

Competishun

52/6, Opposite Metro Mas Hospital, Shipra Path, Mansarovar

Date: 12/08/2024

Time: 3 hours

Max. Marks: 300

PRATHAM-1_(24-25)_MPT-3

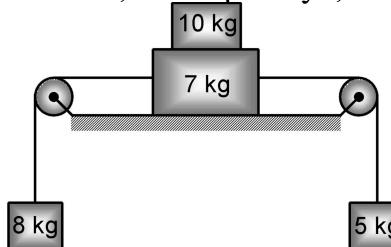
Physics

Single Choice Question

- Q1** Two identical particles of same mass, having velocities opposite to each other, equal in magnitude, collide head on. During collision 50% of kinetic energy is lost. Coefficient of restitution is :

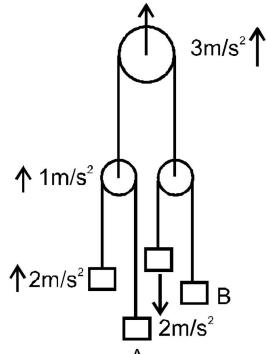
a) $\frac{1}{\sqrt{2}}$ b) $\frac{1}{2}$ c) $\frac{2}{3}$ d) $\frac{1}{4}$

- Q2** The acceleration of 8 kg block just after system is released is : (All surfaces are smooth, ideal pulleys, massless strings) ($g = 10 \text{ m/s}^2$)



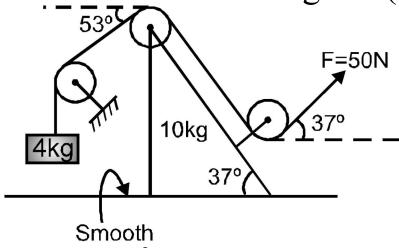
a) 1 m/s^2 b) 2 m/s^2 c) 1.5 m/s^2 d) None of these

- Q3** Acceleration of pulleys and blocks are as shown in the figure. All pulleys & strings are massless & frictionless magnitude of a_A and a_B are :



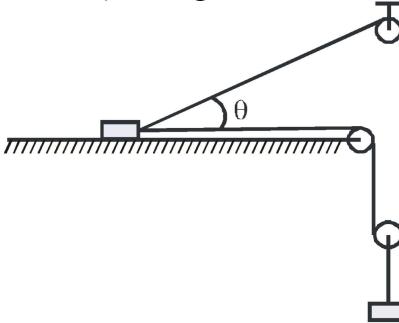
a) $a_A = 0, a_B = 7$ b) $a_A = 0, a_B = 5$ c) $a_A = 0, a_B = 12$ d) $a_A = 5, a_B = 7$

- Q4** Wedge of 10 kg is free to move on horizontal surface. At the given instant, acceleration of wedge is (string and pulleys are ideal)



- a) 2 m/s^2 towards right b) 2 m/s^2 towards left c) 1 m/s^2 toward left
d) 1 m/s^2 toward right

- Q5** The figure shows a pulley block system placed on a smooth table. All pulleys are light and smooth and the strings are light. The mass of each block is 5 kg and the angle $\theta = 60^\circ$. (Take $g = 10 \text{ m/sec}^2$).



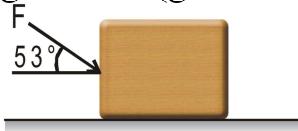
The acceleration of hanging block just after the system is released from rest will be :

- a) 4.8 m/s^2 b) 1.2 m/s^2 c) 3.6 m/s^2 d) zero

- Q6** A block slides down an inclined plane of slope angle ϕ with constant velocity. If it is then projected up the same plane with an initial speed v_0 , the distance in which it will come to rest is:

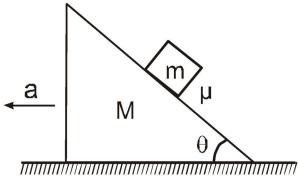
- a) $\frac{v_0^2}{g \tan \phi}$ b) $\frac{v_0^2}{4g \sin \phi}$ c) $\frac{v_0^2}{2g}$ d) $\frac{v_0^2}{2g \sin \phi}$

- Q7** A block of mass 20 kg is acted upon by a force $F = 30 \text{ N}$ at an angle 53° with the horizontal in downward direction as shown. The coefficient of friction between the block and the horizontal surface is 0.2. The friction force acting on the block by the ground is ($g = 10 \text{ m/s}^2$)



- a) 40.0 N b) 30.0 N c) 18.0 N d) 44.8 N

- Q8** A block of mass m is at rest relative to the stationary wedge of mass M . The coefficient of friction between block and wedge is μ . The wedge is now pulled horizontally with acceleration ' a ' as shown in figure. Then the minimum magnitude of ' a ' for the friction between block and wedge to be zero is :

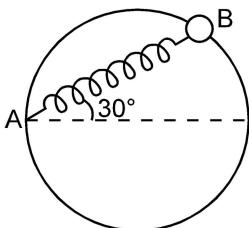


- a) $g \tan \theta$ b) $\mu g \tan \theta$ c) $g \cot \theta$ d) $\mu g \cot \theta$

