JEE MAIN 2020

FULL TEST-7

CHEMISTRY , PHYSICS, MATHEMATICS

Time : - 3 Hours **Max. Marks:- 300** **Date : .....**

INSTRUCTIONS :

1. The test is of 3 hours duration.
2. The Test Booklet consists of 75 questions. The maximum marks are **300.**
3. There are three parts in the question paper A, B, C consisting of Chemistry, Physics and Mathematics having **25 questions** in each part of equal weightage. **20 questions** will be **MCQs** and **5 questions** will have answer to be filled as **numerical value**.
   Marking Scheme for MCQs
   Correct Answer Four mark (+4), Incorrect Answer Minus one mark (–1), Unanswered No mark (0)
   Marking Scheme for questions for which answer is a **Numerical value**
   Correct Answer Four mark (+4), Incorrect Answer No mark (0), Unanswered No mark (0)
4. There is only one correct response for each question. Filling up more than one response in each question will be treated as wrong response and marks for wrong response will be deducted accordingly.

Always desire to learn something Useful.

Wake up every morning with the thought that something Wonderful is about to happen.

The difference between ordinary and eXtraordinary is that little extra.

Name : .....

Address : .....

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Phone/Mobile No. .....

Roll No. .....

PART A – CHEMISTRY

SECTION - 1 (Q.1 - Q.20)

Each question has FOUR options (1), (2), (3) and (4). ONLY ONE of these four options is correct.

Q.1 The volume of gas at NTP produced by 100 g of CaC_2 with water

$$CaC_2 + 2H_2O \rightarrow Ca(OH)_2 + C_2H_2$$

(1) 70 litre (2) 35 litre
(3) 17.5 litre (4) 22.4 litre

Q.2 Which one of the following orders represents the correct sequence of the increasing basic nature of the given oxides?

(1) $Na_2O < K_2O < MgO < Al_2O_3$
(2) $K_2O < Na_2O < Al_2O_3 < MgO$
(3) $Al_2O_3 < MgO < Na_2O < K_2O$
(4) $MgO < K_2O < Al_2O_3 < Na_2O$

Q.3 N_2 and O_2 are converted into monoanions, N_2^- and O_2^- respectively. Which of the following statements is wrong?

(1) In N_2^- , N–N bond weakens.
(2) In O_2^-, O–O bond order increases.
(3) In O_2^-, O–O bond order decreases.
(4) N_2^- becomes paramagnetic.

Q.4 Lassaigne's test for the detection of nitrogen fails in –

(1) $H_2N - CO - NHNH_2 \cdot HCl$
(2) $NH_2 - NH_2 \cdot HCl$
(3) $C_6H_5 - NH - NH_2 \cdot HCl$
(4) $C_6H_5CONH_2$

Q.5 Correct reactivity order for EAR of following compounds is –

$Ph - CH = CH_2$ (I)

$Ph - \underset{\displaystyle CH_3}{\overset{\displaystyle |}{C}} = CH - CH_3$ (II)

$Ph_2C = CH - CH_3$ (III)

$CH_2 = CH - NO_2$ (IV)

(1) IV > I > II > III (2) III > II > I > IV
(3) II > III > I > IV (4) II > III > IV > I

Q.6 Arrange the following alkyl halides in decreasing order of the rate of elimination reaction with alcoholic KOH.

(a) $CH_3 - \underset{\displaystyle CH_3}{\overset{\displaystyle H}{\overset{|}{\underset{|}{C}}}} - CH_2 - Br$ (b) $CH_3 - CH_2 - Br$

(c) $CH_3 - CH_2 - CH_2 - Br$

(1) a > b > c (2) c > b > a
(3) b > c > a (4) a > c > b

Q.7 10 litre of an alkane X require 35 litre of O_2 for complete combustion. X forms only one monochloro derivative Y. The action of alcoholic KOH on Y yields –

(1) $CH_3CH_2CH_2OH$ (2) $CH_2 = CH_2$
(3) $CH_3CH = CH_2$ (4) $CH_3 - \underset{\displaystyle OH}{\overset{\displaystyle |}{CH}} - CH_3$

Q.8 Given the data at 25°C,

$Ag + I^- \rightarrow AgI + e^-$, $E° = 0\ 152V$
$Ag \rightarrow Ag^+ + e^-$, $E° = -0.800\ V$

What is the value of $\log K_{sp}$ for AgI ?

