Krishnagiri District　　　　　　　　　　　　　LS

KGI

SECOND REVISION EXAMINATION - FEBRUARY - 2020
X STANDARD
Time: 3.00 Hours　　　　　　Mathematics　　Reg. No. ☐☐☐☐☐☐☐　　**Marks: 100**

Instructions: (1) Check the question paper for fairness of printing. If there is any lack of fairness, inform the Hall Supervisor immediately
(2) Use Blue or Black ink to write and pencil or draw diagrams.

Part - A

Note: (i) Answer all the 14 questions.　　　　　　　　　　**14×1=14**
(ii) Choose the most suitable answer from the given four alternatives and write the option code with the corresponding answer.

1) Let $f(x) = \sqrt{1+x^2}$ then
   a) $f(xy) = f(x).f(y)$　　　　　　b) $f(xy) \geq f(x).f(y)$
   c) $f(xy) \leq f(x).f(y)$　　　　　　d) None of these

2) If the ordered pairs $(a+2, 4)$ and $(5, 2a+b)$ are equal then (a, b) is
   a) $(2, -2)$　　　　　　　　　　b) $(5, 1)$
   c) $(2, 3)$　　　　　　　　　　d) $(3, -2)$

3) Using Euclid's division lemma, if the cube of any positive integer is divisible by 9 then the possible remainders are
   a) 0, 1, 8　　　　　　　　　　b) 1, 4, 8
   c) 0, 1, 3　　　　　　　　　　d) 1, 3, 5

4) The next term of the sequence $3/16, 1/8, 1/12, 1/18, \ldots$ is
   a) 1/24　　　　　　　　　　b) 1/27
   c) 2/3　　　　　　　　　　d) 1/81

5) $\dfrac{3y-3}{y} + \dfrac{7y-y}{3y^2}$ is
   a) $\dfrac{9y}{7}$　　　　　　　　　b) $\dfrac{9y^3}{(21y-y)}$
   c) $\dfrac{2y^2 - 42y + 21}{3y^3}$　　　　　d) $\dfrac{7(y^2 - 2y + 1)}{y^2}$

6) Which of the following can be calculated from the given matrices
   $A = \begin{pmatrix} 1 & 2 \\ 3 & 4 \\ 5 & 6 \end{pmatrix}$　$B = \begin{pmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{pmatrix}$
   a) A^2　　　b) B^2　　　c) AB　　　d) BA
   i) a, b only　　ii) b, c only　　iii) b, d only　　iv) All

7) How many tangents can be drawn to the circle from an exterior point?

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   a) one   b) Two
   c) infinite   d) Zero

8) The straight line given by the equation $x = 11$ is
    a) Parallel to X axis   b) Parallel to Y axix
    c) Passing through the Origin   d) Passing through the point(0, 11)

9) A straight line has equation $8y = 4x + 21$ which of the following is true.
    a) The slope is 0.5 and y intercept is 2.6
    b) The slope is 5 and y intercept is 1.6
    c) The slope is 0.5 and y intercept is 1.6
    d) The slope is 5 and y intercept is 2.6

10) If $\sin\theta = \cos\theta$ then $2\tan^2\theta + \sin^2\theta - 1$ is equal to
    a) $-3/2$ b) $3/2$
    c) $2/3$ d) $-2/3$

11) The height of a right Circular Cone whose radius is 5 cm and slant height is 13 cm will be
    a) 12 cm   b) 10 cm
    c) 13 cm   d) 5 cm

12) The ratio of the volumes of a cylinder, a cone and a sphere, if each has the same dia meter and same height is
    a) $1:2:3$ b) $2:1:3$
    c) $1:3:2$ d) $3:1:2$

13) Variance of first 20 natural numbers is
    a) 32.25   b) 44.25
    c) 33.25   d) 30

14) The probability of getting a job for a person is x/3, if the probability of not getting the job is 2/3. then the value of x is
    a) 2   b) 1   c) 3   d) 1.5

Part - II

II. Answer 10 questions:
   Question No. 28 is compulsory $10 \times 2 = 20$

15) A = {-2, -1, 0, 1, 2} and f: A → B is an onto function defined by $f(x) = x^2 + x + 1$ then find B.

