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FOR KARNATAKA CLASS 11 PREPARATION

Karnataka 1st PUC Model Question Paper 2027 for Mathematics (Paper 2)

EXAM	YEAR	TYPE	SUBJECT
Karnataka Class 11	2027	Sample Paper	Maths

GOVERNMENTOF KARNATAKA
DEPARTMENT OF SCHOOL EDUCATION (PRE UNIVERSITY)
I P.U.C ANNUAL EXAMINATION 2027
SAMPLE MODEL QUESTION PAPER II

Subject Code: 35
MATHEMATICS

[Time: 3 Hours] **[TOTAL No. of questions: 47]** **[Max. Marks: 80]**

Instructions:

1. The question paper has five Parts namely A, B, C, D and E. Answer **all** the parts.
2. PART-A has **15** Multiple choice questions and **5** Fill in the blank questions.
3. For PART-A questions, only the first written answers will be considered for evaluation.

PART - A

I. Answer ALL the multiple choicequestions ***(15 ×1 = 15)***

1. **Let A = {1, 2, {3, 4}, 5}. Which of the following statement is correct?**

   A){3, 4} ⊂A B){3, 4} ∈A C) 3∈A D) 4∈A.

2. **If (x - 1, y + 2) = (1, 5), then (x, y) is**

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

3. **The range of f (x) = sin x is**

   A)[0, ∞) B) (-∞, ∞) C) [-1, 1] D) (-1, 1)].

4. **The square roots of – 1**

   A) 1,-1 B) $-i$ C) i D) $i, -i$

5. **The solution of 3x + 8 > 2, when x is a real number is**

   A) (-2, ∞) B) (-∞, -2) C) (-∞, -2] D) (-∞, -1)

6. **Match List I with List II**

List I	List II
a) $^5C_0$	i) 20
b) $^5P_2$	ii) 10
c) $^5C_2$	iii) 1

Choose the correct answer from the options given below:

A) a-i, b-ii, c-iii B) a-iii, b-ii, c-i

C) a-ii, b-i, c-iii D) a-iii, b-i, c-ii

7. **The number of 2digit even numbers can be formed from the digits 1, 2, 3, 4, 5 if the digits can be repeated**
A) 10 B)8 C)120 D)

8. **The value of** ${}^{10}C_1 + {}^{10}C_2 + {}^{10}C_3 + \ldots\ldots {}^{10}C_{10}$ **is**
A)1024 B)1023 (C)1022 (D) 512

9. **The 9th term of the sequence defined by** $a_n = (-1)^{n-1}n^3$ **is**
A) 3^6 B) 3^9 C) -3^9 D)-3^6

10. **The angle between the *x*-axis and the line joining the points (3,–1) and (4,–2)**
A) 45^0 B) 135^0 C) -45^0 D) -135^0

11. **Equation of the circle with centre at (-3,2) and radius 4.**
A) $x^2 + y^2 + 6x - 4y + 3 = 0$ B) $x^2 + y^2 - 6x + 4y - 3 = 0$
C) $x^2 + y^2 - 6x + 4y + 3 = 0$ D) $x^2 + y^2 + 6x - 4y - 3 = 0$

12. **The point (-2, -3, -4) lies in the**
A) First Octant B)Seventh octant C) Second octant D) Eighth octant

13. $\lim_{x \to -1} (x^3 - x^2 + 1)$ is
A) -1 B) 0 C) 1 D) 2

14. **The median of 3, 10, 6, 7, 11, 13, 15 is**
A) 7 B) 9 C) 10 D) 11

15. **Which of the following is incorrect**
A) If A and B are any two events then$P(A \cup B) = P(A) + P(B) - P(A \cap B)$
B) $P(A') = 1 - P(A)$
C) $P(A \cap B') = P(A) - P(A \cap B)$
D)$P(A' \cap B') = 1 + P(A \cup B)$

II. Fill in the blanks by choosing the appropriate answer from those given in the bracket. (0,1, 2, 3, 4, 5) ***(5 ×1 = 5)***

16. The length of the intervals (-1, 1] is_____
17. The solution of $-8 \leq 5x - 3 < 7$ *is* $a \leq \boldsymbol{x} < \boldsymbol{b}$, ***then*** $\boldsymbol{a + b}$ is_____
18. The x-intercept of the line $2x + 5y - 10 = 0$ is_____
19. The length of the lotus rectum of the parabola $y^2 = 4x$ is_____
20. The derivative of $f(x) = 3x$ at x =2

