Model Question paper

Trigonometry 3

11th Standard

Maths

Reg.No. :

I. Answer all the questions.

II. Use blue pen only.

Time : 02:30:00 Hrs

Total Marks : 75

Part - A

10 x 1 = 10

1) One radianis equal to (in terms of degree)..............

(a) $\frac{180^{\circ}}{11}$ (b) $\frac{\pi}{180^{\circ}}$ (c) $\frac{180^{\circ}}{\pi}$ (d) $\frac{11}{180^{\circ}}$

2) $\frac{1}{360}$ of a complete rotation clockwise is..........

(a) -1° (b) -360° (c) -90° (d) $^{\circ}1^{0}$

3) Area of traingle ABC is............

(a) $\frac{1}{2}abcosc$ (b) $\frac{1}{2}absinc$ (c) $\frac{1}{2}absinc$ (d) $\frac{1}{2}bcsinB$

4) In any traingle ABC,is........

(a) abc (b) $\frac{abc}{4R}$ (c) $\frac{abc}{2R}$ (d) $\frac{abc}{R}$

5) cos B is equal to...........

(a) $\frac{c^2+a^2-b^2}{2ca}$ (b) $\frac{c^2+b^2-a^2}{2bc}$ (c) $\frac{a^2+b^2-c^2}{2ab}$ (d) $\frac{a^2+b^2+c^2}{2ab}$

6) Which one of the following is true,

(a) cos (A + B) = cos A + cos B (b) cos (A - B) = cos A - cos B (c) cos (A - B) = cos A + cos B (d) cos (A + B) $\neq$ cos A + cos B

7) The value of sin(-780^{o}) is

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

8) $\sin^4\theta+\cos^4\theta$ =

(a) $\sin^2\theta\cos^2\theta$ (b) $1+2\sin^2\theta\cos^2\theta$ (c) $1-2\sin^2\theta\cos^2\theta$ (d) $2\cos^2\theta\sin^2\theta$

9) sin 75^0-sin 15^0 =

(a) sin 60^0 (b) cos 105^0+cos 15^0 (c) sin 105^0-sin 15^0 (d) cos 105^0-cos 15^0

10) The value of sec $\frac{\pi}{4}$ is

(a) $\sqrt{2}$ (b) $\frac{1}{\sqrt{2}}$ (c) -$\sqrt{2}$ (d) -$\frac{1}{\sqrt{2}}$

Part - B

10 x 2 = 20

11) Convert the following degree measure into radian measure.

30^{o}

12) Prove that $sin(45° + A) - cos(45° + A) = \sqrt{2}sinA$

13) Find $cos45° - cos30°$and compare with $cos15°$

14) If $sinA = \frac{1}{3}, sinB = \frac{1}{4}$ find $sin(A + B)$, where A and B are acute.

15) Find the general solution of the following equation:

$sin2\theta = \frac{1}{2}$

16) Solve the following

$cos^2x + sin^2x + cosx = 0$

17) If $asin^2\theta + bcos^2\theta = c$ show that $tan^2\theta = \frac{c-b}{a-c}$

18) Show that $4(cos^320^0 + cos^340^0) = 3(cos20^0 + cos40^0)$

19) Prove that $\sum\left(b^2 - c^2\right)sin^2A = 0$

20) Show that tan 75^o + cot 75^o = 4

Part - C

10 x 3 = 30

21) Express the following as functions of positive acute angles

cos (1220^0)

22) Express the following as functions of positive acute angles

cos (- 1050^{o})

23) Express the following as functions of A:

$sec(A - \frac{3\pi}{2})$

24) Prove that $\frac{sin(180° + A) . cos(90° - A) . tan(270° - A)}{sec(540° - A) cos(360° + A) cosec(270° + A)} = -sinAcos^2A$

25) Find the value of the following expressions:

$cos\frac{\pi}{6}.\,cos\frac{\pi}{3} - sin\frac{\pi}{6}.\,sin\frac{\pi}{3}$

26) Prove the following

$2sin15°cos15° = \frac{1}{2}$

27) Prove that $cos^2\left(\frac{\pi}{4} - \theta\right) - sin^2\left(\frac{\pi}{4} - \theta\right) = sin2\theta$

28) If $tan\alpha = \frac{1}{3}$ and $tan\beta = \frac{1}{7}$ show that $2\alpha + \beta = \frac{\pi}{4}$

29) Prove that $tan\,(A + B) = \frac{tanA + tanB}{1 - tanA\,.\,tanB}$

30) If $\sin\theta = \frac{3}{8}$ and θ is acute, find $\sin2\theta$?

Part - D

3 x 5 = 15

31) Prove the following: $\frac{1}{1 + sin\theta} + \frac{1}{1 - sin\theta} = 2sec^2\theta$

32) Prove that $sin20° \quad sin40° \quad sin60° \quad sin80° = \frac{3}{16}$

33) In any triangle ABC prove that $\frac{a^2sin(B-C)}{sinA} + \frac{b^2sin(C-A)}{sinB} + \frac{c^2sin(A-B)}{sinC}$

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