- Q9** A particle is projected vertically upwards with a speed of 16 m/s , after some time, when it again passes through the point of projection, its speed is found to be 8 m/s . It is known that the work done by air resistance is same during upward and downward motion. Then the maximum height attained by the particle is (Take $g = 10 \text{ m/s}^2$) :

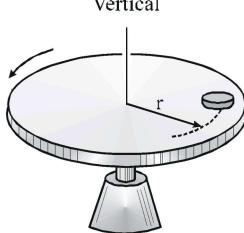
- a) 8 m b) 4.8 m c) 17.6 m d) 12.8 m

- Q10** A bead of mass m is attached to one end of a spring of natural length R and spring constant $K = \frac{(\sqrt{3}+1)mg}{R}$. The other end of the spring is fixed at point A on a smooth vertical ring of radius R as shown in figure. The normal reaction at B just after it is released is :



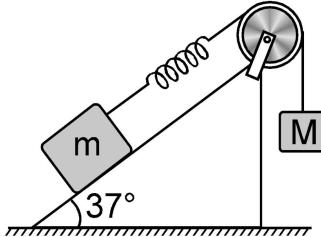
- a) $\frac{mg}{2}$ b) $\sqrt{3} mg$ c) $3\sqrt{3} mg$ d) $\frac{3\sqrt{3}mg}{2}$

- Q11** A small coin of mass 40 g is placed on the horizontal surface of a rotating disc. The disc starts from rest and is given a constant angular acceleration $\alpha = 2 \text{ rad/s}^2$. The coefficient of static friction between the coin and the disc is $\mu_s = 3/4$ and coefficient of kinetic friction is $\mu_k = 0.5$. The coin is placed at a distance $r = 1 \text{ m}$ from the centre of the disc. The magnitude of the resultant force on the coin exerted by the disc just before it starts slipping on the disc is : (Take $g = 10 \text{ m/s}^2$)



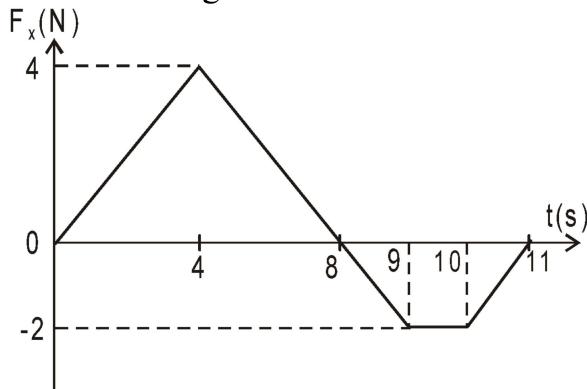
- a) 0.2 N b) 0.3 N c) 0.4 N d) 0.5 N

- Q12** A block of mass m is attached with a massless spring of force constant k . The block is placed over a fixed rough inclined surface for which the coefficient of friction is $\mu = \frac{3}{4}$. The block of mass m is initially at rest. The block of mass M is released from rest with spring in undeformed state. The minimum value of M required to move the block up the plane is (neglect mass of string and pulley and friction in pulley.)



- a) $\frac{3}{5} m$ b) $\frac{4}{5} m$ c) $\frac{6}{5} m$ d) $\frac{3}{2} m$

- Q13** A 2 kg toy car can move along x axis. Graph shows resultant force F_x , acting on the car which begins at rest at time $t = 0$. The velocity of the particle at $t = 10$ s is :



- a) $-i$ m/s b) $-1.5 i$ m/s c) $6.5 i$ m/s d) $13 i$ m/s

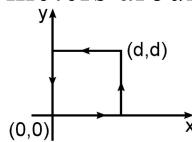
- Q14** A particle is given an initial velocity V in smooth fixed vertical circular track of radius $R = 1\text{m}$. It is just able to complete circle. Acceleration of particle when its acceleration is in vertical direction. (Take $g = 10 \text{ m/s}^2$)

- a) 10 m/s^2 b) 5 m/s^2 c) 7.5 m/s^2 d) 12 m/s^2

- Q15** A body is moving with a velocity 1 ms^{-1} and a force F is needed to stop it within a distance x . If the speed of the body is 3 ms^{-1} , the force needed to stop it within the same distance (x) will be-

- a) $9F$ b) $6F$ c) $3F$ d) $1.5F$

- Q16** The work done by the force $\vec{F} = A (y^2 \hat{i} + 2x^2 \hat{j})$, where A is a constant and x & y are in meters around the path shown is:



