Model Quetion Paper

11th Standard

Date : 07-Sep-19

SKV MATRIC HR SEC. SCHOOL, KOLUNDAMPET - 600 200. Reg.No. :

MATHEMATICS

Exam Time : 03:00:00 Hrs Total Marks : 90

PART - I 20 x 1 = 20

Answer All Questions:-

1) Let X={1,2,3,4}, Y={a,b,c,d} and f={f(1,a),(4,b),(2,c),(3,d),(2,d)}. Then f is

(a) an one-to-one function (b) an onto function (c) a function which is not one-to-one (d) not a function

2) The shaded region in the adjoining diagram represents.

(a) A\B (b) A (c) B' (d) B\A

3) Let R be the set of all real numbers. Consider the following subsets of the plane R x R: S = {(x, y) : y =x + 1 and 0 < x < 2} and T = {(x,y) : x - y is an integer} Then which of the following is true?

(a) T is an equivalence relation but S is not an equivalence relation (b) Neither S nor T is an equivalence relation (c) Both S and T are equivalence relation (d) is an equivalence relation but T is not an equivalence relation.

4) Let X = {1, 2, 3, 4} and R = {(1, 1), (1, 2), (1, 3), (2, 2), (3, 3), (2, 1), (3 1), (1, 4),(4, 1)}. Then R is

(a) reflexive (b) symmetric (c) transitive (d) equivalence

5) If 3 is the logarithm of 343 then the base is

(a) 5 (b) 7 (c) 6 (d) 9

6) The equation whose roots are numerically equal but opposite in sign to the roots $3x^2-5x-7=0$ is

(a) $3x^2-5x-7=0$ (b) $3x^2+5x-7=0$ (c) $3x^2-5x+7=0$ (d) $3x^2+x-7$

7) The value of $\log_3 11.\log_{11} 13.\log_{13} 15\log_{15} 27.\log_{27} 81$ is

(a) 1 (b) 2 (c) 3 (d) 4

8) If $\cos28^0+\sin28^0=k^3$, then $\cos 17^0$ is equal to

(a) $\frac{k^3}{\sqrt{2}}$ (b) $-\frac{k^3}{\sqrt{2}}$ (c) $\pm\frac{k^3}{\sqrt{2}}$ (d) $-\frac{k^3}{\sqrt{3}}$

9) Which of the following is not true?

(a) $\sin\theta=-\frac{3}{4}$ (b) $\cos\theta=-1$ (c) $\tan\theta=25$ (d) $\sec\theta=\frac{1}{4}$

10) $\frac{cos6x+6cos4x+15cos2x+10}{cos5x+5cos3x+10cosx}$ equal to

(a) cos2x (b) cosx (c) cos3x (d) 2cosx

11) In $\triangle ABC$, $\hat{C} = 90°$ then a cosA + b cosB is:

(a) 2R sinB (b) 2 sinB (c) 0 (d) 2a sinB

12) The sum of the digits at the 10^{th} place of all numbers formed with the help of 2, 4, 5, 7 taken all at a time is

(a) 432 (b) 108 (c) 36 (d) 18

13) Number of sides of a polygon having 44 diagonals is

(a) 4 (b) 4! (c) 11 (d) 22

14) The product of first n odd natural numbers equals

(a) ${}^{2n}C_n \times {}^nP_n$ (b) $\left(\frac{1}{2}\right)^n {}_{2n}C_n \times {}^nP_n$ (c) $\left(\frac{1}{4}\right)^n \times {}_{2n}C_n \times {}_{2n}P_n$ (d) ${}^nC_n \times {}^nP_n$

15) The nth term of the sequence 1, 2, 4, 7, 11,... is

(a) $n+3n^2+2n$ (b) $n_3-3n+3n$ (c) $\frac{n(n+1)(n+2)}{3}$ (d) $\frac{n^2-n+2}{2}$

16) The value of $1-\frac{1}{2}\left(\frac{2}{3}\right)+\frac{1}{3}\left(\frac{2}{3}\right)^2-\frac{1}{4}\left(\frac{2}{3}\right)^2+\ldots.$ *is*

(a) $log\left(\frac{5}{3}\right)$ (b) $\frac{3}{2}log\left(\frac{5}{3}\right)$ (c) $\frac{5}{3}log\left(\frac{5}{3}\right)$ (d) $\frac{2}{3}log\left(\frac{2}{3}\right)$

17) Thye value of $1-\frac{1}{2}(\frac{3}{4})+\frac{1}{3}(\frac{3}{4})^2-\frac{1}{4}(\frac{3}{4})^3+\ldots$ is:

(a) $\frac{3}{4}log(\frac{7}{4})$ (b) $\frac{4}{3}log(\frac{7}{4})$ (c) $\frac{1}{3}log(\frac{7}{4})$ (d) $\frac{4}{3}log(\frac{4}{7})$

18) Equation of the straight line that forms an isosceles triangle with coordinate axes in the I-quadrant with perimeter $4 + 2\sqrt{2}$ is

(a) x+y+2=0 (b) x+y-2=0 (c) $x + y - \sqrt{2} = 0$ (d) $x + y + \sqrt{2} = 0$

19) Equation of the straight line perpendicular to the line x - y + 5 = 0, through the point of intersection the y-axis and the given line

(a) x-y-5=0 (b) x+y-5=0 (c) x+y+5=0 (d) x+y+10=0

20) If one of the lines given by $6x^2 - xy + 4cy^2 = 0$ is 3x + 4y = 0, then c equals to

(a) -3 (b) -1 (c) 3 (d) 1

PART - II 7 x 2 = 14

Answer Any Seven And Compulsory Question is 30:-

21) State whether the following sets are finite or infinite.

