VECTORS AND SCALARS

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1. A vector is described by magnitude as well as: a) Angle b) Distance c) Direction d) Height C

2. Addition, subtraction and multiplication of scalars is done by: a) Algebraic principles b) Simple arithmetical rules c) Logical methods d) Vector algebra A

3. The direction of a vector in a plane is measured with respect to two straight lines which are _____ to each other. a) Parallel b) Perpendicular c) At an angle of 60° d) Equal B

4. A unit vector is obtained by dividing the given vector by: a) its magnitude b) its angle c) Another vector d) Ten A

5. Unit vector along the three mutually perpendicular axes x, y and z are denoted by: a) $\hat{a}$, $\hat{b}$, $\hat{c}$ b) $\hat{i}$, $\hat{j}$, $\hat{k}$ c) $\hat{p}$, $\hat{q}$, $\hat{r}$ d) $\hat{x}$, $\hat{y}$, $\hat{z}$ B

6. Negative of a vector has direction _____ that of the original vector. a) Same as b) Perpendicular to c) Opposite to d) Inclined to C

7. There are _____ methods of adding two or more vectors. a) Two b) Three c) Four d) Five A

8. The vector obtained by adding two or more vectors is called: a) Product vector b) Sum vector c) Resultant vector d) Final vector C

9. Vectors are added according to: a) Left hand rule b) Right hand rule c) Head to tail rule d) None of the above C

10. In two-dimensional coordinate system, the components of the origin are taken as: a) (1, 1) b) (1, 0) c) (0, 1) d) (0, 0) D

11. The resultant of two or more vectors is obtained by: a) Joining the tail of the first vector with the head of the last vector. b) Joining the head of the first vector with the tail of the last vector. c) Joining the tail of the last vector with the head of the first vector. d) Joining the head of the last vector with the tail of the first vector. A

12. The position vector of a point p is a vector that represents its position with respect to: a) Another vector b) Centre of the earth c) Any point in space d) Origin of the coordinate system D

13. To subtract a given vector from another, its _____ vector is added to the other one. a) Double b) Half c) Negative d) Positive C

14. If a vector is denoted by $\vec{A}$ then its x-components can be written as: a) $A \sin\theta \hat{i}$ b) $A \sin\theta \hat{j}$ c) $A \cos\theta \hat{i}$ d) $A \cos\theta \hat{j}$ C

15. The direction of a vector $\vec{F}$ can be fond by the formula: a) $\theta = \tan^{-1}(\frac{F_y}{F_x})$ b) $\theta = \sin^{-1}(\frac{F_x}{F})$ c) $\theta = \sin^{-1}(\frac{F_y}{F_x})$ d) $\theta = \tan^{-1}(\frac{F}{F_y})$ A

16. The y-component of the resultant of η vectors can be obtained by the formula: a) $Ay = \sum_{\gamma=1}^{n} Ar \cos\theta r$ b) $Ay = \sum_{\gamma=1}^{n} Ar \tan\theta r$ c) $Ay = \sum_{\gamma=1}^{n} Ar \tan^{-1}\theta r$ d) $Ay = \sum_{\gamma=1}^{n} Ar \sin\theta r$ D

17. The sine of an angle is positive in _____ quadrants. a) First and Second b) Second and fourth c) First and third d) Third and fourth A

18. The cosine of an angle is negative in _____ quadrants. a) Second and fourth b) Second and third c) First and third d) None of the above B

19. The tangent of an angle is positive in _____ quadrants. a) First and last b) First only c) Second and fourth d) First and third D

20. If the x-component of the resultant of two vectors is positive and its y-component is negative, the resultant subtends an angle of _____ on x-axes. a) $360^o - \theta$ b) $180^o + \theta$ c) $180^o + \theta$ d) θ A

21. Scalar product is obtained when: a) A scalar is multiplied by a scalar b) A scalar is multiplied by vector c) Two vectors are multiplied to give a scalar d) Sum of two scalars is taken C

22. The scalar product of two vectors $\vec{A}$ and $\vec{B}$ is written as: a) $\vec{A} \times \vec{B}$ b) $\vec{A} . \vec{B}$ c) $\vec{A}\vec{B}$ d) AB B

23. The scalar product of two vectors $\vec{F}$ and $\vec{V}$ with magnitude of F and V is given by: a) $FV \sin\theta$ b) $FV \tan\theta$ c) $\frac{F}{V} \cos\theta$ d) $FV \cos\theta$ D

24. The magnitude of product vector $\vec{C}$ i.e. $\vec{A} \times \vec{B} = \vec{C}$, is equal to the: a) Sum of the adjacent sides b) Area of the parallelogram c) Product of the four sides d) Parameter of the parallelogram B

25. Work is defined as: a) Scalar product of force and displacement b) Vector product of force and displacement c) Scalar product of force and velocity d) Vector product of force and velocity A

26. The scalar product of a vector $\vec{A}$ is given by: a) A $\cos\theta$ b) A $\sin\theta$ c) A $\tan\theta$ d) None of the above D

27. If two vectors are perpendicular to each other, their dot product is: a) Product of their magnitude b) Product of their x-components c) Zero d) One C

28. If $\hat{i}$, $\hat{j}$, $\hat{k}$ are unit vectors along x, y and z-axes then $\hat{i}.\hat{j} = \hat{j}.\hat{k} = \hat{k}.\hat{i} = ?$ a) 1 b) -1 c) $-\frac{1}{2}$ d) 0 D

29. $\hat{i}.\hat{i} = \hat{j}.\hat{j} = \hat{k}.\hat{k} =$ _____ a) 0 b) 1 c) -1 d) $\frac{1}{2}$ B

30. If dot product of two vectors which are not perpendicular to each other is zero, then either of the vectors is: a) A unit vector b) Opposite to the other c) A null vector d) Position vector C

32. In the vector product of two vectors $\vec{A}$ & $\vec{B}$ the direction of the product vector is: a) Perpendicular to $\vec{A}$ b) Parallel to $\vec{B}$ c) Perpendicular to $\vec{B}$ d) Perpendicular to the plane joining both $\vec{A}$ & $\vec{B}$ D

34. The magnitude of vector product of two vectors A & B is given by: a) AB $\sin\theta$ b) AB c) AB $\cos\theta$ d) $\frac{A}{B}\tan\theta$ A

35. If $\hat{i}$, $\hat{j}$, $\hat{k}$ are unit vectors along x, y and z-axes then $\hat{k}.\hat{j} =$ _____ a) $\hat{i}$ b) $\hat{j}$ c) $-\hat{k}$ d) $-\hat{i}$ D

36. $\hat{i} \times \hat{i} = \hat{j} \times \hat{j} = \hat{k} \times \hat{k} =$ _____ a) 0 b) 1 c) -1 d) $\frac{1}{2}$ A

