CLASS 12 PUBLIC EXAMINATION – MARCH 2025

11.03.2025

PART – I TYPE – A

1	(a) N
2	(d) 2
3	(d) $\frac{1}{5}$
4	(d) 2.5
5	(a) 1,2
6	(a) 19
7	(b) $y = x^3 + 2$
8	(b) [1,2]
9	(d) 2xu
10	(b) 2
11	(b) $\pm \frac{1}{\sqrt{2}}(1+i)$
12	(b) 1+i
13	(d) 0.25
14	(c) $\frac{\pi}{2}$
15	(a) (1,0)
16	(b) $\frac{\pi}{6}$
17	(c) $\frac{\pi a^3}{6}$
18	(b) $\frac{1}{\sqrt{2}}$
19	(a) π
20	(b) $\frac{1}{f(x)} f'(x)\,dx$ pg-66 properties of differentials(9)

PART – I TYPE – B

1	(b) $\frac{1}{\sqrt{2}}$
2	(a) π
3	(d) 2xu
4	(a) N
5	(d) $\frac{1}{5}$
6	(a) (1,0)
7	(d) 2.5
8	(b) $\frac{1}{f(x)} f'(x)\,dx$ pg-66
9	(b) [1,2]
10	(d) 2
11	(c) $\frac{\pi a^3}{6}$
12	(a) 1,2
13	(b) $\frac{\pi}{6}$
14	(a) 19
15	(b) 1+i
16	(c) $\pi/2$
17	(b) $\pm \frac{1}{\sqrt{2}}(1+i)$
18	(b) $y = x^3 + 2$
19	(d) 0.25
20	(b) 2

PART – II

21	Example 1.6	I 9
22	Exercise 2.4 (2)(i)	I 65
23	Example 4.9 (i)	I 146
24	Example 5.12	I 181
25	Example 7.67	II 49
26	Example 8.21	II 85
27	Exercise 10.5 (4)(i)	II 161
28	Example 11.11	II 196
29	Creative	
30	Example 9.20	II 107

PART – III

31	Exercise 1.3 (1)(i)	I 33
32	Exercise 2.5 (6)	I 72
33	Example 3.27	I 122
34	Exercise 4.5 (4)(i)	I 166
35	Example 6.18	I 237
36	Exercise 8.6 (1)	II 84
37	Exercise 9.5 (1)(i)	II 117
38	Exercise 11.4 (8)	II 210
39	Creative	
40	Creative	

PART – IV

41	(a) Example 1.25	I 34
	(b) Exercise 7.2 (8)	II 15
42	(a) Exercise 2.8 (6)	I 92
	(b) Exercise 9.8 (7)	II 134
43	(a) Exercise 3.5 (7)	I 124
	(b) Example 10.17	II 163
44	(a) Exercise 5.5 (1)	I 214
	(b) Exercise 6.1 (9)	I 231
45	(a) Creative	
	(b) Creative	
46	(a) Example 6.43	I 262
	(b) Example 10.27	II 170
47	(a) Exercise 7.8 (12)	II 47
	(b) Distributive law (ii)	II 245

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MARCH 2025

29. Find the polynomial equation of minimum degree with rational coefficients having $i-2$ as a root.

Let the root be $-2+i$

Another root be $-2-i$

Sum of roots

$$\alpha+\beta = -2+i+(-2-i)$$

$$= -2+i-2-i$$

$$\boxed{\alpha+\beta = -4}$$

Product of roots

$$\alpha\beta = (-2+i)(-2-i)$$

$$= (-2)^2 - i^2$$

$$= 4-(-1)$$

$$= 4+1$$

$$\boxed{\alpha\beta = 5}$$

$$x^2-(\alpha+\beta)x+\alpha\beta = 0$$

$$x^2-(-4)x+5 = 0$$

$$\boxed{x^2+4x+5 = 0}$$

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39. Find the Taylor's series about $x=2$ for $f(x)=x^3+2x+1, (-\infty<x<\infty)$

