

2022 - 23



## National Level Science Talent Search Examination

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### CLASS 12 (PCM)

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**01** The number of functions  $f$  from  $(1, 2, 3, \dots, 20)$  onto  $(1, 2, 3, \dots, 20)$  such that  $f(k)$  is a multiple of 3, whenever  $k$  is a multiple of 4 is :

- (A)  $6^5 \times (15)!$                       (B)  $5! \times 6!$   
 (C)  $(15)! \times 6!$                       (D)  $5^6 \times 15$

**02** If  $S$  is the sum of the first 10 terms of the series

$$\tan^{-1}\left(\frac{1}{3}\right) + \tan^{-1}\left(\frac{1}{7}\right) + \tan^{-1}\left(\frac{1}{13}\right) + \tan^{-1}\left(\frac{1}{21}\right) + \dots$$

then  $\tan(S)$  is equal to

- (A)  $\frac{5}{6}$                       (B)  $\frac{5}{11}$                       (C)  $\frac{-6}{5}$                       (D)  $\frac{10}{11}$

**03** Let  $P = \begin{bmatrix} 1 & 0 & 0 \\ 3 & 1 & 0 \\ 9 & 3 & 1 \end{bmatrix}$  and  $Q = [q_{ij}]$  be two  $3 \times 3$  matrices

such that  $Q - P^5 = I_3$ . Then  $\frac{q_{21} + q_{31}}{q_{32}}$  is equal to:

- (A) 10                      (B) 135                      (C) 15                      (D) 9

Space for rough work

04 If  $\Delta_1 = \begin{vmatrix} x & \sin \theta & \cos \theta \\ -\sin \theta & -x & 1 \\ \cos \theta & 1 & x \end{vmatrix}$  and

$\Delta_2 = \begin{vmatrix} x & \sin 2\theta & \cos 2\theta \\ -\sin 2\theta & -x & 1 \\ \cos 2\theta & 1 & x \end{vmatrix}$ ,  $x \neq 0$ , then for all

$\theta \in \left(0, \frac{\pi}{2}\right)$

(A)  $\Delta_1 - \Delta_2 = -2x^3$

(B)  $\Delta_1 - \Delta_2 = x(\cos 2\theta - \cos 4\theta)$

(C)  $\Delta_1 \times \Delta_2 = -2(x^3 + x - 1)$

(D)  $\Delta_1 + \Delta_2 = -2x^3$

05 Let  $a_1, a_2, a_3, \dots, a_{10}$  be in GP with  $a_i > 0$  for  $i = 1, 2, \dots, 10$  and  $S$  be the set of pairs  $(r, k)$ ,  $r, k \in \mathbb{N}$  (the set of natural numbers) for which

$$\begin{vmatrix} \log_e a_1^r a_2^k & \log_e a_2^r a_3^k & \log_e a_3^r a_4^k \\ \log_e a_4^r a_5^k & \log_e a_5^r a_6^k & \log_e a_6^r a_7^k \\ \log_e a_7^r a_8^k & \log_e a_8^r a_9^k & \log_e a_9^r a_{10}^k \end{vmatrix} = 0$$

Then the number of elements in  $S$ , is :

(A) 4

(B) infinitely many

(C) 2

(D) 10

Space for rough work

**06** Let  $[t]$  denote the greatest integer  $\leq t$  and

$$\lim_{x \rightarrow 0} x \left[ \frac{4}{x} \right] = A. \text{ Then the function, } f(x) = [x^2]$$

$\sin(\pi x)$  is discontinuous, when  $x$  is equal to:

- (A)  $\sqrt{A+1}$                       (B)  $\sqrt{A+5}$   
 (C)  $\sqrt{A+21}$                     (D)  $\sqrt{A}$

**07** If  $f$  and  $g$  are differentiable functions in  $[0, 1]$  satisfying  $f(0) = 2 = g(1)$ ,  $g(0) = 0$  and  $f(1) = 6$ , then for some  $c \in ]0, 1[$

- (A)  $f'(c) = g'(c)$                       (B)  $f'(c) = 2g'(c)$   
 (C)  $2f'(c) = g'(c)$                     (D)  $2f'(c) = 3g'(c)$

**08** A water tank has the shape of an inverted right circular cone, whose semi-vertical angle is  $\tan^{-1}\left(\frac{1}{2}\right)$ . Water is poured into it at a constant rate of 5 cubic meter per minute. Then the rate (in m/min), at which the level of water is rising at the instant when the depth of water in the tank is 10m, is:

