Tender Heart High School, Sector 33B, Chd.

CLASS X

Shares and Dividends

Date: 28.10.2024

Q1 A man invests ₹9600 on ₹100 shares at ₹80. If the company pays him 18% dividend, find
(i) the number of shares he buys.
(ii) his total dividend
(iii) his percentage return on the shares.

Q2 A man invests ₹1680 in buying shares of nominal value ₹25 and selling at 12% premium. The dividend on the shares is 15% per annum.
(i) Calculate the number of shares he buys
(ii) Calculate the dividend he receives annually.

Q3 Rohit invested ₹9600 on ₹100 shares at ₹20 premium paying 8% dividend. Rohit sold the shares when the price rose to ₹160. He invested the proceeds (excluding dividend) in 10% ₹50 shares at ₹40. Find :-
(i) original number of shares
(ii) sale proceeds
(iii) new number of shares
(iv) change in the two dividends

Q4 A man invests ₹8456, partly in 17% shares at ₹140 and remaining in 9% shares at ₹112. If the second investment gives ₹58 more dividend than the first one, find each investment.

Q5 Mr. Parekh invested ₹52000 on ₹100 shares at a discount of ₹20 paying 8% dividend. At the end of one year, he sells the shares at a premium of ₹20. Find
(i) the annual dividend
(ii) the profit earned including his dividend

Answers

1) (i) 120 (ii) 2160 (iii) 22.5%

2) (i) 60 (ii) 225

3) ~~960~~ 80, 12800, 320, 1600-640 = 960

4) 5376, 3080

5) (i) ₹5200 (ii) ₹18200

CLASS X
(Banking, Matrices, Shares & Dividend)

1) Simplify $\sin\theta \begin{bmatrix} \sin\theta & -\cos\theta \\ \cos\theta & \sin\theta \end{bmatrix} + \cos\theta \begin{bmatrix} \cos\theta & \sin\theta \\ -\sin\theta & \cos\theta \end{bmatrix}$

2) Find x, y if $\begin{bmatrix} -2 & 0 \\ 3 & 1 \end{bmatrix} \begin{bmatrix} -1 \\ 2x \end{bmatrix} + 3 \begin{bmatrix} -2 \\ 1 \end{bmatrix} = 2 \begin{bmatrix} y \\ 3 \end{bmatrix}$

3) If $A = \begin{bmatrix} 1 & -3 \\ 2 & 4 \end{bmatrix}$, $B = \begin{bmatrix} -1 \\ 2 \end{bmatrix}$ and C is a matrix, such that $AC = B$, find (i) order of matrix C
(ii) matrix C

4) Nandita deposits ₹350 per month at 10% p.a. in a recurring deposit account for $2\frac{1}{2}$ years. Find
(i) interest earned in $2\frac{1}{2}$ years
(ii) matured value

5) Ayushi has a R.D. account and deposits ₹600 per month for a period of 5 years. If she gets ₹43320 at the time of maturity, then find the rate of interest per annum.

6) A person invests ₹4368 and buys 100 rupees shares at ₹91. He sells out 24 shares when the price rises to ₹95 and remaining when the price falls to ₹85. Find the gain or loss on the total transaction.

7) A man sold certain ₹100 shares paying 10% dividend at a discount of 25% and invested the proceeds in ₹100 shares paying 16% dividend quoted at ₹80 and thus increased his income by ₹2000. Find the no. of shares sold by him.

8) A company with 4000 shares of nominal value of ₹110 each declares an annual dividend of 15%. Calculate
(i) the total amount of dividend paid by the company
(ii) the annual income of Tanya who hold 88 shares
(iii) if he received only 10% on his investment, find the price Shruti paid for each share

Answers

1) $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$

2) $x = 3, y = -2$

3) (i) 2×1 (ii) $\begin{bmatrix} 1/5 \\ 2/5 \end{bmatrix}$

4) (i) 135625 (ii) 11856.25

5) 8%

6) Loss of .48

7) 400

8) (i) 66000 (ii) 1452 (iii) 165

CLASS X

Banking, Shares & Dividend, Matrices

Ques 1 Given matrix $A = \begin{bmatrix} 4\sin 30^\circ & \cos 0^\circ \\ \cos 0^\circ & 4\sin 30^\circ \end{bmatrix}$, $B = \begin{bmatrix} 4 \\ 5 \end{bmatrix}$

If $AX = B$ (i) Write the order of matrix X

(ii) Find the matrix 'X'

Ques 2 Construct a 2×2 matrix where $a_{ij} = 3i - j$

Ques 3 Tanya gets ₹ 6,455 at the end of one year at the rate of 14% per annum in a Recurring Deposit Account. Find the monthly instalment.