37. $\hat{k} \times \hat{i} =$ _____ a) $\hat{j}$ b) $-\hat{j}$ c) $\hat{k}$ d) $-\hat{k}$ A

38. The torque is given by the formula: a) $\vec{\tau} = \vec{\gamma} . \vec{F}$ b) $\vec{\tau} = \vec{F}$ C

$\times \vec{\gamma}$ c) $\vec{\tau} = \vec{\gamma} \times \vec{F}$ d) $\vec{\tau} = -\vec{\gamma} \times \vec{F}$

39. The force on a particle with charge q and velocity in a magnetic field $\vec{B}$ is given by: a) $q(\vec{V} \times \vec{B})$ b) $-q(\vec{V} \times \vec{B})$ c) $\frac{1}{q}(\vec{V} \times \vec{B})$ d) $\frac{1}{q}(\vec{B} \times \vec{V})$ A

40. The scalar quantities are described by their magnitude and _____ a) Direction b) Proper unit c) With graph d) None of these B

41. The vector quantities are described by their magnitude as well as _____ a) Distance b) Direction c) Speed d) Acceleration B

43. Speed is a _____ quantity. a) Vector b) Scalar c) Negative d) Null A B

46. We can write vector C as: a) $\vec{C}$ b) $\underset{\rightarrow}{C}$ c) a & b both are correct d) $\hat{C}$ C

47. The module is another name of _____ of the vector. a) Magnitude b) Null c) Zero d) None of these A

48. The magnitude of a vector $\vec{C}$ is represented as _____. a) $|\hat{C}|$ b) $|\vec{C}|$ c) $\frac{|\vec{C}|}{\vec{C}}$ d) None of these B

49. The vector whose magnitude is equal to one is called _____. a) Unit vector b) Null vector c) Zero vector d) Positive vector A

50. The unit vector of $\vec{z}$ is represented as: a) $|\vec{z}|$ b) $\frac{|\vec{z}|}{\vec{z}}$ c) $\hat{Z}$ d) None of these C

51. The formula of unit vector is defined as_____. a) Dividing the vector by its magnitude b) Dividing the magnitude by its vector c) A

Draw a cap on it d) None of these

52. Along the three mutually perpendicular axes x, y and z, the unit vectors are denoted by: a) $\hat{i}$, $\hat{j}$, $\hat{k}$ b) $-\hat{i}$, $-\hat{j}$, $\hat{k}$ c) $\hat{x}$, $\hat{y}$, $\hat{z}$ d) None of these B

53. In negative of a vector, a vector has same magnitude but _____ direction. a) Positive b) Negative c) Opposite d) None of these C

54. The negative of vector $\vec{C}$ is represented as: a) $-\vec{C}$ b) $-|\vec{C}|$ c) $\frac{|\vec{C}|}{3}$ d) None of these A

55. The null-vector has _____ magnitude. a) Four b) Five c) Zero d) Six C

56. If we multiply vector $\vec{A}$ by 14, then we can write it as: a) $14\,|\vec{A}|$ b) $\frac{|\vec{A}|}{14}$ c) $\frac{14}{|\vec{A}|}$ d) None of these D

57. If we multiply vector $\vec{z}$ by -4, then we can write it as: a) $\frac{-4}{|\vec{z}|}$ b) $-4\,|\vec{z}|$ c) $\frac{|\vec{z}|}{-4}$ d) None of these D

58. If we multiply vector $\vec{A}$ by -1, then its direction changes by _____. a) 90° b) 160° c) 270° d) 180° D

59. A. B = B. A = _____. a) AB Cos θ b) AB Sin θ c) AB d) $|A|\ |B|$ Tan θ A

60. Symbol "Σ" is known as _____. a) Pi b) Resultant c) Power d) Summation D

61. Let we have two vectors $\vec{B}_1$ and $\vec{B}_2$, then we can write as: a) $\vec{B_1} + \vec{B_2} = \vec{B_2} + \vec{B_1}$ b) $\vec{B_1} + \vec{B_2} = \vec{B_2}$ c) $\vec{B_1} - \vec{B_2} = \vec{B_1} + \vec{B_2}$ d) None of these A

62. Let we have two vectors A and B, then according to subtraction of vector, we can write _____. a) $\vec{A} + \vec{B} = \vec{A} - \vec{B}$ b) $\vec{A} - \vec{B} = \vec{A} + (-\vec{B})$ c) $\vec{A} + \vec{B} = \vec{A} + (-\vec{B})$ d) None of these B

63. The process of replacing one vector by two or more parts is called_____ a) Addition of two vectors b) Subtraction of C

vectors c) Resolution of vectors d) None of these

64. If we replace vector $\vec{F}$ into two components $\vec{F}_x$ and $\vec{F}_y$ then $\vec{F}_x$ and $\vec{F}_y$ are called_____ respectively. a) Horizontal and vertical components b) Vertical and horizontal components c) Positive and negative components d) None of these A

65. If $\vec{F}_x$ and $\vec{F}_Y$ are the components of vector $\vec{F}$, then we can write as _____. a) $\vec{F} = \vec{F}_x - \vec{F}_y$ b) $\vec{F} = \vec{F}_x + \vec{F}_y$ c) a & b both are correct d) None of these B

66. If B_x and B_y are the magnitudes of the components and $\hat{i}$ and $\hat{j}$ are the unit vectors along x and y axis, then we can write: a) $\vec{B} = B_x\hat{i} + B_y\hat{j}$ b) $\vec{B} = B_x\hat{j} + B_y\hat{i}$ c) $\vec{B} = B_x\hat{i} - B_y\hat{j}$ d) $\vec{B} = B_x\hat{j} - B_y\hat{i}$ A

67. Let we have a vector $\vec{F}$, then its horizontal component is written as: a) $\vec{F} = F_x \cos\theta$ b) $\vec{F}_x = F\cos\theta\,\hat{i}$ c) $\vec{F}_x = F\cos\theta\,\hat{j}$ d) $\vec{F}_y = F\cos\theta\,\hat{i}$ B

68. Let we have a vector $\vec{F}$, then its vertical component is written as: a) $\vec{F}_y = F\sin\theta\,\hat{j}$ b) $\vec{F}_y = F\cos\theta\,\hat{j}$ c) $\vec{F}_x = F\sin\theta\,\hat{j}$ d) $\vec{F}_x = F\sin\theta\,\hat{i}$ A

69. In three dimensional space the position vector of a point P(a, b, c) is represented by $\vec{r}$ and is written as _____. a) $\vec{r} = a\hat{i} + b\hat{j} - c\hat{k}$ b) $\vec{r} = a\hat{i} + b\hat{j} + c\hat{k}$ c) $\vec{r} = a\hat{i} - b\hat{j} - c\hat{k}$ d) None of these B

