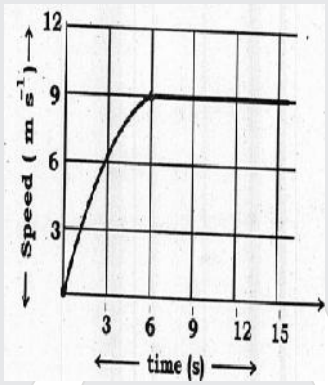
SCHOLASTIC APTITUDE TEST

1. The distance travelled by a body is proportional to time. Its speed

(1) increases (2) decreases

(3) becomes zero (4) remains constant.

2. The speed – time graph for a car is shown in figure. How far does the car travel in the first 6 seconds?



(1) 27 m (2) 54 m (3) 6 m (4) 9 m

Sol. Distance = Area under v-t Curve

$$S = \frac{1}{2} \times 6 \times 9 = 27$$

3. The physical quantity which has unit newton/kg is

(1) force (2) momentum (3) acceleration (4) energy

4. Two objects of masses 100g and 200 g are moving along the same line and direction with velocities of 2 ms^{-1} and 1 ms^{-1} respectively. Ratio of their momenta is.

(1) 4 : 1 (2) 1 : 1 (3) 2 : 1 (4) 1 : 2

Sol.

$$P_1 = m_1 v_1 = \frac{100}{1000} \times 2 = 0.2$$

$$P_2 = m_2 v_2 = \frac{200}{1000} \times 1 = 0.2$$

$$P_1 : P_2 = 1:1$$

5. Acceleration of all freely falling bodies

(1) increases with time (2) decreases with time

(3) remains constant (4) remains zero

6. A stone is thrown vertically upward with a velocity of 9.8 ms^{-1} . The maximum height attained by the stone is.

(1) 19.6 m (2) 9.8 m (3) 49 m (4) 4.9 m

Sol. u= 9.8 a = 9.8 m/s^2

v = 0 h = ?

$v^2 = u^2 + 2gh$

$0 = (9.8)^2 - 2 \times 9.8 \times h$

$h = \frac{9.8 \times 9.8}{2 \times 9.8} = 4.9$ m

7. When we place an iron nail on the surface of water the nail sinks. This means that

(1) upthrust on iron nail is more than its weight

(2) upthrust on iron nail is less than its weight

(3) upthrust on iron nail is same as its weight

(4) density of iron nail is less than that of water.

8. The S.I. unit of relative density is

(1) kg m^{-3} (2) gm cm^{-3} (3) kg m^{-2} (4) no unit

9. When a ball is thrown upward in the condition of negligible air resistance then its total energy.

(1) increases

(2) decreases

(3) remains constant

(4) becomes zero at the highest point of its journey.

10. Work done is reducing the velocity from 20 ms^{-1} to 10 ms^{-1} of a mass of 0.5 kg is.

(1) 75 J (2) 7.5 J (3) 50 J (4) 25 J

Sol. m = 0.5 kg

u = 20 m/s

v = 10 m/s

Work Done = $\Delta K.E$

$$= \frac{1}{2}mV^2 - \frac{1}{2}mu^2$$

$$= \frac{1}{2}\times\frac{5}{10}\times(10)^2 - \frac{1}{2}\times\frac{5}{10}\times(20)^2$$

$$= 25 - 100$$

= – 75 J

11. kWh is unit of

(1) energy × time (2) power/ time (3) energy/time (4) work

12. In which of the following materials speed of sound is maximum?

(1) Aluminium (2) Glass (3) Water (4) Air.

13. For hearing distinct echoes the minimum distance of the obstacle from the source of sound must be

(1) 34.4 m (2) 17.2 m (3) 3.44 m (4) 1.72 m

14. Heart of a young man beats 80 times in 1 minute. What will be the frequency of his heartbeat?

(1) 13.3 Hz (2) 80 Hz (3) 1.33 Hz (4) 60 Hz

15. In convex lens forms an image equal in size to that of the object the object is placed at a distance.

(1) between F and 2F (2) greater than 2F (3) less than F (4) 2F.

16. What will be the focal length of a convex lens whose power is 1.5 D?

(1) + 1.5 m (2) + 66.6 cm (3) – 66.6 cm (4) – 1.5 m.

