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10M

Tirunelveli District Common Examinations
Common Second Revision Test - 2019

S R X 0 3 2

Thirunelveli District.

Standard 10
MATHS

Time: 2.30 Hrs. Marks: 100

Section - I

Note: i) Answer all the 15 questions. **15×1=15**
ii) Choose the most correct answer from the given four alternatives and write the option code and the corresponding answer.

1) If $A \subset B$, then $A \cap B$ is
a) B b) A/B c) A d) B/A

2) If $a_1, a_2, a_3, \ldots\ldots\ldots$ are in A.P such that $\frac{a_4}{a_7} = \frac{3}{2}$, then the 13th term of the A.P is
a) 3/2 b) 0 c) $12a_1$ d) $14a_1$

3) In a G.P, $t_2 = \frac{3}{5}$ and $t_3 = \frac{1}{5}$, then the common ratio is
a) 1/5 b) 1/3 c) 1 d) 5

4) A system of two linear equations in two variables is in consistent, if their graphs
a) coincide b) intersect only at a point
c) do not intersect at any point d) cut the x-axis

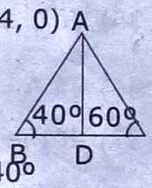
5) Let b = a+c, then the equation $ax^2+bx+c = 0$ has equal roots, if
a) a = c b) a = −c c) a = 2c d) a = −2c

6) Matrix $A = [a_{ij}]_{m\times n}$ is a square matrix if
a) m<n b) m>n c) m = 1 d) m = n

7) The midpoint of the line joining (a, −b) and (3a, 5b) is
a) (−a, 2b) b) (2a, 4b) c) (2a, 2b) d) (−a, −3b)

8) The point of intersection of the straight lines y = 0 and x = −4 is
a) (0, −4) b) (−4, 0) c) (0, 4) d) (4, 0)

9) In the figure, if $\frac{AB}{AC} = \frac{BD}{DC}$, $\angle B = 40^\circ$ and $\angle C = 60^\circ$, then $\angle BAD$ =

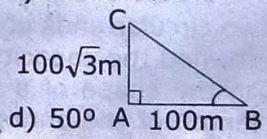


a) 30° b) 50° c) 80° d) 40°

10) ΔABC is a right angled triangle where $\angle B = 90^\circ$ and $BD \perp AC$. If BD = 8 cm, AD = 4 cm then CD is
a) 24 cm b) 16 cm c) 32 cm d) 8 cm

11) $\cos^4 x - \sin^4 x$ =
a) $2\sin^2 x - 1$ b) $2\cos^2 x - 1$ c) $1+2\sin^2 x$ d) $1-2\cos^2 x$

12) In the adjoining figure $\angle ABC$ =



a) 45° b) 30° c) 60° d) 50°

13) If the total surface area of a solid hemisphere is 12π cm², then its curved surface area is equal to
a) 6π cm² b) 24π cm² c) 36π cm² d) 8π cm²

14) For any collection of n items, $(\Sigma x) - \bar{x}$ =
a) $n\bar{x}$ b) $(n-\alpha)\bar{x}$ c) $(n-1)\bar{x}$ d) 0

15) Probability of sure event is
a) 1 b) 0 c) 100 d) 0.1

Section - II

Note: i) Answer any 10 questions. **10×2=20**
ii) Question No. 30 is compulsory. Select any 9 questions from the first 14 questions.

16) If $A \subset B$, then find $A \cap B$ and $A \backslash B$ (use venn diagram).
17) For the given function f = {(1, 3), (2, 5), (4, 7), (5, 9), (3, 1)} write the domain and range.
18) Find the first six terms of the sequence given by $a_1=a_2=a_3=1$ and $a_n=a_{n-1}+a_{n-2}$ for n>3.
19) Find the quotient and remainder using synthetic division $(3x^3-4x^2-5) \div 3x+1$.
20) Determine the nature of the roots of the equation $2x^2-3x+4 = 0$.
21) Define: Diagonal matrix
22) Solve for x and y if $\begin{pmatrix} 2x+y \\ x-3y \end{pmatrix} = \begin{pmatrix} 5 \\ 13 \end{pmatrix}$.

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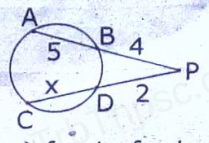
23) Find the midpoint of the line segment joining the points (3, 0) and (−1, 4).