- a) zero b) $A d$ c) $A d^2$ d) $A d^3$

Q17

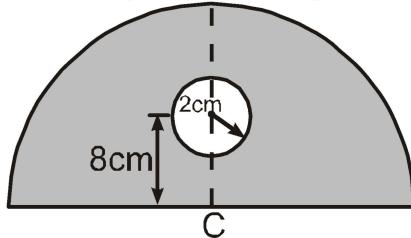
A force which varies with time t as $\vec{F} = (3t\hat{i} + 5\hat{j}) \text{ N}$ acts on a body due to which its position varies with time t as $\vec{s} = (2t^2\hat{i} - 5\hat{j})$ where t is in seconds. Work done by this force in initial 2s is:

- a) 23 J b) 32 J c) zero d) can't be obtained

Q18 A plate, of uniform thickness and uniform density, has shape in the x-y plane defined by the lines $x = 0$, $y = 2$, and curve $y = \frac{1}{2}x$. The plate lies in first quadrant of x-y plane. Then the x-coordinate of centre of mass of this plate is:

- a) $\frac{1}{2}$ b) $\frac{3}{2}$ c) $\frac{4}{3}$ d) $\frac{3}{4}$

Q19 In the figure shown a hole of radius 2 cm is made in a semicircular disc of radius 6π cm at a distance 8 cm from the centre C of the disc. The distance of the centre of mass of this system from point C is:



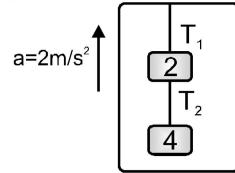
- a) 4 cm b) 8 cm c) 6 cm d) 12 cm

Q20 A continuous stream of particles of mass m and velocity v , is emitted from a source at a rate of n per second. The particles travel along a straight line, collide with a body of mass M and are buried in this body. If the mass M was originally at rest, its velocity when it has received N particles will be:

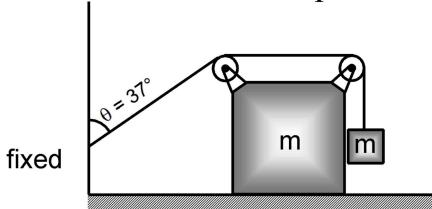
- a) $\frac{mvn}{Nm+n}$ b) $\frac{mvN}{Nm+M}$ c) $\frac{mv}{Nm+M}$ d) $\frac{Nm+M}{mv}$

Numerical

Q21 If ratio of T_1 and T_2 is x then find value of $10x$. (strings are massless and inextensible, T_1 and T_2 are tension in the string as shown, $g = 10 \text{ m/s}^2$).

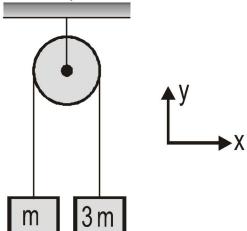


- Q22** Consider the arrangement shown in figure. Pulleys and string are ideal. There is no friction between smaller and bigger block. Both blocks have same mass m . The minimum coefficient of friction between bigger block and ground for which both blocks remains in equilibrium is μ , then 70μ is :



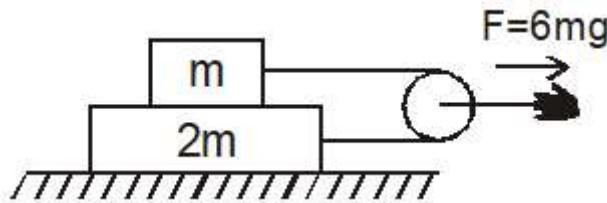
- Q23** A ladder AB , 2.5 m long and of weight 150 N has its centre of gravity 1 m from A is lying flat on ground. A weight of 40 N is attached to the end B. The work required (in Joule) to raise the ladder from the horizontal position to vertical position so that the bottom end A is resting in a ditch 1m below the ground level will be :

- Q24** In the figure shown pulley and string are massless. The blocks move in vertical plane due to gravity. If the magnitude of acceleration of centre of mass of blocks is a (in m/s^2) then value of $2a$ is (Take $g = 10 \text{ m/s}^2$)

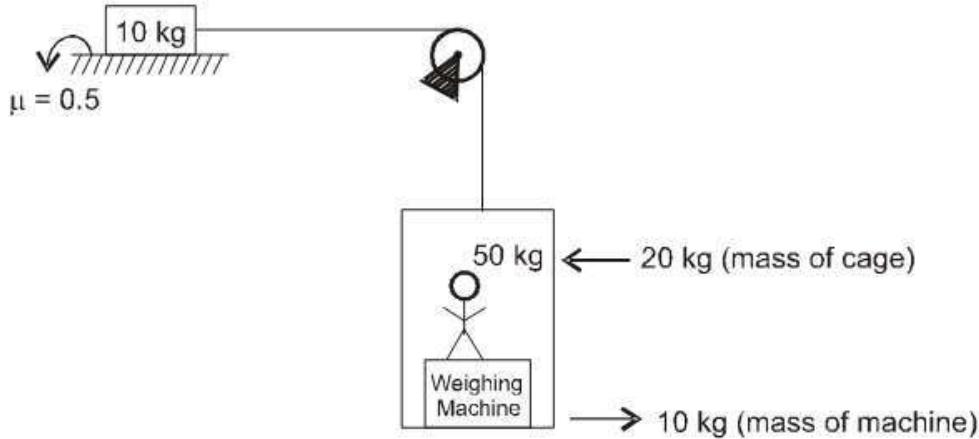


- Q25** Two particles of mass $M = 3 \text{ kg}$ each are kept on a horizontal circular platform on two mutually perpendicular radii at equal distance $R = 1 \text{ m}$ from the centre of the table. The particles are connected with a string, which is just taught when the platform is not rotating. Coefficient of friction between the platform and block is $\mu = 0.1$. Then the maximum angular speed (ω in rad/sec) of platform about its centre so that the blocks remain stationary relative to platform. (take $g = 10 \text{ m/s}^2$)

