

به نام خدا

پاسخنامه تشریحی کنکور ریاضی

داخل کشور اردیبهشت ۱۴۰۴

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سوال ۱: فرضیه (۲)

$$\frac{a_1 \frac{2^y - 1}{2 - 1}}{a_1 \frac{2^r - 1}{2 - 1}} = \sqrt{r} \rightarrow \frac{2^y - 1}{2^r - 1} = \sqrt{r} \rightarrow \frac{(2^r - 1)(2^y - 2^r + 1)}{2^r - 1} = \sqrt{r} \rightarrow$$

$$2^y + 2^r + 1 = \sqrt{r} \rightarrow 2^y + 2^r - \sqrt{r} = 0 \rightarrow (2^r - 9)(2^r - 1) = 0 \rightarrow \begin{cases} 2^r - 9 \rightarrow 2^r = \sqrt{9} \\ 2^r - 1 \rightarrow 2^r = 2 \end{cases}$$

$$\begin{aligned} 2 \in \mathbb{Z} &\rightarrow 2 = 2 & \frac{a_r}{a_1} = \frac{a_1 2^r}{a_1} = 2^r &\xrightarrow{2=2} 2^r = 2 \end{aligned}$$

سوال ۲: فرضیه (۳)

$$2x^r + \frac{1}{2x^r + 1} = 9 \rightarrow 2x^r + 2x^r + 1 = 9 \cdot 2x^r + 9 \rightarrow 2x^r - 1 \cdot 2x^r + 1 = 0 \quad (I)$$

$$2x^r + \frac{1}{2x^r + 1} = 9 \rightarrow (2x^r - 9)^r = \frac{1}{(2x^r + 1)^r} \quad (II) \quad (2x^r + 1)^r + \frac{1}{(2x^r + 1)^r} = \underline{\underline{(II)}}$$

$$(2x^r + 1)^r + (2x^r - 9)^r = 2x^r - 1 \cdot 2x^r + 1 \cdot 1 \quad (I) \quad \underline{\underline{2(2x^r - 1 \cdot 2x^r + 1) + 1 = 1}}$$

سوال ۳: فرضیه (۱)

$$\left. \begin{aligned} (A \subseteq A \cup B') \wedge (A \cap B \subseteq A) &\rightarrow A \cap B \subseteq A \cup B' \\ &\rightarrow A \cap B = A \cup B' \end{aligned} \right\} \rightarrow A \cap B = A \cup B' \rightarrow$$

فرض سوال $\rightarrow A \cup B' \subseteq A \cap B$

$$(B' \subseteq A) \wedge (A \subseteq B) \rightarrow B' \subseteq B \rightarrow \left. \begin{aligned} B' \cap B = B' \\ B' \cap B = \emptyset \end{aligned} \right\} \rightarrow B' = \emptyset \rightarrow B = U$$

سوال ۴ گزینه ۴

P	Q	$\sim P$	$\sim P \leftrightarrow Q$	$\sim(P \wedge Q)$	$\sim P \vee Q$	$\sim[\sim(\sim P \wedge Q) \wedge (\sim P \vee Q)]$
د	د	ن	ن	د	د	ن
د	ن	ن	د	د	ن	د
ن	د	د	د	ن	د	د
ن	ن	د	ن	د	د	ن

سوال ۵ گزینه ۳

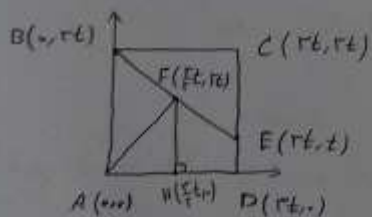
$$\beta^T \cdot \Delta \beta + r = 0 \rightarrow \beta^T \cdot \Delta \beta = -r \rightarrow \beta^T \cdot (\Delta \beta - r) = r \beta^T - r \cdot \beta + \epsilon = 1 \cdot \Delta \beta - \epsilon \rightarrow$$

$$\beta^A = 1 \cdot \Delta \beta - \epsilon \cdot \beta = \epsilon \vee \beta - r \cdot 1 \quad (I) \quad \Delta \beta^T = r \Delta \beta - 1 \quad (II)$$

$$J = \alpha \cdot \beta = \frac{1}{2} = 0 \rightarrow \alpha = 0 - \beta \rightarrow \epsilon \alpha = r - \epsilon \beta \quad (III) \quad \xrightarrow{(I, II, III)}$$

$$\frac{\epsilon \alpha + \beta^A}{\Delta \beta^T} = \frac{r - \epsilon \beta + \epsilon \vee \beta - r \cdot 1}{r \Delta \beta - 1} = \frac{\epsilon \vee \Delta \beta - r}{r \Delta \beta - 1} = \frac{11(r \Delta \beta - 1)}{r \Delta \beta - 1} = 11$$