- (A)  $\frac{1}{15\pi}$     (B)  $\frac{1}{10\pi}$     (C)  $\frac{2}{\pi}$     (D)  $\frac{1}{5\pi}$

**09** If  $\int \frac{d\theta}{\cos^2\theta(\tan 2\theta + \sec 2\theta)} = \lambda \tan\theta + 2\log_e |f(\theta)| + C$

where  $C$  is a constant of integration, then the ordered pair  $(\lambda, f(\theta))$  is equal to

- (A)  $(1, 1 - \tan\theta)$                       (B)  $(-1, 1 - \tan\theta)$   
 (C)  $(-1, 1 + \tan\theta)$                     (D)  $(1, 1 + \tan\theta)$

10 The integral

$$\int_{\frac{\pi}{6}}^{\frac{\pi}{3}} \tan^3 x \sin^2 3x (2\sec^2 x \sin^2 3x + 3\tan x \sin 6x) dx$$

is equal to

- (A)  $\frac{7}{18}$       (B)  $\frac{-1}{9}$       (C)  $\frac{-1}{18}$       (D)  $\frac{9}{2}$

11 Given  $f(x) = \begin{cases} x & , & 0 \leq x < \frac{1}{2} \\ \frac{1}{2} & , & x = \frac{1}{2} \\ 2-x & , & \frac{1}{2} < x \leq 1 \end{cases}$

and  $g(x) = \left(x - \frac{1}{2}\right)^2, x \in \mathbb{R}$ . Then the area (in sq. units) of the region bounded by the curves,  $y = f(x)$  and  $y = g(x)$  between the lines,  $2x = 1$  and  $2x = \sqrt{3}$ , is

- (A)  $\frac{1}{3} + \frac{\sqrt{3}}{4}$       (B)  $\frac{\sqrt{3}}{4} - \frac{1}{3}$   
 (C)  $\frac{1}{2} - \frac{\sqrt{3}}{4}$       (D)  $\frac{1}{2} + \frac{\sqrt{3}}{4}$

Space for rough work

**12** The general solution of the differential equation

$$\sqrt{1+x^2+y^2+x^2y^2} + xy \frac{dy}{dx} = 0 \text{ is :}$$

(Where C is a constant of integration)

(A)  $\sqrt{1+y^2} + \sqrt{1+x^2} = \frac{1}{2} \log_e \left( \frac{\sqrt{1+x^2+1}}{\sqrt{1+x^2-1}} \right) + C$

(B)  $\sqrt{1+y^2} - \sqrt{1+x^2} = \frac{1}{2} \log_e \left( \frac{\sqrt{1+x^2+1}}{\sqrt{1+x^2-1}} \right) + C$

(C)  $\sqrt{1+y^2} + \sqrt{1+x^2} = \frac{1}{2} \log_e \left( \frac{\sqrt{1+x^2-1}}{\sqrt{1+x^2+1}} \right) + C$

(D)  $\sqrt{1+y^2} - \sqrt{1+x^2} = \frac{1}{2} \log_e \left( \frac{\sqrt{1+x^2-1}}{\sqrt{1+x^2+1}} \right) + C$

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Space for rough work

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13 Let  $\vec{a} = (3\hat{i} + 2\hat{j} + 2\hat{k})$  and  $\vec{b} = (\hat{i} + 2\hat{j} - 2\hat{k})$  be two vectors.

If a vector perpendicular to both the vectors  $\vec{a} + \vec{b}$  and  $\vec{a} - \vec{b}$  has the magnitude 12 then one such vector is :

- (A)  $2(42\hat{i} + 2\hat{j} + 2\hat{k})$  (B)  $4(2\hat{i} - 2\hat{j} - \hat{k})$   
 (C)  $4(2\hat{i} + 2\hat{j} - \hat{k})$  (D)  $4(-2\hat{i} - 2\hat{j} + \hat{k})$

14 A tetrahedron has vertices  $P(1, 2, 1)$ ,  $Q(2, 1, 3)$ ,  $R(-1, 1, 2)$  and  $O(0, 0, 0)$ . The angle between the faces OPQ and PQR is

- (A)  $\cos^{-1}\left(\frac{17}{31}\right)$  (B)  $\cos^{-1}\left(\frac{19}{35}\right)$   
 (C)  $\cos^{-1}\left(\frac{9}{35}\right)$  (D)  $\cos^{-1}\left(\frac{7}{31}\right)$

15 An unbiased coin is tossed. If the outcome is a head then a pair of unbiased dice is rolled and the sum of the numbers obtained on them is noted. If the toss of the coin results in tail then a card from a well-shuffled pack of nine cards numbered 1, 2, 3, ..., 9 is randomly picked and the number on the card is noted. The probability that the noted number is either 7 or 8 is.