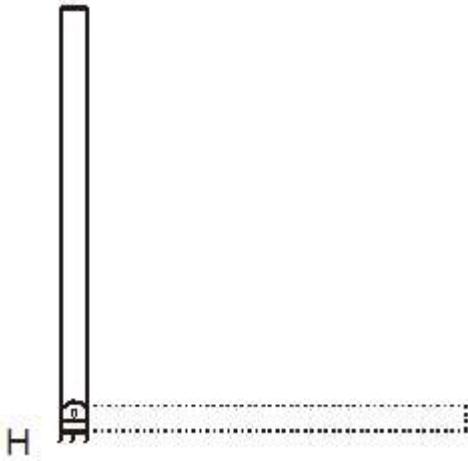
- Q26** A block of mass m is placed on top of a block of mass $2m$ which in turn is placed on fixed horizontal surface. The coefficient of friction between all surfaces is $\mu = 1$. A massless string is connected to each mass and wraps halfway around a massless and frictionless pulley, as shown. The pulley is pulled by horizontal force of magnitude $F = 6mg$ towards right as shown. If the magnitude of acceleration of pulley is $\frac{x}{2} \text{ m/s}^2$, fill the value of X . (Take $g = 10 \text{ m/s}^2$)



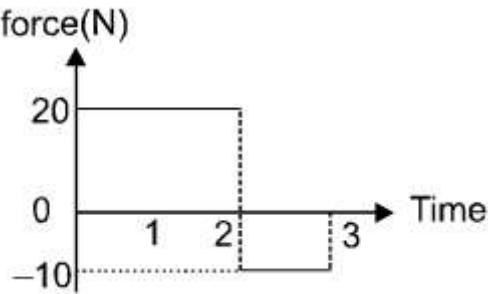
- Q27** If pulley is ideal and string is massless then reading of weighing machine is $\frac{5x}{3}$ kg then calculate x. : ($g = 10 \text{ m/s}^2$)



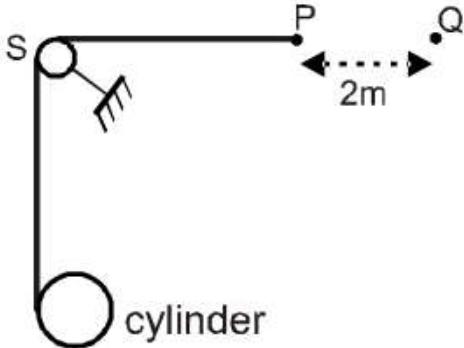
- Q28** A thin rod of length 1 m is kept vertical and is hinged from the lower end 'H'. Its linear mass density varies with the distance (x) from the end 'H' as $\lambda = (12x)$ kg/m, where x is distance along rod from point H. The potential energy (in Joules) of the rod is 5N. Find N (at H the potential energy is zero)



- Q29** Starting at rest, a 5 kg object is acted upon by only one force as indicated in figure. Find the total work (in J) done by the force.



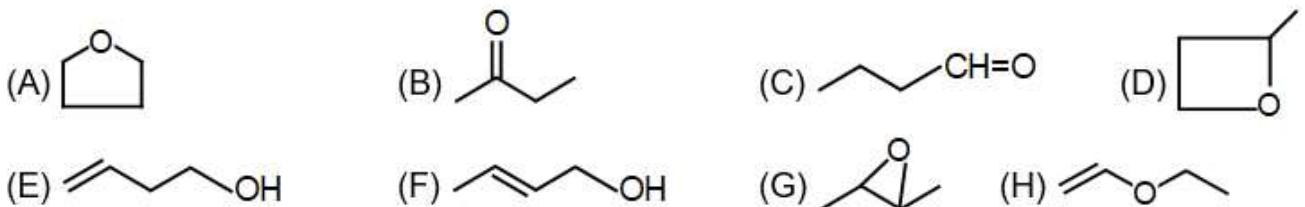
- Q30** A light string is wrapped on a cylinder of mass 1 kg. The string passes over a fixed smooth pulley S. The cylinder is released from rest while a constant force 100 N is applied at the end P of the string .When P has moved to Q, the Center of mass of the cylinder is found to ascend by 4 m. The kinetic energy of the cylinder at this instant is $10x$ Joule. Then Find x . (Take $g = 10 \text{ m/s}^2$)



