JEE Main 2024 April 6 Shift 1 Question Paper

1. $KMnO_4$ + $(C_2O_4)^{-2}$ in acidic medium. Number of unpaired electrons?
2. Number of molecules that can show hydrogen bonding among CH_3OH, H_2O, HF, C_2H_6, NH_3?
3. Match the following
    1. SF_4 Sea-Saw
    2. BrF_3 Bent T-Shape
    3. $(BrO_3)-$ Pyramidal
    4. $(NH_4)+$ Tetrahedral
4.

In photoelectric experiment of 2.48ev irradiates a photo sensitive material the stopping potential was measured to be 0.5v cork function of the photo sensitive material.

(1) 2.48

(2) 0.5

(3) 1.68

(4) 1.98 .

5.

A. Bullet of mass 50 g is fired with a speed 100 m/s on a plywood and emerges with 40 m/s the percentage of loss of kinetic energy is

(1) 84 %.

(2) 32%.

(3) 16%

(4) 44%

6.

A sample contain mixture of helium and oxygen gas the ratio of root mean square speed of helium and oxygen sample is.

(1) $\frac{1}{4}$

(2) $\frac{1}{2\sqrt{2}}$

(3) $\frac{2\sqrt{2}}{1}$

(4) $\frac{1}{32}$

7.

A train starting from rest first accelerates uniformly up to speed 80 km/h. for time t then it moves with a constant speed for time 3t. The average speed of the train for this duration of journey will be.
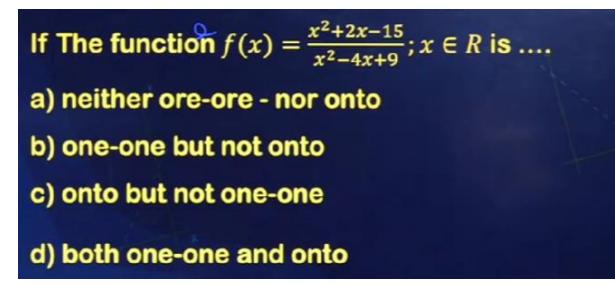
(1) 30

(2) 40

(3) 70

(4) 80

8.

while measuring diameter of a wire using a screw gauge the following readings were noted Main scale reading is 1mm and circular scale reading is equal to 42 division Pitch of screw gauge is 1mm and it has 100 divisions on circular scale The diameter of wire is $\frac{x}{50}$ mm The value of x is

(1) 21

(2) 142

(3) 42

(4) 71

9.

Let y=y(x) be the solution of the differential equation

$(2\pi\log_e \pi)\frac{dy}{dx} + 2y = \frac{3}{x}\log_e x, x > 0$ and $y(e^{-1}) = 0$ The $y(e)$ is

equal to.

a) $\frac{-3}{e}$

b) $\frac{-3}{3e}$

c) $\frac{-3}{2e}$

d) $\frac{-2}{e}$

10.

Let the area of the region enclosed by curves $y = 3x, 2y =$

$27 - 3x$ and $y = 3x - 5\sqrt{x}$ be A Then. $10A$ is equal to 162

184, 154, 172

11.

Let c be the circle of minimum area touching the parabola

y = 6-x² and the lines $y = \sqrt{3}(x)$. Then, which one of the

following paints lies on the circle c

a) (1,1)

b) (2,2)

c) (1,2)

d) (2,4)

12.

If The function $f(x) = \dfrac{x^2+2x-15}{x^2-4x+9}$; $x \in R$ is ....

a) neither ore-ore - nor onto

b) one-one but not onto

c) onto but not one-one

d) both one-one and onto

13.

If $f(x) = \begin{cases} x^3\sin\left(\dfrac{1}{x}\right), & x \neq 0, \\ 0, & , x = 0 \end{cases}$ then

(a) $f''\left(\dfrac{2}{\pi}\right) = \dfrac{12-\pi^2}{2\pi}$

(b) $f''(0) = 0$

(c) $f''(0) = 1$

(c) $f''\left(\dfrac{2}{\pi}\right) = \dfrac{24-\pi^2}{2\pi}$