$\left(2.303 \frac{RT}{F} = 0.059\ V\right)$

(1) –8.12 (2) +8.612
(3) –37.83 (4) –16.11

Q.9 The correct order of acidic strength is:

(1) $Cl_2O_7 > SO_2 > P_4O_{10}$
(2) $CO_2 > N_2O_5 > SO_3$
(3) $Na_2O > MgO > Al_2O_3$
(4) $K_2O > CaO > MgO$

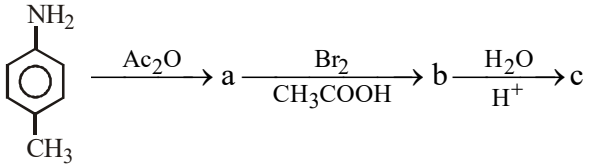
Q.10 Which of the following statements about H_3BO_3 is not correct

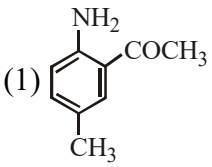
(1) It is a strong tribasic acid.
(2) It is prepared by acidifying an aqueous solution of borax.
(3) It has a layer structure in which planar BO_3 units are joined by hydrogen bonds.
(4) It does not act as proton donor but acts as a Lewis acid by accepting hydroxyl ion.

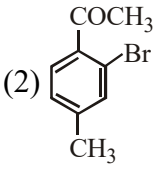
SPACE FOR ROUGH WORK

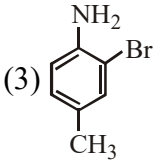
Q.11 Similar sizes of second and third transition elements can be explained on the basis of :
(1) Inert-pair effect.
(2) Screening effect.
(3) Lanthanide contraction.
(4) Increasing effective nuclear charge

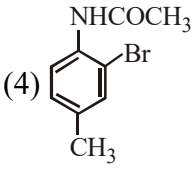
Q.12 The final product c, obtained in this reaction would be



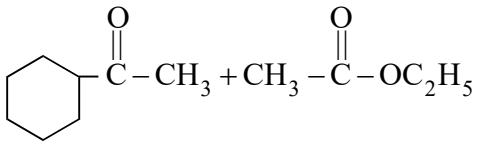
(1) 

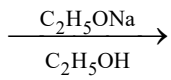
(2) 

(3) 

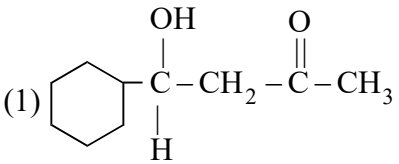
(4) 

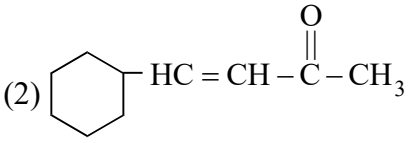
Q.13 In the given reaction:

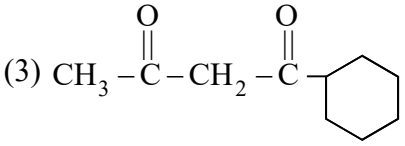


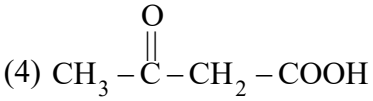


[X] ; [X] will be:

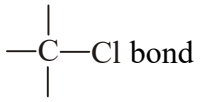
(1) 

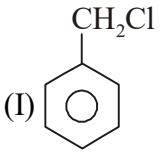
(2) 

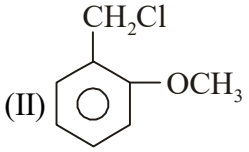
(3) 

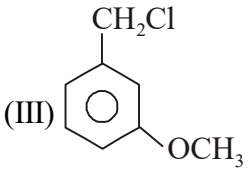
(4) 

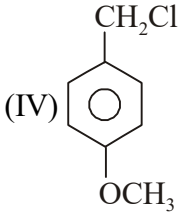
Q.14 Arrange the following compounds in the decreasing order of heterolytic bond dissociation energy of



(I) 

(II) 

(III) 

(IV) 