{x ∈ N:x is a rational number}

22) State whether the following relations are functions or not. If it is a function check for one-to-oneness and ontoness. If it is not a function state why?

If A={a,b,c} and f={(a, c) (b, c) (c, b)} : (f : A → A).

23) Prove $\log a+\log a^2+\log a^3+\ldots \log a^n = \frac{n(n+1)}{2} loga$

24) Show that $\frac{(cos\theta - cos3\theta)(sin8\theta + sin2\theta)}{(sin5\theta - sin\theta)(cos4\theta - cos6\theta)} = 1$

25) Find the degree measure corresponding to the following radian measure; $\frac{10\pi}{9}$

26) How many three-digit odd numbers can be formed using the digits 0, 1, 2, 3, 4, 5? if **Repetition of digits is not allowed**

27) A student appears in an objective test which contain 5 multiple choice questions. Each question has four choices out of which one correct answer.

(i) What is the maximum number of different answers can the students give?

(ii) How will the answer change if each question may have more than one correct answers?

28) Compute 102^4

29) Write the n^{th} term of the following sequences

6,10,4,12,2,14,0,16,-2...

30) Find the value of a for which the straight lines x + y - 4 = 0, 3x + 2 = 0 and x - y + 3a = 0 are concurrent.

PART - III 7 x 3 = 21

Answer All Questions and Compulsory Question is 40

31) By taking suitable sets A, B, C, verify the following results:

$A \times (B \cap C) = (A \times B) \cap (A \times C)$

32) Consider the functions:

i) $f(x) = x^2$,

ii) $f(x) = \frac{1}{2}x^2$,

iii) $f(x) = 2x^2$

33) Simplify $\frac{1}{3-\sqrt{8}} - \frac{1}{\sqrt{8}-\sqrt{7}} + \frac{1}{\sqrt{7}-\sqrt{6}} - \frac{1}{\sqrt{6}-\sqrt{5}} + \frac{1}{\sqrt{5}-2}$

34) Find all values of x for which $\frac{x^3(x-1)}{x-2} > 0$.

35) if a cos θ -b sin θ = C Show that a sin θ +b cos $\theta = \pm\sqrt{a^2 + b^2 - c^2}$

36) If $\cos(\alpha - \beta) + \cos(\beta - \gamma) + \cos(\gamma - \alpha) = \frac{-3}{2}$ then prove that $\cos\alpha + \cos\beta + \cos\gamma = \sin\alpha + \sin\beta + \sin\gamma = 0$

37) Prove that ${}^{35}C_5 + \sum_{r=0}^{4} {}^{(39-r)}C_4 = {}^{40}C_5$

38) Find the Constant term of $\left(2x^3 - \frac{1}{3x^2}\right)^5$

39) Write the first 4 terms of the logarithmic series of $\log\left(\frac{1-2x}{1+2x}\right)$

40) Find the value of λ for which the equation $12x^2-10xy+2y^2+11x\ 5y+\lambda=0$ represents a pair of straight lines.

PART- III 7x 5 = 35

Answer All Questions:-

41) a) Discuss the following relations for reflexivity, symmetricity and transitivity :

On the set of natural numbers, the relation R is defined by "xRy if x + 2y = 1".

(OR)

b) Show that the statement, "if f and gof are one-to-one, then g is one to-one" is not true.

42) a) Solve : $log_2 x - 3log_{\frac{1}{2}} x = 6$

(OR)

b) Resolve the following rational expressions into partial fractions.

$\frac{x^2+2x+1}{x^2+5x+6}$

43) a) Prove that $\frac{sinx+sin3 \ + \ in5x+sin7x}{cosx+cos3x+cos5x+cos7x} = tan4x$

(OR)

b) Find the values of other five trigonometric functions for the following

tan θ = -2, θ lies in the II quadrant

44) a) Prove that for any a and b,$-\sqrt{a^2+b^2} \ \leq$ a sin θ+ b cos $\theta \leq \sqrt{a^2+b^2}$

(OR)

b) In a triangle ABC, prove that $\frac{a^2+b^2}{a^2+c^2} = \frac{1+cos(A-B)cosC}{1+cos(A-C)cosB}$

45) a) Count the numbers between 999 and 10000 subject to the condition that there are

(i) no restriction.

(ii) no digit is repeated.

(iii) at least one of the digits is repeated.

(OR)

b) By the principle of mathematical induction, prove that for n $\geq$ 1

$1 \cdot 2 + 2 \cdot 3 + \ldots + n(n+1) = \frac{n(n+1)(n+2)}{3}$

46) a) Find the value of n if the sum to n terms of the series $\sqrt{3} + \sqrt{75} + \sqrt{243} + \ldots.$ *is* $435\sqrt{3}$.

(OR)

b) If p - q is small compared to either p or q, then show that $n\sqrt{\frac{p}{q}} = \frac{(n+1)p+(n-1)q}{(n-1)p+(n+1)q}$

Hen e find $8\sqrt{\frac{15}{16}}$

47) a) If θ is a parameter, find the equation of the locus of a moving point, whose coordinates are x=a $\cos^3$, y=a $\sin^3$ θ.

(OR)

b) Find the distance between the parallel lines

(i) 12x + 5y = 7 and 12x + 5y + 7 = 0.

(ii) 3x - 4y + 5 = 0 and 6x - 8y - 15 = 0.

All the

Best!!!

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