70. If a vector $\vec{Z}$ having three components (Z_x, Z_y, Z_z) along x, y and z-axis, then it can be written as _____. a) $\vec{Z} = Z_x\hat{i} + Z_y\hat{j} + Z_z\hat{k}$ b) $\vec{Z} = Z_a\hat{i} + Z_b\hat{j} + Z_c\hat{k}$ c) $\vec{Z} = Z_{xa}\hat{i} + Z_{yb}\hat{j} + Z_{zc}\hat{k}$ d) None of these A

71. If the x-component of the resultant is negative and its y-component is positive, the result is true for. a) An angle of ($180^o - \theta$) with x-axis b) An angle of ($180^o - \theta$) with y-axis c) An angle of 90° d) An angle of 180° A

72. The x-component of the resultant is positive and its y-component is negative, then the result is true for. a) An angle of ($180^o - \theta$) with y-axis b) An angle of ($90^o - \theta$) with x-axis c) An angle of ($360^o - \theta$) with x-axis d) None of these C

73. The product of two vector is called scalar or dot product when they give _____. a) Vector quantity b) Scalar quantity c) B

Negative quantity d) Positive quantity

74. When the multiplication of two vectors result into a vector quantity, then the product is called _____. a) Cross product b) Dot product c) Magnitude of two vectors d) None of these A

75. The scalar product of two vectors $\vec{L}$ and $\vec{M}$ is defined as _____ a) $\vec{L} \times \vec{M} = L.M \cos\theta$ b) $\vec{L}.\vec{M} = L.M \cos\theta$ c) $\vec{L}.\vec{M} = L.M \sin\theta$ d) $\vec{L} \times \vec{M} = L.M \sin\theta$ B

76. "Sin θ" is _____ in second quadrant and first quadrant. a) Negative b) Null c) Positive d) None of these C

77. "Cos θ" is positive in first and _____ quadrant. a) Fourth b) Second c) Third d) None of these A

78. The tangent of an angle is positive in first and _____ quadrant. a) Fourth b) Third c) Second d) Fifth B

79. The cosine of an angle is negative in _____ quadrants. a) Second and third b) First and second c) Third and fourth d) None of these A

80. If $\vec{L}.\vec{M} = \vec{M}.\vec{L}$, then we can say: a) Scalar product is commutative b) Scalar product is positive c) Scalar product is negative d) None of these A

81. Let we have two vectors $\vec{X}$ and $\vec{Y}$, and if $\vec{X}.\vec{Y} = 0$, then: a) Both are null vectors b) $\vec{X}$ or $\vec{Y}$ is a null vector c) The vectors are mutually perpendicular d) b and c both are correct D

82. Let we have three vectors $\vec{A}$, $\vec{B}$ and $\vec{C}$, then according to distributive law: a) $\vec{A}.(\vec{B}+\vec{C}) = \vec{A}.\vec{B} + \vec{A}.\vec{C}$ b) $\vec{A} \times (\vec{B}+\vec{C}) = \vec{A} \times \vec{B} + \vec{A} + \vec{C}$ c) $(\vec{A} \times \vec{A}).\vec{C} = \vec{A} \times \vec{A} \times \vec{A} \times \vec{C}$ d) None of these A

83. The vector product of two vector $\vec{L}$ and $\vec{M}$ can be determined by the formula _____. a) $\vec{A}.\vec{B} = \vec{L}.\vec{M} \cos\theta$ b) $L.\ M \sin\theta\ \hat{n}$ c) $L \times M \cos\theta\ \hat{n}$ d) None of these B

84. If $\vec{A} \times \vec{B} = 0$ then: a) Two vectors both are zero b) Either of the two vectors is a null or vectors $\vec{A}$ and $\vec{B}$ are parallel to each other c) They are perpendicular to each other d) None of these B

85. In cross product $\hat{i} \times \hat{i} = \hat{j} \times \hat{j} = \hat{k} \times \hat{k} = ?$ a) 4 b) 1 c) 0 d) 100 C

86. Let we have three vectors $\vec{A}$, $\vec{B}$ and $\vec{C}$ then according to distributive law with respect to addition. a) $\vec{A}.(\vec{B} \times \vec{C}) = \vec{K}$ b) $\vec{A} \times (\vec{B}+\vec{C}) = \vec{A} \times \vec{B} + \vec{A} \times \vec{C}$ c) $\vec{A} \times (\vec{B}+\vec{C}) = \vec{A}.\vec{B} + \vec{A}.\vec{C}$ d) None of these B

87. If $\hat{i}$, $\hat{j}$, and $\hat{k}$ are unit vectors along x, y, and z-axis, then $\hat{k} \times \hat{j} = ?$ a) $-\hat{i}$ b) $-\hat{j}$ c) $-\hat{k}$ d) None of these A

88. A scalar is a physical quantity which is completely specified by: a) Direction only b) Magnitude only c) Both magnitude & direction d) None of these D

89. A vector is a physical quantity which is completely specified by: a) Both magnitude & direction b) Magnitude only c) Direction only d) None of these A

90. Which of the following is a scalar quantity? a) Density b) Displacement c) Torque d) Weight A

91. Which of the following is the only vector quantity? a) Temperature b) Energy c) Power d) Momentum D

92. Which of the following lists of physical quantities consists only of vectors? a) Time, temperature, velocity b) Force, volume, momentum c) Velocity, acceleration, mass d) Force, acceleration, velocity D

93. A vector having magnitude as one, is known as: a) A position vector b) A null vector c) A unit vector d) A negative vector C

94. A vector having zero magnitude is called: a) A unit vector b) A position vector c) A negative vector d) A null vector D

95. A vector which specifies the direction is called: a) A null vector b) A unit vector c) A position vector d) A resultant vector B

96. If a vector is divided by its magnitude, we get a) A resultant vector b) A null vector c) A unit vector d) A position vector C

97. The rectangular components of a vector have angle between them a) 0° b) 60° c) 90° d) 120° C

98. A force of 10N is acting along y-axis. Its component along x-axis is a) 10 N b) 20 N c) 100 N d) Zero N D

99. Two forces are acting together on an object. The magnitude of their resultant is minimum when the angle between force is a) 0° b) 60° c) 120° d) 180° D

100. Two forces of 10N and 15N are acting simultaneously on an object in the same direction. Their resultant is a) Zero b) 5 N c) 25 N d) 150 N C

101. Geometrical method of addition of vectors is a) Head-to-tail rule method b) Rectangular components method c) Right hand rule A

method d) Hit and trial method

102. A force F of magnitude 20N is acting on an object making an angle of 30^0 with the X-axis. Its F_y component is a) 0 b) 10 N c) 20 N d) 60 N B

103. The resultant of two forces each of magnitude F is 2F, then the angle between them will be a) 120° b) 30° c) 60° d) 0° D

