 + 9x^2 + 4x - 10$  by  $x + 3$  leaves the remainder 5.

33. Simplify :  $\frac{6x^2 - 5x + 1}{9x^2 + 12x - 5}$ .

34. If  $(2A + B)x + (A + B) \equiv 11x + 7$ , find the values of  $A$  and  $B$ .

35. The sum  $S$  of first  $n$  natural numbers is given by the formula

$$S = \frac{n(n+1)}{2}. \text{ If } S = 231, \text{ find } n.$$

### PART - II

N. B. : i) This Part contains *four* Sections, **Section - C**, **Section - D**, **Section - E** and **Section - F**.

ii) **Section - C** and **Section - E** contain 3 questions each. Answer any *two* questions in each Section.

iii) **Section - D** and **Section - F** contain 4 questions each. Answer any *three* questions in each Section.

iv) Each question carries *five* marks.

### SECTION - C

III. Answer any *two* questions :  $2 \times 5 = 10$

36. In an A.P., the sum of the first 10 terms is 175 and the sum of the next 10 terms is 475. Find the A.P.

37. Find the 3 numbers in G.P. whose sum is 14 and product is 64.

38. Find the sum of  $n$  terms of the series  $0.4 + 0.94 + 0.994 + \dots$ .

### SECTION - D

IV. Answer any *three* questions :  $3 \times 5 = 15$

39. Verify  $A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$  using Venn diagram.

40. Given  $f(x) = x - 2$ ,  $g(x) = 3x + 5$ ,  $h(x) = 2x - 3$ , verify that

$$(g \circ h) \circ f = g \circ (h \circ f).$$

41. Rahul deposited Rs. 5,000 in a bank which pays 6% S.I. per annum for 2 years. Ajay deposited on the same day Rs. 5,000 in another bank which pays  $5\frac{1}{2}\%$  C.I. per annum. Who will get more interest and how much ?
42. At the end of 3 years, a recurring deposit fetches Rs. 16,398 with 9% S.I. per annum. Find the amount to be deposited every month.

### SECTION - E

V. Answer any *two* questions :

$2 \times 5 = 10$

43. A hollow cylindrical iron pipe is 40 cm long. Its outer and inner diameters are 8 cm and 5 cm respectively. Find the volume of the material and the weight of the pipe if 1 c.c. of iron weighs 7 gm.
44. A right circular cone of height 40 cm and base radius 15 cm is casted into smaller cones of equal sizes with base radius 5 cm and height 4 cm. Find how many cones are made.
45. A hollow spherical shell has an inner radius of 8 cm. If the volume of the material is  $\frac{1952\pi}{3}$  c.c., find the thickness of the shell.

### SECTION - F

VI. Answer any *three* questions :

$3 \times 5 = 15$

46. If both  $x - 2$  and  $x - \frac{1}{2}$  are factors of  $px^2 + 5x + r$ , show that  $p = r$ .
47. Resolve into partial fractions :

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

48. Find the values of  $a$  and  $b$  if  $\frac{1}{x^4} - \frac{6}{x^3} + \frac{13}{x^2} + \frac{a}{x} + b$  is a perfect square.
49. If  $\alpha$  and  $\beta$  are the roots of the equation  $2x^2 - 3x - 4 = 0$ , form the equation whose roots are  $\frac{1}{\alpha^2}, \frac{1}{\beta^2}$ .

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## PART - III

- N. B. :
- i) The Part contains Section - G
  - ii) Answer any *one* question.
  - iii) Each question carries *ten* marks.

## SECTION - G

VII. Answer any *one* question :

$1 \times 10 = 10$

50. Solve graphically :  $x^2 - x - 12 = 0$ .

51. Draw the graph of  $y = x^2 - 3x$  and hence solve the equation

$$x^2 - 3x - 4 = 0.$$