- (A)  $\frac{13}{36}$  (B)  $\frac{15}{72}$  (C)  $\frac{19}{72}$  (D)  $\frac{19}{36}$

Space for rough work

**16** Let  $R = \{(3, 3), (6, 6), (9, 9), (12, 12), (6, 12), (3, 9), (3, 12), (3, 6)\}$  be a relation on the set  $A = \{3, 6, 9, 12\}$ . The relation is

- (A) reflexive and transitive only
- (B) reflexive only
- (C) an equivalence relation
- (D) reflexive and symmetric only

**17** Let  $\sum_{k=1}^{10} f(a+k) = 16(2^{10} - 1)$ , where the function  $f$  satisfies  $f(x+y) = f(x) f(y)$  for all natural numbers  $x ; y$  and  $f(1) = 2$ . Then the natural number 'a' is

- (A) 4      (B) 3      (C) 16      (D) 2

**18**  $\sin^{-1} \frac{\sqrt{3}}{2} + \sin^{-1} \frac{\sqrt{2}}{3} = ?$

- (A)  $\sin^{-1} \left( \frac{\sqrt{3} + \sqrt{2}}{2\sqrt{3}} \right)$
- (B)  $\pi - \sin^{-1} \left( \frac{\sqrt{3} + \sqrt{2}}{2\sqrt{3}} \right)$
- (C)  $-\pi - \sin^{-1} \left( \frac{\sqrt{3} + \sqrt{2}}{2\sqrt{3}} \right)$
- (D)  $\pi + \sin^{-1} \left( \frac{\sqrt{3} + \sqrt{2}}{2\sqrt{3}} \right)$

Space for rough work



- 19 There are 3 bags A, B and C. Bag A contains 2 white and 3 black balls, bag B contains 4 white and 2 black balls and Bag C contains 3 white and 2 black balls. If a ball is drawn at random from a randomly chosen bag, then the probability that the ball drawn is black, is

(A)  $\frac{2}{3}$       (B)  $\frac{4}{9}$       (C)  $\frac{5}{9}$       (D)  $\frac{1}{9}$

- 20 Let  $a, b, c$  be the distinct nonnegative numbers. If the vectors  $ai + aj + ck, i + k$  and  $ci + cj + bk$  lie in a plane then  $c$  is

- (A) the arithmetic mean of  $a$  and  $b$   
(B) the geometric mean of  $a$  and  $b$   
(C) the harmonic mean of  $a$  and  $b$   
(D) equal to zero

- 21 If the direction cosines of two lines are given by  $l + 3m + 5n = 0$  and  $5l/m - 2mn + 6/n = 0$ , then the angle between the lines is

(A)  $\cos^{-1}\left(\frac{1}{6}\right)$       (B)  $\cos^{-1}\left(\frac{1}{3}\right)$   
(C)  $\cos^{-1}\left(\frac{1}{5}\right)$       (D)  $\sin^{-1}\left(\frac{1}{6}\right)$

Space for rough work

22 Solution of the differential equation

$$\cos x \, dy = y(\sin x - y)dx, \quad 0 < x < \frac{\pi}{2} \text{ is}$$

- (A)  $\sec x = (\tan x + c)y$  (B)  $y \sec x = \tan x + c$   
 (C)  $y \tan x = \sec x + c$  (D)  $\tan x = (\sec x + c)y$

23 If  $I = \int_0^1 \cos \left( 2 \cot^{-1} \sqrt{\frac{1-x}{1+x}} \right) dx$

- (A)  $I > \frac{1}{2}$  (B)  $I = -\frac{1}{2}$  (C)  $I < \frac{1}{2}$  (D)  $I = \frac{1}{2}$