سوال ۶ گزینه ۲



$$BE \perp DF \rightarrow F\left(\frac{x_B + x_E}{2}, \frac{y_B + y_E}{2}\right) = F\left(\frac{1}{2}, \frac{1}{2}\right)$$

$$AF = \Delta = \sqrt{(x_F - x_A)^2 + (y_F - y_A)^2} = \frac{\Delta}{2} \rightarrow$$

$$t = 1 \quad (I) \quad S_{ADEF} = S_{AEF} + S_{HFED} \rightarrow$$

$$S_{ADEF} = \frac{(\frac{1}{2} \cdot 1)}{2} + \frac{(1, 1)(\frac{1}{2} \cdot 1)}{2} \quad (I) = 4 + 9 = 13$$

سوال ۳

$$f_{\max} = 1 \rightarrow \frac{\omega}{\sqrt{m a^T - 1000}} = 1 \rightarrow m a^T - 1000 = 100 \xrightarrow{m > 0}$$

$$m a^T - 1000 = 100 \rightarrow \frac{-75 + 100m}{100} = 100 \rightarrow 100m - 75 = 100 \rightarrow m = \frac{175}{100}$$

$$\rightarrow 1 < m = \frac{175}{100} < 2 \rightarrow [m] = 1$$

سوال ۵

$$p(x) = x^2 + ax^r = x^r(x^r + a)$$

$$q(x) = x^r + r x^r + r x^r = x^r(x^r + r + r) = x^r(x + 1)(x + r)$$

$$x^r + x^r = x^r + x^r \rightarrow x = r$$

$$x^r + x^r = x^r(x + 1) \rightarrow$$

$$\left. \begin{array}{l} x^r(x + 1) \mid x^r(x^r + a) \rightarrow x + 1 \mid x^r + a \\ x + 1 \mid x^r + x^r \end{array} \right\} \rightarrow \left. \begin{array}{l} x + 1 \mid x^r + a \\ x + 1 \mid x^r + x^r \end{array} \right\} \rightarrow x + 1 \mid a$$

$$\rightarrow \left. \begin{array}{l} x + 1 \mid (a + 1)x \\ x + 1 \mid (a + 1)x + a + 1 \end{array} \right\} \rightarrow x + 1 \mid a + 1 \rightarrow a + 1 \rightarrow a - 1 \rightarrow a - r$$

توجه: اگر r و t درجه اول باشند، $r \mid t$ نشان می‌دهد این است که r (عامل) است.

سوال ۲

$$f(n) = \dots \rightarrow \begin{cases} n-1 \rightarrow n-1 \checkmark \\ n+1 \rightarrow n-1 \checkmark \end{cases} \xrightarrow{f(n)} \begin{cases} f(n)-1 \\ f(n)-1 \end{cases} \xrightarrow{D_f}$$

$$\begin{cases} n-1 \rightarrow n-1 \checkmark \\ n+1 \rightarrow n-1 \checkmark \end{cases} \rightarrow \begin{cases} n-1 \rightarrow n-1 \checkmark \\ n+1 \rightarrow n-1 \checkmark \end{cases} \rightarrow \dots \in [n-1, n-1]$$

سوال ۱۱۱۱۱۱

$$\lim_{x \rightarrow a} f(x) = L \rightarrow \lim_{x \rightarrow a} f(x) = L \rightarrow f(x) = f(x) \Rightarrow f(x) = L \rightarrow x = a \rightarrow$$

$$f(a) = a \rightarrow \lim_{x \rightarrow a} \frac{f(x)}{x} = \lim_{x \rightarrow a} \frac{f(a)}{a} = \lim_{x \rightarrow a} \frac{a}{a} = 1$$

سوال ۱۱۱۱۱۱

$$\begin{vmatrix} \log 5 & \log 7 \\ \log 7 & \log 5 \end{vmatrix} = (\log 5)^2 - (\log 7)^2 = (\log 5 + \log 7)(\log 5 - \log 7) =$$

$$\log 1 = \log \frac{5}{7} = \log \frac{5}{7} \xrightarrow{\text{مشتق}} \log (x+1) = \log \frac{5}{7} \rightarrow$$

$$x+1 = \frac{5}{7} \rightarrow x = -\frac{2}{7} \rightarrow \frac{\log \frac{5}{7}}{\frac{5}{7}} = \frac{\log \frac{5}{7}}{\log \frac{5}{7}} = \frac{-\log 7}{\frac{1}{7} \log 5} = -7$$

