# MATHS

# BOOKS - UNITED BOOK HOUSE

# DAULATPUR DALUICACHA BHARATI VIDYALAYA

## Exercise

**1.** Multiple Choice Questions (MCQ) If a principal becomes twice of its amonut in 10

years, then the rate of simple interest per annum is

A. 0.05

B. 0.1

C. 0.15

D. 0.2

**Answer:**

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**2.** If the product of two roots of the equation $x^2 - 3x + k = 10$ is -2 then k=

A. $-2$

B. $-8$

C. 8

D. 12

**Answer:**

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**3.** Length of radius and length of one chord of a circle are 13 cm and 10cm respectively. The distance from centre to the chord of the circle is.

A. 12.5 cm

B. 12 cm

C. $(69)$ cm

D. 24 cm

**Answer:**

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**4.** In $\triangle ABC$, $\sin\left(\frac{B+C}{2}\right)$=

A. $\sin\left(\frac{A}{2}\right)$

B. $\cos\left(\frac{A}{2}\right)$

C. sin A

D. cos A

**Answer:**

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**5.** In a right circular cylinder, if the length of radius is halved and height is doubled, volume of cylinder will be

A. equal

B. double

C. half

D. 4 times

**Answer:**

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**6.** If the median of arranging the ascending order of data 8,9,12,17,x+2,x+6,30,31,34,39 is 24, then the value of x is

A. 22

B. 21

C. 20

D. 24

**Answer:**

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**7.** Fill in the blanks

If the principal of 1st year at the rate of r% compound interest is RsP, then the principal of 2nd year is Rs___.

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**8.** Fill in the blanks

Conjugate surds of $\left(\sqrt{3}-5\right)$ is____.

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**9.** In ABCD is a cyclic parallelogram then $\angle A$=

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**10.** Fill in the blanks

If $\sin(\theta - 30^\circ) = \frac{1}{2}$ then $\cos\theta$=_____.

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**11.** Fill in the blanks

Number of surfaces of a solid hemisphere

is_____.

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**12.** Fill in the blanks

If the mean of n numbers $x_1, x_2, x_3, \ldots, x_n$ is $\bar{x}$ then the mean of $kx_1, kx_2, kx_3, \ldots, kx_n$ is_____.

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**13.** In a business, the ratio of the capital of Rajus and Asif is 5:4 and if the profit of Rajus is Rs 80 then the profit share of Asif will be___

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**14.** To warn ships for underwater rocks, a lighthouse spreads a red colored light over a sector of angle $80^{o}$ to a distance of 16.5 km. Find the area of the sea over which the ships are warned.

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**15.** If two circles of radii 7 cm and 3 cm touch each other extermally, then the distance between their centres will be 4 cm.

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**16.** $\cos^2 20^\circ + \cos^2 70^2 = 1.$

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**17.** Write true or false:

If the ratio of the total surface area of two cube is 4:9 then the ratio of their volumes will be 27:8.

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**18.** Define Assumed Mean Method Formula elaborately.

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**19.** In a partnership business, the ratio of the capital of Pritha and Rabea is 2:3 and that of Rabea and Jashmin is 4:5. Find the ratio of the capital of Pritha, Rabea and Jeshmin.

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**20.** What is the rate of simple interest per annum, when the interest of some money in 4 years will be $\frac{8}{25}$ part of its principal?

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**21.** Calculate the compound ratio of a:bc.b:ca and c:ab.

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**22.** If 2x + 1/x = 2, then find the value of $\frac{x}{2x^2 + x + 1}$.

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**23.** PQ and AB are two equal chords of a circle with centre O, If $\angle POQ = 60^\circ$ and AB = 8.5 cm, then calculate the length of diameter of it.

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**24.** AB is the diameter of a semicircle with radius 4 cm in length and $\angle ACB$ is semicircular angle. If $BC = 2\sqrt{7}$ then find the length of AC.

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**25.** ABCD is a cyclic trapezium having AD||BC. If $\angle ABC = 70^\circ$ then $\angle BCD = ?$

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**26.** If $\tan(\theta + 15^\circ) = \sqrt{3}$ then $\sin\theta + \cos\theta$=?

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**27.** If the number of surface of a cuboid is x, the number of edges is y, the number of vertices is z and the number of diagonals is P, then find the value of x - y + z + P.

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**28.** If the numberical values of volume and curved surface area of a right circular cylinder are equal then find the length of its radius.

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**29.** In a frequency distribution table, mean = 54, $sunf_ix_i = 2200 + 50k$ and $sunf_i = 40 + k$, find the value of k.