24 If the function,  $g(x) = \begin{cases} k\sqrt{x+1}, & 0 \leq x \leq 3 \\ mx+2, & 3 < x \leq 5 \end{cases}$  is

differentiable, the value of  $k + m$  is

- (A) 2 (B)  $\frac{16}{5}$  (C)  $\frac{10}{3}$  (D) 4

25 Choose the equivalent of  $[(p \wedge \sim q) \vee q \vee (\sim p \wedge q)]$ .

- (A)  $\sim p \wedge q$  (B)  $p \wedge q$   
 (C)  $p \vee q$  (D)  $p \vee \sim q$

Space for rough work

- 26 To what temperature a certain length of silver wire initially at  $20^{\circ}\text{C}$  should be heated so that its resistance becomes twice that at  $20^{\circ}\text{C}$ . Temperature coefficient of resistance of silver at  $0^{\circ}\text{C}$  is  $3.8 \times 10^{-3} \text{ }^{\circ}\text{C}^{-1}$ .
- (A)  $173^{\circ}\text{C}$  (B)  $255^{\circ}\text{C}$   
(C)  $303^{\circ}\text{C}$  (D)  $418^{\circ}\text{C}$
- 27 An alternating e.m.f.  $100 \cos 100 t$  volt is connected in series to a resistance of 10 ohm and inductance 100 mH. What is the phase difference between the current in the circuit and the e.m.f. ?
- (A)  $\frac{\pi}{4}$  (B) Zero (C)  $\pi$  (D)  $\frac{\pi}{2}$
- 28 The incorrect statement regarding the lines of force of the magnetic field  $B$  is
- (A) Magnetic intensity is a measure of lines of force passing through unit area held normal to it  
(B) Magnetic lines of force form a close curve  
(C) Inside a magnet, its magnetic lines of force move from north pole of magnet towards its south pole  
(D) Due to a magnet, magnetic lines of force never cut each other

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Space for rough work

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**29** In a certain region of surface, there exists a uniform electric field of  $2 \times 10^3 \hat{k}$  V/m. A rectangular coil of dimensions 10 cm  $\times$  20 cm is placed in x-y plane. The electric flux through the coil is

- (A) zero (B) 30 V-m  
 (C) 40 V-m (D) 50 V-m

**30** Imagine an atom is made up of proton and a hypothetical particle of double the mass of electron, but having the same charge as that of electron. Apply the Bohr atom model and consider all possible transitions of this hypothetical particle to the first excited level. The longest wavelength photon that will be emitted has wavelength  $\lambda$ , (given in terms of Rydberg constant R for hydrogen atom) equal to

- (A)  $\frac{9}{5R}$  (B)  $\frac{36}{5R}$  (C)  $\frac{18}{5R}$  (D)  $\frac{4}{R}$

**31** A solenoid 30 cm long and 6 cm diameter is made using a copper wire of resistance of 0.01 ohm per m. The total number of turns in the solenoid is 150. The solenoid is connected across a 12 V battery. Find the magnetic field inside the solenoid in Tesla.

- (A) 0.0168 (B) 0.0277  
 (C) 0.0345 (D) 0.0593

Space for rough work

- 32 If a clear liquid has a refractive index of 1.45 and a transparent solid has an index of 2.90 then, for total internal reflection to occur at the interface between these two media, which of the following must be true ?

	Incident beam originates in the	At an angle of incidence greater than
(A)	Solid	30
(B)	Liquid	30
(C)	Solid	60
(D)	Liquid	60

- 33 Half-lives of two radioactive substances X and Y are respectively 20 minutes and 40 minutes. Initially, the sample of X and Y have equal number of nuclei. After 80 minutes the ratio of remaining number of X and Y nuclei is

- (A) 1 : 16                      (B) 4 : 1  
(C) 1 : 4                        (D) 1 : 1

- 34 Two Nicol-prisms are first crossed and then one of them is rotated through  $60^\circ$ . The percentage of incident light transmitted is :

- (A) 50                            (B) 25.0  
(C) 37.5                        (D) 75

Space for rough work



- 38 The coil of a moving coil galvanometer is wound over a metal frame in order to
- (A) reduce hysteresis
  - (B) provide electromagnetic damping
  - (C) increase the moment of inertia
  - (D) increase the sensitivity
- 39 A cylinder of radius  $R$  and length  $l$  is placed in a uniform electric field  $E$  parallel to the axis of the cylinder. The total flux over the curved surface of the cylinder is
- (A) Zero
  - (B)  $\pi R^2 E$
  - (C)  $2\pi R^2 E$
  - (D)  $E/\pi R^2$
- 40 Two co-axial solenoids are made by winding thin insulated wire over a pipe of cross-sectional area  $A = 10 \text{ cm}^2$  and length = 20 cm. If one of the solenoids has 300 turns and the other 400 turns, their mutual inductance is, ( $\mu_0 = 4 \times 10^{-7} \text{ T m A}^{-1}$ )
- (A)  $2.4\pi \times 10^{-4} \text{ H}$
  - (B)  $2.4\pi \times 10^{-5} \text{ H}$
  - (C)  $4.8\pi \times 10^{-4} \text{ H}$
  - (D)  $4.8 \times 10^{-5} \text{ H}$