(1) II > III > IV > I (2) III > I > II > IV
(3) I > II > III > IV (4) IV > III > II > I

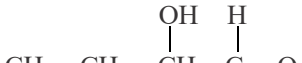
Q.15 $A + CH_3COOH \longrightarrow B(soluble) + CO_2 + H_2O$;
$B + (NH_4)_2C_2O_4 \longrightarrow$ white ppt.
A and B may contain
(1) Ni^{2+} (2) Ba^{2+}
(3) Sr^{2+} (4) Ca^{2+}

Q.16 On hydrolysis of one mole of maltose two moles of D-glucose are obtained. These two glucose units are linked together through a α-glycoside linkage between
(1) C-2 of one unit and C-4 of another unit
(2) C-1 of one unit and C-2 of another unit
(3) C-1 of one unit and C-4 of another unit
(4) C-2 of one unit and C-3 of another unit

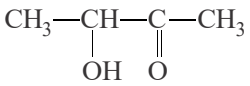
Q.17 Which of the following is a cross linked polymer?
(1) Starch (2) Bakelite
(3) PVC (4) Polythene

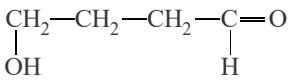
SPACE FOR ROUGH WORK

Q.18 Acetaldehyde reacts with NaOH to form :-

(1) 

(2) 

(3) 

(4) 

Q.19 Compounds A and B are treated with dilute HCl separately. The gases liberated are Y and Z respectively Y turns acidified dichromate paper green while Z turns lead acetate paper black. So A and B compounds are respectively :-

(1) Na_2SO_3, Na_2S (2) NaCl, Na_2CO_3

(3) Na_2S, Na_2SO_3 (4) Na_2SO_3, K_2SO_4

Q.20 Which of the following species will have the minimum bond energy

(1) N_2 (2) N_2^-

(3) N_2^+ (4) N_2^{-2}

SECTION - 2 (Q.21 - Q.25)

The answer to each question is a SINGLE DIGIT INTEGER ranging from 0 to 9, both inclusive.

Q.21 3.1 mol of $FeCl_3$ and 3.2 mol of NH_4SCN are added to one litre of water. At equilibrium 3.0 mol of $FeSCN^{2+}$ are formed. The equilibrium constant K_c of the reaction $Fe^{3+} + SCN^- \rightleftharpoons FeSCN^{2+}$ will be $(25 \times X)$. Find the value of X.

Q.22 Water that must be added to 1 litre of an aqueous solution of HCl with a pH of 1 to create an aqueous solution with pH of 2 is X Litre. Find the value of X.

Q.23 For hypothetical reversible reaction

$\frac{1}{2}A_2(g) + \frac{3}{2}B_2(g) \rightarrow AB_3(g)$; $\Delta H = -20$ KJ if standard entropies of A_2, B_2 and AB_3 are 60, 40 and 50 JK^{-1} $mole^{-1}$ respectively. The above reaction will be in equilibrium at $(100 \times X)$ K. Find the value of X.

Q.24 The freezing point of a solution containing 0.2 g of acetic acid in 20.0 g benzene is lowered by 0.45°C. The degree of association of acetic acid in benzene is (90.5 + X)%. Find the value of X.
(Assume acetic acid dimerises in benzene and K_f for benzene= 5.12 K kg mol^{-1})
$M_{observed}$ of acetic acid = 113.78

Q.25 The number of geometrical isomers of $[Co(NH_3)_3(NO_3)_3]$ are :

PART B – PHYSICS

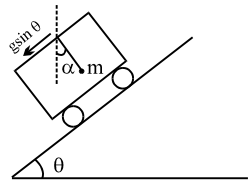
SECTION - 1 (Q.26 - Q.45)

Each question has FOUR options (1), (2), (3) and (4). ONLY ONE of these four options is correct.

Q.26 In an optical bench experiment to measure the focal length of a concave mirror, random error in focal length will be

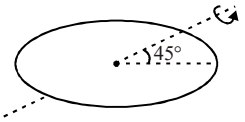
(1) minimum when u = f and maximum when u = ∞
(2) minimum when u = ∞ & maximum when u = f
(3) minimum when u = 0 & maximum when u = 2f
(4) minimum when u = 2f & maximum when u = 0

Q.27 A trolley is accelerating down an incline of angle θ with acceleration g sinθ. Which of the following is correct (α is the angle made by the string with vertical).