سوال ۱۱۱۱۱۱

$$2 \sin \alpha < \sin 2\alpha \Rightarrow 2 \sin \alpha < 2 \sin \alpha \cos \alpha \Rightarrow 1 < (\cos \alpha - 1)(2 \sin \alpha) \xrightarrow{\cos \alpha - 1 < 0}$$

$$\Rightarrow 2 \sin \alpha < 0 \Rightarrow \sin \alpha < 0 \rightarrow \alpha \in [\pi, 2\pi] = A_1$$

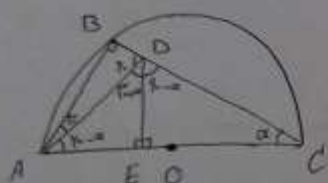
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$$\frac{\cos \alpha}{\sin \alpha} > 0 \Rightarrow \frac{\cos \alpha}{\sin \alpha} > 0 \xrightarrow{\sin \alpha > 0} \cos \alpha > 0 \rightarrow \alpha \in [0, \frac{\pi}{2}] = A_1$$

$$A \cap A_1 = \emptyset$$

$$\frac{\frac{\sqrt{r+\sqrt{r}}}{r} - \frac{r\sqrt{r-\sqrt{r}}}{r}}{\frac{\Delta\sqrt{r-\sqrt{r}}}{r}} = \frac{\sqrt{r+\sqrt{r}} - r\sqrt{r-\sqrt{r}}}{\Delta\sqrt{r-\sqrt{r}}} = \frac{\sqrt{r+\sqrt{r}} - \frac{r}{\sqrt{r+\sqrt{r}}}}{\frac{\Delta}{\sqrt{r+\sqrt{r}}}} = \frac{r\sqrt{r+\sqrt{r}} - r}{\Delta} = r\sqrt{r}$$

سوال ۱۴ تیرہ (۱)



$$\sin \hat{BAD} = \frac{\overline{BD}}{\overline{AD}} = \frac{\sqrt{v}}{\sqrt{v}} \rightarrow \angle BAD = \frac{1}{1} \rightarrow$$

$$\hat{B\hat{A}D} = 70^\circ \quad \text{Só um ângulo em } ABC = 90^\circ \rightarrow$$

$$\hat{AD}E = 90^\circ + \alpha \quad \xrightarrow{\text{في المثلث}} \quad DE = \sqrt{AD^2 - AE^2}$$

$$\rightarrow DE = \sqrt{17 - 14} = \sqrt{3}$$

$$\tan(\tau + \alpha) \cdot \frac{AE}{DE} \rightarrow \frac{\tan \tau + \tan \alpha}{1 - \tan \tau \tan \alpha} \cdot \frac{1}{\sqrt{1}} \rightarrow \frac{\frac{\sqrt{1}}{1} + \tan \alpha}{1 - \frac{\sqrt{1}}{1} \tan \alpha} \cdot \frac{1}{\sqrt{1}} \rightarrow$$

$$1 + \sqrt{F} \tan \alpha = r - \frac{\sqrt{F}}{r} \tan \alpha \rightarrow \frac{\Delta \sqrt{F}}{r} \tan \alpha = 1 \rightarrow \tan \alpha = \frac{r}{\Delta} \rightarrow \tan \alpha = \sqrt{F}$$

مسائل ۱۵۰ (۴)

$$\lim_{a \rightarrow 0} \frac{k_1 \cos(\sqrt{a} \cdot x)}{k_1 x^2} = \frac{k_1}{x^2} = \frac{k_1}{x^2} = k_1 \cdot 1 = k_1 \rightarrow \int_{a \rightarrow 0} \frac{-1 \cdot \cos(\sqrt{a} \cdot x)}{-2x} dx =$$

$$\lim_{n \rightarrow \infty} \frac{-\sqrt{n} \sin(\sqrt{n})}{-\sqrt{n}} = \frac{\sin(\sqrt{n}) \sim \sqrt{n}}{\sqrt{n}} \lim_{n \rightarrow \infty} \frac{-a^n}{-n} = \frac{a}{1} = r \rightarrow a \cdot r \rightarrow \frac{a}{k} = \frac{4}{-1} = -4$$