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Space for rough work

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**41** The e.m.f. of the cell

$\text{Zn} \mid \text{Zn}^{2+} (0.01 \text{ M}) \parallel \text{Fe}^{2+} (0.001 \text{ M}) \mid \text{Fe}$  at 298 K is 0.2905 volt. Then the value of equilibrium constant for the cell reaction is

(A)  $e^{\frac{0.32}{0.0295}}$

(B)  $10^{\frac{0.32}{0.0295}}$

(C)  $10^{\frac{0.26}{0.0295}}$

(D)  $10^{\frac{0.32}{0.0591}}$

**42**  $a \text{K}_2\text{Cr}_2\text{O}_7 + b \text{KCl} + c \text{H}_2\text{SO}_4 \longrightarrow x \text{CrO}_2\text{Cl}_2 + y \text{KHSO}_4 + z \text{H}_2\text{O}$

(A)  $a = 2, b = 4, c = 6$  and  $x = 2, y = 6, z = 3$

(B)  $a = 4, b = 2, c = 6$  and  $x = 6, y = 2, z = 3$

(C)  $a = 6, b = 4, c = 2$  and  $x = 6, y = 3, z = 2$

(D)  $a = 1, b = 4, c = 6$  and  $x = 2, y = 6, z = 3$

**43** An organic compound A reacts with methyl magnesium iodide to form an addition product which on hydrolysis forms the compound B. Compound B gives blue colour salt in Victor Meyer's test. The compounds A and B respectively are

(A) Acetaldehyde, tertiary butyl alcohol

(B) Acetaldehyde, ethyl alcohol

(C) Acetaldehyde, isopropyl alcohol

(D) Acetone, isopropyl alcohol



- 44 In the first order reaction, half of the reaction is completed in 100 secs. The time for 99% reaction to occur will be
- (A) 664.64 sec. (B) 646.6 sec.  
 (C) 660.9 sec. (D) 654.5 sec.
- 45 The two isomers X and Y with the formula  $\text{Cr}(\text{H}_2\text{O})_5\text{ClBr}_2$  were taken for experiment on depression in freezing point. It was found that one mole of X gave depression corresponding to 2 moles of particles and one mole of Y gave depression due to 3 moles of particles. The structural formulae of X and Y respectively are
- (A)  $[\text{Cr}(\text{H}_2\text{O})_5\text{Cl}]\text{Br}_2$ ;  $[\text{Cr}(\text{H}_2\text{O})_4\text{Br}_2]\text{Cl} \cdot \text{H}_2\text{O}$   
 (B)  $[\text{Cr}(\text{H}_2\text{O})_5\text{Cl}]\text{Br}_2$ ;  $[\text{Cr}(\text{H}_2\text{O})_3\text{ClBr}_2]2\text{H}_2\text{O}$   
 (C)  $[\text{Cr}(\text{H}_2\text{O})_5\text{Br}]\text{BrCl}$ ;  $[\text{Cr}(\text{H}_2\text{O})_4\text{ClBr}]\text{Br} \cdot \text{H}_2\text{O}$   
 (D)  $[\text{Cr}(\text{H}_2\text{O})_4\text{Br}_2]\text{Cl} \cdot \text{H}_2\text{O}$ ;  $[\text{Cr}(\text{H}_2\text{O})_5\text{Cl}]\text{Br}_2$
- 46 A 5% solution (by mass) of cane sugar in water has freezing point of 271 K and freezing point of pure water is 273.15 K. The freezing point of a 5% solution (by mass) of glucose in water is
- (A) 271 K (B) 273.15 K  
 (C) 269.07 K (D) 277.23 K

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 Space for rough work
 

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- 49 Which of the following statements regarding the  $S_N1$  reaction shown by alkyl halide is not correct ?
- (A) The added nucleophile plays no kinetic role in  $S_N1$  reaction.
  - (B) The  $S_N1$  reaction involves inversion of configuration of the optically active substrate.
  - (C) The  $S_N1$  reaction on the chiral starting material ends up with racemization of the product.
  - (D) The more stable the carbocation intermediate faster is the  $S_N1$  reaction.