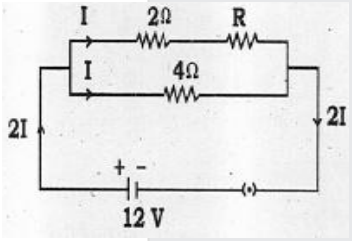
17. The amount of light entering the eye is controlled by.

(1) eye lens (2) pupil (3) cornea (4) retina

18. The direction of conventional current in a conductor is assumed in the direction of flow of.

(1) electrons (2) atoms (3) positive charges (4) negative ions.

19. What will be the value of R in the following electric circuit ?



(1) 6 Ω (2) 4 Ω (3) 8 Ω (4) 2 Ω .

20. The electric power of an electric appliance is given by.

(1) I^2V (2) IV (3) IR^2 (4) V^2R.

21. By increasing the number of turns in a current carrying coil the intensity of the magnetic field produced by it.

(1) decreases (2) increases

(3) first decreases then increases (4) remains unchanged

22. A compass needle just above a wire in which electrons are moving towards east will point.

(1) South (2) East (3) North (4) West.

23. A rectangular coil of copper wire is rotated in a plane perpendicular to the magnetic field. The direction of induced current reverses once in each.

(1) two rotations (2) one rotation (3) one fourth rotations (4) half rotation.

24. To make practical use of wind energy the minimum wind speed should be.

(1) 2 kmh^{-1} (2) 5 kmh^{-1} (3) 10 kmh^{-1} (4) 15 kmh^{-1}

25. For operation of ocean thermal energy conversion plants the minimum temperature difference between the water at the surface and water at the depths up to 2 km should be.

(1) 20ºC (2) 15º C (3) 10ºC (4) 5ºC

26. What is the mass of an atom ?

(1) sum of the masses of electron and neutron

(2) sum of the masses of electron and proton

(3) Sum of the masses of proton and neutron

(4) Sum of the masses of electron, proton and neutron.

27. Corrosion is which type of reaction?

(1) Reduction (2) Oxidation

(3) Double Displacement (4) Decomposition

28. Human body works within which pH range?

(1) 4.8 – 5.6 (2) 8.1 – 9.2 (3) 5.9 – 7.0 (4) 7.0 – 7.8

29. Which reaction produces bleaching power?

(1) $Na_2CO_3 + 10H_2O \rightarrow$ (2) $CaCO_3 + 3H_2O \rightarrow$

(3) $NaOH + Cl_2 \rightarrow$ (4) $Na(OH)_2 + Cl_2 \rightarrow$

30. Which one is natural source of oxalic acid?

(1) Lemon (2) Orange (3) Tamarind (4) Tamato.

31. What is Aqua regia?

(1) Mixture of concentrated sulphuric acid and nitric acid

(2) 2 : 1 mixture of nitric acid and hydrochloric acid

(3) Fresh mixture of concentrated hydrochloric acid and concentrated nitric acid in 3 : 1 ratio.

(4) Water extract of a plant namely Regia.

32. Which type of medicine is used for the treatment of indigestion?

(1) Antiseptic (2) Antacid

(3) Anti - histaminic (4) Anti – psychotic.

33. Which is /are allotrope 9s) of carbon ?

(1) Diamond (2) Fullerene

(3) Both (4) None of these

34. Which one is the correct formula for ketone function group?

(1) – C = O (2) $\begin{matrix} & & -C- \\ & & \| \\ & & O \end{matrix}$ (3) – CHO (4) – COOH.

35. Which is the formula of Propanal ?

(1) C_3H_6 (2) C_3H_8 (3) C_3H_6O (4) C_3H_8O

36. Poisonous liqueur contains which substance?

(1) Ethanol (2) Methanol (3) Propanol (4) Butanol

37. On the basis of which property, elements are arranged in modern periodic table.

(1) Atomic radii (2) Ionization potential

(3) Atomic number (4) Atomic weight

38. The element with atomic number 79 stands in which period and group of the modern periodic table?

(1) 6^{th} period, 11^{th} group (2) 5^{th} period, 12^{th} group

(3) 6^{th} period, 12^{th} group (4) 7^{th} period, 11^{th} group.

39. Electronegative elements are found on which side of modern periodic table?

(1) Left side (2) Right side (3) Middle (4) No where.

40. How many elements are there in 6^{th} period?

(1) 31 (2) 18 (3) 32 (4) 28.

