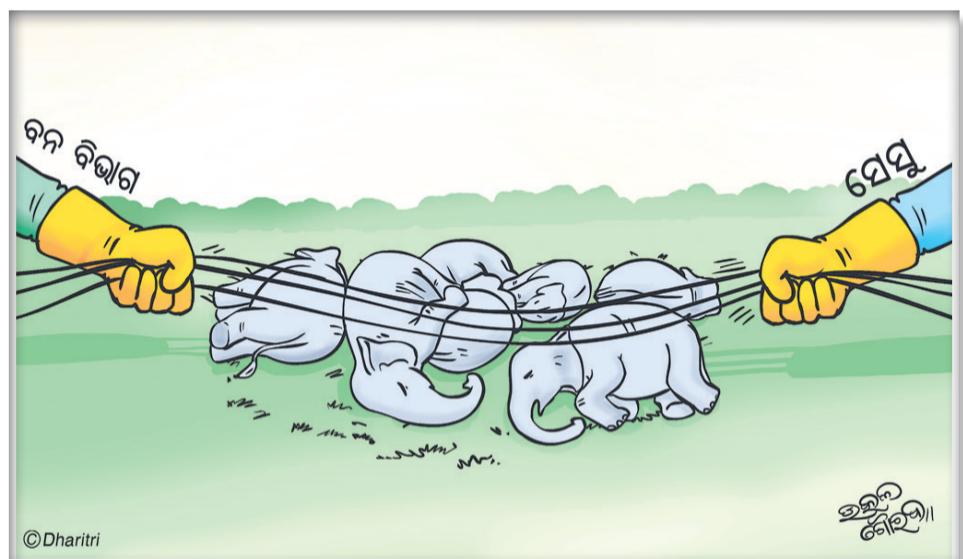




ସାମାଜିକ, ଅର୍ଥନୈତିକ, ରାଜନୈତିକ, ନ୍ୟାୟିକ ଘଣ୍ଟାବଳୀ ସହ ପରିବେଶ ଓ ଜୀବଜଙ୍ଗୁ ସମ୍ବନ୍ଧୀୟ ଖବର ୨୦୧୮ ରୁ ଚଳଚଞ୍ଚିଲ କରି ରଖିଥିଲା । ସେହିସବୁ ଘଣ୍ଟାକୁ ନେଇ ଧରିବୋର କାର୍ତ୍ତନ ସେଥି ଉପରୁ ହୋଇଥିଲା । ସେଥିମଧ୍ୟ ପାଠିକାପାଠକୁ ଆଯୋଜିତ କଲାଭଳି କିଛି ବ୍ୟକ୍ତିତ୍ବରୁ ଏଠାରେ ପ୍ଲାନେଟ କରାଯାଇଛି ।

-କାର୍ତ୍ତନିଷ୍ଠା: ଉନ୍ନତ ଗୌରବ







ସୁଧର୍ମ ସମାଜ ଯେ ଯାହା ଧର୍ମର ଆଶ ବ୍ୟାକୁ ଭାବେ ଜୀବଙ୍କୁ ତାକିଲେ ସେ ନିଷୟ ମନୋବିଜ୍ଞାନ ପୂର୍ଣ୍ଣ

- ମାନକୃଷ୍ଣ ପରମହଂସ

## ଜନ୍ମଦିନର ଶୁଭେଚ୍ଛା

ନାମ: .....  
ବୟବସା: .....  
ଜନ୍ମ ତାରିଖ: .....



ସଂତୋଷ ୨୦୧୮ ରେ ୨୦୧୮

ରତ୍ନଚନ୍ଦ୍ର  
ପରିବାରରେ  
ପ୍ରମୋଦ  
ପରିବାରରେ

ଏଠାରେ ୨୦୧୮  
ବ୍ୟ.ର. ପଣେ  
ଲକ୍ଷ୍ମୀ















Mock Test Paper for Std X, XII CBSE Board, IIT - JEE Main &amp; Advanced.

1. Let  $f: R \rightarrow R$  be a positive increasing function with  $\lim_{x \rightarrow \infty} \frac{f(3x)}{f(x)} = 1$ . Then  $\lim_{x \rightarrow \infty} \frac{f(2x)}{f(x)}$  is equal to

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

2.  $\int \frac{\sin 4x}{(2013 + \sin 2x)^{2014}} dx$

- (1)  $\frac{(1 + \sin 2x)}{2012(2013 + \sin 2x)^{2013}} + C$   
 (2)  $\frac{(1 - \sin 2x)}{2012(2013 + \sin 2x)^{2013}} + C$

(3)  $\frac{1 + \cos 2x}{(2013 + \sin 2x)^{2013}}$

(4) None of these

3. If  $f: (-1, 1) \rightarrow R$  be a differentiable function with  $f(0) = -1$  and  $f'(0) = 1$ .

Let  $g(x) = [f\{2f(x) + 2\}]^2$ .