سوال ۱۲ فرم ۳

$$\lim_{n \rightarrow (-\infty)^+} f(n) = \lim_{n \rightarrow (-\infty)^-} f(n) = -\infty \rightarrow \text{نقطه شکست} \rightarrow (n, a)(m, n-r) =$$

$$m n^r + (a m - r) n - r a \xrightarrow{\Delta \rightarrow 0} (a m - r)^r - \varepsilon(m)(-r a) \rightarrow$$

$$a^r m^r - \varepsilon a m + \varepsilon + r a m \rightarrow (a m + r)^r \rightarrow a m = -r$$

$$- \varepsilon = \lim_{n \rightarrow \pm \infty} f(n) = \frac{a^r}{m} \rightarrow a^r = -\varepsilon m$$

$$\left. \begin{array}{l} a = r \\ m = -1 \end{array} \right\} \rightarrow$$

سوال ۱۴ فرم ۳

$$\lim_{n \rightarrow \pi^-} \frac{C \tan}{[n - \pi]} = \lim_{n \rightarrow \pi^-} \frac{C \tan}{[\pi - \pi]} = \lim_{n \rightarrow \pi^-} \frac{C \tan}{[0]} = \lim_{n \rightarrow \pi^-} -C \tan = (-\infty) = +\infty$$

سوال ۱۵ فرم ۲

$$\lim_{n \rightarrow a} f(n) = \frac{\sqrt{r} |a^r a|}{0^+} = c \rightarrow a^r a = \frac{p_{x=0}}{a^r} \rightarrow a = -1$$

$$(-1)^r = (m-r)(-1) + (-1)^r = 0 \rightarrow m = r \rightarrow f(n) = \frac{\sqrt{r} | -n - 1 |}{|n^r + 1|} = \frac{\sqrt{r}}{|n^r - n + 1|}$$

$$\lim_{n \rightarrow -1} f(n) = \frac{\sqrt{r}}{|1 - 1 + 1|} = \frac{1}{\sqrt{r}}$$

سوال ۱۶ فرم ۲

$$f(n) - r g(n) = \frac{|r n - 1|}{\sqrt{n^r}} = \frac{r |n - 1| + \sqrt{r n}}{\sqrt{n^r}} = \frac{-r \sqrt{r n}}{\sqrt{n^r}} \rightarrow f'(n) - r g'(n) = \left(\frac{-r \sqrt{r n}}{\sqrt{n^r}} \right)'$$

$$\frac{\left(\frac{-r}{\sqrt{u}}\right)\left(\frac{r}{\sqrt{u}}\right) - \left(\frac{r}{r\sqrt{u}}\right)(-r\sqrt{u})}{u\sqrt{u}} \rightarrow f'(1) = g'(1) = \frac{-\sqrt{r} + \frac{r}{r}\sqrt{r}}{1} = \frac{\sqrt{r}}{r}$$

سوال ۲۰ فرید ۴

$$f'(r) = \text{نسبت حاصل از مشتق} \rightarrow a = \frac{\Delta - 1}{r - 0} = \frac{\Delta}{r}$$

سوال ۲۱ فرید ۱

$$\left. \begin{array}{l} \text{نقطه مشت در } 0^+ : \lim_{u \rightarrow 0^+} f(u) = \lim_{u \rightarrow 0^+} f(u) \rightarrow ra + c = ra^+ \\ \text{نقطه مشت در } 0^- : f'_-(a) = f'_+(a) \rightarrow rb = ra \end{array} \right\} \rightarrow$$

$$(ra)(0) + c = ra^+ \rightarrow c = -ra^+ \rightarrow a^+ b - c = a^+ (ra) - (-ra^+) =$$

$$a^+ \cdot ra^+ \cdot ra = a^+ \cdot ra^+ \cdot ra + 1 = (a+1)^+ - 1$$

سوال ۲۲ فرید ۱

$$u \in [0, a] \rightarrow f(u) = \frac{r}{\sqrt{u}} (a - u) \rightarrow f'(u) = \frac{r}{r\sqrt{u}} (a - u) + (-1)\left(\frac{r}{\sqrt{u}}\right) =$$

$$\frac{ra - \Delta u}{r\sqrt{u}} \rightarrow f'(u) = \frac{ra - \Delta u}{r\sqrt{u}} \rightarrow \Delta u + ra \rightarrow u = \frac{r}{\Delta} a \rightarrow$$

$$\sqrt{\frac{\Delta}{r_0}} a^+ \left(\frac{r}{\Delta} a\right) = 1 \Delta \rightarrow \sqrt{\frac{\Delta}{r_0}} (a) = \frac{\Delta}{r} \xrightarrow{(\cdot)^2} \frac{\Delta a^2}{r\Delta} = \frac{1 \Delta}{\Delta} \rightarrow a^2 = \frac{\Delta}{r} \rightarrow$$

$$a = \frac{\Delta}{r} = r, \Delta$$

سوال ۱۲ نزدیک (۲)

$$\begin{cases} x_1 - y = -1 \\ x_2 - y = -5 \\ x_3 - y = -7 \\ x_4 - y = -9 \\ x_5 - y = -5 \end{cases} \rightarrow \begin{cases} x_1 = y - 1 \\ x_2 = y - 5 \\ x_3 = y - 7 \\ x_4 = y - 9 \\ x_5 = y - 5 \end{cases} \xrightarrow{\frac{\sum x_i}{5} = \bar{x}} \bar{x} = \frac{5y - 15}{5} = y - 3$$

$$\sigma^2 = \frac{(\sqrt{\sum (x_i - \bar{x})^2})^2}{(5)^2} \rightarrow \sigma^2 = \frac{5 + 5 + 9 + 14 + 9}{5} = \frac{42}{5} = 14, 4$$

