COMMON THIRD REVISION TEST - 2023

Standard X

| | 1 | | | | | |
|---------|---|---|---|---|---|--|
| Reg.No. | 1 | 0 | E | 1 | 5 | |

| Time 2 00 hours | MATHE | MATICS | |
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| Time: 3.00 hours | Par | rt-I | Marks: 100 |
| I. Choose the corre | ct answer: | | 14 x 1 = 14 |
| 1. $A = \{a, b, p\}, B = \{2, 2, 3, 4, 5, 4, 5, 4, 5, 4, 5, 4, 5, 4, 5, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6,$ | (3) , C = {p, q, r, s} th | en n[(AUC) x B] is | |
| a) 8 | b) 20 | | d) 16 |
| 2. Let f and g be two f | unctions given by f = | {(0,1), (2,0), (3,-4), (4,2) | 2), (5,7)} |
| $g = \{(0,2), (1,0), (2,4)\}$ | 4), (-4,2), (7,0)} then | the range of fog is | |
| a) {0,2,3,4,5} | b) {-4,1,0,2,7} | c) {1,2,3,4,5} | d) {0,1,2} |
| 3. Given $F_1 = 1$, $F_2 = 3$ | | | |
| a) 3 | b) 5 | c) 8 | d) 11 |
| 4. The number of poin | its of intersection of t | he quadratic polynomia | $1x^2 + 4x + 4$ with the x |
| axis is | | | |
| a) 0 | b) 1 | c) 0 or 1 | d) 2 |
| 5. If number of column | ns and rows are not o | equal in a matrix then it | is said to be a |
| a) diagonal matrix | | b) rectangular matrix | |
| c) square matrix | | d) identity matrix | |
| 6. In \triangle LMN, \angle L = 60° , | $\angle M = 50^{\circ}$. If $\triangle LMN \sim$ | ΔPQR then the value of | |
| a) 40° | b) 70° | c) 30° | d) 110° |
| 7. If slope of the line P | ^{2}Q is $^{1}\sqrt{_{3}}$, then slope | pe of the perpendicular | bisector of PQ is |
| a) $\sqrt{3}$ | b) $-\sqrt{3}$ | c) $\frac{1}{\sqrt{3}}$ | d) 0 |
| 3. (2,1) is the point of i | | | |
| a) $x-y-3=0$, $3x$ | | b) $x + y = 3$, $3x + y = 3$ | 7 |
| a) $x - y - 3 = 0$, $3x + y = 3$, $x + y = 3$ | The same of the sa | d) $x + 3y - 3 = 0$, $x - y = 0$ | |
| 3. A tower is 60 m hei | | | |
| | en 30°, then x is equ | A CONTRACTOR OF THE CONTRACTOR | le suit s'aititude is 45 |
| | b) 43.92 m | | d) 45.6 m |
| | | | |
| | A STATE OF THE STA | 45°. The height of loca | |
| the lake is | | | |

Kindly send me your questions and answerkeys to us: Padasalai.Net@gmail.com

c) h tan(45° – β)

d) none of these

 $\frac{h(1-\tan\beta)}{1+\tan\beta}$

 $\frac{h(1+\tan\beta)}{1-\tan\beta}$

X Mathematics

11. If two solid hemispheres of same base radius r units are joined together along their bases, then curved surface area of this new solid is

a) $4\pi r^2$ sq.units b) $6\pi r^2$ sq.units c) $3\pi r^2$ sq.units d) $8\pi r^2$ sq.units

12. A solid sphere of radius x cm is melted and cast into a shape of a solid cone of same radius. The height of the cone is

a) 3x cm

b) x cm

c) 4x cm

d) 2x cm

13. Variance of first 20 natural number is

a) 32.25

b) 44.25

c) 33.25

d) 30

14. A page is selected at random from a book. The probability that the digit at unit place of the page number closed is less than 7 is

a) $\frac{3}{10}$

b) $\frac{7}{10}$

c) $\frac{3}{9}$

d) 7/9

Part - II

II. Answer any 10 questions. (Q.No.28 is compulsory)

 $10 \times 2 = 20$

- 15. Let $f = \{(x, y) \mid x, y \in \mathbb{N} \text{ and } y = 2x\}$ be a relation on N. Find the domain, codomain and range. Is this relation a function?
- 16. Find k if fof(k) = 5 where f(k) = 2k 1
- 17. Prove that two consecutive positive integer are always coprime.