4 Ayushi has a recurring deposit account in a bank of ₹ 2000 per month at the rate of 10% per annum. If she gets ₹ 83,100 at the time of maturity, find the total time (in years) for which the account was held.

Ques 5 Nandita invested ₹ 8000 in 7% ₹ 100 shares at ₹ 80. After a year, he sold these shares at ₹ 75 each and invested the proceeds in 18% ₹ 25 shares at ₹ 41. Find (i) his dividend for the first year

(ii) his annual income in the second year

(iii) the percentage increase in his return on his original investment.

Ques 6 A dividend of 9% was declared on ₹ 100 shares selling at a certain price. If the rate of return is 7.5%, calculate :-

(i) the market value of the share

(ii) the amount to be invested to obtain an annual dividend of ₹ 630.

Ques 7 Vridhi invested ₹ 50,760 into two parts such that if one part is invested in 8% ₹ 100 shares at 8% discount and the other in 9% ₹ 100 shares at 8% premium, the annual income from both the investments are equal.

Answers

3) 500

4) 3 yrs

5) (i) 700 (ii) 900 (iii) 2.5%

6) (i) 120 (ii) 8400

7) 24840 , 25920

Revision
Shares and Divided

1. A dividend of 9% was declared on ₹ 100 shares selling at a certain price. If the rate of return is $7\frac{1}{2}$%, calculate:
   (*i*) the market value of the share.
   (*ii*) the amount to be invested to obtain an annual dividend of ₹ 630. ***(ICSE 2000)***
2. A man invests ₹ 8800 in buying shares of face value of rupees hundred each at a premium of 10% in a company. If he earns ₹ 1200 at the end of the year as dividend, find:
   (*i*) the number of shares he has in the company.
   (*ii*) the dividend percentage per share. ***(ICSE 2001)***
3. A man wants to buy 62 shares available at ₹ 132 (par value of ₹ 100).
   (*i*) How much should he invest?
   (*ii*) If the dividend is 7.5%, what will be his annual income?
   (*iii*) If he wants to increase income by ₹ 150, how many extra shares should he buy? ***(ICSE 2002)***
4. A man invests ₹ 20,020 in buying shares of nominal value ₹ 26 at 10% premium. The dividend on the shares is 15% per annum. Calculate:
   (*i*) the number of shares he buys.
   (*ii*) the dividend he receives annually.
   (*iii*) the rate of interest he gets on his money. ***(ICSE 2003)***
5. A man invested ₹ 45,000 in 15% ₹ 100 shares quoted at ₹ 125. When the market value of these shares rose to ₹ 140, he sold some shares, just enough to raise ₹ 8400? Calculate:
   (*i*) the number of shares he still holds.
   (*ii*) the dividend due to him on these remaining shares. ***(ICSE 2004)***
6. Mr. Tewari invested ₹ 29,040 in 15%, ₹ 100 shares quoted at a premium of 20%. Calculate:
   (*i*) The number of shares bought by Mr. Tewari.
   (*ii*) Mr. Tewari's income from the investment.
   (*iii*) The percentage return on his investment. ***(ICSE 2005)***
7. Mr. Ram Gopal invested ₹ 8000 in 7% ₹ 100 shares at ₹ 80. After a year he sold these shares at ₹ 75 each and invested the proceeds (including his dividend) in 18%, ₹ 25 shares at ₹ 41. Find:
   (*i*) his dividend for the first year.
   (*ii*) his annual income in the second year.
   (*iii*) the percentage increase in his return on his original investment. ***(ICSE 2006)***
8. Ajay owns 560 shares of a company. The face value of each share is ₹ 25. The company declares a dividend of 9%. Calculate:
   (*i*) The dividend that Ajay will get.
   (*ii*) The rate of interest on his investment, if Ajay had paid ₹ 30 for each share. ***(ICSE 2007)***