سوال ۱۳ نزدیک (۳)

$$P(A) = \frac{A}{\Omega} P(B) \rightarrow P(A-B) = \frac{A}{\Omega} P(B) P(B^c) = \frac{A}{\Omega} P(B) (1 - P(B)) \rightarrow$$

$$P(A-B) = \frac{A}{\Omega} P(B) - \frac{A}{\Omega} P(B)^2 \quad P(A \cap B^c) + P(A-B) + P(B) = 1 \rightarrow$$

$$\frac{1}{5} = \frac{A}{\Omega} P(B) - \frac{A}{\Omega} P(B)^2, P(B) = 1 \rightarrow 2A P(B)^2 - 3A P(B) + 15 = 0 \rightarrow (5P(B) - 3)(AP(B) - 5) = 0 \rightarrow$$

$$\begin{cases} P(B) = \frac{3}{5} > 1 \quad \times \\ P(B) = \frac{5}{A} \quad \checkmark \end{cases} \rightarrow P(B) = \frac{5}{A} \rightarrow P(A-B) = \frac{5}{A}, P(A) = \frac{5}{\Omega}$$

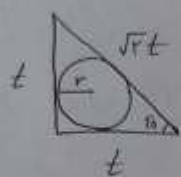
$$P(A) = P(A-B) + P(A \cap B) \rightarrow P(A \cap B) = \frac{A}{\Omega} \quad P(A \cup B^c) = 1 - P(B-A)$$

$$1 - (P(B) - P(A \cap B)) = 1 - \left(\frac{5}{A} - \frac{A}{\Omega} \right) = \frac{3A}{5} = \frac{14}{5}$$

سوال ۱۴ نزدیک (۲)

$$\text{تعداد کلمات ۱۰ رقمی} = (5 \times 4 \times 3) \times 10 = 60 = 6A - 10 = 3A$$

سوال ۲۶ - نزدیک (۴)

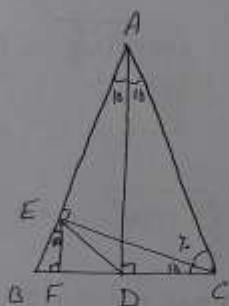


$$\rightarrow r = \frac{S}{P} \rightarrow r = \frac{\frac{t^2}{\sqrt{2}}}{(\sqrt{2}+1)t} = \frac{t}{\sqrt{2}+1} \rightarrow$$

$$\sqrt{2} = \frac{t}{\sqrt{2}+1} \rightarrow t = 2 + \sqrt{2}$$

برای هم‌دست کردن آن باید خط واحد برابر کنیم از $\frac{2+\sqrt{2}}{2} = 1+\sqrt{2}$ می‌توان نوشت $\frac{2+\sqrt{2}}{2}$ و $1+\sqrt{2}$ را به یک خط واحد باز می‌نویسد.

سوال ۲۷ - نزدیک (۱)



$$\sin \hat{EAC} = \frac{EC}{AC} = \frac{EC}{AB} = \frac{1}{2} \rightarrow \sin \hat{EAC} = \frac{1}{2}$$

$$\rightarrow \hat{ABC} = \hat{BCA} = 45^\circ \rightarrow \hat{BCE} = 45^\circ$$

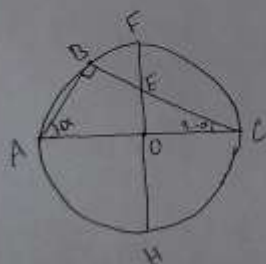
$$ED \parallel BC \rightarrow ED = \frac{BC}{2} \rightarrow BC = 1 + \sqrt{2}$$

$$AD \parallel EF \rightarrow \hat{BEF} = 45^\circ$$

$$\sin 45^\circ = \frac{EB}{BC} \rightarrow EB = (1 + \sqrt{2}) \sin 45^\circ \quad \sin 45^\circ = \frac{BF}{EB} \rightarrow$$

$$BF = (1 + \sqrt{2}) \sin 45^\circ = (1 + \sqrt{2}) \left(\frac{\sqrt{2}-1}{2} \right) = \frac{1}{2} (2 + \sqrt{2} - \sqrt{2} - 1) = \frac{1}{2}$$