16) If B × A = {(-2, 3), (-2, 4), (0, 3), (0, 4), (3, 3), (3, 4)}. Find A and B.

17) Use Euclid's Division Algorithm to find the HCF of 867 and 255.

18) Find the sum $3 + 1 + 1/3 + \ldots\ldots\ldots \infty$

19) Simplify : $\dfrac{x^3}{x-y} + \dfrac{y^3}{y-x}$

20) Find the value of x, y, z If

$(x \quad y-z \quad z+3) + (y \quad 4 \quad 3) = (4 \quad 8 \quad 16)$

21) A man goes 18 m due east and then 24 m due north. Find the distance of his current position from the starting point?

22) Find the slope of a line joining the points $(5, \sqrt{5})$ with the origin.

23) Find the intercepts made by the line $4x - 9y + 36 = 0$ on the coordinate axes.

24) Prove the following identity

$\sec \theta - \cos \theta = \tan \theta \sin \theta$

25) If the base area of hemispherical solid is 1386 m² then find its TSA.

26) The standard deviation and Co-efficient of variation of a data are 1.2 and 25.6 respectively. Find the value of mean.

27) A die is rolled and coin is tossed simultaneously. Find the probability that the die shows an odd number and the coin shows a head.

28) A solid sphere and a solid hemisphere have equal total surface area. Prove ratio of their volume is $3\sqrt{3} : 4$

Part -III

III. Answer 10 questions: Question No. 42 is compulsory.   10×5=50

29) Let A = $\{x \in w / x < 2\}$; B = $\{x \in N / 1 < x \le 4\}$ and C = $\{3, 5\}$
Verify that $(A \cup B) \times C = (A \times C) \cup (B \times C)$

30) The function 't' which maps temperature in Celsius (C) into temperature in Fahrenheit (F) is defined by t(C) = F; Where F = 9/5 C + 32.
Find (i) t (0)

     (ii) t(28)

     (iii) t (−10)

     (iv) the value of C when t(C) = 212

     (v) the temperature when the Celsius value is equal to the Farenheit value.

31) The ratio of 6th and 8th term of an AP is 7:9.
Find the ratio of 9th term to 13th term.

32) Find the sum of $15^2 + 16^2 + 17^2 + \ldots\ldots\ldots + 28^2$

33) Find the square root of $(4x^2 - 9x + 2)(7x^2 - 13x - 2)(28x^2 - 3x - 1)$

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34) If $A = \begin{bmatrix} 1 & 2 & 1 \\ 2 & -1 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} 2 & -1 \\ -1 & 4 \\ 0 & 2 \end{bmatrix}$

Show that $(AB)^T = B^T A^T$.

35) State and prove Angle Bisector Theorem.

36) Show that the Points $(-2, 5)$ $(6, -1)$ and $(2, 2)$ are Collinear.

37) Find the equation of a straight line through the intersection of $3x + y + 2 = 0$ and $x - 2y - 4 = 0$ to the point of Intersection of $7x - 3y = -12$ and $2y = x + 3$.

38) The top of a 15 m high tower makes an angle of elevation of 60° with the bottom of an electric pole and angle of elevation of 30° with the top of the pole. What is the height of the electric pole?

39) A solid sphere of radius 6 cm is melted into a hollow cylinder of uniform thickness. If the external radius of the base of the cylinder 5 cm and its height is 32 cm. Then find thickness of the cylinder.

40) Find the Co-efficient of variation of 24, 26, 33, 37, 29, 31.

41) Three unbiased coins are tossed once. Find the probability of getting atmost 2 tails or atleast 2 heads.

42) Simplify: $\dfrac{1}{x^2 - 5x + 6} + \dfrac{1}{x^2 - 3x + 2} - \dfrac{1}{x^2 - 8x + 15}$

Part - IV

IV. Answer both questions: 2×8=16

43) a) Draw a circle of radius 4 cm. At a point L on it draw a tangent to the circle using the alternative segment.

[or]

b) Construct a Δ PQR such that QR = 6.5 cm ∠P = 60° and altitude from P to QR is of length 4.5 cm.

44) a) Draw the graph of $x^2 - 8x + 16 = 0$ and discuss the nature of solution of the quadratic equation.

(or)

b) Draw the graph of $y = x^2 + x$ and hence solve $x^2 + 1 = 0$.

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