Then  $g'(0)$  is equal to

- (1) 4      (2) -4  
 (3) 0      (4) -2

4. Two numbers  $m$  and  $n$  are chosen at random from the numbers 1, 2, 3, 4, ..., 10. The probability that  $(m^2 - n^2)$  is divisible by 3 is:

- (1)  $\frac{7}{15}$       (2)  $\frac{8}{15}$   
 (3)  $\frac{2}{7}$       (4)  $\frac{5}{7}$

5. Let  $f(x)$  be a polynomial of degree four having extreme values at  $x = 1$  and  $x = 2$ . If

$$\lim_{x \rightarrow 0} \left( 1 + \frac{f(x)}{x^2} \right) = 3, \text{ then } f(2) \text{ is equal to}$$

- (1) -4      (2) 0  
 (3) 4      (4) -8

6. A real root of the equation  $|x| e^x = 1$  lies in the interval

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

7. Let  $f: R \rightarrow R$  be defined by

$$f(x) = \begin{cases} k - 2x, & \text{if } x \leq -1 \\ 2x + 3, & \text{if } x > -1 \end{cases}$$

If  $f$  has a local minimum at  $x = -1$ , then a possible value of  $k$  is

- (1) -1      (2) 1  
 (3) 0      (4)  $-\frac{1}{2}$

8. The real number  $k$  for which the equation  $2x^3 + 3x + k = 0$  has two distinct real roots in  $[0, 1]$

- (1) lies between 2 and 3  
 (2) lies between -1 and 0  
 (3) does not exist  
 (4) lies between 1 and 2

9. Given  $f(x) = x^3 - px + q$  where  $p > 0$ . Then which one of the following holds?

# Exam Mate

FOR ANSWERS VISIT : [www.dharitri.com](http://www.dharitri.com)

## MOCK TEST PAPER # 2

### IITJEE (Main) (MATHEMATICS)

Maximum Marks: 120

Time : 1 hour

#### GENERAL INSTRUCTIONS

For each question you will be given 4 Marks if you have darkened only the bubble corresponding to the correct answer and zero mark if no bubble is darkened. In all other cases, minus one (-1) Marks (NEGATIVE MARKING) will be given.

- (1) The cubic has minima at  $-\sqrt{\frac{p}{3}}$  and maxima at  $\sqrt{\frac{p}{3}}$

- (3)  $\sqrt{2} + 1$       (4)  $\sqrt{5} + 1$

- (2) The cubic has minima at both  $\sqrt{\frac{p}{3}}$  and  $-\sqrt{\frac{p}{3}}$

- (1)  $\frac{xe^x}{(1+x^2)} + C$       (2)  $\frac{x}{(\log x)^2 + 1} + C$   
 (3)  $\frac{\log x}{(\log x)^2} + C$       (4)  $\frac{x}{x^2 + 1} + C$

- (3) The cubic has maxima at both  $\sqrt{\frac{p}{3}}$  and  $-\sqrt{\frac{p}{3}}$

18. The D.E.  $\frac{d^2y}{dx^2} = 0$  represents a family of  
 (1) straight lines in the plane  
 (2) concentric circles in the plane  
 (3) circles in the plane  
 (4) parabolas in the plane

- (4) The cubic has minima at  $\sqrt{\frac{p}{3}}$  and maxima at  $-\sqrt{\frac{p}{3}}$

19. The population  $p(t)$  at time  $t$  of a certain mouse species satisfies the D.E.  $\frac{dp}{dt} = 0.5p - 450$ . If  $p(0) = 850$ , then the time at which the population becomes zero, is

- (1)  $\frac{1}{2} \ln 18$       (2)  $\ln 18$   
 (3)  $2 \ln 18$       (4)  $\ln 9$

10. If the integral

$$\int \frac{5 \tan x}{(\tan x - 2)} dx = x + a \ln |\sin x - 2 \cos x| + K$$

then 'a' is equal to

- (1) -1      (2) -2  
 (3) 1      (4) 2

11. If  $f(x) = \min\{1, x^2, x^3\}$ , then  $f'(1)$  is

- (1) 0      (2) 2  
 (3) 3      (4) Non-existent

12. The solution to the differential equation

$$(1+y^2) + (x - e^{\tan^{-1} y}) \frac{dy}{dx} = 0 \text{ is}$$

(1)  $(x-2) = ke^{-\tan^{-1} y}$

(2)  $2xe^{\tan^{-1} y} = e^{2\tan^{-1} y} + k$

(3)  $xe^{\tan^{-1} y} = \tan^{-1} y + k$

(4)  $xe^{2\tan^{-1} y} = e^{\tan^{-1} y} + k$

13. If  $f(x+y) = 2f(x)f(y)$ ,  $f$  is differentiable and  $f(2) = 8$  then  $f'(3)$  equals

- (1)  $64(\ln 2)$       (2)  $128(\ln 2)$   
 (3)  $256(\ln 2)$       (4)  $1024(\ln 2)$