- 50 Which of the following statements is incorrect ?
- (A) Molecular weight of  $\text{NaCl}$  found by osmotic pressure measurements is half of the theoretical value.
  - (B) Molecular weight of  $\text{CH}_3\text{COOH}$  in benzene found by cryoscopic methods is double of the theoretical value.
  - (C) Osmotic pressure 0.1 M glucose solution is half of that of 0.1 M  $\text{NaCl}$  solution
  - (D) Molecular weight of  $\text{HCl}$  found by any colligative property will be same in the aqueous solution and benzene solution.

- 51 Number of electrons transferred in each case when  $\text{KMnO}_4$  acts as an oxidising agent to give  $\text{MnO}_2$ ,  $\text{Mn}^{2+}$ ,  $\text{Mn}(\text{OH})_3$  and  $\text{MnO}_4^{2-}$  are respectively.

- (A) 3, 5, 4 and 1
- (B) 4, 3, 1 and 5
- (C) 1, 3, 4 and 5
- (D) 5, 4, 3 and 1



54 P, Q and R are three complexes of chromium (III) with the empirical formula  $H_{12}O_6Cl_3Cr$ . All the three complexes have water and chloride ion as ligands. Complex P does not react with concentrated  $H_2SO_4$ , whereas complexes Q and R lose 6.75% and 13.5% of their original weight respectively, on treatment with concentrated  $H_2SO_4$ . Identify P, Q and R.

- (A) P is  $[Cr(H_2O)_6]Cl_3$ , Q is  $[Cr(H_2O)_5Cl]Cl_2 \cdot H_2O$ ,  
R is  $[Cr(H_2O)_4Cl_2] \cdot Cl_2 \cdot H_2O$
- (B) P is  $[Cr(H_2O)_6]Cl_3$ , Q is  $[Cr(H_2O)_4Cl_2] \cdot Cl \cdot 2H_2O$ ,  
R is  $[Cr(H_2O)_5Cl_2] \cdot Cl \cdot H_2O$
- (C) P is  $[CrCl_3(H_2O)_3] \cdot 3H_2O$ , Q is  $[Cr(H_2O)_5Cl]Cl_2 \cdot H_2O$ ,  
R is  $[Cr(H_2O)_4Cl_2] \cdot Cl \cdot 2H_2O$
- (D) Both (A) and (B)

55 Which of the following reaction can produce  $R-CO-Ar$ ?

- (A)  $ArCOCl + H-Ar \xrightarrow{AlCl_3}$
- (B)  $RCOCl + ArMgX \longrightarrow$
- (C)  $ArCOCl + RMgX \longrightarrow$
- (D)  $RCOCl + H-Ar \xrightarrow{AlCl_3}$

Space for rough work

56 There are two components to this question.

1. A grid which describes the function of a series of switches.
2. A flowchart showing: input - switches - output.

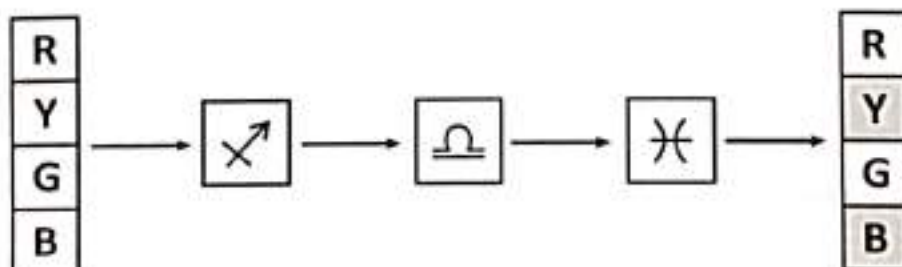
Each of the switches acts to alter the input before the next switch in the series.

Switch	Function	Fault	Code
	Allows all colours to pass	Allows only red to pass	<b>A</b>
	Allows only red & yellow to pass	Allows only green & blue to pass	<b>B</b>
	Turns on red & green	Turns on yellow & blue	<b>C</b>
	Toggles all colours	Toggles red & blue	<b>D</b>
	No Faults		<b>E</b>

This grid shows four switches and their effect on four coloured inputs which may be either on or off.

