# MATHS

# BOOKS - UNITED BOOK HOUSE

# ANNUAL EXAMINATION QUESTION PAPERS 2017

## Exercise

**1.** If $B \subseteq A$,then the set B -A will be ____

A. a)B

B. b)A

C. c)$\varphi$

D. d)A'

**Answer:**

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**2.** If $\omega$be the imaginary cube root of 1 ,then the value of $\left(3+\omega+3\omega^2\right)^4$will be ___

A. a)16

B. b)$16\omega$

C. c)$16\omega^2$

D. d)none of these

**Answer:**

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**3.** If the differnce between the roots of the quadratic equation $x^2 + px + 8 = 0$be 2,thn the value of p will be __

A. a)$\pm 2$

B. b) $\pm 4$

C. c) $\pm 6$

D. d) $\pm 8$

**Answer:**

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**4.** If 16C_r = 16C_(2r+1) then the vaue of r is

A. a) 6

B. b) 5

C. c)4

D. d)3

**Answer:**

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**5.** Find the coordinates of the focus , axis, the question of the directrix and latus rectum of the parabola $y^2 = 8x$.

A. a)y=0

B. b)x=1

C. c)x=-1

D. d)y=-1

**Answer:**

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**6.** The co-ordinattes of B and C of the trianglle ABC are (5,2,8) and (2,-3,4) respectively.If the centroid of the triangle ABC are (3,-1,3) then the coordinates of A are ___

A. a)(2,-2,2)

B. b)(2,-2,-3)

C. c)(2,-2,-3,)

D. d)(-2,-2,-3)

**Answer:**

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**7.** The value of $Lt_{x \to 0} \frac{e^x - e^{-x}}{x}$ is ___

A. a)0

B. b)2

C. c)1

D. d)3

**Answer:**

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**8.** if $y = \cos^2\left(\frac{x}{2}\right)$ the value of dy/dx is ___

A. a)cosx

B. b)1/2cosx

C. c)-1/2sinx

D. d)-sinx

**Answer:**

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**9.** If $P(A \cap B) = \frac{5}{13}$,then the value of $P(A^c \cup B^c)$is___

A. a)4/13

B. b)6/13

C. c)8/13

D. d)12/13

**Answer:**

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**10.** If the variance of a distribution is 4 coefficient of variation is 5%,then mean of the distribution is ___

A. a)20

B. b)40

C. c)60

D. d)80

**Answer:**

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**11.** A relation R is defined from A={1,2,3,4,5} to B={1,2,3}in such a way that,$(x, y) \in R \Rightarrow x > y$ .Express R a set of ordered pairs.

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**12.** If (x+y) $\propto$ (x-y) , then show that $\left(x^3+y^3\right) \propto \left(x^3-y^3\right)$.

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**13.** Show that $\frac{1}{\sin 10^\circ} - \frac{\sqrt{3}}{\cos 10^\circ} = 4$

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**14.** Find the value of $2ac\sin\left(\frac{A-B+C}{2}\right)$ for $\triangle ABC$

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**15.** If z be a complex number and $|z+5| \leq 6$ ,then find the maximum and minimum values on |z+2|.

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**16.** If ^nP_r=504 and $\hat{} \; nC_r = 84$,then find value of n and r.

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**17.** Find the coefficinet of $\frac{1}{x^2}$ in the expansion of $\left(2x^3 - \frac{1}{x^2}\right)^6$.

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**18.** If P-th term of an arithmetic progression be Q and Q-th term be P.then show that (P+Q)thterm is O.

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**19.** If the perimeter of the triangle formed by the straight line $4x+3y+k=0$with the coordinate axes be 24 unit,then the value of k.

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**20.** Find the co-ordinates of the point lies on the plane YOZ which is equidistant from the points A(1,-1,0),B(2,1,2) and C(3,2,-1).

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**21.** Evaluate : $\lim_{x \to 0} \frac{\cos 5x - \cos 7x}{\cos x - \cos 5x}$

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**22.** If (x+4)y=x.then show that x dy/dx+y(y-1)=0.

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**23.** If a coin is tossed 3 times in succession,then find the probability of obtaining tail at least once.