18. If $1 + 2 + 3 + \dots + k = 325$, then find $1^3 + 2^3 + \dots + k^3$.

19. Simplify: $\frac{x^3}{x-y} + \frac{y^3}{y-x}$

20. If
$$A = \begin{bmatrix} 1 & 3 & -2 \\ 5 & -4 & 6 \\ -3 & 2 & 9 \end{bmatrix}$$
, $B = \begin{bmatrix} 1 & 8 \\ 3 & 4 \\ 9 & 6 \end{bmatrix}$, find $A + B$

- 21. Define Concurrency Theorem.
- 22. Show that the points (-2,5), (6,-1) and (2,2) are collinear.
- 23. Find the equation of a line whose intercepts on the x and y axes are -5 and $\frac{3}{4}$ respectively.
- 24. A tower stands vertically on the ground. From a point on the ground which is 48 m away from the foot of the tower, the angle of elevation of the top of the tower is 30°. Find the height of the tower.
- 25. The radius of a sphere increases by 25%. Find the percentage increase in its surface area.

(3)

X Mathematics

- 26. The range of a set of data is 13.67 and the largest value is 70.08. Find the smallest value.
- 27. Write the sample space for tossing three coins using tree diagram.
- 28. The radius of a spherical balloon increases from 12 cm to 16 cm as air being pumped into it. Find the ratio of the surface area of the balloons in the two cases.

Part - III

III. Answer any 10 questions. (Q.No.42 is compulsory)

 $10 \times 5 = 50$

29. A function f is defined by f(x) = 2x - 3

i) Find
$$\frac{f(0) + f(1)}{2}$$

ii) Find x such that f(x) = 0

iii) Find x such that f(x) = x

iv) Find x such that f(x) = f(1 - x)

- 30. If $p_1^{x_1} \times p_2^{x_2} \times p_3^{x_3} \times p_4^{x_4} = 113400$ where $p_1^{}, p_2^{}, p_3^{}, p_4^{}$ are ascending order and $x_1^{}, x_2^{}, x_3^{}, x_4^{}$ are integers, find the value of $p_1^{}, p_2^{}, p_3^{}, p_4^{}$ and $x_1^{}, x_2^{}, x_3^{}, x_4^{}$.
- 31. In a G.P. the product of three consecutive terms is 27 and the sum of the product of two terms taken at a time is $\frac{57}{2}$. Find the three terms.

32. Simplify:
$$\frac{1}{x^2 - 5x + 6} + \frac{1}{x^2 - 3x + 2} - \frac{1}{x^2 - 8x + 15}$$

33. Let
$$A = \begin{pmatrix} 1 & 2 \\ 1 & 3 \end{pmatrix}$$
, $B = \begin{pmatrix} 4 & 0 \\ 1 & 5 \end{pmatrix}$, $C = \begin{pmatrix} 2 & 0 \\ 1 & 2 \end{pmatrix}$, show that $A(BC) = (AB)C$.

- 34. State and prove Pythagoras theorem.
- 35. Find the area of the quadrilateral formed by the points (8,6), (5,11), (-5,12) and (-4,3).
- 36. You are downloading a song. The percent y (in decimal form) of mega bytes remaining to get downloaded in x seconds is given by y = 0.1x + 1
 - i) Find the total MB of the song
 - ii) After how many seconds will 75% of the song gets downloaded?
 - iii) After how many seconds the song will be downloaded completely?
- 37. To a man standing outside his house, the angle of elevation of the top and bottom of a window are 60° and 45° respectively. If the height of the man is 180 cm and if he is 5 m away from the wall, what is the height of the window? $(\sqrt{3} = 1.732)$
- 38. A cylindrical glass with diameter 20 cm has water to a height of 9 cm. A small cylindrical metal of radius 5 cm and height 4 cm is immersed completely. Calculate the raise of the water in the class?

(4)

x Mathematics

- 39. A right circular cylindrical container of base radius 6 cm and height 15 cm is full of ice cream. The ice cream is to be filled in cones of height 9 cm and base radius 3 cm, having a hemispherical cap. Find the number of cones needed to empty the container.
- 40. Find the coefficient of variation of 24, 26, 33, 37, 29, 31,
- 41. Two dice are rolled once. Find the probability of getting an even number on the first die or a total of face sum 6.

42. Solve:
$$\frac{1}{2x} + \frac{1}{4y} - \frac{1}{3z} = \frac{1}{4}$$
; $\frac{1}{x} = \frac{1}{3y}$, $\frac{1}{x} - \frac{1}{5y} + \frac{4}{z} = 2\frac{2}{15}$

Part - IV

IV. Answer all the questions.

2 x 8 = 16

43. a) Construct a triangle similar to a given triangle PQR with its sides equal to $\frac{2}{3}$ of the corresponding sides of the triangle PQR.

(OR)

- b) Draw a circle of radius 4 cm. At a point L on it draw a tangent to the circle using the alternate segment.
- 44. a) The following table shows the data about the number of pipes and the time taken to fill the same tank.

| No of pipes (x) | 2 | 3 | 6 | 9 |
|-------------------------|----|----|----|----|
| Time taken (in min) (y) | 45 | 30 | 15 | 10 |

Draw the graph for the above data and hence

- i) Find the time taken to fill the tank when pipes are used
- ii) Find the number of pipes when the time is 9 minutes

(OR)

b) Graph the equation (2x-3)(x+2)=0 and state their nature of solutions.