PART-B

III. Answer Any Six of the following questions ***(6× 2 = 12)***

21. If A= {3, 5, 7, 9, 11}, B= {7, 9, 11, 13}, C= {15, 17} find A∩(B∪C).

22. In a circle of diameter 40 cm, the length of a chord is 20 cm. Find the length of minor arc of the chord

23. Prove that $(\sin 3x + \sin x)\sin x + (\cos 3x - \cos x)\cos x = 0$

24. Express $i^{18} + \left(\frac{1}{i}\right)^{25}$ in a + ib form.

25. How many 4-letter codes can be formed using the first 10 letters of the English alphabet, if no letter can be repeated?

26. Find an approximation of $(0.99)^5$ using the first three terms of its expansion

27. The sum of first three terms of a G.P. is $\frac{13}{12}$ and their product is -1. Find the common ratio and the terms

28. Find the equation of the ellipse whose vertices are (± 13, 0) and foci are (± 5, 0).

29. One card is drawn from a well shuffled deck of 52 cards. If each outcome is equally likely, calculate the probability that the card will be (i) a diamond (ii) not an ace card

PART –C

IV. Answer Any Six of the following questions *(6× 3 = 18)*

30. Let U= {1, 2, 3, 4, 5, 6} A= {2, 3}, and B={3, 4, 5}. Show that $(A \cup B)^C = A^C \cap B^C$

31. Determine the domain and range of the relation R defined by $R = \{(x, x + 5): x \in \{0, 1, 2, 3, 4, 5\}\}$.

32. Show that $\tan 3x \tan 2x \tan x = \tan 3x - \tan 2x - \tan x$

33. If $(x + iy)^3 = u + iv$, then show that $\frac{u}{x} + \frac{v}{y} = 4(x^2 - y^2)$.

34. Solve the inequality and show the graph of the solution on the number line $\frac{3x-4}{2} \geq \frac{x+1}{4} - 1$

35. Expand using binomial theorem $\left(1 + \frac{x}{2} - \frac{2}{x}\right)^4, x \neq 0$

36. If the angle between two lines is π/4 and slope of one of the lines is 1/2 find the slope of the other line.

37. If the origin is the centroid of the triangle PQR with vertices P (2a, 4, 6 $Q(-4, 3b, -10)$ and $R(8, 14, 2c)$ then find the values of a, b, c

38. Find the derivative of $\tan x$ w. r. t x from first principle.

PART – D

V. Answer Any Four of the following questions *(4× 5 = 20)*

39. Define Modulus function. Draw the graph of it. Also write its domain and range.

40. Prove that $\frac{\cos 4x + \cos 3x + \cos 2x}{\sin 4x + \sin 3x + \sin 2x} = \cot 3x$

41. A committee of 7 has to be formed from 9 boys and 4 girls. In how many ways can this be done when the committee consists of:
(i) exactly 3 girls? (ii) atleast 3 girls? (iii) atmost 3 girls?

42. Derive a formula for the angle between two lines with slopes m_1 and m_2. If the angle between two lines is $\frac{\pi}{4}$ and slope of one of the lines is $\frac{1}{2}$, find the slope of the other line

43. Prove that,for any positive integer n,$\lim_{x\to 0}\left[\frac{x^n-a^n}{x-a}\right] = na^{n-1}$, and hence evaluate $\lim_{x\to 1}\left[\frac{x^{15}-1}{x^{10}-1}\right]$.

44. Find the variance and standard deviation for the following data

x_i	4	8	11	17	30	24	32
f_i	3	5	9	5	4	3	1

45. One card is drawn from a well shuffled deck of 52 cards. If each outcome is equally
likely, calculate the probability that the card will be
(i) a diamond (ii) not an ace card (iii) a black card
(iv) not a diamond (v) not a black card.

PART-E

VI. Answer the following question.

46. Prove geometrically that $cos(x+y) = cosx\ cosy - sinx\ siny$, and hence evaluate $\cos\left(\frac{\pi}{2}+x\right)$

OR

Define hyperbola and derive the equation in the form $\frac{x^2}{a^2}-\frac{y^2}{b^2}=1$. **6**

47. Find the derivative of $f(x)=\frac{x^5-\cos x}{\sin x}$

OR

Find the sum of n terms of the sequence 7,77,777,7777,....tonterms. **4**

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