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**24.** The standard deviation of 32 numbers is 5.If the sum of the numbers is 80,determine the sum of the squares of the numbers.

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**25.** For any three sets A,B and C ,prove that $A-(B\cup C)=(A-B)\cap(A-C)$.

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**26.** If $\frac{\sin^4\alpha}{a}+\frac{\cos^4\alpha}{b}=\frac{1}{a+b}$,then show that $\frac{\sin^8\alpha}{a^3}+\frac{\cos^8\alpha}{b^3}=\frac{1}{(a+b)^3}$.

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**27.** If for a triangle ABC , cot A+cotB+cotC=$\sqrt{3}$ ,then show that the triangle is equilateral.

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**28.** If n in N,then prove by mathematical induction that 7^(2n)+2^3(n-1).3^(n-1) is always a multipe of 25.

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**29.** If z=x+iy and $\frac{z-i}{z+1}$ is purely imaginary,then show that the point z always lies on a circle.

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**30.** How many odd numbers of fve digits can be formed with the digits 3,6,7,2,0 when no digits is repeated?

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**31.** Prove that the middle term in the expansion of $(1+x)^{2n}$ is $\frac{1.3.5.\ldots\ldots(2n-1)}{\lfloor n}.2^n.\,x^n$

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**32.** If the ratio the sum of 1st n terms of two arithemtic series is (4n-13):(3n+10),then find the ration of their ninth terms.

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**33.** Find the equations of the lines passing thorugh the point (4,5)making equal angles with the lines 3x=4y+7 and 5y=12x+6.

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**34.** If the equation of the side BC of an equilateral triangle ABC is $x + y = 2$ and the coordinate of the vertex A is (2,3) then find the equation of the other two sides.

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**35.** A circle in the first quadrant touches both the axes its centre lies on the straight line lx+my+n=0.show that the equation of that circle is

$$(1+m)^2\left(x^2+y^2\right)+2n(l+m)(x+y)+n^2=0$$

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**36.** Evaluate: $\lim_{x \to 0} \frac{(e^x - 1)\log(1 + x)}{\sin^2 x}$


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**37.** Find from the first principle,the derivative of f(x)=sec2xat $x = \frac{\pi}{8}$.


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**38.** Prove by method of contradiction that $\sqrt{5}$is an irrational number

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**39.** Prove that truth table ~(pvq)=~p~q.

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**40.** If 30 dates are named at random,find the probability that 5 of them will be sundays.

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**41.** calculate the mean deviation about median for the following data:

| Marks : | 0-10 | 10-20 | 20-30 | 30-40 | 40-50 | 50-60 | 60-70 |
|---|---|---|---|---|---|---|---|
| No. of students | 6 | 5 | 8 | 15 | 7 | 6 | 3 |

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**42.** Solve: $4 \sin x \sin 2x \sin 4x = \sin 3x$.

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**43.** if $\tan\left(\frac{\theta}{2}\right) = \sqrt{\frac{1-e}{1+e}}\tan\left(\frac{\varphi}{2}\right)$,then prove that $\cos\varphi = \frac{\cos\theta - e}{I - e\cos\theta}$

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**44.** Solve the following inequation $\frac{|x+2|+2x}{x+2} > 2.$

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**45.** Solve applying formula:

$3x^2 - (2-i)x + 10 - 4i = 0$

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**46.** Out of 14 marbles 10 are red in colour and remaining 4 are of different colours.How many ways can you select 10 marbles out of these 14 marbles?

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**47.** Find the sum to n terms : $\frac{1}{2}+\frac{3}{2^2}+\frac{5}{2^3}+\ldots+\frac{2n-1}{2^n}$

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**48.** Prove that the locus of the mid-points of chords of length 2d units of the hyperbola $xy = c^2$is $\left(x^2 + y^2\right)\left(xy - c^2\right) = d^2xy$

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**49.** The co-ordinates of end points of a focal chord of an ellipse are $(x_1, y_1)$and $(x_2, y_2)$ .Prove that $y_1y_2 + 4x_1x_2 = 0$

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**50.** The ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$passes through the point of intersection of the lines 7x+13y=87and 5x-8y+7=0and the length of its latus rectum is $\frac{32\sqrt{2}}{5}$units.Find the values of a and b.

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