41. Neutralisation reaction is

(1) between acid and salt (2) between salt and base

(3) between acid and base (4) between acid and water.

42. Three R stands for

(1) Reduce, Recycle, Reuse (2) Refuse, Right, Routine

(3) Both (4) None of these

43. Amrita Devi Vishnoi is famous as a

(1) film actress (2) conservator of Khejri trees

(3) dacoit (4) dancer

44. Which is Greenhouse gas?

(1) C_2H_2 (2) CO_2 (3) SO_3 (4) N_2O_5.

45. Amalgam is an alloy with.

(1) Copper (2) Tin (3) Mercury (4) Zinc

46. Metals at the bottom of activity series are found as.

(1) free state (2) sulphide ore (3) carbonate (4) oxide

47. What will produce when NaOH (sodium hydroxide) is heated with zinc?

(1) Sodium metal (2) Zinch oxide

(3) sodium zincate (4) No reaction occurs

48. Which solution will conduct electric current?

(1) Glucose solution (2) Sulphuric acid solution

(3) Alcohol solution (4) None of these

49. Ionic compounds generally show

(1) hardness
(2) high melting and boiling points
(3) water solubility
(4) all of these.

50. What is the atomic number of Cobalt?

(1) 24 (2) 27 (3) 28 (4) 26

51. The enzyme related with digestion of fat is

(1) amylase (2) lipase (3) pepsin (4) trypsin

52. The breakdown of glucose, a 6- carbon molecule into two, 3- carbon molecule pyruvate is called

(1) Calvin cycle
(2) Glycolysis
(3) Krebs' cycle
(4) Glycogenolysis

53. A hormone which is synthesized at the shoot tip and then diffuses towards the shady side of the shoot and causes curvature is called.

(1) Auxin (2) Cytokinin (3) Gibberellin (4) Abscisic acid

54. The means of vegetative propagation is Bryophyllum plant is

(1) Auxillary bud (2) Apical bud (3) Flower bud (4) Leaf bud.

55. Which is not an example of sexually transmitted disease?

(1) Gonorrhoea (2) Syphilis (3) AIDS (4) Herpes.

56. The main factor responsible for the damage of ozone layer is.

(1) Carbon dioxide
(2) Carbon monoxide
(3) Hydrocarbons
(4) Chlorofluorocarbon.

57. The water harvesting structure found in Rajasthan is

(1) Khadins (2) Tal (3) Kulhas (4) Bundhis.

58. Cell organelle which functions is the storage, modification and packaging of substances manufactured in the cell is.

(1) Mitochondria (2) Golgi apparatus

(3) Endoplasmic reticulum (4) Lysosome.

59. Ciliated columnar epithelium is present in the inner lining of

(1) kidney tubules (2) ducts of salivary glands

(3) respiratory tract (4) blood vessels.

60. The absence of specialized tissue for conduction of water and minerals is the main characteristic feature of.

(1) Angiosperms (2) Bryophyta

(3) Pteridophyta (4) Gymnosperms

61. Which of the following is the cause of Kala – azar disease?

(1) Trypansoma (2) Leishmania (3) Staphylococci (4) Plasmodium.

62. The nitrogen fixing bacteria found in root nodules of leguminous plants is

(1) Clostridium (2) Azotobacter (3) Cyanobacteria (4) Rhizobium.

63. White revolution is related with.

(1) Fish (2) Silk (3) Milk (4) Cereals.

64. The essential element for the formation of chlorophyll in plants is.

(1) Manganese (2) Nitrogen (3) Magnesium (4) Phosphorus.

65. An example of cereal plant is

(1) xanthium (2) Triticum (3) Parthenium (4) Cyprinus.

66. Which of the following hormones regulates the menstruation?

(1) Relaxin (2) Progesterone (3) Prolactin (4) Oxytocin

67. What will happen if the uterus is replaced by a plastic pouch in a woman ?

(1) Embryo development will not take place (2) Female gamete will not be formed

(3) Menstruation will not take place (4) Ovary will not release egg.

68. The correct pair of Analogous organs is.

(1) our arm and dog's fore-leg (2) wings of bird and wings of butterfly

(3) our teeth and elephant's tusk (4) wings of parrot and wings of eagle.

69. The phylum which has true Coelom (body cavity) is.

(1) Platyhelminthes (2) Nematode (3) Coelenterata (4) Annelida.