(1) α = θ
(2) α = 0^0
(3) Tension in the string, T = mg
(4) Tension in the string, T = mg sec θ

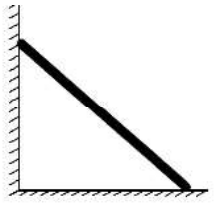
Q.28 Find the moment of inertia of ring of mass m and radius R about an axis passing through its centre and making an angle of 45° with its plane :



(1) $\frac{MR^2}{4}$ (2) $\frac{MR^2}{2}$ (3) $\frac{3}{4}MR^2$ (4) MR^2

SPACE FOR ROUGH WORK

Q.29 A ladder leans against a wall. If the ladder is not to slip, which one of the following must be true?

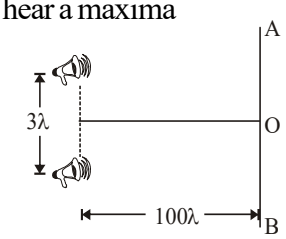


(1) The coefficient of friction between the ladder and the wall must not be zero.
(2) The coefficient of friction between the ladder and the floor must not be zero.
(3) Both 1 and 2
(4) Either 1 or 2

Q.30 Maximum height reached by a bullet fired vertically upward with a speed equal to 50% of the escape velocity from earth's surface is (R is radius of earth)
(1) R/3 (2) R/2
(3) 16R/9 (4) R/8

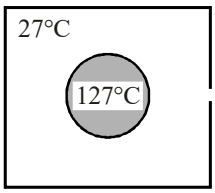
Q.31 The shape of a wave propagating in the positive x or negative x- direction is given $y = \frac{1}{\sqrt{1+x^2}}$ at t =0 and $y = \frac{1}{\sqrt{2-2x+x^2}}$ at t = 1s where x and y are in meters. The shape the wave disturbance does not change during propagation. Find the velocity of the wave.
(1) 1 m/s in positive x direction
(2) 1 m/s in negative x direction
(3) 1/2 m/s in positive x direction
(4) 1/2 m/s in negative x direction
(E) 2 m/s in positive x-direction

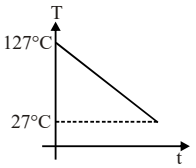
Q.32 2 loudspeakers are emitting sound waves of wavelength λ with an initial phase difference of π/2. At what minimum distance from O on line AB will one hear a maxima

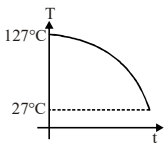


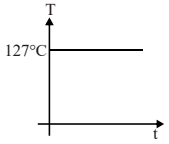
(1) 25 λ (2) $\frac{100\lambda}{\sqrt{15}}$
(3) $\frac{25\lambda}{3}$ (4) 50 λ

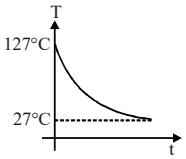
Q.33 A silver ball, painted black is kept inside a box which is maintained at a temperature of 27°C. The ball is maintained initially at a constant temperature of 127°C by making the radiation to fall on it through a small hole in the box. Latter on due to some chemical reaction between silver and paint, the paint uniformly evaporates from the surface of ball exposing the silver. If same amount of radiation continues to fall on ball, then temperature of ball as a function of time is shown as : (Assume emissivity of silver is zero and paint to be black body also assume radiation to be the only mode of heat transfer.)



(1) 

(2) 

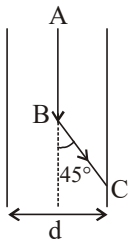
(3) 

(4) 

Q.34 One mole of diatomic gas is being heated in a closed tank from 300 K up to 1000 K. During the process part of the molecules dissociate. At 1000 K the energy of the diatomic molecules are only half of that of the whole gas. By what factor has the gas pressure increased ($P_{final} / P_{initial}$)? (The oscillation of the molecules are not to be taken in account.)
(1) 160 /33 (2) 16 / 11
(3) 3/2 (4) none

SPACE FOR ROUGH WORK

Q.35 A sphere carrying a charge of Q having weight w falls under gravity between a pair of vertical plates at a distance of d from each other. When a potential difference V is applied between the plates the acceleration of sphere changes as shown in the figure, to along line BC. The value of Q is