104. Two equal forces $\vec{F}$ and $\vec{F}$ make an angle of 180° with each other, the magnitude of their resultant is a) Zero b) F c) 2F d) 3F A

105. If two forces of 10N and 20N are acting on a body in the same direction, then their resultant is a) 10N b) 20N c) 30N d) 200N C

106. The scalar product of a vector $\vec{F}$ with itself is equal to a) F b) F^2 c) $\frac{F}{2}$ d) 2F B

107. The dot product of two vector $\vec{A}$ and $\vec{B}$ making an angle θ with each other is a) AB $\cos\theta$ b) AB $\sin\theta$ c) AB d) AB $\tan\theta$ A

108. The scalar product of two vectors is zero, when a) They are parallel b) They are anti-parallel c) They are equal vectors d) They are perpendicular to each other D

109. If $\vec{A} = A\hat{i}$, $\vec{B} = A\hat{j}$, then $\vec{A}.\vec{B}$ is equal to a) Zero b) A c) -A d) A^2 A

110. If the dot product of two non-zero vectors vanishes, the vectors will be a) In the same direction b) Opposite to each other c) Perpendicular to each other d) Zero C

111. If two non-zero vector $\vec{A}$ and $\vec{B}$ are parallel to each other then $\vec{A}.\vec{B}$ is equal to a) Zero b) AB c) A + B d) A - B B

112. The dot product of two vectors is negative when a) They are parallel vectors b) They are anti-parallel vectors c) They are perpendicular vectors d) None of the above is correct B

113. The vector product of two vectors is zero, when a) They are parallel to each other b) They are perpendicular to each other c) They are equal vectors d) They are inclined at angle of 60° A

114. If $(\vec{a} \times \vec{b})$ points along positive z-axis, then the vectors $\vec{a}$ and $\vec{b}$ must lie in a) zx-plane b) yz-plane c) xy-plane d) None of the above C

115. If $\vec{A} = A_1\hat{i} + A_2\hat{j}$ and $\vec{B} = B_1\hat{i} + B_2\hat{j}$ are non-parallel vectors, then the direction $\vec{A} \times \vec{B}$ is a) Along $\vec{A}$ b) Along x-axis c) Along y-axis d) Along z-axis D

116. Area of the parallelogram in which the two adjacent sides are $\vec{A}$ and $\vec{B}$ is given by a) AB $\sin\theta$ b) Ab c) AB $\cos\theta$ d) Zero A

117. The cross product of vector $\vec{F}$ with itself (i.e. $\vec{F} \times \vec{F}$) is equal to a) F b) 2F c) 1 d) Zero D

118. The cross product ($\vec{A} \times \vec{B}$) of two non-zero parallel vectors is equal to a) AB $\sin\theta\,\hat{n}$ b) AB $\cos\theta$ c) Zero d) AB C

119. Which of the following is true a) $\vec{A} \times \vec{B} = -\vec{B} \times \vec{A}$ b) $\vec{A} \times \vec{B} = \vec{B} \times \vec{A}$ c) $\vec{A} \times \vec{B} = \vec{C} \times \vec{A}$ d) $\vec{A} \times \vec{B} = \vec{A} \times \vec{C}$ A

120. Which of the following is true a) $\vec{A}.\vec{B} = -\vec{B}.\vec{A}$ b) $\vec{A}.\vec{B} = \vec{B}.\vec{A}$ c) $\vec{A}.\vec{B} \neq \vec{B}.\vec{A}$ d) $\vec{A}.\vec{B} = \vec{B} \times \vec{A}$ B

121. Which of the following is correct a) $\hat{i}.\hat{j} = \hat{k}$ b) $\hat{i}.\hat{j} = \hat{i}$ c) $\hat{i}.\hat{j} = 1$ d) $\hat{i}.\hat{j} = 0$ D

122. Which of the following is correct a) $\hat{i} \times \hat{j} = 0$ b) $\hat{i} \times \hat{j} = 1$ c) $\hat{i} \times \hat{j} = \hat{k}$ d) $\hat{i} \times \hat{j} = -\hat{k}$ C

123. The position vector of a point in xz-plane is given by a) $\vec{r} = x\hat{i} + y\hat{j}$ b) $\vec{r} = y\hat{i} + z\hat{k}$ c) $\vec{r} = x\hat{i} + y\hat{j} + z\hat{k}$ d) $\vec{r} = x\hat{i} + z\hat{k}$ D

124. When we take scalar product of a vector by itself (self product) the result gives the: a) Magnitude of the vector b) Square root of the magnitude of the vector c) Square of the magnitude of the vector d) Same vector C

125. If $\vec{A}.\vec{B} = 0$ and also $\vec{A} \times \vec{B} = 0$, then a) $\vec{A}$ and $\vec{B}$ are perpendicular to each other b) $\vec{A}$ and $\vec{B}$ are parallel to each other c) $\vec{A}$ and $\vec{B}$ are anti-parallel to each other d) Either $\vec{A}$ or $\vec{B}$ is a null vector D

126. A vector in space has a) One component b) Two components c) Three components d) No component C

127. x- and y-components of the velocity of a body are 3 ms^{-1} and 4 ms^{-1} respectively. The magnitude of velocity is a) 7 ms^{-1} b) 1 ms^{-1} c) 5 ms^{-1} d) 2.64 ms^{-1} C

128. If $\vec{a} = 3\hat{i} - 2\hat{k}$ and $\vec{b} = -2\hat{i} + 4\hat{j}$, $\vec{a}.\vec{b}$ is equal to a) $-6 - 4\hat{j} + 12\hat{k}$ b) -6 c) $-8\hat{i} + 4\hat{j} + 12\hat{k}$ d) Zero B

129. If $\vec{a} = 2\hat{i} + 4\hat{j} - 5\hat{k}$ and $\vec{b} = 13\hat{i} - 9\hat{j} + 2\hat{k}$ then $\vec{a} + \vec{b}$ is equal to a) $15\hat{i} + 5\hat{j} - 3\hat{k}$ b) $15\hat{i} - 5\hat{j} + 3\hat{k}$ c) $15\hat{i} - 5\hat{j} - 3\hat{k}$ d) $11\hat{i} + 5\hat{j} + 3\hat{k}$ C

130. A force of 30 N acts on a body and moves it 2m in the direction of force. The work done is a) 60 J b) 15 N c) 0.06 J d) Zero A

131. A horse is pulling a cart exerting a force of 100 N at an angle of 30 to one side of motion of the cart. Work done by the horse as it moved 20m is a) 173.2 J b) 1732 J c) 86.6 J d) 1000 J B

132. Identify the vector quantity a) Time b) Work c) Heat d) Angular momentum D

133. Identify the scalar quantity a) Force b) Acceleration c) Displacement d) Work D

134. Which of the following is a scalar quantity a) Electric Current b) Electric field c) Acceleration d) Linear Momentum A