70. Green plant $\rightarrow$ Grasshopper $\rightarrow$ Rat $\rightarrow$ Snake $\rightarrow$ Eagle – In this food chain which animal will receive maximum energy?

(1) Rat (2) Grasshopper (3) Snake (4) Eagle.

71. The $\frac{p}{q}$ form of number $1.\overline{27}$ is.

(1) $\frac{12}{11}$ (2) $\frac{13}{11}$ (3) $\frac{14}{11}$ (4) $\frac{15}{11}$

Sol. $1.\overline{27} \Rightarrow \frac{126}{99} \Rightarrow \frac{42}{33} \Rightarrow \frac{14}{11}$

72. The value of $2^{2/3}.2^{1/3}$ is.

(1) $2^{2/9}$ (2) 2^2 (3) 2 (4) $2^{1/3}$

Sol. $2^{\frac{2}{3}} \cdot 2^{\frac{1}{3}} = 2^1 \Rightarrow 2$

73. If one of the factors of $x^3 - 2x^2 - x + 2$ is $(x+1)$, then another factor will be.

(1) $x^2 - 3x + 2$ (2) $x^2 + 3x - 2$ (3) $x^2 - 3x - 2$ (4) $x^2 + 3x + 2$

Sol.

$$(x+1)\overline{)\,x^3 - 2x^2 - x + 2\,}\;\;x^2 - 3x + 2$$

$x^3 + x^2$

$-3x^2 - x$

$-3x^2 - 3x$

$2x + 2$

$2x + 2$

Hence another factor is $(x^2 - 3x + 2)$

74. If we add 1 to the numerator and subtract 1 from the denominator, a fraction reduces to 1.It becomes $\frac{1}{2}$, if we only add 1 to denominator. What is the fraction?

(1) $\frac{2}{5}$ (2) $\frac{3}{5}$ (3) $\frac{4}{5}$ (4) $\frac{2}{3}$

Sol. Let's fraction is $\frac{x}{y}$

So $\frac{x+1}{y-1} = 1$

$x - y = -2$ .....(1)

$\frac{x}{y+1} = \frac{1}{2}$

$y = 2x - 1$ .....(2)

From (1) & (2)

$x = 3$ & $y = 5$

75. If $9x^2 - 15x + 6 = 0$ and $\left(3x - \frac{5}{2}\right)^2 = k$ are identical, then the value of k is.

(1) $\frac{1}{4}$ (2) 4 (3) 9 (4) $\frac{1}{9}$

Sol. $9x^2 - 15x + 6 = 0$

$\left(3x - \frac{5}{2}\right)^2 = K$

$9x^2 - 15x + \frac{25}{4} - K = 0$

So $\frac{25}{4} - K = 6$ so $K = \frac{1}{4}$

76. In the flower bed, there are 23 rose plants in the first row, 21 in the second, 19 in the third and so on. If there are 5 rose plants in the last row, then how many rows are there in the flower bed?

(1) 20 (2) 15 (3) 10 (4) 5

Sol. 23, 21, 19 5

5 = 23 + (n –1) (–2)

n = 10

Sol. sin 3A = cos (A – 26°)

sin 3A = sin [90 – (A – 26°)]

3A = 90 – A + 26

A = 29°

77. If sin 3A = cos (A – 26º), where 3A is an acute angle then the value of A is.

(1) A = 16º (2) A = 29º (3) A = 58º (4) A = 30º

Sol. sin 3A = cos (A – 26°)

sin 3A = sin [90 – (A – 26°)]

3A = 90 – A + 26

A = 29°

78. $\frac{1+\tan^{2-}}{1+\cot^{2-}}$ is equal to.

(1) $\sec^{2-}$ (2) –1 (3) $\cot^{2-}$ (4) $\tan^{2-}$.

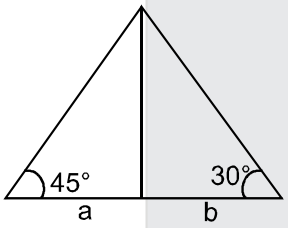
Sol. $\frac{1+\tan^2\theta}{1+\cot^2\theta} = \frac{\sec^2\theta}{\text{cosec}^2\theta}$

$= \tan^2\theta$

79. From a point on a bridge across a river, the angles of depression of the bank on opposite sides of the river are 30º & 45º respectively. If the bridge is at a height of 3 m from the bank, the width of the river is.