Chemistry

Single Choice Question

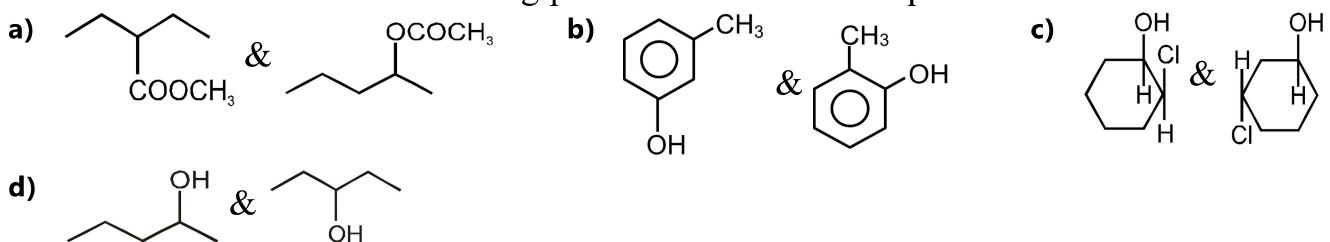
Q31 Observe the isomers with the molecular formula C_4H_8O given below



Now select the false statement regarding the above isomers A, B, C, D, E, F, G, H.

- | | |
|-----------------------------------|-----------------------------------|
| a) B and C are functional Isomers | b) H and A are metamers |
| c) E and F are position isomers | d) B and D are functional isomers |

Q32 Member of which of the following pair of isomers are not position isomers?



Q33 The chemical formula of Pyrosulphuric acid is:

- | | | | |
|----------------|----------------|----------------|----------------|
| a) $H_2S_2O_7$ | b) $H_2S_2O_5$ | c) $H_2S_2O_6$ | d) $H_2S_2O_4$ |
|----------------|----------------|----------------|----------------|

Q34 In $NaIO$ oxidation number of Iodine is :

- | | | | |
|-------|-------|-------|-------|
| a) +4 | b) +2 | c) +3 | d) +1 |
|-------|-------|-------|-------|

Q35 Which of the following anion has pyro-prefix:

- | | | | |
|------------------|----------------|------------------|----------------|
| a) $S_2O_7^{2-}$ | b) SO_5^{2-} | c) $S_2O_8^{2-}$ | d) SO_3^{2-} |
|------------------|----------------|------------------|----------------|

Q36 What is the formula of aluminium arsenite :

- | | | | |
|----------------|----------------|--------------|--------------|
| a) $Al(AsO_3)$ | b) $Al(AsO_4)$ | c) $AlAsO_5$ | d) $AlAsO_4$ |
|----------------|----------------|--------------|--------------|

Q37 The chemical name of $Ca(ClO_2)_2$ is -

- | | | |
|------------------------|---------------------|---------------------|
| a) Calcium chloride | b) Calcium chlorite | c) Calcium chlorate |
| d) Calcium perchlorate | | |

Q38 Match the column :

- Formulas of anion
 (P) hypophosphate ion
 (Q) Pyrophosphate ion
 (R) Metaphosphate ion
 (S) Orthophosphate ion
 a) P-c; Q-a; R-b; S-d
 b) P-d; Q-c; R-a; S-b

- Name
 (a) $P_2O_7^{4-}$
 (b) $(PO_3^-)_3$
 (c) $H_2PO_2^-$
 (d) PO_4^{3-}

b) P-a; Q-b; R-c; S-d c) P-b; Q-c; R-a; S-d

Q39 What is the formula of sodium hypophosphite?

- a) NaH_2PO_2 b) Na_2HPO_3 c) Na_3PO_3 d) NaH_2PO_3

Q40 What is the total mass of products formed when 34 g of H_2S is oxidised by excess of oxygen gas to produce water & sulphur dioxide?

- a) 34 g b) 68 g c) 82 g d) 164 g

Q41 Which of the following will not give positive iodoform test.

- a) b) c) d)

Q42 Which of the following alkenes give four monochloro (structural isomer) product after hydrogenation ?

- a) Pent-2-ene b) 2-Methylbut-2-ene c) 3-Methylhex-2-ene
 d) 2, 3-Dimethylbut-2-ene

Q43 Which of the following is the not reagent of reductive ozonolysis

- a) O_3 and Zn/H_2O b) O_3 and H_2O_2 c) O_3 and Zn/CH_3COOH
 d) O_3 and Zn/CH_3SCH_3

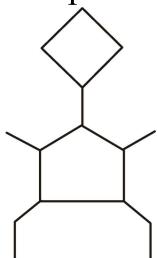
Q44 What is reductive ozonolysis product of the following compound $CH_3-CH=CH_2$

- a) $CH_3-CHO + O=CH-CH_2-CH_3$ b) $CH_3-CH_2-CHO + O-CH_3$
 c) $CH_3-CHO + HCHO$ d) $CH_3-CHO + O$

Q45 At a constant pressure, what should be the percentage increase in the temperature in kelvin for a 10% increase in volume :