9. A company with 4000 shares of nominal value of ₹ 110 each declares an annual dividend of 15%. Calculate:
   (*i*) The total amount of dividend paid by the company.
   (*ii*) The annual income of Shahrukh who holds 88 shares in the company.
   (*iii*) If he received only 10% on his investment, find the price Shahrukh paid for each share. ***(ICSE 2008)***
10. Amit Kumar invests ₹ 36,000 in buying ₹ 100 shares at ₹ 10 premium. The dividend is 15% per annum. Find:
    (*i*) the number of shares he buys.
    (*ii*) his yearly dividend.
    (*iii*) the percentage return on his investment. Give your answer correct to the nearest whole number. ***(ICSE 2009)***
11. Vivek invests ₹ 4,500 in 8%, ₹ 10 shares at ₹ 15. He sells the shares when the price rises to ₹ 30 and invests the proceeds in 12% ₹ 100 shares at ₹ 125. Calculate.
    (*i*) the sale proceeds, (*ii*) the number of ₹ 125 shares he buys, (*iii*) the change in his annual income from dividend. ***(ICSE 2010)***
12. Mr. Parekh invested ₹ 52,000 on ₹ 100 shares of a discount of ₹ 20 paying 8% dividend. At the end of one year he sells the shares at a premium of ₹ 20. Find:
    (*i*) the annual dividend.
    (*ii*) the profit earned including his dividend. ***(ICSE 2011)***
13. A man invests ₹ 9600 on 100 shares at ₹ 80. If the company pays him 18% dividend, find:
    (*i*) the number of shares he buys.
    (*ii*) his total dividend.
    (*iii*) his percentage return on shares. ***(ICSE 2012)***
14. Salman buys 50 shares of face value ₹ 100 available at ₹ 132
    (*i*) What is his investment?
    (*ii*) If the dividend is 7.5%, What will be his annual income?
    (*iii*) If he wants to increase his annual income by ₹150, how many extra shares should he buy? ***(ICSE 2013)***
15. Salman invests a sum of money in ₹ 50 shares, paying 15% dividend quoted at 20% premium. If his annual dividend is ₹ 600, calculate:
    (*i*) the number of shares he bought.
    (*ii*) his total investment.
    (*iii*) the rate of return on his investment ***(ICSE 2014)***
16. Rohit invested ₹ 9600 on ₹ 100 shares at ₹ 20 premium paying 8% dividend. Rohit sold the shares when the price rose to ₹ 160. He invested the proceeds (excluding dividend) in 10% ₹ 50 shares at ₹ 40. Find the:
    (*i*) original number of shares
    (*ii*) sale proceeds
    (*iii*) new number of shares
    (*iv*) charge in the two dividends ***(ICSE 2015)***
17. Ashok invested ₹ 26,400 on 12%, ₹ 25 shares of a company. If he receives a dividend of ₹ 2475, find the:
    (*i*) the number of shares he bought.
    (*ii*) market value of each share. ***(ICSE 2016)***

ANSWERS

1. (*i*) ₹ 120 (*ii*) ₹ 8400
2. (*i*) 80 (*ii*) 15%
3. (*i*) ₹ 8184 (*ii*) ₹ 465 (*iii*) 20 shares
4. (*i*) ₹ 700 (*ii*) 2730 (*iii*) 13.64%
5. (*i*) 300 shares (*ii*) ₹ 4500
6. (*i*) 242 (*ii*) ₹ 3630 (*iii*) 12.5%
7. (*i*) ₹ 700 (*ii*) ₹ 900 (*iii*) 2.5%
8. (*i*) ₹ 1260 (*ii*) $7\frac{1}{2}\%$
9. (*i*) ₹ 66000 (*ii*) ₹ 1452 (*iii*) ₹ 165
10. (*i*) 300 shares (*ii*) ₹ 4500 (*iii*) 13%
11. (*i*) ₹ 9000 (*ii*) 72 shares (*iii*) ₹ 624
12. (*i*) Annual dividend = ₹ 5200 (*ii*) Profit including dividend = ₹ 31,200
13. (*i*) ₹ 120 (*ii*) ₹ 2160 (*iii*) 22.5%
14. (*i*) ₹ 6600 (*ii*) ₹ 375 (*iii*) 20 shares
15. (*i*) 80 shares (*ii*) ₹ 4800 (*iii*) 12.5%
16. (*i*) 80 (*ii*) ₹ 12800 (*iii*) ₹ 30 (*iv*) ₹ 960
17. (*i*) 825 (*ii*) ₹ 32