14. If  $\lim_{x \rightarrow \infty} \left( \frac{x^2 + x + 1}{x+1} - ax - b \right) = 4$  then

- (1)  $a = 1, b = 4$       (2)  $a = 1, b = -4$   
 (3)  $a = 2, b = -3$       (4)  $a = 2, b = 3$

15. If  $g(x) = 1 - x^{1/3}$  and

$$(fog)(x) = 2 + 5x^{1/3} - x^{2/3} - x, \text{ then the maximum value of } f(x) \text{ in } [-1, 3.5] \text{ is}$$

- (1) 0      (2) 1

- (3) 5      (4) 7

16.  $\lim_{n \rightarrow \infty} \sum_{r=1}^{2n} \frac{r}{\sqrt{n^2 + r^2}} \cdot \frac{1}{n}$  is equal to

- (1)  $\sqrt{2} - 1$       (2)  $\sqrt{5} - 1$

(1)  $\frac{1}{2}[(\vec{a} \times \vec{b}) + (\vec{b} \times \vec{c}) + (\vec{c} \times \vec{a})]$

(2)  $8[(\vec{a} \times \vec{b}) + (\vec{b} \times \vec{c}) + (\vec{c} \times \vec{a})]$

(3)  $\frac{3}{2}[(\vec{a} \times \vec{b}) + (\vec{b} \times \vec{c}) + (\vec{c} \times \vec{a})]$

(4)  $3[(\vec{a} \times \vec{b}) + (\vec{b} \times \vec{c}) + (\vec{c} \times \vec{a})]$

25. If the volume of the parallelepiped having  $(\vec{a} \times \vec{b})$ ; and  $(\vec{b} \times \vec{c})$  and  $(\vec{c} \times \vec{a})$  as coterminous edges is 8 cubic units, then the volume of the parallelepiped  $(\vec{b} + \vec{c}), (\vec{c} + \vec{a})$  and  $(\vec{a} + \vec{b})$  is coterminous edges is

- (1)  $4\sqrt{2}$       (2) 16

- (3) 64      (4) 256

26. An angle between the line

$$\vec{r} = (\hat{i} + 2\hat{j} - 3\hat{k}) + \lambda(2\hat{i} + \hat{j} - 2\hat{k}) \text{ and}$$

$$\text{the plane } \vec{r} \cdot (\hat{i} + \hat{j}) + 4 = 0, \text{ is}$$

- (1) 0      (2)  $\frac{\pi}{6}$

- (3)  $\frac{\pi}{4}$       (4)  $\frac{\pi}{2}$

27. The equation of a plane passing through the point (2, 2, 1) and (9, 3, 6) and perpendicular to the plane  $2x + 6y + 6z - 1 = 0$  is

(1)  $3x + 4y + 5z - 19 = 0$

(2)  $3x + 4y - 5z + 9 = 0$

(3)  $3x - 4y + 5z + 3 = 0$

(4)  $3x + 4y - 5z - 9 = 0$

28. 6 girls and 5 boys sit together randomly in a row. The probability that no two boys sit together is

(1)  $\frac{6!5!}{11!}$       (2)  $\frac{6!6!}{11!}$

(3)  $\frac{6!7!}{2!11!}$       (4)  $\frac{5!7!}{2!11!}$

29. Three integers are selected at random from the first 20 integers. The probability that their product is even, is

(1)  $\frac{1}{2}$       (2)  $\frac{17}{19}$

(3)  $\frac{15}{38}$       (4)  $\frac{27}{38}$

30. The value of 'p' and 'q' for which the function

$$f(x) = \begin{cases} \frac{\sin(p+1)x + \sin x}{x}, & x < 0 \\ q, & x = 0 \\ \frac{\sqrt{(x+x^2)} - \sqrt{x}}{x^{3/2}}, & x > 0 \end{cases}$$

is continuous for all  $x$  in  $R$ , are

(1)  $p = \frac{5}{2}, q = \frac{1}{2}$

(2)  $p = -\frac{3}{2}, q = \frac{1}{2}$

(3)  $p = \frac{1}{2}, q = \frac{3}{2}$

(4)  $p = \frac{1}{2}, q = -\frac{3}{2}$

24. If the position vectors of the vertices of a triangle are  $\vec{a}, \vec{b}$  and  $\vec{c}$  respectively, then its area is:

For Answers visit: [www.dharitri.com](http://www.dharitri.com)









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