(1) 6m (2) $3\left(\sqrt{3}+1\right)m$ (3) $2\left(\sqrt{3}+1\right)m$ (4) $\left(\sqrt{3}+1\right)m$.

Sol.

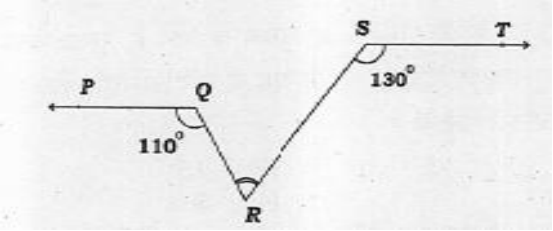


$\tan 45° = \frac{3}{a}$ $\tan 30° = \frac{3}{b}$

$a + b = 3\left(\frac{1}{1} + \frac{1}{1/\sqrt{3}}\right)$

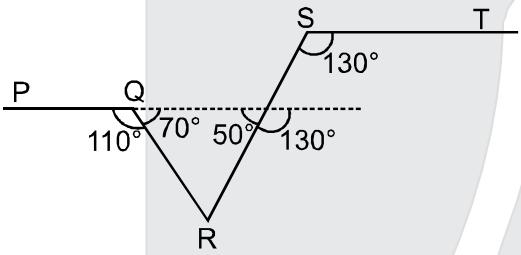
$= 3(1 + \sqrt{3})m$

80. In the given figure , if $PQ \parallel ST$, $\angle PQR = 110^\circ$ $\angle RST = 130^\circ$. Then the value of $\angle QRS$ is.



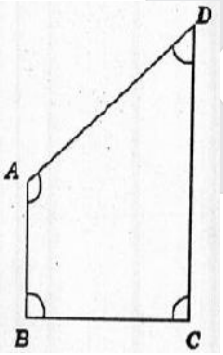
(1) 60º (2) 70° (3) 80º (4) 90º

Sol.



$\angle R = 60^\circ$

81. In the given figure, if AB and CD are respectively the smallest and longest sides of a quadrilateral ABCD, then which statement is true?

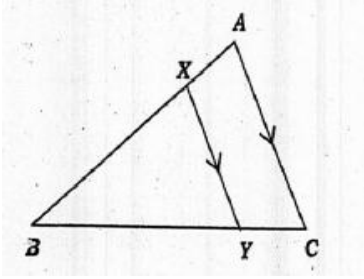


(1) $\angle A > \angle C > \angle D > \angle B$ (2) $\angle C > \angle B > \angle D > \angle A$

(3) $\angle B > \angle C > \angle D > \angle A$ (4) $\angle A > \angle C > \angle B > \angle D$

Ans. [4]

82. In the given figure, the line segment XY is parallel to side AC of ΔABC and divides the triangle into two parts of equal area. The ratio XB and AB is.



(1) $\sqrt{2}:1$ (2) $1:\sqrt{2}$ (3) $1:\left(\sqrt{2}-1\right)$ (4) $\left(\sqrt{2}-1\right):1$

Sol. Let area of $\Delta ABC = 2x$

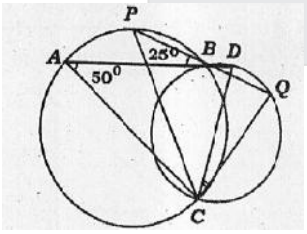
area of BXY = area of trapezium = x

$$\therefore \frac{\text{area of } \Delta BXY}{\text{area of } \Delta ABC} = \left(\frac{BX}{AB}\right)^2$$

$$\frac{X}{2X} = \left(\frac{XB}{AB}\right)^2$$

$$\frac{XB}{AB} = \frac{1}{\sqrt{2}}$$

83. In the given figure, two circles intersect in two points B and C. Through B, two line segments ABD and PBQ are drawn intersecting the circles in A, D and P, Q respectively. If $\angle ABP = 25^o$ and $\angle CAB = 50^o$ then the value of $\angle DCQ$ is.