135. Which of the following is not a vector quantity a) Density b) Displacement c) Electric field intensity d) Angular momentum C

136. Vectors are the physical quantity which are completely represented by their magnitude as well as in proper _____ . a) Unit and Direction b) Unit c) Direction d) Number with proper Unit C

137. Which one of the following is the scalar quantity a) Force b) Work c) Momentum d) Velocity B

138. Which one of the following is the vector quantity a) Acceleration b) Power c) Density d) Volume A

139. Which of the following is the example of scalar quantity a) Momentum b) Force c) Acceleration d) Mass D

140. Which of the following is the example of vector quantity a) Volume b) Temperature c) Velocity d) Speed C

141. A vector whose magnitude is same as that of **A**, but opposite in direction is known as a) Null vector b) Negative vector c) Addition vector d) Subtraction vector B

142. Let us take i, j, k be three unit vectors such that: a) i . j = 0 b) i . j = 1 c) i . j = k d) i . j = j A

143. Physical quantities represented by magnitude are called a) Scalar b) Vector c) Functions d) None of the above A

144. Physical resultant of two or more vectors is a single vector whose effect is same as the combine effect of all the vectors to be added is called. a) Unit vector b) Product vector c) Component of vector d) Resultant of vector D

145. Vectors are added graphically using a) Right hand rule b) C
Left hand rule c) Head to tail rule d) Hit and trial rule
146. The angle between rectangular components of vector is a) 45° C
b) 60° c) 90° d) 180°
147. Two forces 3N and 4N are acting on a body, if the angle between B
them is 90 then magnitude of resultant force is a) 2 Newton b)
5 Newton c) 7 Newton d) 10 Newton
148. Which of the following quantity is scalar a) Electric field b) B
Electrostatic potential c) Angular momentum d) Velocity
149. Two vectors having different magnitudes a) Have their direction C
opposite b) May have their resultant zero c) Cannot have their
resultant zero d) None of the above
150. If A and B are two vectors, then the correct statement is a) A + B A
= B + A b) A - B = B - A c) $A \times B = B \times A$ d) None of the
above
151. When three forces acting at a point are in equilibrium: a) Each A
force is numerically equal to the sum of the other two b) Each force is
numerically greater than the sum of the other two c) Each force is
numerically greater than the difference of the other two d) None of the
above
152. If two vectors are anti-parallel, scalar product is equal to the: a) B
Product of their magnitudes b) Negative of the product of their
magnitude c) Equal to zero d) None of the above
153. Angular momentum is a) Scalar b) A polar vector c) C
An axial vector d) Linear momentum
154. The scalar product of two vectors is negative when they are a) A
Anti-parallel vectors b) Parallel vectors c) Perpendicular vectors
d) Parallel with some magnitude
155. Scalar product is also called a) Cross product b) Vector D
product c) Base vector d) Dot product
156. Scalar product is also known as: a) Dot product b) Cosine A
product c) Cross product d) None of the above
157. If a vector $\vec{a}$ makes an angle θ with the x-axis its x-component is A
given as a) $a \cos\theta$ b) $a \sin\theta$ c) $a \tan\theta$ d) $a \sin\alpha$
158. Cross product of two vectors is zero when they are a) Of C
different magnitude and perpendicular to each other b) At an angle of
60° c) Parallel to each other d) At an angle of 90°

159. A vector is multiplied by positive number then a) Its magnitude changes b) Its direction changes but magnitude remains the same c) Its magnitude as well as direction changes d) Neither its magnitude nor direction changes A

160. If two forces act together on an object then the magnitude of the resultant is least when the angle between the forces is a) 60° b) 90° c) 180° d) 360° C

161. If A.B = 0, we conclude that a) Either of two vectors is a null vector b) Both of the vectors are null vectors c) The vectors are mutually perpendicular d) All of the above D

162. Two forces each of magnitude F act perpendicular to each other. The angle made by the resultant force with the horizontal will be a) 30° b) 45° c) 60° d) 90° B

163. If a charged particle of mass m and charge q is projected across uniform magnetic field B with a velocity V, it experience magnitudes force given by a) $F = q(V \times B)$ b) $F = (V.B)$ c) $F = \frac{V \times B}{q}$ d) $F = \frac{q \times B}{V}$ A

164. If $A \times B$ points along positive z-axis then the vectors A and B must lie in a) YZ-plane b) ZX-plane c) XY-plane d) None of the above C

165. If the resultant of two vectors each of magnitude F is also of magnitude F, the angle between them will be a) 90° b) 60° c) 30° d) 120° D

166. Position vector of point in xy-plane is given by a) $\vec{r} = y\hat{i} + z\hat{k}$ b) $\vec{r} = x\hat{i} + y\hat{k}$ c) $\vec{r} = x\hat{i} + z\hat{k}$ d) None of the above D

167. A vector which has magnitude 'One' is called a) A resultant vector b) A unit vector c) A null vector d) A positive vector B

168. The F_x component of a force vector 'F' of magnitude 30N make an angle of 60° with X-axis is a) 7N b) 15N c) 5N d) 10N B

169. When a certain vector is multiplied by -1, the direction changes by a) 90° b) 180° c) 120° d) 60° B

170. The minimum number of unequal forces whose vector sum can be zero is a) 1 b) 2 c) 3 d) 4 C

171. If a force of 10N makes an angle of 30° with x-axis, its x-component is given by a) 0.866N b) 0.886N c) 89.2N d) 8.66N D

172. Two forces each of 10N magnitude act on a body. If the forces are inclined at 30° and 60° with x- axis, then the x-component of their resultant is a) 10N b) 1.366N c) 13.66N d) 136.6N C

173. When two equal forces F and F make an angle of 180° with each other, the magnitude of their resultant is a) F b) 2F c) 0 d) 3F C

174. The scalar or dot product of $\vec{A}$ with itself i.e. $\vec{A}.\vec{A}$ is equal to a) 2A b) A^2 c) $\frac{A}{2}$ d) None of the above B

175. If the vectors $\vec{A}$ and $\vec{B}$ are of magnitude 4 and 3 cm making of 30° and 90° respectively with X- axis, their scalar product will be a) 0 cm^2 b) 18 cm^2 c) 6.0 cm^2 d) 21 cm^2 C

176. If the dot product of two non-zero vectors vanishes, the vectors will be a) Parallel to each other b) Anti-parallel to each other c) Perpendicular to each other d) None of the above C

177. Dot product of two non-zero vectors is zero ($\vec{a}.\vec{b} = 0$) when angle between them is be a) 30° b) 45° c) 60° d) 90° D

178. If two non-zero vectors $\vec{a}$ and $\vec{b}$ are parallel to each other, then a) $\vec{a}.\vec{b} = 0$ b) $\vec{a}.\vec{b} = ab$ c) $|\vec{a} \times \vec{b}| = ab$ d) $|\vec{a} \times \vec{b}| = \vec{a}.\vec{b}$ B