- a) 10% b) 20% c) 5% d) 50%

Q46 How many cyclo alkenes (structural only) on hydrogenation can give following compound.



a) 7

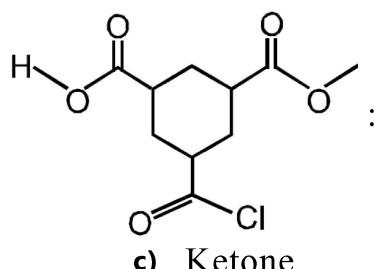
b) 8

c) 9

d) 10

Q47

Which functional group is absent in



a) Ester

b) Acidhalide

c) Ketone

d) Carboxylic acid

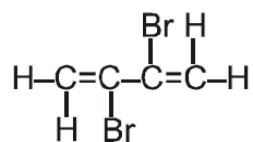
Q48 In which of the following pairs, the number of lone pair(s) over central atom is same

a) $\text{TeCl}_4, \text{PCl}_4^+$ b) $\text{ClF}_3, \text{PCl}_3$ c) $\text{SiCl}_4, \text{BF}_4^-$ d) $\text{BrF}_5, \text{XeF}_5^-$

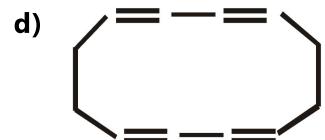
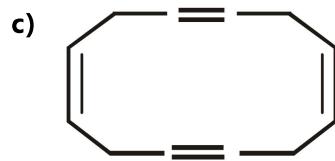
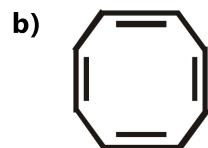
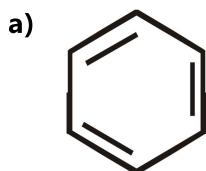
Q49 In which of the following, the π -bonds lie in same plane?

a) $\text{Cl} - \text{C} \equiv \text{C} - \text{Cl}$ b) $\text{O} = \text{C} = \text{O}$ c) N_2

d)



Q50 An hydrocarbon on oxidative ozonolysis produces oxalic acid and butanedioic acid. Its structure is



Numerical

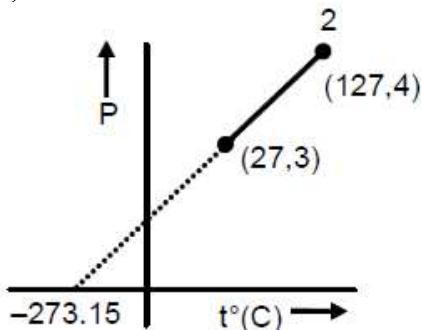
Q51 How many alkenes give 2-methylbutane on catalytic hydrogenation?

Q52

How many types of C–O bond length are present in $\text{CH}_3 - \overset{\underset{\text{OH}}{\parallel}}{\text{C}} - \text{CH}_2 - \overset{\underset{\text{OH}}{\parallel}}{\text{C}} - \text{O}^\ominus$?

Q53 The haemoglobin from the red blood corpuscles of most mammals contains approximately 0.33% of iron by mass. The molar mass of haemoglobin is 67,200. The number of iron atoms in each molecule of haemoglobin is (atomic mass of iron = 56):

Q54 Two moles of an ideal gas undergoes the following process. Given that $\left(\frac{\partial P}{\partial T}\right)_V$ is $x \times 10^y$, then calculate the value of $(x + y)$



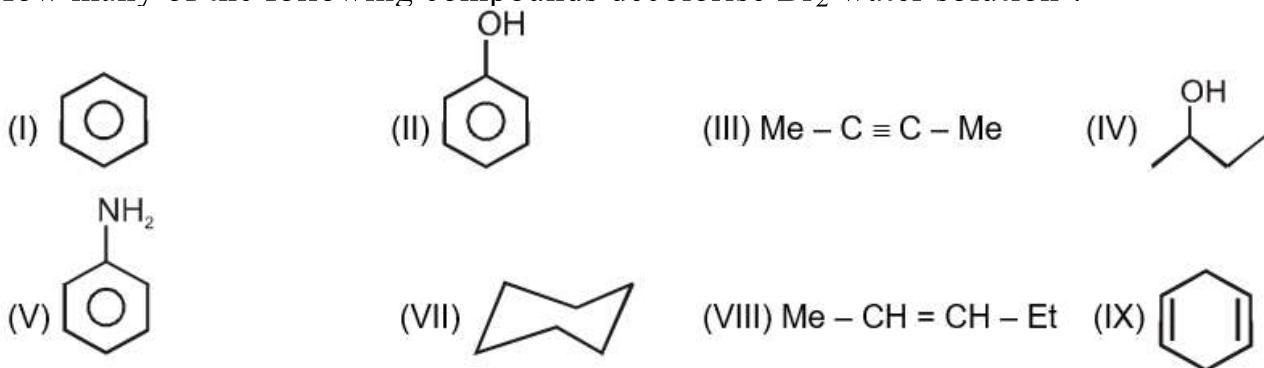
Q55 A gas XH_2 has molar mass 34 g/mol. What is the molar mass (in g/mol) of XO_3 (nearly) ?

