TILAK MAHARASHTRA VIDYAPEETH, PUNE

BACHELOR OF SCIENCE(B.SC.)–GAME ART AND DESIGN (S)

BACHELOR OF ARTS (B.A.)–GAME ART AND DESIGN (S)

EXAMINATION:DECEMBER - 2022

THIRDSEMESTER

Sub.: Mathematics(Theory)(BSGD-21-306 BAGD-19-306)

Date: 20/12/2022 **Total Marks:40** **Time:2.00 pm to 4.00 pm**

Instructions: All questions are compulsory.

Q. 1. **Multiple-choice questions** **(10)**

1. In ΔABC, right angled at B, AB = 24 cm, BC = 7 cm. The value of tan C is :
   a)12/7 b)24/7 c)20/7 d)7/24
2. sin (90^o – A) and cosA are :
   a) Different b) Same c) Not related d) None of the above
3. If cos x = a/b, then sin x is equal to :
   a) $(b^2 - a^2)/b$ b) $(b - a)/b$ c) $\sqrt{(b^2 - a^2)}/b$ d) $\sqrt{(b - a)}/b$
4. sin2A = 2sinA is true when A =
   a) 30^o b) 45^o c) 0^o d) 60^o
5. The position vector of the point (1, 2, 0) is :
   a) i + j + k b) i + 2j + k c) i + 2j d) 2j + k
6. What is the magnitude of vector, v = 1/√3i + 1/√3j + 1/√3k?
   a) 0 b) 1 c) 2 d) 3
7. The scalar product of 5i + j – 3k and 3i – 4j + 7k is :
   a) 15 b) – 15 c) 10 d) -10
8. If A = $[a_{ij}]$ is a square matrix of order 2 such that a_{ij} = 1, when i ≠ j and a_{ij}= 0, when i = j, then A^2 is :
   a) $\begin{bmatrix}1 & 0\\1 & 0\end{bmatrix}$ b) $\begin{bmatrix}1 & 1\\0 & 0\end{bmatrix}$ c) $\begin{bmatrix}1 & 1\\1 & 0\end{bmatrix}$ d) $\begin{bmatrix}1 & 0\\0 & 1\end{bmatrix}$
9. If $\begin{bmatrix}\boldsymbol{2p+q} & \boldsymbol{p-2q}\\ \boldsymbol{5r-s} & \boldsymbol{4r+3s}\end{bmatrix} = \begin{bmatrix}\boldsymbol{4} & \boldsymbol{-3}\\ \boldsymbol{11} & \boldsymbol{24}\end{bmatrix}$, then the value of p + q – r + 2s is
   a) 8 b) 10 c) 4 d) -8
10. If A = $\begin{bmatrix}\boldsymbol{0} & \boldsymbol{2}\\ \boldsymbol{3} & \boldsymbol{-4}\end{bmatrix}$ and kA = $\begin{bmatrix}\boldsymbol{0} & \boldsymbol{3a}\\ \boldsymbol{2b} & \boldsymbol{24}\end{bmatrix}$, then the values of k, a and b respectively are :
    a) -6, -12, -18 b) -6, -4, -9 c) -6, 4, 9 d) -6, 12, 18

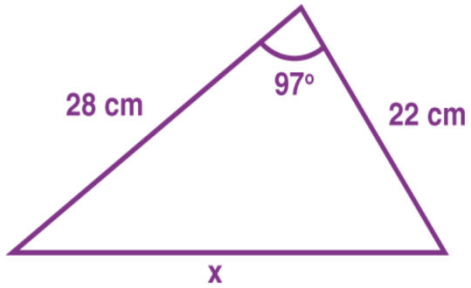
Q. 2. **Solve the following (Any two)** **(10)**

1. Find the value of cos 570^o sin 510^o + sin (-330^o)cos(-390^o).
2. Show that the points A, B and C with position vectors $\vec{a} = 3\hat{\imath} - 4\hat{\jmath} - 4\hat{k}$, $\vec{b} = 2\hat{\imath} - \hat{\jmath} + \hat{k}$ and $\vec{c} = \hat{\imath} - 3\hat{\jmath} - 5\hat{k}$ form the vertices of a right angled triangle.
3. Let $\boldsymbol{A} = \begin{bmatrix}\boldsymbol{2} & \boldsymbol{-1}\\ \boldsymbol{3} & \boldsymbol{4}\end{bmatrix}, \boldsymbol{B} = \begin{bmatrix}\boldsymbol{5} & \boldsymbol{2}\\ \boldsymbol{7} & \boldsymbol{4}\end{bmatrix}, \boldsymbol{C} = \begin{bmatrix}\boldsymbol{2} & \boldsymbol{5}\\ \boldsymbol{3} & \boldsymbol{8}\end{bmatrix}$, then find a matrix D such that CD – AB = O.

Q. 3. **Write the Answers of the following (Solve any 2)** **(20)**

1. The scalar product of vector $\hat{\imath} + \hat{\jmath} + \hat{k}$ with a unit vector along the sum of the vectors $2\hat{\imath} + 4\hat{\jmath} - 5\hat{k}$ and $\lambda\hat{\imath} + 2\hat{\jmath} + 3\hat{k}$ is equal to 1. Find the value of λ.

2. Find the length of x and remaining two angles in the following figure and hence find the perimeter of the triangle.



3. If $\boldsymbol{A} = \begin{bmatrix} \mathbf{2} & \mathbf{3} \\ \mathbf{1} & \mathbf{-4} \end{bmatrix} \boldsymbol{and}\ \boldsymbol{B} = \begin{bmatrix} \mathbf{1} & \mathbf{-2} \\ \mathbf{-1} & \mathbf{3} \end{bmatrix}$ then show that $(\boldsymbol{AB})^{-1} = \boldsymbol{B^{-1}A^{-1}}$.

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