سوال ۲۸ - نزدیک (۳)



$$\sin \alpha = \frac{1}{2} \rightarrow \sin (90^\circ - \alpha) = \frac{1}{2} \rightarrow \frac{OE}{EC} = \frac{1}{2} \rightarrow$$

$$OE = 2t, EC = 4t \xrightarrow{\text{قضیه پیتاگوراس}} OC = \sqrt{OE^2 + EC^2} = \sqrt{4t^2 + 16t^2} = 2\sqrt{5}t$$

$$E \text{ میانه } CH : FE \cdot EH = BE \cdot EC \rightarrow \frac{BE}{EF} = \frac{EH}{EC}$$

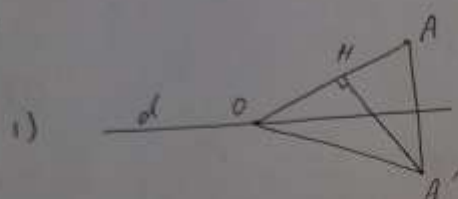
$$\frac{EH}{EC} = \frac{ED+OH}{EC} = \frac{rt + \epsilon t}{\Delta t} = \frac{vt}{\Delta t} = 1, \epsilon$$

سوال III جزء ⑤

$$\left. \begin{aligned} \text{برای نقطه } (y) : (y)^2 = (r)(v+y) \rightarrow y = \Delta \\ (r_{n+1})(r) = (y)(t) \rightarrow r_{n+1} = 1 \rightarrow r = r \end{aligned} \right\} \rightarrow \frac{r}{y} = \frac{r}{\Delta} = 1, \epsilon$$

سوال IV جزء ①

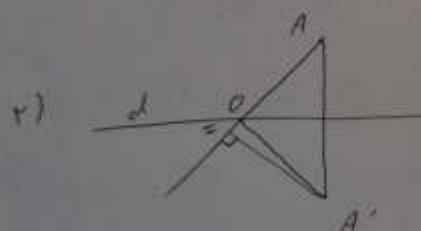
داده ها :



پس از آن :

$$OH = \sqrt{h^2 - (v\epsilon)^2} = \epsilon h$$

$$\rightarrow AA' = \sqrt{(v\epsilon)^2 + (v\epsilon)^2} = 1\epsilon$$



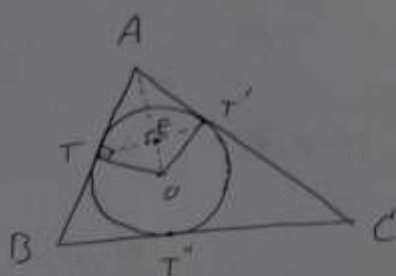
پس از آن :

$$OH = \sqrt{h^2 - (v\epsilon)^2} = \epsilon h$$

$$\rightarrow AA' = \sqrt{(v\epsilon)^2 + (v\epsilon)^2} = 1\epsilon$$

$$\rightarrow 1\epsilon + 1\epsilon = 2\epsilon$$

سوال II جزء ②



$$AT = AT' = \epsilon h \rightarrow \begin{cases} BT = \epsilon h \\ CT' = \epsilon h \end{cases} \rightarrow$$

$$\begin{cases} BT = \epsilon h \\ CT' = \epsilon h \end{cases} \xrightarrow{(+)} q - r = v \rightarrow q = 1 \rightarrow$$

$$AT = AT' = 1$$

$$P, \frac{\epsilon + \Delta + v}{r} = 1$$

$$S = \sqrt{P(P \times X(P, V) / (P, \epsilon))} = \sqrt{(1)(1)(\epsilon)(\epsilon)} = \epsilon \sqrt{1} \rightarrow r, \frac{S}{P} = \frac{\sqrt{1}}{r}$$

$$\text{فياض} \rightarrow AO = \sqrt{OT^2 + AT^2} = \sqrt{\frac{4}{5} + 1} = \frac{\sqrt{9}}{1}$$

$$\hat{ATO} \sim \hat{AET} \rightarrow \frac{OT}{AO} = \frac{TE}{AT} \rightarrow \frac{\frac{\sqrt{5}}{2}}{\frac{\sqrt{5}}{1}} = \frac{TE}{1} \rightarrow TE = \sqrt{\frac{5}{4}} \xrightarrow{TE \cdot TT'}$$

