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FOR KARNATAKA CLASS 12 PREPARATION

Karnataka 2nd PUC Model Question Paper 2027 for Basic Mathematics (Paper 3)

EXAM	YEAR	TYPE	SUBJECT
Karnataka Class 12	2027	Sample Paper	Maths

GOVERNMENT OF KARNATAKA
KARNATAKA SCHOOL EXAMINATION AND ASSESSMENT BOARD
6TH CROSS, MALLESHWARAM, BENGALURU – 560 003

II PUC MODEL QUESTION PAPER – 3 (2026 - 27)

SUBJECT:BASIC MATHEMATICS **MAXIMUM MARKS:80**

TIME: 03 HOURS **NUMBER OF QUESTIONS:42**

Instructions:

i) The question paper has 5 Parts A, B, C, D and E. Answer all the Parts.

ii)Part - A carries 20 marks, Part - B carries 12 marks, Part - C carries 18 marks, Part - D carries 20 marks and Part - E carries 10 marks.

iii)Write the question number properly as indicated in the question paper.

PART-A

I. Answer ALL the multiple-choice questions: $10 \times 1 = 10$

1. If $A = \begin{bmatrix} 1 & -2 \\ 3 & 4 \end{bmatrix}$, find adj A

a) $\begin{bmatrix} 4 & 2 \\ 3 & 1 \end{bmatrix}$, b) $\begin{bmatrix} 4 & 2 \\ -3 & 1 \end{bmatrix}$ c) $\begin{bmatrix} -4 & -2 \\ 3 & 1 \end{bmatrix}$ d) $\begin{bmatrix} 4 & 2 \\ 3 & -1 \end{bmatrix}$

2. If $9c_x + 9c_7 = 10c_7$ then the value of x is

a) 6 b) 0 c) 9 d) 7

3. If $P(A') = 0.65$, then $P(A)$ is

a) 1 b) 0 c) 0.35 d) 0.65

4. **Negate:** $\sim p \rightarrow q$

a) $p \rightarrow \sim q$ b) $\sim p \wedge \sim q$ c) $\sim p \wedge q$ d) $p \wedge q$

5. The mean proportion of 36 and 4 is

a) 10 b) 11 c) 12 d) 62

6. The value of $3 \sin 20^0 - 4 \sin^3 20^0$ is

a) $\frac{1}{2}$ b) $\frac{1}{\sqrt{2}}$ c) $\frac{\sqrt{3}}{2}$ d) 0

7. The length of the latus rectum of the parabola $y^2 = -8x$ is

a) 2 b) -2 c) -8 d) 8

8. If $y = \frac{x+1}{x}$ then $\frac{dy}{dx}$ is

a) $-\frac{1}{x}$ b) $-\frac{1}{x^2}$ c) $\frac{1}{x}$ d) $\frac{1}{x^2}$

9. Evaluate: $\int 4\,\text{cosec}^2 x\,dx$

a) $4\sec^2 x + c$ b) $-4\sec^2 x + c$ c) $4\cot x + c$ d) $-4\cot x + c$

10. Evaluate: $\int \frac{2x}{1+x^2}\,dx$

a) $\log x + c$ b) $\log 2x + c$ c) $\log(1+x) + c$ d) $\log(1+x^2) + c$

II. **Match the following:** $\mathbf{5 \times 1 = 5}$

11.	**A**	**B**
a)	If $A = \begin{bmatrix} 1 & -1 \\ 2 & 4 \end{bmatrix}$ then the value of $\|A\|$ is	i) $\frac{\sqrt{3}+1}{2\sqrt{2}}$
b)	The value of ${}^8P_3$ is	ii) 6
c)	The value of x in $5:15 = 3:x$	iii) 336
d)	$\sin 15^\circ$ is	iv) 9
e)	The value of $\lim_{x\to 1} \frac{x^3+4}{1+x}$ is	v) $\frac{\sqrt{3}-1}{2\sqrt{2}}$
		vi) $\frac{5}{2}$

III. Fill in the blanks by choosing appropriate answer from given options : $\mathbf{5 \times 1 = 5}$

(e, 0, 9, 2, 24, $e-1$)

12. A square matrix A is a singular matrix if $|A| =$ _____

13. The number of ways 5 people can be seated around a table is _____

14. The third proportional of 4 and 6 is _____

15. If the length of the latus rectum of the parabola $x^2 = 4ky$ is 8, then the value of k is ____

16. $\int_0^1 e^x\,dx =$ _____

PART-B

IV. Answer any SIX questions. $\mathbf{6 \times 2 = 12}$

17. If $A = \begin{bmatrix} 2 & 3 & 1 \\ 1 & -2 & 0 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & -2 & 4 \\ 1 & 3 & 2 \end{bmatrix}$ find $2A - 3B$