Q56 The number of structure isomers of $C_3H_5Br_3$ is

Q57 How many isomeric alkynes on catalytic hydrogenation gives 3-Ethyl-4-methylheptane ?

Q58 Find the number of structural isomers of fully saturated cycloalkane of molecular formulae C_6H_{12} which give three monochloro structural products.

Q59 How many of the following compounds decolorise Br_2 water solution ?



Q60 How many structures possible for a compound with the molecular formula $C_6H_{12}O$ which can give positive iodoform and 2,4-DNP test.

Mathematics

Single Choice Question

- Q61** For $3 \leq r \leq n$, ${}^nC_r + 3 \cdot {}^nC_{r-1} + 3 \cdot {}^nC_{r-2} + 3 \cdot {}^nC_{r-3}$ is-
- a) ${}^{n+3}C_r$ b) $2 \cdot {}^{n+2}C_{r+2}$ c) $3 \cdot {}^{n+1}C_{r+1}$ d) $3 \cdot {}^nC_r$
- Q62** A seven-digit number made up of all distinct digits 8, 7, 6, 4, 2, x and y is divisible by 3. Then possible number of order pair (x, y) is-
- a) 4 b) 8 c) 2 d) None of these
- Q63** There are three coplanar parallel lines. If any n points are taken on each of the lines, the maximum number of triangles with vertices at these points will be
- a) $3n^2(n-1)$ b) $3n^2(n-1) + 1$ c) $n^2(4n-3)$ d) None of these
- Q64** If a, b and c be three distinct real numbers in G.P. and $a + b + c = xb$, then x cannot be:
- a) 2 b) -3 c) -2 d) 4
- Q65** The sum of an infinite geometric series with positive terms is 3 and the sum of the cubes of its terms is $\frac{27}{19}$. Then the common ratio of this series is
- a) $\frac{1}{3}$ b) $\frac{2}{9}$ c) $\frac{2}{3}$ d) $\frac{4}{9}$
- Q66** If the sum of the first 15 terms of the series $\left(\frac{3}{4}\right)^3 + \left(1\frac{1}{2}\right)^3 + \left(2\frac{1}{4}\right)^3 + 3^3 + \left(3\frac{3}{4}\right)^3 + \dots$ is equal to 225 k, then k is equal to :
- a) 108 b) 27 c) 9 d) 54
- Q67** **STATEMENT-1 :** If a, b, c are three positive numbers in G.P., then $\left(\frac{a+b+c}{3}\right) \left(\frac{3abc}{ab+bc+ca}\right) = (\sqrt[3]{abc})^2$.
- STATEMENT-2 :** $(G.M.)^2 = (AM)(HM)$ is true for any set of positive numbers.
- a) STATEMENT-1 is True, STATEMENT-2 is True ; STATEMENT-2 is a correct explanation for STATEMENT-1
- b) STATEMENT-1 is True, STATEMENT-2 is True ; STATEMENT-2 is NOT a correct explanation for STATEMENT-1
- c) STATEMENT-1 is True, STATEMENT-2 is False
- d) STATEMENT-1 is False, STATEMENT-2 is True

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Q68 Let $(x + 10)^{50} + (x - 10)^{50}$
 $= a_0 + a_1 x + a_2 x^2 + \dots + a_{50} x^{50}$, for all
 $x \in \mathbb{R}$; then $\frac{a_2}{a_0}$ is equal to :

- a) 12.25 b) 12.75 c) 12.00 d) 12.50

Q69 If the fourth term in the Binomial expansion of $\left(\frac{2}{x} + x^{\log_8 x}\right)^6$ ($x > 0$) is 20×8^7 , then a value of x is :

- a) 8^3 b) 8 c) 8^{-2} d) 8^2

Q70 If $3^{2 \sin 2x - 1}$, 14, $3^{4-2 \sin 2x}$ are first three consecutive terms of A.P., then its fifth term is equal to

- a) 25 b) 12 c) 40 d) 53

Q71 The number of function 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) $5^6 \times 15$ b) $6^5 \times (15)!$ c) $5! \times 6!$ d) $(15)! \times 6!$

Q72 If a, b, c are in A.P., $a + b + c = 60$, $(a - 2), b, (c + 3)$ are in G.P., then possible values of $a^2 + b^2 + c^2$ are

- a) 1218 b) 1208 c) 1288 d) 1296

Q73 A committee of 11 members is to be formed from 8 males and 5 females. If m is the number of ways the committee is formed with at least 6 males and n is the number of ways the committee is formed with at least 3 females, then :

- a) $m = n = 68$ b) $m + n = 68$ c) $m = n = 78$ d) $n = m - 8$

Q74 If $x + y + z = 1$ then the maximum value of $(1-x)(1-y)(1-z)$ is, where $x, y, z < 1$.