(1) 25^o (2) 50^o (3) 30^o (4) 90^o

Sol. $\angle PBA = \angle DBQ$ .....(1) (vertical opposite angle)

$\angle QBD = \angle QCD$ .....(2) (angle made by an arc DQ in same segment of circle)

From (1) & (2)

$\angle PBA = \angle QCB$

$\angle QCB = 25°$

84. If (3,0), (x, y), (-1,4) and (-2,-1) are vertices of a rhombus taken in order vertex (x,y) is.

(1) (–2, –3) (2) (0,3) (3) (4,5) (4) (-4,5)

Sol. O is the mid point of AC

$$\therefore \quad O = \left(\frac{3-1}{2}, \frac{0+4}{2}\right) = (1, 2)$$

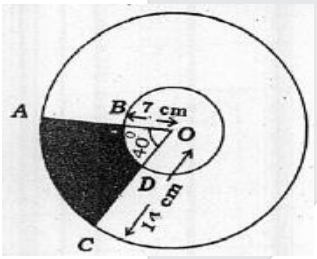
and O is the mid point of BD

$$1 = \frac{x-2}{2} \quad 2 = \frac{y-1}{2}$$
$$x = 4 \quad y = 5$$

$$\therefore \quad B = (4, 5)$$

85. According to figure, the radii of two concentric circles with centre O are 7 cm & 14 cm respectively.

If $\angle AOC = 40^\circ$, then the area of shaded region is



(1) $\frac{49\pi}{3}$ (2) $\frac{21\pi}{3}$ (3) $\frac{28\pi}{3}$ (4) $\frac{35\pi}{3}$

Sol. Area of shaded region = Area of major sector – Area of minor sector

$$= \frac{\pi R^2\theta}{360} - \frac{\pi r^2\theta}{360}$$

$$= \frac{\pi\theta}{360}(R^2 - r^2)$$

$$= \frac{\pi \times 40}{360}(14^2 - 7^2)$$

$$= \frac{49\pi}{3}$$

86. The diameter of a sphere is decreased by 25%. Its surface area will be decreased by.

(1) 56.25% (2) 55% (3) 40% (4) 43.75%

Sol. Diameter = x decrease diameter = $x - \frac{x \times 25}{100} = \frac{3x}{4}$

Area = $4\pi x^2$, Area of decrease diameter = $4\pi\left(\frac{3x}{4}\right)^2$

Decreased Area = $4\pi x^2 - 4\pi\frac{9x^2}{16} = 4\pi x^2\left(\frac{7}{16}\right)$

Percentage area decreased = $\frac{4\pi x^2\left(\frac{7}{16}\right)\times 100}{4\pi x^2}$

= 43.75

87. The radii of the ends of frustum of a cone of height 45 cm are 28 cm and 7 cm. The volume of frustum of cone is

(1) 8079.5 cm^3 (2) 6620 cm^3 (3) 48510 cm^3 (4) 5461.5 cm^3

Sol. Area of frustum = $\frac{1}{3}\pi h(R^2 + r^2 + r \times R)$

$= \frac{1}{3}\times\frac{22}{7}\times 45\times\left((28)^2 + (7)^2 + 28\times 7\right)$

= 48510

88. If the mean of the following distribution is 6, the value of f is.

Class - interval	0-2	2-4	4-6	6-8	8-10
Frequency	1	2	5	f	3

(1) 6 (2) 7 (3) 5 (4) 3

Sol.

	x	f	x × f
0 – 2	1	1	1
2 – 4	3	2	6
4 – 6	5	5	25
6 – 8	7	f	7f
8 – 10	9	3	27
		$\sum f = 11 + f$	$\sum f \times x = 59 + 7f$

$$\bar{M} = \frac{\sum f \times x}{\sum f}$$

$$6 = \frac{59 + 7f}{11 + f}$$

$$f = 7$$

89. The wickets taken by a bowler in 10 cricket matches are as follows :

2,6,4,5,0,2,1,3,2,3

The mode of the data is

(1) 6 (2) 5 (3) 3 (4) 2

Sol. 2, 6, 4, 5, 0, 2, 1, 3, 2, 3

mode = maximum frequency = 2

90. A die is thrown 1000 times with the frequencies for the outcomes 1,2,3,4,5 and 6 are given in the following table.

Outcome:	1	2	3	4	5	6
Frequency	179	150	157	149	175	190

(1) 0.150 (2) 0.175 (3) 0.149 (4) 0.157

Sol. Probability = $= \frac{175}{1000} = 0.175$

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447
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