$$TT' = 2\sqrt{\frac{5}{4}} = \frac{2}{2}\sqrt{10} = 1,2\sqrt{10}$$

Ⓔ سوال ٢٤

$$d = \frac{(\vec{a}) \cdot \left(\frac{\vec{a}}{|\vec{a}|} + \frac{\vec{b}}{|\vec{b}|} \right)}{|\vec{a}|} = \frac{\frac{\vec{a} \cdot \vec{a}}{|\vec{a}|} + \frac{\vec{a} \cdot \vec{b}}{|\vec{b}|}}{|\vec{a}|} = \frac{|\vec{a}| + \frac{|\vec{a}||\vec{b}| \cos \gamma}{|\vec{b}|}}{|\vec{a}|} \Rightarrow$$

$$d = \frac{|\vec{a}| + \frac{|\vec{a}|}{2}}{|\vec{a}|} = \frac{3}{2}$$

Ⓕ سوال ٢٤

$$A^T = \begin{bmatrix} 1 & 1 & 1 \\ 1 & 1 & 1 \\ 1 & 1 & 1 \end{bmatrix} \begin{bmatrix} 1 & 1 & 1 \\ 1 & 1 & 1 \\ 1 & 1 & 1 \end{bmatrix} = \begin{bmatrix} 3 & 3 & 3 \\ 3 & 3 & 3 \\ 3 & 3 & 3 \end{bmatrix} \quad (k-1)A = \begin{bmatrix} (k-1) & (k-1) & (k-1) \\ (k-1) & (k-1) & (k-1) \\ (k-1) & (k-1) & (k-1) \end{bmatrix}$$

$$|A^T + kA - A| = 150 \Rightarrow \begin{vmatrix} 9 + (k-1) & \lambda + \tau(k-1) & \lambda + \tau(k-1) \\ \lambda + \tau(k-1) & 9 + (k-1) & \lambda + \tau(k-1) \\ \lambda + \tau(k-1) & \lambda + \tau(k-1) & 9 + (k-1) \end{vmatrix} = 150 \rightarrow$$

$$[9 + (k-1)] [(9 + (k-1)) - (\lambda + \tau(k-1))^2] = [\lambda + \tau(k-1)] [(\lambda + \tau(k-1))(9 + (k-1)) - (\lambda + \tau(k-1))^2]$$

$$+ [\lambda + \tau(k-1)] [(\lambda + \tau(k-1))(9 + (k-1)) + (\lambda + \tau(k-1))^2] = 150 \xrightarrow{\text{divide}} k = -2$$

$$(k+1)I_3 = \begin{bmatrix} -1 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & -1 \end{bmatrix} \xrightarrow{\text{det}} \begin{vmatrix} -1 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & -1 \end{vmatrix} = -1$$

$$B^T = \begin{bmatrix} 1 & 0 & a \\ 0 & \sqrt{b} & 0 \\ c & 0 & d \end{bmatrix} \begin{bmatrix} 1 & 0 & a \\ 0 & \sqrt{b} & 0 \\ c & 0 & d \end{bmatrix} = \begin{bmatrix} 1+ac & 0 & a+ad \\ 0 & b & 0 \\ c+cd & 0 & ac+ad \end{bmatrix} = \gamma I$$

$$\rightarrow \left\{ \begin{array}{l} a \cdot ad \cdot \cdot \rightarrow d \cdot -1 \\ c \cdot cd \cdot \cdot \rightarrow d \cdot -1 \\ + b^T \cdot r \rightarrow b \cdot \pm 1 \\ ac \cdot d^T - ac \cdot 1 \cdot r \rightarrow ac \cdot 1 \\ 1 + ac \cdot r \rightarrow ac \cdot 1 \end{array} \right.$$

$$b=1: -a-c \cdot t \rightarrow c-a \cdot t$$

$$a(-a-r) = 1 \Rightarrow a^2 + ra + 1 = 0 \Rightarrow$$

$$(a_{n+1})^T \rightarrow a_{n+1.62} \checkmark$$

$$b = -1 : -a - C \cdot T \rightarrow C \cdot T + a$$

$$a(a+r)_{n-1} \rightarrow a^r \cdot r a_{n-1} \rightarrow$$

$a \notin Z_X$

$$\rightarrow b=1, d=-1, a=-1, c=-1$$

$$B^T = B(B^T) = rB = \begin{bmatrix} r & -r \\ -r & r \end{bmatrix}$$

جواب: $(-2)(-2)(-2)(-2)(2\sqrt{2}) = -2\sqrt{2}$

سوال ۴۵ مزیدہ (۴)

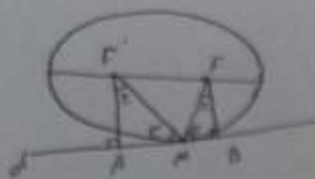
عمل تفاعلهای خودتلف با یون (Co^{2+}) در کدورت $\text{pH} = 5$ و $\text{pH} = 7$ را نشان می‌دهد.