CLASS - X

CHAPTER TEST

Time : 1 Hour — Shares and Dividend — MM : 30

1. A man invested ₹ 10,560 in a company paying 9% dividend at the time when its ₹ 100 shares can be bought at ₹ 132. Find :
   (i) the number of shares bought by him.
   (ii) his annual income from these shares.
   (iii) the rate of return on his investment. 3
2. By purchasing ₹ 50 shares of a company for ₹ 75 each, a man gets 8% per annum on his investment.
   (i) What rate percent is the company paying?
   (ii) What is his annual dividend if he buys 245 shares? 3
3. Karim buys 400, ₹ 20 shares at a premium of ₹ 4 each and receives a dividend of 12%. Find :
   (i) the amount investment.
   (ii) his total income from the shares. 3
4. Peter invests ₹ 14,950 in ₹ 100 shares of a company paying 14% dividend. If his annual income from these shares is ₹ 1,610, find the market value of each share. 3
5. By investing ₹ 8,875 in the shares of a company paying 15% dividend a person gets an income of ₹ 375. If the nominal value of each share is ₹ 100. Find :
   (i) the market value of each share.
   (ii) the rate of return on his investment. 3
6. Mr. Sandeep invests ₹ 13,500 partly in shares paying 6% at ₹ 140 and partly in shares paying 5% at ₹ 125. If his total income is ₹ 560, how much has he invested in each? 3
7. Bishan bought 360, ₹ 25 shares paying 12% dividend per annum. he sold them when the price rose to ₹ 40 and invested the proceeds in ₹ 50 shares, paying 10% dividend and quoted at ₹ 60. Find the change in his annual income. 3
8. Mr. Goswami invests ₹ 9,000 in a company paying 6% dividend p.a., when a share of face value ₹ 100 stands at ₹ 150. What is his annual income? He sells 50% of his share when the market value rises to ₹ 200. What is his gain on this transaction? 3
9. A man invested ₹ 45,000 in 15% ₹ 100 shares quoted at ₹ 125. When the market value of these shares rose to ₹ 140, he sold some shares, just enough to raise ₹ 8,400. Calculate :
   (i) the number of shares, he still holds.
   (ii) the dividend due to him on these remaining shares. 3
10. Divide ₹ 25,380 into two parts such that if one part is invested in 8% ₹ 100 shares at ₹ 92 and the other in 9% ₹ 100 shares at 8% premium, the annual incomes from both the investments are equal. 3

Answers:

1) (i) 80 (ii) 720 (iii) $6\frac{9}{11}\%$; 2) (i) 12% (ii) 1,470; 3) (i) 9600 (ii) 960
4) 130; 5) (i) 355 (ii) $4\frac{16}{71}\%$; 6) 7000, 6500; 7) 120; 8) 360, 1500
9) (i) 300 (ii) 4500 10) 12420, 12960

Class X

Topic-Matrices

Q 1. *Find the values of u, x, y and v when:*

$$\begin{bmatrix} x-2y & u-2v \\ x+2y & 2u+2y \end{bmatrix} = \begin{bmatrix} 5 & 8 \\ 11 & 6 \end{bmatrix}$$

Ans : $\begin{bmatrix} u=\frac{3}{2} \\ v=\frac{-13}{4} \end{bmatrix}$

Q 2. ***Simply*** $\cos\theta \begin{bmatrix} \cos\theta & \sin\theta \\ -\sin\theta & \cos\theta \end{bmatrix} + \sin\theta \begin{bmatrix} \sin\theta & -\cos\theta \\ \cos\theta & \sin\theta \end{bmatrix}$ *Ans:* $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$

Q 3. ***Let*** $A = \begin{bmatrix} -3 & 2 \\ 4 & -5 \end{bmatrix}$ *and* $B = \begin{bmatrix} -1 & 3 \\ 2 & -6 \end{bmatrix}$

Find a matrix x such that $x + A = B$

Ans : $\begin{bmatrix} 2 & 1 \\ -2 & -1 \end{bmatrix}$

Q 4.