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**30.** Three friends invested ₹ 1,20,000, ₹ 1.50,000 and ₹ 1,10,000 respectively to purchase a bus. The first person is a driver and the other two are conductors. They decided to divide 2/5th of the profit among themselves in

the ratio of 3 : 2 : 2 according to their work and the remaining in the ratio of their capitals. If they earn ₹29,260 in one month, find share of each of them.

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**31.** As a result of publicity on against smoking the number of smoker is decreased by $6\frac{1}{4}\%$ every year in comparison to its previous year. If the number of smokers at present in a citgy is

33,750 then find the number of smokers in that city 3 years before.

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**32.** The tenth digit of two digit number is less by 3 than the unit digit. If the product of the two digits are subtracted from the number the result is 15. Find the unit digit of a number.

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**33.** If one root of the equation $ax^2 + bx + c = 0(a \neq 0)$ is twice the other, than show that $2b^2 = 9ac$.

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**34.** সরল করো :

$$\frac{\sqrt{5}}{\sqrt{3}+\sqrt{2}} - \frac{3\sqrt{3}}{\sqrt{2}+\sqrt{5}} + \frac{2\sqrt{2}}{\sqrt{3}+\sqrt{5}}।$$

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**35.** Find the value of x for which the points (x, – 1), (2, 1) and (4, 5) are collinear.

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**36.** What should be added to each of 6,15,20 and 43 to make the sums proportional?

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**37.** If $\frac{x}{lm-n^2}=\frac{y}{mn-l^2}=\frac{z}{nl-m^2}$, then show that lx+my+nz=0

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**38.** Prove that opposite angles of a cyclic quadrilateral are supplementary

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**39.** Prove that the front angle formed at the centre of a circle by an arc, is double of the angle formed by the same arc at any point on the circle.

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**40.** Two circles interest at A and B. P is a point on produced BA. PT and PQ are tangents to the circle. The relation of PT and PQ is___

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**41.** AB and CD are two chords of a cricle. Extended BA and CD intersect at P. Prove that $\angle PCB = \angle PAD.$

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**42.** Draw a triangle ABC whose BC = 5cm, BA = 5.5 cm and $\angle ABC = 70^\circ$ draw the incircle of $\triangle ABC.$

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**43.** Geometrically calculate the value of $\sqrt{23}$.

(Only traces of construction are required).

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**44.** Find the value of

$$\cot^2 30^\circ - 2\cos^2 60^\circ - \frac{3}{4}\sec^2 45^\circ - 4\sin^2 30^\circ$$

.

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**45.** If $\angle A + \angle B = 90^\circ$, show that $1 + \frac{\tan A}{\tan B} = \sec^2 A$.

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**46.** If $5\sin^2\theta + 4\cos^2\theta = \frac{9}{2}$, find the value of $\tan\theta$.

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**47.** From a point on the roof of five storied building the angle of elevation of the top of a monument and that of depression of the foot of the monument are $60^\circ$ and $30^\circ$ respectively. If the height of the building is 16 metres, then calculate the height of the monument and the distance of the building from the monument.

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**48.** A man standing in the midst of a field observes, a flying bird in his north at an angle of elevation of $30^\circ$ and after 2.5 minutes he observes the bird in his south at an angle of elevation of $60^\circ$. If the bird flies in a straight line all along at a height of $60\sqrt{3}$ metres, what is its speed?

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**49.** The length of the base diameter of a wooden toy of conical shape is 10 cm. The expenditure for polishing whole surfaces of the toy at the rate of Rs. 2.10 per$m^2$ is Rs. 429. Calculate the height of the toy and also determine the quantity of wood which is required to make the toy.

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**50.** The length and breadth of a rectangular field of the village are 20m and 15 m respectivley. For construction of pillars in the 4 corners of that filed 4 cubic holes having length of 4 m are dug out and the soils removed are dispersed on the remaining land. Calculate 6 and write the height of the surface of field that is increased by.

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**51.** The length of outer an inner diameter of a right circular cylindrical pipe open at two ends are 30 cm and 26 cm respectively and length of pipe is 14.7 metre. Find the cost of painting its all surfaces with coaltar at Rs 2.25 per dcm.

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**52.** If the mean of the following frequency distribution table is 24 then find the value of P.

| Class limit (Marks) | 0-10 | 10-20 | 20-30 | 30-40 | 40-50 |
|---|---|---|---|---|---|
| No. of students | 15 | 20 | 35 | $P$ | 10 |

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**53.** Calculate the median of the following data

| Marks Obtained | 0-10 | 10-30 | 30-60 | 60-70 | 70-90 |
|---|---|---|---|---|---|
| No. of students | 15 | 25 | 30 | 4 | 10 |

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**54.** Find the mode of the following data

| Age (years) | 16-18 | 18-20 | 20-22 | 22-24 | 24-26 |
|---|---|---|---|---|---|
| No. of Examinee | 45 | 75 | 38 | 22 | 20 |

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