179. For a vector $\vec{V}$ a) $\vec{V}.\vec{V} = V$ b) $\vec{V} \times \vec{V} = V^2$ c) $\vec{V} \times \vec{V} = \vec{V}$ d) $\vec{V}.\vec{V} = V^2$ D

180. The scalar product of two vectors is negative when a) They are parallel vectors b) They a anti-parallel vectors c) They are perpendicular vectors d) They are parallel with some magnitude B

181. The cross-product of two vectors is a negative vector when a) They are parallel vectors b) They are anti-parallel vectors c) They are perpendicular vectors d) They are rotated through 270° D

182. The Cross product of two parallel vectors $\vec{A}$ and $\vec{B}$ (i.e. $\vec{A} \times \vec{B}$) is equal to a) AB sin $\theta\hat{n}$ b) AB cos θ c) AB d) 0 A

183. The cross product of vector $\vec{A}$ with itself ($\vec{A} \times \vec{A}$) is equal to a) A b) 1 c) 2A d) Zero D

184. The magnitude of $\hat{i}.(\hat{j} \times \hat{k})$ is a) 0 b) 1 c) -1 d) 2i B

185. If the dot product of two non-zero vectors $\vec{A}$ and $\vec{B}$ is zero, their cross D

product will be of magnitude a) AB sinθ b) B cosθ c) AB sin6θ d) AB

186. The y-component of a vector 100N force, making an angle of 30° with the x-axis is a) 50N b) 20N c) 10N d) 80N A

187. The magnitude of cross product of two parallel vectors $\vec{a}$ and $\vec{b}$ is equal to a) ab cosecθ^o b) 0 c) 2ab d) abcosθ^o B

188. If $\vec{A} = 2\hat{i} + \hat{j} + 2\hat{k}$ then $|\vec{A}|$ is a) 0 b) 3 c) 6 d) 9 B

189. Two vectors of magnitude A_1 and A_2 inclined at each other at an angle θ have resultant of magnitude equal to a) $\sqrt{A_1^2 + A_2^2 + 2A_1A_2\cos\theta}$ b) $\sqrt{A_1^2 + A_2^2 + 2A_1A_2}$ c) $\sqrt{A_1^2 + A_2^2 + A_1A_2\cos\theta}$ d) c) $\sqrt{\frac{A_1^2 - A_2^2}{2}}$ d) $\sqrt{\frac{A_1^2 + A_2^2}{2}}$ A

191. The magnitude of a vector is obtained by a) $\sqrt{\vec{A}}$ b) $\sqrt{\vec{A}.\vec{A}}$ c) $\sqrt{\vec{A}} \times \vec{A}$ d) $\frac{\vec{A}}{|A|}$ B

192. Which one is correct? a) $\hat{j} \times \hat{k} = 1$ b) $\hat{j} \times \hat{k} = 0$ c) $\hat{j} \times \hat{k} = -\hat{i}$ d) $\hat{j} \times \hat{k} = \hat{i}$ D

193. The unit vector in the direction of vector A = $2\hat{i} - 2\hat{j} + \hat{k}$ is a) $\frac{2\hat{i} - 2\hat{j} + \hat{k}}{3}$ b) $\frac{2\hat{i} - 2\hat{j} + \hat{k}}{9}$ c) $\frac{2\hat{i} - 2\hat{j} + \hat{k}}{5}$ d) $2\hat{i} - 2\hat{j} + \hat{k}$ A

194. Dot or scalar product obeys a) Associative law b) Commutative law c) Distributive law d) All these D

195. If $\vec{F} = 8\hat{i} - 2\hat{j}$ and $\vec{r} = 6\hat{i} + 8\hat{k}$ then $\vec{r}.\vec{F}$ is a) 6 b) 8 c) 32 d) 48 D

196. The angle between the vectors $\vec{A} = 2\hat{i} + 3\hat{j} - \hat{k}$ $\vec{B} = 4\hat{i} + 6\hat{j} - \hat{k}$, is a) 0° b) 30° c) 60° d) 90° A

197. For $|\vec{A}| \neq 0$ if $\vec{A}.\vec{B} = 0$ and $\vec{A} \times \vec{B} = 0$, then a) $\vec{B}$ will be a zero vector b) $\vec{B}$ will be a non-zero vector c) $\vec{B}$ and $\vec{A}$ are parallel to each other d) $\vec{A}$ and $\vec{B}$ are perpendicular to each other A

198. If displacement of a body is $\vec{d} = 3\hat{i}$, its only significance is a) The displacement of 3 units is not along any axis b) The displacement of 3 units along z-axis c) The displacement of 3 units along y-axis d) The displacement of 3 units along x-axis D

199. The magnitude of a vector $A=A_x i+A_y j+A_z k$ is a) $A_x^2 + A_y^2 + A_z^2$ C
b) $(A_x + A_y + A_z)^2$ c) $(A_x^2 + A_y^2 + A_z^2)^{1/2}$ d) $A/\sqrt{3}$
200. Two forces of same magnitude F act on a body inclined at an angle of A
90°, then the magnitude of their resultant is a) $\sqrt{2}$ F b) $\sqrt{2F}$ c)
2F d) $\frac{F}{2}$
201. If $|F_1|$=3cm and $|F_2|$=4cm, F_1 is making an angle of 30° and F_2 is A
making an angle of 120° with the x-axis, then their scalar product is a)
0 cm^2 b) 6 cm^2 c) 10.39 cm^2 d) 12 cm^2
202. The vector product between two vectors A and B is a) AB $\sin\theta$ C
b) AB $\cos\theta$ c) AB $\sin\theta\,\hat{n}$ d) AB $\cos\theta\,\hat{n}$
203. A force of 10N is acting on a body making an angle of 45° with A
x-axis. its x and y components are a) 7.07 N and 7.07 N b) 7.07
N and 5 N c) 5 N and 7.07 N d) 8.66 N and 5 N
204. If B = $\hat{i}$ -2$\hat{j}$+2$\hat{k}$, then unit vector along B will be a) 3 b) D
3B c) $\hat{i}$ -2$\hat{j}$+2$\hat{k}$ d) B / 3
205. If r = 2$\hat{i}$ m and p = 12$\hat{j}$ kg ms^{-1} the r $\times$p will be a) 24 $\hat{k}$ kg m^2s^{-1} A
b) 24 kg ms c) 24 kg m^2s^{-1} d) 24 kg m^2s^2
206. The magnitude of resultant of three vectors is 3. Its x-component is 2, C
y-component is 1 then its z- component will be a) 4 b) 1 c)
2 d) 0
207. If two equal unit vectors are inclined at an angle of 90^0, then B
magnitude of their resultant will be a) 2 b) $\sqrt{2}$ c) 1 d)
0
208. Unit vector is used to specify a) Magnitude of a vector b) C
Dimension of a vector c) Direction of a vector d) Position of a
vector
209. The unit vector of a vector A of magnitude 2 is a) 2A b) A
A^2 c) A/2 d) $A^2/2$
210. When the product of two vectors is a scalar quantity, it is called: a) C
Vector product b) Multiplication of vectors c) Dot product d)
Cross product
211. The angle of a vector A = $A_x\hat{i}$ - $A_y\hat{j}$ with the x-axis will be in C
between a) 0° to 90° b) 90° to 180° c) 180° to 270° d)
270° to 360°
212. A vector having magnitude equal to given vector but in opposite C

direction is called a) Unit vector b) Positive vector c) Negative vector d) Position vector