**R** - Red **Y** - Yellow **G** - Green **B** - Blue  = on  = off

Which switch is showing a fault ?



- (A) A (B) B  
(C) C (D) D

57 Read the passage and answer the following question.

Up until recently, the village of ramdegi was bustling farming community in central India's famous Tiger Reserve. Today, the village's human population stands at exactly zero. As part of an on-going effort to reduce human conflict with wildlife, the Indian government has been encouraging communities living in and around nature reserves to relocate for the sake of peaceful coexistence. Last month, everyone in Ramdegi did just that: some 200 families agreed to accept incentive packages and move beyond the reserve's borders, freeing the land to be reclaimed by the surrounding biodiversity.

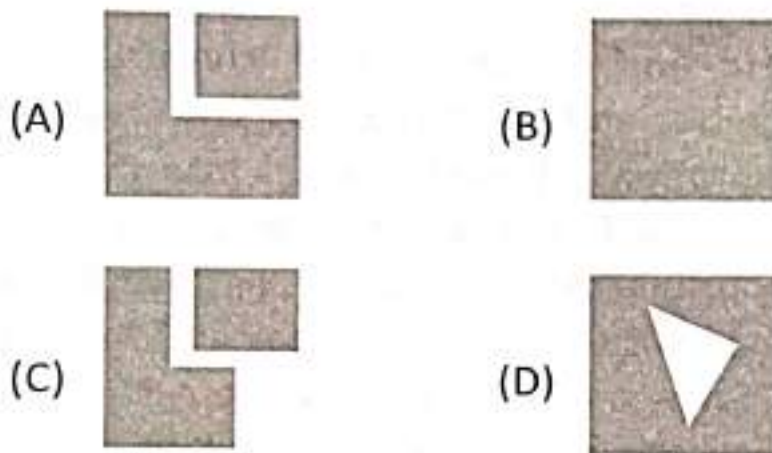
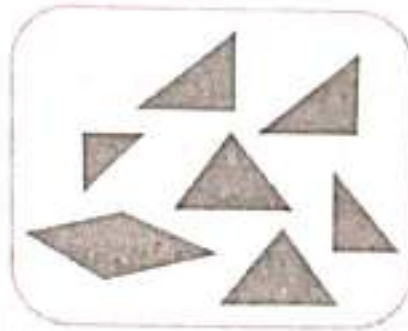
A little over a month after the last human departed, Ramdegi is now home to herds of deer, antelope and boars - grazing on the meadows that were once cropland and cattle farms. Even a tiger has been spotted prowling the grounds of the empty village, free from dangerous and often deadly conflicts with humans that have driven the species to "endangered" status.

Which one of the following is an assumption made by the author in the second paragraph ?

- (A) Humans can be violent towards animals
- (B) Tigers are quiet animals
- (C) Tigers usually kill humans
- (D) Humans are considerate of wildlife

Space for rough work

- 58** Which shape can be assembled using all of the individual shapes shown ?



- 59** Which option is true for the given statements ?

**Statements:**

1. M is brother of Kiran and Trisha is sister of Kiran.
2. Kiran's mother is married to Janu's husband who has one son and two daughters.

- (A) I alone is sufficient while II alone is not sufficient  
 (B) II alone is sufficient while I alone is not sufficient  
 (C) Either I or II is sufficient  
 (D) Neither I nor II is sufficient

Space for rough work



- 60 Read the Passage carefully and answer the following question.

We are tempted to assume that technological progress is the real progress and that material success is the criterion of civilisation. If the eastern people become fascinated by machines and techniques and use them as western nations do, to build industrial organisations and large military establishments, they will get involved in power politics and drift into the danger of death. Scientific and technological civilization brings opportunities and great rewards but also great risks and temptations. If machines get into the saddle, all our progress will have been in vain. The problem facing us is a universal one. Both east and west are threatened with the same danger and face the same destiny. Science and technology are neither good nor bad. They are not to be tabooed but tamed and assigned their proper place. They become dangers only if they become idols.

Which of the following statements is are true in the context of the passage ?

1. Science and technology are neither good nor bad.
2. Through machines, man can achieve all progress.
3. Science and technology bring great risks and temptations.

(A) 1 and 2

(B) 1 and 3

(C) 2 and 3

(D) 1, 2 and 3

Space for rough work