- a) $\frac{2}{3}$ b) $\frac{8}{27}$ c) $\frac{4}{9}$ d) $\frac{16}{81}$

Q75 If a_1, a_2, a_3, \dots and b_1, b_2, b_3, \dots are two A.P.s, with common difference α, β respectively and $a_1 b_1 = 120$, $\alpha \beta = -6$, $a_1 \beta + b_1 \alpha = 29$, then $a_7.b_7$ is equal to

- a) 178 b) 78 c) 278 d) 378

Q76 If $x = \frac{1}{1^2} + \frac{1}{3^2} + \frac{1}{5^2} + \dots$; $y = \frac{1}{1^2} + \frac{3}{2^2} + \frac{1}{3^2} + \frac{3}{4^2} + \dots$ and $z = \frac{1}{1^2} - \frac{1}{2^2} + \frac{1}{3^2} - \frac{1}{4^2} + \dots$, then

- a) $(y - x) = 9(x - z)$ b) $(y - x) = 5(x - z)$ c) $(y - x) = 3(x - z)$
d) $(y - x) = 7(x - z)$

Q77 Given $a^x = b^y = c^z = d^u \neq 1$ and a, b, c, d are in G.P. then x, y, z, u are in

- a) A.P. b) G.P. c) H.P. d) None of these

- Q78** If $(1 + ax)^n = 1 + 8x + 24x^2 + \dots$; then $\frac{a-n}{a+n}$ is equal to -
 a) 3 b) -3 c) -1/3 d) 1/3
- Q79** No. of terms in the expansion of $(1 + x)^{101} (1 + x^2 - x)^{100}$ is
 a) 302 b) 301 c) 202 d) 101
- Q80** Sum of coefficients of terms which contains integral powers of x in the expansion $(2 + \sqrt{x})^{30}$ is-
 a) $\frac{2^{30}+1}{2}$ b) $\frac{2^{30}-1}{2}$ c) $\frac{3^{30}-1}{2}$ d) $\frac{3^{30}+1}{2}$

Numerical

- Q81** For a game in which two partners oppose two other partners, 6 men are available. If every possible pair must play every other pair, the number of games played is :
- Q82** The number of prime factors of the coefficient of x^8 in the expansion of $(1 - 2x + 3x^2 - 4x^3 + 5x^4 - 6x^5 + 7x^6)^6$ is-
- Q83** If $\sum_{r=0}^n \left(\frac{r+2}{r+1} \right) {}^n C_r = \frac{2^8-1}{6}$ then n is
- Q84** If $(2 + a\sqrt{3})^{50} + (2 + b\sqrt{3})^{50} = 5 + 4\sqrt{2}$, then number of pairs (a, b) for which the equation is true (a, b are rational numbers)
- Q85** The coefficient of the term independent of x in the expansion of $\left[\sqrt{\left(\frac{x}{3} \right)} + \sqrt{\sqrt{\left(\frac{3}{2x^2} \right)}} \right]^{10}$
- Q86** The number of 3 digit odd numbers divisible by 3, using the digits 3, 4, 5, 6 when repetition is allowed, is
- Q87** How many numbers can be chosen at random from first one hundred natural numbers such that $\frac{(x-20)(x-40)}{x-30} < 0$
- Q88** If $\log_{\cos x} \sin x + \log_{\sin x} \cos x = 2$, $0 < x < \frac{\pi}{2}$, then $\frac{4}{\pi}x$ is equal to -
- Q89** The minimum value of $\tan \theta + \cot \theta$ in $(0, \frac{\pi}{2})$ is-
- Q90** The no. of integral values of λ for which the equation $7 \cos x + 5 \sin x = 2\lambda + 1$ has a solution is

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Answer Key

Que.	1	2	3	4	5	6	7	8	9	10
Ans.	A	C	C	D	C	B	C	C	A	D
Que.	11	12	13	14	15	16	17	18	19	20
Ans.	D	A	C	A	A	D	B	D	B	B
Que.	21	22	23	24	25	26	27	28	29	30
Ans.	15	15	60	5	1	25	5	8	90	16
Que.	31	32	33	34	35	36	37	38	39	40
Ans.	B	A	A	D	A	A	B	A	A	C
Que.	41	42	43	44	45	46	47	48	49	50
Ans.	A	B	B	C	A	C	C	C	D	D
Que.	51	52	53	54	55	56	57	58	59	60
Ans.	3	3	4	3	80	5	3	3	5	4
Que.	61	62	63	64	65	66	67	68	69	70
Ans.	A	B	C	A	C	B	C	A	D	D
Que.	71	72	73	74	75	76	77	78	79	80
Ans.	D	B	C	B	B	C	C	C	C	D
Que.	81	82	83	84	85	86	87	88	89	90
Ans.	45	4	5	0	0	11	28	1	2	8