24) Find the value of x.



25) Prove: $\dfrac{\cos\theta}{\sec\theta - \tan\theta} = 1 + \sin\theta$

26) A girl of height 150 cm stands infront of a lamp-post and casts a shadow of length $150\sqrt{3}$ cm on the ground. Find the angle of elevation of the top of the lamp-post.

27) Total surface area of a solid hemisphere is 675π sq.cm. Find the curved surface area of the solid hemisphere.

28) Calculate the standard deviation of the first 13 natural number.

29) The probability that it will rain on a particular day is 0.76. What is the probability that it will not rain on that day?

30) a) Find the equations of the straight lines parallel to the co-ordinate axes and passing through the point (3, −4). **(OR)**

b) The volume of a solid hemisphere is 1152π cu.cm. Find its curved surface area.

Section - III

Note: i) Answer 9 questions only. **9×5=45**

ii) Question No. 45 is compulsory. Select any 8 questions from the first 14 questions.

31) Let U = {−2, −1, 0, 1, 2, 3, ...10}, A = {−2, 2, 3, 4, 5}, B = {1, 3, 5, 8, 9}. Verify Demorgan's laws of complementation.

32) A function f: [−7, 6) → R is defined as follows:

$$f(x) = \begin{cases} x^2 + 2x + 1; & -7 \le x < -5 \\ x + 5; & -5 \le x \le 2 \\ x - 1; & 2 < x < 6 \end{cases} \text{ find } \frac{4f(-3) + 2f(4)}{f(-6) - 3f(1)}$$

33) Find the sum of first n terms of the series: 7+77+777+.....

34) Find the square root of $x^4-6x^3+19x^2-30x+25$.

35) If α and β are the roots of the equation whose roots are $\dfrac{\alpha^2}{\beta}$ and $\dfrac{\beta^2}{\alpha}$. $3x^2-4x+1$

36) If $A = \begin{pmatrix} a & b \\ c & d \end{pmatrix}$ and $I_2 = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$, then show that $A^2-(a+d)A = (bc-ad)I_2$.

37) If the three points (h, 0), (a, h) and (0, k) lie on a straight line, then using the area of the triangle formula, show that $\dfrac{a}{h} + \dfrac{b}{k} = 1$, where h, k ≠ 0.

38) Find the co-ordinates of the foot of the perpendicular from the origin on the straight line 3x+2y = 13.

39) State and prove Thales Theorem.

40) If x = a secθ + b tanθ and y = a tanθ + b secθ then prove that $x^2-y^2 = a^2-b^2$.

41) The radii of two circular ends of a frustum shaped bucket are 15 cm and 8 cm. If its depth is 63 cm, find the capacity of the bucket in litres (Take π = 22/7).

42) A capsule is in the shape of a cylinder with two hemispheres stuck to each of its ends. If the length of the entire capsule is 14mm and the diameter of the capsule is 5mm. Find its surface area.

43) Find the co-efficient of variation of the following data: 18, 20, 15, 12, 25

44) Each individual letter of the word "ACCOMMODATION" is written in a piece of paper, and all 13 pieces of papers are placed in a jar. If one piece of paper is selected at random from the jar, find the probability that (i) the letter "A" or "O" is selected. (ii) the letter "M" or "C" is selected.

45) a) If a, b, c, d are in a geometric sequence, then prove that $(b-c)^2+(c-a)^2+(d-b)^2 = (a-d)^2$ **(OR)**

b) A person in a helicopter flying at a height of 700m, observer two objects lying opposite to each other on either bank of a river. The angles of depression of the objects are 30° and 45°. Find the width of the river. $(\sqrt{3} = 1.732)$

Section - IV

Note: Answer both the questions choosing either of the alternatives. **2×10=20**

46) a) Construct a ΔABC, in which BC = 4.5 cm, ∠A = 40° and the median AM from A to BC is 4.7 cm. Find the length of the altitude from A to BC. **(OR)**

b) Construct a cyclic quadrilateral ABCD, given AB = 6 cm, ∠ABC = 70°, BC = 5 cm and ∠ACD = 30°.

47) a) Solve graphically: (x−5) (x−1) = 0 **(OR)**

b) Draw the graph of xy = 20, x, y > 0. Use the graph to find y when x = 5 and to find x when y = 10.

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