213. If a vector A = $\hat{i} + \hat{j} + \hat{k}$, its magnitude will be a) 3 b) $3\sqrt{3}$ c) $\sqrt{3}$ d) $\sqrt{3}/3$ C

214. When two equal and opposite vectors are added, then their resultant will have a) Same magnitude b) Double magnitude c) Zero magnitude d) Half magnitude C

215. A force of 20N is acting along x-axis, Its component along x-axis is a) 20N b) 10N c) 5N d) Zero A

216. Two forces of same magnitude are acting on an object, the magnitude of their resultant is minimum if the angle between them is a) 45° b) 60° c) 90° d) 180° D

217. If two forces each of magnitude 5N act along the same line on a body, then the magnitude of their resultant will be a) 5 N b) 10 N c) 20 N d) 30 N B

218. If A = $A_x i + A_y j$ and B = $B_x i + B_y j$ then A.B will be equal to a) $A_xB_x + A_yB_y$ b) $A_xB_y + A_yB_x$ c) $A_x^2B_y^2 + A_y^2B_x^2$ d) $A_x^2B_x^2 + A_y^2B_y^2$ A

219. If cross product between two non zero vectors A and B is zero then their dot product is a) AB $\sin\theta$ b) AB $\cos\theta$ c) 0 d) AB D

220. The cross product of a vector A with itself is a) A^2 b) 2A c) 0 d) 1 C

221. If A = Ai and B = Bj then A . B is equal to a) AB b) Zero c) 1 d) AB k B

222. The product i $\times$ j is equal to a) Zero b) 1 c) k d) -k C

223. The magnitude of i. (i $\times$ k) is a) i b) 0 c) -1 d) j B

224. If x-component of a vector is 3 N and y-component is -3 N, then angle of the resultant vector with x- axis will be a) 45° b) 315° c) 135° d) 225° B

225. If A = 3i + 4j, then the magnitude of A will be a) 7 b) 5 c) 25 d) 1 B

226. When a force of 10 N is acting on a body making an angle of 60° with x-axis and displaces this body through 10 m, then scalar product of force and displacement is a) 100 J b) 50 J c) 8.66 J d) 50 N B

227. If A = 2i + 2j and B = -2i + 2j then A . B will be equal to a) -4 B
b) 0 c) 2 d) 8
228. Two vectors of magnitude 20 N and 2m are acting on opposite C
direction. Their scalar product will be a) 40 Nm b) 40 N c)
-40 Nm d) 40 m
229. If A = 3i + 6j, B = xi + k and A.B = 12, then x will be equal to a) B
2 b) 4 c) 12 d) 3
230. A physical quantity which is completely described by a number with A
proper units is called a) Scalar b) Vector c) Null vector
d) None of the above
231. A physical quantity which requires magnitude in proper units as well B
as direction is called a) Scalar b) Vector c) Null vector
d) None of the above
232. A vector whose magnitude or modulus is one and it points in the A
direction of a given vector is called _____ a) A unit vector b)
A null vector c) Negative of a vector d) Zero vector
233. A vector having an arbitrary direction and zero magnitude is called B
_____ a) A unit vector b) A null vector c) Inverse of a
vector d) None of the above
234. In a right angled triangle $\cos\theta$ = a) $\frac{\text{Perpendicular}}{\text{Hypotenuse}}$ b) $\frac{\text{Base}}{\text{Hypotenuse}}$ B
c) $\frac{\text{Perpendicular}}{\text{Base}}$ d) None of the above
235. For a force F, Fx = 6 N Fy = 6 N. What is the angle between F and C
x-axis a) Less than 30° b) 60° c) 45° d) Greater than
60°
236. $\vec{A}.\vec{B}$ = a) $\vec{B}.\vec{A}$ b) $-\vec{B}.\vec{A}$ c) AB d) None of the A
above
237. A simple example of a dot product is the_____ a) Force b) C
Energy c) Work d) Momentum
238. If the vectors $\vec{A}.\vec{B}$ = 0, either the vectors are mutually perpendicular B
to each other or one or both vectors are a) Unit vectors b) Null
vector c) Base vectors d) None of the above
239. The scalar product of a vector $\vec{A}$ with itself i.e. $\vec{A}.\vec{A}$ is called a) B
A null vector b) Square of the vector c) Unit vector d)
Magnitude of $\vec{A}$
240. The scalr product of $\vec{A}$ and $\vec{B}$ in the form of the components A_x, A_y, C

A_z, and B_x, B_y, B_z, is defined as a) $A_x B_y + A_x B_x + A_z B_z$ b) $A_x B_b + B_z B_z + A_z B_z$ c) $A_x Bx + A_y B_y + A_z B_z$ d) $A_z B_y + A_x B_x + A_y B_z$

241. The vector product $\vec{C}$ of two vectors $\vec{A}$ and $\vec{B}$ making an angle θ with each other is defined as _____ a) $\vec{C} = AB \cos\theta$ b) $\vec{C} = AB \sin\hat{\theta}$ c) $\vec{C} = AB \cos\hat{\theta} n$ d) None of the above D

242. $\vec{A} \times \vec{B} =$ _____ a) $\vec{A} \times \vec{B}$ b) $-\vec{A} \times \vec{B}$ c) $-\vec{B} \times \vec{A}$ d) None of the above C

243. The vector product of a vector by itself is a) 1 b) -1 c) 0 d) None of the above C

244. The cross product of two vector $\vec{A}$ and $\vec{B}$ in the form of their components A_x, A_y, A_z, and B_x, B_y, B_z, is defined as _____ a) $(A_xB_x + A_yB_y)\hat{i} - (A_zB_b + A_yB_y)\hat{j} + (A_xB_x - A_yB_x)\hat{k}$ b) $(A_yB_z - A_zB_y)\hat{i} + (A_zB_x - A_xB_z)\hat{j} + (A_xB_y - A_yB_x)\hat{k}$ c) $(A_yB_z - A_zB_y)\hat{i} - (A_zB_x - A_xB_z)\hat{j} + (A_xB_y - A_yB_x)\hat{k}$ d) $(A_yB_z + A_zB_y)\hat{i} + (A_zB_x - A_xB_z)\hat{j} + (A_xB_y - A_yB_x)\hat{k}$ B