18. In how many ways 3 boys and 4 girls can be arranged in a row so that all the 3 boys sit together?

19. If $P(A) = \frac{1}{2}$, $P(B) = \frac{1}{3}$, $P(A \cup B) = \frac{7}{12}$, find $P(B|A)$

20. If 10 persons can do a job in 60 days, then in how many days can 20 persons do the same job?

21. True discount on a bill was ₹100 and Banker's gain was ₹10. What is the face value of the bill?

22. Find the focus and equation of the directrix of the parabola $x^2 - 16y = 0$

23. If $y = x^x$, find $\frac{dy}{dx}$

24. The total revenue function is given by $R = 400x - 2x^2$ and the total cost function given by $C = 2x^2 + 40x + 4000$ find the marginal revenue and marginal cost function

25. Find the area enclosed by the curve $y = x^2 + 2x$ between the ordinates $x = 0$ and $x = 2$

PART-C

V. Answer any SIX questions. $6 \times 3 = 18$

26. If $A = \begin{bmatrix} 2 & -1 \\ -1 & 2 \end{bmatrix}$ then show that: $A^2 - 4A + 3I = 0$

27. Find the number of permutations of the letters of the word '**COMMITTEE**'. How many of these

a) have all the vowels together

b) begin with T and end with T

28. In a fort, there was ration for 560 soldiers that would last the soldiers for 70 days. After 20 days, 60 soldiers left the fort. For how many days the remaining ration can support the remaining soldiers?

29. The Banker's gain on a bill is $1/5^{Th}$ of the banker's discount and the rate of interest is 20% p.a.Find the unexpired period of the bill.

30. Sanjana invests ₹3240 in a stock at 108 and sells when the price falls to 104. How much stock at 130 can Sanjana buy now?

31. Bharath bought a shirt for ₹336 including 12% sales tax and a neck tie for ₹110 including 10% sales tax. Find the printed price of shirt and neck tie together.

32. A circular patch of oil spreads on water, the area growing at the rate of $16cm^2/min$. How fast are the radius and the circumference increasing when the diameter is 12cms?

33. Evaluate: $\int \frac{1}{x(x+2)} dx$

34. Evaluate: $\int_0^1 \frac{2x+5}{x^2+5x+3} dx$

PART-D

VI. Answer any FOUR questions. $4 \times 5 = 20$

35. Solve by matrix method: $x + y + z = 5$, $2x + y - z = 2$, $2x - y + z = 2$

36. Resolve into partial fraction: $\frac{x^2+1}{(x+1)(x-2)^2}$

37. Verify whether the proposition $(\sim p \wedge q) \wedge \sim r$ is a Tautology, contradiction or neither.

38. An engineering company has 80% learning effect and spends 1000 hours to produce 1 lot of the product. Estimate the labour cost of producing 8 lots of the product if the labour cost is ₹100 per hour.

39. Maximize:$Z = 5x + 3y$

subject to the constraints $3x + 5y \leq 15,\ \ 5x + 2y \leq 10,\ \ x \geq 0,\ \ y \geq 0$

40. Prove that: $\frac{\cos 7x+\cos 3x-\cos 5x-\cos x}{\sin 7x-\sin 3x-\sin 5x+\sin x} = \cot 2x$

41. If $y = \left(x + \sqrt{1+x^2}\right)^m$ Prove that : $(1+x^2)y_2 + xy_1 - m^2y = 0$

PART-E

VII. Answer the following questions.

42. (a)P.T: $\lim_{x\to a}\left(\frac{x^n-a^n}{x-a}\right) = na^{n-1}$, for all rational values of n **(6 marks)**

(OR)

Show that the points $(4,8),(8,6),(-1,3)$ and $(0,0)$ are concyclic.

(b) The angle of elevation of an object from a point 100m above a lake is 30^0 and angle of depression of its image in the lake is 45^0. Find the height of the object above the lake. **(4 marks)**

(OR)

Find the value of $(1.01)^5$ using Binomial theorem, upto 4 decimal places

PART-F

(Only for visually challenged students)

39. A Company produces two products P and Q. Each P requires 4 hours of grinding and 2 hours of polishing and each Q requires 2 hours of grinding and 5 hours of polishing. The total available hour for grinding is 20 hours and for polishing is 24 hours. Profit per unit of P is ₹6 and that of Q is ₹8. Formulate the L.P.P to maximize the profit.