مرکز دھرم ہے۔

$$\left. \begin{aligned} \frac{1}{\sigma} x - \frac{r}{\sigma} &= y \xrightarrow{\text{multiplied}} -\Delta H + \frac{rT}{T} = y \\ \frac{r_{m-1}}{T} &= z \xrightarrow[\text{(r...)}]{\text{multiplied}} \frac{-r}{T} x + \frac{r}{T} = z \end{aligned} \right\} \xrightarrow{(\Delta)} -\Delta H + \frac{rT}{T} = \frac{-r}{T} x + \frac{r}{T} \rightarrow$$

$$\frac{-r}{T} x = \frac{-r}{T} \rightarrow x = T \Delta \xrightarrow{\text{multiplied}} y = -1 \rightarrow (T \Delta, -1)$$

سوال ۱۳ جزء ۲



$FA = FB$: دایره محیطی M را می‌سازد

$$\frac{AM}{AF'} = \cos \angle F'AF = \frac{AF}{AF} \quad , \quad \frac{BM}{BF} = \cos \angle FBF' = \frac{BF}{BF} \quad \rightarrow$$

$$\frac{AF}{AF'} \cdot AM = \frac{BF}{BF} \cdot BM \quad \xrightarrow{(+)} \quad AM \cdot BM = \frac{AF}{BF} (AF \cdot BF) = AF \cdot BF$$

$$\rightarrow AF \cdot BF = 1 \rightarrow FA = 1 \rightarrow \text{محل دایره} : \mathcal{C}$$

سوال ۱۳ جزء ۱

$$A n^T \cdot x = b \cdot y \quad \rightarrow \quad A n^T \cdot T n = y \cdot x y = y(1-n) \rightarrow y = \frac{A n^T \cdot T n}{1-n} \quad \text{جواب}$$

$$\left. \begin{array}{l} 1-n \mid A n^T \cdot T n \\ 1-n \mid A n \cdot A n^T \end{array} \right\} \xrightarrow{(+)} \left. \begin{array}{l} 1-n \mid 11n \\ 1-n \mid 11-n \end{array} \right\} \xrightarrow{(-)} 1-n \mid 0 \rightarrow 1-n = 0 \rightarrow n = 1$$

$$n = 1, \dots, T, 11 \rightarrow (x, y) = (0, 1), (1, -1), (-1, 1), (11, -1, 1)$$

پایین جدول را مشاهده کنید

سوال ۱۳ جزء ۲

محل دایره $\mathcal{C}$ را می‌سازد

x_1	x_2	x_3, x_4	معادلات
0	0	1	$0 = (1)$
0	0	1	$1 = (1)$
0	1	0	$1 = (1)$
1	0	0	$1 = (1)$
1	0	0	$1 = (1)$
1	0	0	$1 = (1)$
1	0	0	$1 = (1)$
1	0	0	$1 = (1)$
1	0	0	$1 = (1)$

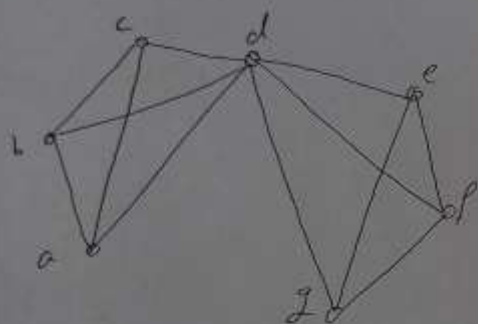
$$\xrightarrow{(+)} \quad \Delta = 1, 1, 1, 1, 1, 1, 1, 1, 1, 1$$

سوال ۱۹ گزینه ۲

هرکدام از اعضاء داد معنی را از برورد اختیاری کند و همچنین مجموع چهار عدد فردی باشد یا یکی از آنها زوج و سه تای دیگر فرد باشد و یا یکی از آنها زوج و سه تای دیگر زوج باشد.

$$\underbrace{\binom{4}{1}}_{\text{زوج ۱ تا ۴}} + \underbrace{\binom{4}{2}}_{\text{زوج ۱ تا ۴}} + \underbrace{\binom{4}{3}}_{\text{زوج ۱ تا ۴}} + \underbrace{\binom{4}{4}}_{\text{زوج ۱ تا ۴}} = 1 + 3 + 3 + 1 = 8$$

سوال ۲۰ گزینه ۲



(G)

$$\chi(G) = 2, \quad \chi(G) = 2$$

دسته‌های این گراف d, e, f, g و a, b, c است و همچنین تعداد رأس 7 است.