245. In contrast of a scalar a vector must have a a) Direction b) Weight c) Quantity d) None of the above A

246. Electric intensity is a a) Ratio b) Scalar c) Vector d) Pure number C

247. The acceleration vector for a particle in uniform circular motion in a) Tangential to the orbit b) Directed toward the centre of the orbit c) Directed in the same direction as the force vector d) b and c D

248. Which of the following group of quantities represent the vectors a) Acceleration, Force, Mass b) Mass, Displacement, Velocity c) Acceleration, Electric flux, Force d) Velocity, Electric field, Momentum D

249. The following physical quantities are called vectors a) Time and mass b) Temperature and density c) Force and displacement d) Length and volume C

250. Scalar quantities have a) Only magnitudes b) Only directions c) Both magnitude and direction d) None of these A

251. The vector quantity which is defined as the displacement of the particle during a time interval divided by that time interval is called a) Speed b) Average speed c) Average velocity d) None of these C

252. For the addition of any number of vectors in a given coordinate system the first step is to a) Find out the algebraic sum of all the individual x-components b) Find out the algebraic sum of all the individual y-components c) Resolve each given vector into its rectangular components (x and y components) d) Find out the magnitude of the sum of all the vectors C

253. When a vector is multiplied by a negative number, its direction a) Is reversed b) Remains unchanged c) Make an angle of 60° d) May be changed or not A

254. A vector which can be displaced parallel to itself and applied at any point is known as a) Parallel vector b) Null vector c) Free vector d) Position vector C

255. A vector in any given direction whose magnitude is unity is called a) Normal vector b) Parallel vector c) Free vector d) Unit vector D

256. The position vector of a point p is a vector that represents its position with respect to a) Another vector b) Centre of the earth c) Any point in space d) Origin of the coordinate system D

257. Negative of a vector has a direction _____ that of the original vector a) Same as b) Perpendicular to c) Opposite to d) Inclined to C

258. The sum and difference of two vectors are equal in magnitude. The angle between the vectors is a) 0° b) 90° c) 120° d) 180° B

259. In graphical addition of vectors a) The position of vectors is unimportant b) The order of vectors is not to be altered c) The direction of resultant is unknown d) The position of vectors is important B

260. The dot product of $\hat{i}$ and $\hat{j}$ is a) More b) 1 c) 0 d) Any value C

261. The magnitude of product vector $\vec{C}$ i.e. $\vec{A} \times \vec{B} = \vec{C}$, is equal to the a) Sum of the adjacent sides b) Area of the parallelogram c) Product of the four sides d) Parameter of the parallelogram B

262. If two vectors lie in xy-plane, their cross product lies a) In the same plane b) Adjacent plane c) Along perpendicular to that plane d) Parallel to the plane C

263. Two forces of 8N and 6N are acting simultaneously at right angle, the C

resultant force will be a) 14N b) 2N c) 10N d) 12N

264. The scalar product of two vectors is zero, when: a) They are equal vectors b) They are in the same direction c) They are at right angle to each other d) They are opposite to each other C

265. Two forces of magnitude 20N each are acting 30° & 60° with the x-axis, the y-component of the resultant fore is approx. a) 20 N b) 40 N c) 27.32 N d) 17.32 N C

266. $\vec{F} = 5\hat{i} - 3\hat{j} + 2\hat{k}$ is moved from $\vec{r_1} = 2\hat{i} + 8\hat{j} + 4\hat{k}$ to $\vec{r_2} = -5\hat{i} + 3\hat{j} + 3\hat{k}$, the work done will be a) -22 units b) 22 units c) 11 units d) $\sqrt{22}$ units A

267. (6i+4j-k) . (4i+2j-2k) = ? a) 24i+8j+2k b) 30 c) 34 d) 40 C

268. The projection of $\vec{A}$ = 2i-3j+6k onto the direction of vector $\vec{B}$ = i+2j+2k is a) 8 b) 3 c) 8/3 d) 6 C

269. The quantities which can be added, subtracted and multiplied by simple algebraic rules are: a) Scalars b) Vectors c) Physical d) Positive A

270. Choose the vector a) Weight and mass b) Velocity and speed c) Force and acceleration d) Velocity and energy C

271. The length of the arrow represents the _____ of a vector a) Direction b) Magnitude c) Direction and magnitude both d) Resultant of the vector B

272. Vector A has the same magnitude as B but opposite in direction, then A is said to be a) Normal vector b) Negative vector c) Null vector d) Unit vector B

273. The sum of two vectors equal in magnitude but opposite in direction is a) Less than the individual vectors b) Greater than the individual vectors c) Equal to the individual vector d) Zero D

274. To add all vectors we add their representative lines by a) Right hand rule b) Head-to-tail rule c) Left hand rule d) Hit and trial principle B

275. Vector addition is a) Associative b) Commutative c) Distributive d) Both a) and b) D

276. A vector whose tail lies at the origin of the coordinates and whose head lies at the position of point 'P' in space, known as a) Free vector b) Fixed vector c) Position vector d) Parallel vector C

277. If the magnitudes and directions of two vectors are same then these A

two vectors are a) Equal b) Same c) Equivalent d) Opposite

278. A vector lying along x-axis has a) Its x and z components zero b) Its y-component equal to zero c) Its x and y components equal to zero d) None of these D

279. The resultant vector of two vectors will be zero if a) the magnitude of the vector is zero b) The magnitude of both vectors is same and angle b/w their direction is 90° c) The magnitude of both vectors is same and angle b/w their direction is 180° d) The magnitude of both vectors is different and angle b/w their direction is 45° C

280. The magnitude of resultant of two vectors acting at right angle is _____ than the individual vectors a) More b) Less c) Equal d) Thrice A

281. The angle between the rectangular components of a vector is always a) Less than 90° b) Greater than 90° c) Equal to 180° d) Equal to 90° D

282. If a vector $\vec{A}$ lies in xy-plane and it makes an angle 'θ' with the side of y-axis. Then its y-component is: a) Ay = A Cosθ b) Ay = A Secθ c) Ay = A Sinθ d) Ay = A Tanθ A

283. The components of a vector behave like: a) Vector quantities b) Scalar quantities c) Magnitudes d) Directions A

284. A vector $\vec{B}$ in 4th quadrant than: a) Its x-component is -ve and its y-component is +ve b) Its x-component is +ve and its y-component is +ve c) Its x-component is +ve and its y-component is -ve d) Its x-component is -ve and its y-component is -ve C

285. The process by which a vector can be reconstituted from its components is known as: a) Principle of parallelogram b) Division of vectors c) Composition of vectors d) Factorization of vectors C