If $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$ *and* $B = \begin{bmatrix} 5 & 6 \\ 7 & 8 \end{bmatrix}$
find AB and BA. Show that $AB \neq BA$

Q 5. *Let A be a matrix such that* $A \begin{bmatrix} 2 & 1 \\ 0 & 3 \end{bmatrix} = [4 \quad -7]$

(i) State the order of A (ii) Find A

Ans : $\begin{pmatrix} order\ 1x2 \\ A = [2, -3] \end{pmatrix}$

Q 6. *If* $A = \begin{bmatrix} 2 & 2 \\ a & b \end{bmatrix}$, *find a and b so that* $A^2 = O_{2x2}$.

Ans : $\begin{bmatrix} a=-2 \\ b=-2 \end{bmatrix}$

Q 7. *If* $A = \begin{bmatrix} 1 & 0 \\ -1 & 7 \end{bmatrix}$ *and* $I = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$, *then find k so that that*

$A^2 = 8A + kI$

Ans : $(k = -7)$

Q 8. *Find x, y if* $\begin{bmatrix} 3 & -2 \\ -1 & 4 \end{bmatrix} \begin{bmatrix} 2x \\ 1 \end{bmatrix} + 2 \begin{bmatrix} -4 \\ 5 \end{bmatrix} = \begin{bmatrix} 8 \\ 4y \end{bmatrix}$ *Ans:* $(x = 3, y = 2)$

Q 9. *Solve the matrix equation*

$$[x \quad 1] \begin{bmatrix} 1 & 0 \\ -2 & -3 \end{bmatrix} \begin{bmatrix} x \\ 5 \end{bmatrix} = 0$$

Ans : $(x = 5, -3)$

Q 10. *If* $A = \begin{bmatrix} 1 & -1 \\ 2 & -1 \end{bmatrix}$, $B = \begin{bmatrix} a & 1 \\ b & -1 \end{bmatrix}$ *and*
$(A+B)^2 = A^2 + B^2$, *find a and b*

Ans : $(a = 1, b = 4)$

Topic : Probability

SELF EVALUATION AND REVISION (ICSE Questions)

1. A die is thrown once. What is the probability that the
   (*i*) number is even ?
   (*ii*) number is greater than 2 ? ***(ICSE 2009)***
2. Cards marked with numbers 1, 2, 3, 4..... 20 are well shuffled and a card is drawn at random. What is the probability that the number on the card is :
   (*i*) a prime number ? (*ii*) divisible by 3 ?
   (*iii*) a perfect square ? ***(ICSE 2010)***
3. From a pack of 52 playing cards all cards whose numbers are multiples of 3 are removed. A card is now drawn at random. What is the probability that the card drawn is
   (*i*) a face card (King, Jack or Queen) ?
   (*ii*) an even numbered red card ? ***(ICSE 2011)***
4. Two coins are tossed once. Find the probability of getting:
   (*i*) 2 heads
   (*ii*) at least 1 tail ***(ICSE 2012)***
5. A box contains some black balls and 30 white balls. If the probability of drawing a black ball is two-fifth of a white ball, find the number of black balls in the box. ***(ICSE 2013)***
6. A die has 6 faces marked by the given numbers as shown below:

1	2	3	−1	−2	−3

   The die is thrown once. What is the probability of getting
   (*i*) a positive integer
   (*ii*) an integer greater than − 3
   (*iii*) the smallest integer ***(ICSE 2014)***
7. A bag contains 5 white balls, 6 red balls and 9 green balls. A ball is drawn at random from the bag. Find the probability that the ball drawn is:
   (*i*) a green ball
   (*ii*) a white or a red ball
   (*iii*) is neither a green ball nor a white ball
   (ICSE 2015)
8. A game of numbers has cards marked with 11, 12, 13, ..., 40. A card is drawn at random. Find the probability that the number on the card drawn is:
   (*i*) A perfect square
   (*ii*) Divisible by 7 ***(ICSE 2016)***

ANSWERS

1. (*i*) $\frac{1}{2}$ (*ii*) $\frac{2}{3}$ 2. (*i*) $\frac{8}{20}=\frac{2}{5}$ (*ii*) $\frac{6}{20}=\frac{3}{10}$ (*iii*) $\frac{4}{20}=\frac{1}{5}$ 3. (*i*) $\frac{3}{10}$ (*ii*) $\frac{1}{5}$ 4. (*i*) $\frac{1}{4}$ (*ii*) $\frac{3}{4}$

5. 12 6. (*i*) $\frac{1}{2}$ (*ii*) $\frac{5}{6}$ (*iii*) $\frac{1}{6}$ 7. (*i*) $\frac{9}{20}$ (*ii*) $\frac{11}{20}$ (*iii*) $\frac{6}{20}=\frac{3}{10}$

8. (*i*) $\frac{1}{10}$ (*ii*) $\frac{2}{15}$

Probability

Question 1.

Sixteen cards are labelled as $a, b, c, ...,m, n, o, p$. They are put in a box and reshuffled. A boy is asked to draw a card from the box. What is the probability that the card drawn is :

(*i*) a vowel (*ii*) a consonant (*iii*) none of the letters of the word median **[*ICSE 2017*]**

Question 2.

Cards bearing numbers 2, 4, 6, 8, 10, 12, 14, 16, 18 and 20 are kept in a bag. A card is drawn at random from the bag. Find the probability of getting a card which is

(*i*) a prime number (*ii*) a number divisible by 4

(*iii*) a number that is a multiple of 6 (*iv*) an odd number **[*ICSE 2018*]**

Question 3.

There are 25 dises numbered 1 to 25. They are put in a closed box and shaken thoroughly. A disc is drawn at random from the box. Find the probability that the number on the disc is

(*i*) an odd number (*ii*) divisible by 2 and 3 both

(*iii*) a number less than 16. **[*ICSE 2019*]**

Question 4.

Each of the letters of the word AUTHORIZES is written on identical circular discs and put in a bag. They are well shuffled. If a disc is drawn at random from the bag, what is the probability that the letter is :

(*i*) a vowel

(*ii*) one of the first 9 letters of the English alphabet which appears in the given word.

(*iii*) one of the last 9 letters of the English alphabet which appears in the given word. **[*ICSE 2020*]**

Question 5.

The probability of getting a number divisible by 3 in throwing a die is

(*a*) $\frac{1}{6}$ (*b*) $\frac{1}{3}$ (*c*) $\frac{1}{2}$ (*d*) $\frac{2}{3}$

[*ICSE 2nd Semester 2022*]

Question 6.

A bag contains 5 white, 2 red and 3 black balls. A ball is drawn at random. What is the probability that the ball drawn is a red ball? **[*ICSE 2nd Semester 2022*]**

Question 7.

A letter of the word 'SECONDARY' is selected at random. What is the probability that the letter selected is not a vowel? **[*ICSE 2nd Semester 2022*]**

ANSWERS

1. (*i*) $\frac{1}{4}$ (*ii*) $\frac{3}{4}$ (*iii*) $\frac{5}{8}$

2. (*i*) $\frac{1}{10}$ (*ii*) $\frac{1}{2}$ (*iii*) $\frac{3}{10}$ (*iv*) 0

3. (*i*) $\frac{13}{25}$ (*ii*) $\frac{4}{25}$ (*iii*) $\frac{3}{5}$

4. (*i*) $\frac{1}{2}$ (*ii*) $\frac{2}{5}$ (*iii*) $\frac{1}{2}$

5. (*b*) **6.** $\frac{1}{5}$ **7.** $\frac{2}{3}$