Class : 11

Register Number

UNIT TEST-2, AUGUST - 2024
BUSINESS MATHEMATICS AND STATISTICS

Time Allowed : 1.30 Hours]

Part - I

[Max. Marks : 4

1. Answer all the questions by choosing the correct answer from the given 4 alternatives
2. Write question number, correct option and corresponding answer
3. Each question carries 1 mark.

10x1=1

1. The x-intercept of the straight line $3x + 2y - 1 = 0$ is
   (1) 3
   (2) 2
   (3) $\frac{1}{3}$
   (4) $\frac{1}{2}$

2. If $kx^2 + 3xy - 2y^2 = 0$ represent a pair of lines which are perpendicular then k is equal to
   (1) $\frac{1}{2}$
   (2) $-\frac{1}{2}$
   (3) 2
   (4) -2

3. The centre of the circle $x^2 + y^2 - 2x + 2y - 9 = 0$ is
   (1) (1,1)
   (2) (- 1, - 1)
   (3) (- 1,1)
   (4) (1, - 1)

4. The eccentricity of the parabola is
   (1) 3
   (2) 2
   (3) 0
   (4) 1

5. The angle between the line $y = x$ and $y = - x$ is
   (1) 45°
   (2) 90°
   (3) 100°
   (4) 60°

6. The value of sin 15° is
   (1) $\frac{\sqrt{3}+1}{2\sqrt{2}}$
   (2) $\frac{\sqrt{3}-1}{2\sqrt{2}}$
   (3) $\frac{\sqrt{3}}{2}$
   (4) $\frac{\sqrt{3}}{2\sqrt{2}}$

7. If $\sin A + \cos A = 1$ then $\sin 2A$ is equal to
   (1) 1
   (2) 2
   (3) 0
   (4) $\frac{1}{2}$

8. $\tan \left(\frac{\pi}{4} - x\right)$ is
   (1) $\left(\frac{1+\tan x}{1-\tan x}\right)$
   (2) $\left(\frac{1-\tan x}{1+\tan x}\right)$
   (3) $1 - \tan x$
   (4) $1 + \tan x$

9. If $p\sec 50° = \tan 50°$ then p is
   (1) cos 50°
   (2) sin 50°
   (3) tan 50°
   (4) sec 50°

10. Value of $\sec^2 63° - \tan^2 63°$ is
    (1) 0
    (2) 1
    (3) -1
    (4) ∞

PART - II

1. Answer any 4 questions
2. Each question carries 2 marks
3. Question 16 is compulsory

11. Find the values of : sin 150°

12. Find the equation of the circle having (4,7) and (- 2,5) as the extremities of a diameter.

13. Find the length of the tangent from (1,2) to the circle $x^2 + y^2 - 2x + 4y + 9 = 0$.

14. Convert the following into the product of trigonometric functions: sin 70 – sin 40.

15. Find the angle between the pair of straight lines $3x^2 - 5xy - 2y^2 + 17x + y + 10 = 0$.

16. Find the value of tan 15°.

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PART - III

1. Answer any 4 questions $4 \times 3 = 12$
2. Each question carries 3 marks
3. Question 22 is compulsory

17. Find the value of P if the line $3x + 4y - P = 0$ is a tangent to the circle $x^2 + y^2 = 16$.

18. Using multiple angle identity, find $\tan 60°$.

19. Solve $\tan^{-1}(x + 1) + \tan^{-1}(x - 1) = \tan^{-1}\left(\frac{4}{7}\right)$.

20. If A, B, C, D are angles of a cyclic quadrilateral, prove that : $\cos A + \cos B + \cos C + \cos D = 0$.

21. Find the value of 'a' for which the straight lines $3x + 4y = 13$; $2x - 7y = -1$ and $ax - y - 14 = 0$ are concurrent.

22. Find the vertex , Axis , Length of Latus rectum of the parabola $(x - 1)^2 = 6(y - 2)$.

PART - IV

1. Answer all the questions $3 \times 5 = 15$
2. Each question carries 5 marks

23. a) If the distance of a point from the points $(2,1)$ and $(1,2)$ are in the ratio $2:1$, then find the locus of the point.

(OR)

b) Find the equation of the circle passing through the points $(0,0)$, $(1,2)$ and $(2,0)$.

24. a) If $\tan \alpha = \frac{1}{3}$ and $\tan \beta = \frac{1}{7}$ then prove that $(2\alpha + \beta) = \frac{\pi}{4}$.

(OR)

b) Prove that $\cos 20° \cos 40° \cos 60° \cos 80° = \frac{1}{16}$.

25. a) Solve $\tan^{-1}\left(\frac{x-1}{x-2}\right) + \tan^{-1}\left(\frac{x+1}{x+2}\right) = \frac{\pi}{4}$.

(OR)

b) A private company appointed a clerk in the year 2012, his salary was fixed as ₹ 20,000 . In 2017 his salary raised to ₹25,000.   (i) Express the above information as a linear function in x and y where y represent the salary of the clerk and x-represent the year

(ii) What will be his salary in 2020?

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