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CLASS 12 APPLIED MATHEMATICS - PRACTICE QUESTIONS

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CLASS 12

Applied Mathematics

Sample Paper 1 - Questions

38 questions | 80 marks | 2026-27

Time: 3 hours. Answer all questions and subparts unless a choice is stated. Marks are shown on the right. Write answers on separate sheets. Independently prepared practice paper.

Section A - Objective questions

1. Calculate the determinant of [[12,1],[1,13]]. **1**
(A) 155 (B) 157 (C) 156 (D) 154

2. For $f(x) = 11x^3$, calculate $f'(2)$. **1**
(A) 132 (B) 131 (C) 133 (D) 134

3. Determine the value of the integral from 0 to 1 of $33x^2$ dx. **1**
(A) 10 (B) 12 (C) 11 (D) 13

4. For cost $C(x) = x^2 + 20x + 100$, find marginal cost $C'(5)$. **1**
(A) 30 (B) 32 (C) 31 (D) 29

5. A binomial random variable has n = 15 and p = 0.2. Calculate its mean. **1**
(A) 2 (B) 3 (C) 4 (D) 5

6. An observation is 70, the mean is 50 and standard deviation is 10. Calculate its standard score. **1**
(A) 3 (B) 2 (C) 1 (D) 4

7. Calculate the present value of Rs 11000 due in two years at a 10% annual discount rate. Round to two decimal places. **1**
(A) 9090.91 (B) 9092.91 (C) 9089.91 (D) 9091.91

8. Calculate the central three-period moving average for observations 20, 24, 28. 1

(A) 25 (B) 24 (C) 23 (D) 26

9. Maximise Z = x + y with x >= 0, y >= 0 and x + y <= 20. State the maximum value. 1

(A) 20 (B) 19 (C) 21 (D) 22

10. Calculate the determinant of [[13,1],[1,14]]. 1

(A) 181 (B) 183 (C) 180 (D) 182

11. For $f(x) = 12x^3$, calculate f'(2). 1

(A) 144 (B) 143 (C) 146 (D) 145

12. Determine the value of the integral from 0 to 1 of $36x^2$ dx. 1

(A) 13 (B) 14 (C) 12 (D) 11

13. For cost $C(x) = x^2 + 22x + 100$, find marginal cost C'(5). 1

(A) 31 (B) 33 (C) 32 (D) 34

14. A binomial random variable has n = 15 and p = 0.5. Calculate its variance. 1

(A) 15/4 (B) 11/4 (C) 23/4 (D) 19/4

15. An observation is 72, the mean is 50 and standard deviation is 11. Calculate its standard score. 1

(A) 4 (B) 1 (C) 2 (D) 3

16. Calculate the present value of Rs 12000 due in two years at a 10% annual discount rate. Round to two decimal places. 1

(A) 9919.36 (B) 9917.36 (C) 9918.36 (D) 9916.36

17. Calculate the central three-period moving average for observations 21, 25, 29. 1

(A) 25 (B) 27 (C) 26 (D) 24

18. Maximise Z = x + y with x >= 0, y >= 0 and x + y <= 21. State the maximum value. 1

(A) 21 (B) 20 (C) 22 (D) 23

19. Calculate the determinant of [[14,1],[1,15]]. 1
(A) 211 (B) 208 (C) 209 (D) 210

20. For $f(x) = 13x^3$, calculate f'(2). 1
(A) 157 (B) 155 (C) 156 (D) 158

Section B - Short responses

21. Determine the value of the integral from 0 to 1 of $39x^2$ dx. 2

22. For cost $C(x) = x^2 + 24x + 100$, find marginal cost C'(5). 2

23. A binomial random variable has n = 16 and p = 0.2. Calculate its mean. 2

24. An observation is 74, the mean is 50 and standard deviation is 12. Calculate its standard score. 2

25. Calculate the present value of Rs 13000 due in two years at a 10% annual discount rate. Round to two decimal places. 2

Section C - Short responses

26. Calculate the central three-period moving average for observations 22, 26, 30. 3

27. Maximise Z = x + y with x >= 0, y >= 0 and x + y <= 22. State the maximum value. 3

28. Calculate the determinant of [[15,1],[1,16]]. 3

29. For $f(x) = 14x^3$, calculate f'(2). 3

30. Determine the value of the integral from 0 to 1 of $42x^2$ dx. 3

31. For cost $C(x) = x^2 + 26x + 100$, find marginal cost C'(5). 3

Section D - Extended responses

32. For X distributed binomially with n=10 and p=0.3, find its mean, variance and P(X=0). State the independence assumption. **5**

33. Calculate the present value of three payments of Rs1000, made at the end of years 1,2 and 3, at a 10 percent annual effective rate. Explain why each payment is discounted for a different period. **5**

34. Maximise Z=3x+2y subject to x>=0, y>=0, x+y<=8, x<=5 and y<=6. List feasible corner points and identify the optimum. **5**

35. For observations 10,12,14,16,18 in five consecutive periods, calculate the three-period moving averages and assign them to their central periods. Describe the trend. **5**

Section E - Case and application questions

36. Let X be binomial with n=12 and p=1/4.

(a) Find its mean. **1**

(b) Find its variance. **1**

(c) Give P(X=0), stating the relevant assumptions. **2**

37. Maximise Z=2x+y subject to x>=0,y>=0,x+y<=10,x<=6,y<=7.

(a) Is (6,5) feasible? **1**

(b) Evaluate Z at (6,4). **1**

(c) Identify the maximum by comparing all feasible corner points. **2**

38. Rs12,100 is due in two years. Use a10 percent annual effective discount rate.

(a) State the two-year growth factor. **1**

(b) Find the present value. **1**

(c) Explain why discounting divides by the growth factor. **2**

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