$$f(x)=x^3+2x+1,$$

Taylor's series

$$f(x)=\sum_{n=0}^{\infty}\frac{f^{(n)}(a)}{n!}(x-a)^n$$

$$=f(a)+\frac{f'(a)}{1!}(x-a)+\ldots+\frac{f^{(n)}(a)}{n!}(x-a)^n+\ldots$$

$f(2)=(2)^3+2(2)+1 \Rightarrow f(2)=13$

$f'(x)=3x^2+2$

$f'(2)=3(2)^2+2 \Rightarrow f'(2)=14$

$f''(x)=6x$

$f''(2)=6(2) \Rightarrow f''(2)=12$

$f'''(x)=6 \Rightarrow f'''(2)=6$

$$f(x)=f(2)+\frac{f'(2)}{1!}(x-2)+\frac{f''(2)}{2!}(x-2)^2+\frac{f'''(2)}{3!}(x-2)^3$$

$$=13+\frac{14}{1!}(x-2)+\frac{12}{2!}(x-2)^2+(x-2)^3$$

$$f(x)=13+14(x-2)+6(x-2)^2+(x-2)^3$$

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40. Let Q be the set of all Rational numbers. If * is a binary operation defined on Q as $a*b = a+b-ab+7$ and $\left(\frac{3}{2}\right)*m = \frac{87}{10}$, then find the value of m.

Given that,

$$a*b = a+b-ab+7$$

$$\left(\frac{3}{2}\right)*m = \frac{87}{10}$$

$$\frac{3}{2}+m-\frac{3m}{2}+7 = \frac{87}{10}$$

$$\frac{3+2m-3m+14}{2} = \frac{87}{10}$$

$$\frac{17-m}{2} = \frac{87}{10}$$

$$17-m = \frac{87}{10}\times 2$$

$$17-m = \frac{87}{5}$$

$$-m = \frac{87}{5}-17$$

$$-m = \frac{87-85}{5}$$

$$-m = \frac{2}{5}$$

$$\boxed{m = -\frac{2}{5}}$$

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45 (a) During war, 1 ship out of 9 was sunk on an average in making a certain voyage. What was the probability that:

(i) Exactly 3 out of a convoy of 6 ships would arrive safely?

(ii) No ships arrive safely from a convoy of 4 ships.

(i) Let p be the probability of a ship arriving safely.

$$q = \frac{1}{9} \; ; P = 1 - \frac{1}{9} = \frac{8}{9}, n = 6$$

The probability that exactly 3 ships arrive safely is

$${}^6C_3 \left(\frac{8}{9}\right)^3 \left(\frac{1}{9}\right)^3$$

$$P(x=3) = \frac{6 \times 5 \times 4}{3 \times 2 \times 1} \times \frac{8^3}{9^3} \times \frac{1}{9^3}$$

$$= 20 \times \frac{8^3}{9^{3+3}}$$

$$P(x=3) = 20 \times \frac{512}{9^6}$$

(ii) $P(x=0) = {}^4C_0 \left(\frac{8}{9}\right)^0 \left(\frac{1}{9}\right)^4$

$$= 1 \times 1 \times \frac{1}{9^4}$$

$$= \frac{1}{6561} \text{ (or) } \frac{1}{9^4}$$

45(b) Find the equation of the ellipse whose Foci are (2,1),(-2,1) and the length of the latus rectum is 6.

$$\text{Centre } (h,k) = \left(\frac{2+(-2)}{2}, \frac{1+1}{2}\right)$$

Centre of the ellipse $= (0,1)$

foci are $(\pm 2, 1)$

$\therefore \boxed{c = 2}$

Length of latus rectum $= \frac{2b^2}{a}$

$$\frac{2b^2}{a} = 6$$

$$b^2 = \frac{6a}{2} \Rightarrow \boxed{b^2 = 3a}$$

$$b^2 = a^2 - c^2$$

$$3a = a^2 - 2^2$$

$$3a = a^2 - 4$$

$$a^2 - 3a - 4 = 0$$

$$a^2 - 4a + a - 4 = 0$$

$$a(a-4) + 1(a-4) = 0$$

$$(a-4)(a+1) = 0$$

$$a - 4 = 0 \quad , \quad a + 1 = 0$$

$$\boxed{a = 4} \Rightarrow \boxed{a^2 = 16}$$

$$a = 4 \Rightarrow b^2 = 3 \times 4 \Rightarrow \boxed{b^2 = 12}$$

Equation of the ellipse

$$\frac{(x-h)^2}{a^2} + \frac{(y-k)^2}{b^2} = 1$$

$$\frac{(x-0)^2}{16} + \frac{(y-1)^2}{12} = 1$$

$$\boxed{\frac{x^2}{16} + \frac{(y-1)^2}{12} = 1}$$