(1) $\frac{w}{V}$ (2) $\frac{w}{2V}$

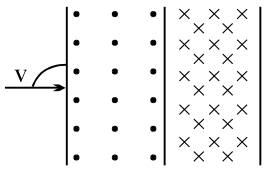
(3) $\frac{wd}{V}$ (4) $\frac{\sqrt{2}wd}{V}$

Q.36 A hollow conducting sphere of inner radius R and outer radius 2R has resistivity 'ρ' a function of the distance 'r' from the centre of the sphere: $\rho=kr^2/R$. The inner and outer surfaces are painted with a perfectly conducting 'paint' and a potential difference ΔV is applied between the two surfaces. Then, as 'r' increases from R to 2R, the electric field inside the sphere

(1) increases
(2) decreases
(3) remains constant
(4) passes through a maxima

Q.37 The magnetic field shown in the figure consists of two uniform regions. The width of the first part is 5cm and the magnetic induction here is 0.001 T. The width of the other part is also 5 cm, with the direction of the induction being opposite in direction and 0.002 T in magnitude. What should be the minimum speed of the electron arriving from the direction indicated in the figure so that it can pass through the magnetic field?

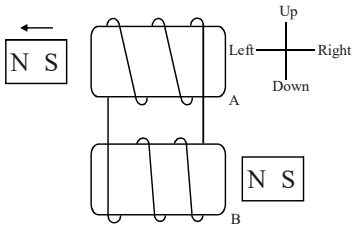
Mass of electron = 9×10^{-31} kg



(1) $\frac{8}{9} \times 10^7$ m/s (2) $\frac{4}{9} \times 10^7$ m/s

(3) $\frac{16}{9} \times 10^7$ m/s (4) none

Q.38 A bar magnet was pulled away from a hollow coil A as shown. As the south pole came out of the coil, the bar magnet next to hollow coil B experienced a magnetic force



(1) to the right. (2) to the left.
(3) upwards. (4) equal to zero.

Q.39 The x-z plane separates two media A and B of refractive indices $\mu_1 = 1.5$ and $\mu_2 = 2$. A ray of light travels from A to B. Its direction in the two media are given by unit vectors $\vec{u}_1 = a\hat{i} + b\hat{j}$ and $\vec{u}_2 = c\hat{i} + d\hat{j}$. Then

(1) $\frac{a}{c} = \frac{4}{3}$ (2) $\frac{a}{c} = \frac{3}{4}$

(3) $\frac{b}{d} = \frac{4}{3}$ (4) $\frac{b}{d} = \frac{3}{4}$

Q.40 Two point sources P and Q are 24 cm apart. Where should a convex lens of focal length 9 cm be placed in between them so that the images of both sources are formed at the same place?

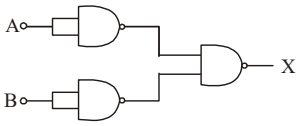
(1) 3 cm from P (2) 15 cm from Q
(3) 9 cm from Q (4) 18 cm from P

Q.41 The half lives of a radioactive sample are 30 years and 60 years from α-emission and β-emission respectively. If the sample decays both by α-emission and β-emission simultaneously, the time after which,only one-fourth of the sample remain is

(1) 10 years (2) 20 years
(3) 27.72 years (4) 45.2 years

SPACE FOR ROUGH WORK

Q.42 The combination of gates shown below yields.



(1) XOR gate (2) NAND gate
(3) OR gate (4) NOT gate

Q.43 A nuclear fission is given below

$A^{240} \rightarrow B^{100} + C^{140} + Q(\text{energy})$

Let binding energy per nucleon of nucleus A, B and C is 7.6 MeV, 8.1 MeV and 8.1 MeV respectively. Value of Q is : (Approximately)

(1) 20 MeV (2) 220 MeV
(3) 120 MeV (4) 240 MeV

Q.44 If $V = 100 \sin 100t$ volt, and $I = 100 \sin(100t + \frac{\pi}{6})$ A. then find the watt less power in watt :-

(1) 10^4 (2) 10^3
(3) 10^2 (4) 2.5×10^3

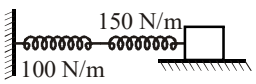
Q.45 In an interference experiment, third bright fringe is obtained at a point on the screen with a light of 700 nm. What should be the wavelength of the light in order to obtain 5^{th} bright fringe at the same point?

(1) 500 nm (2) 630 nm
(3) 750 nm (4) 420 nm

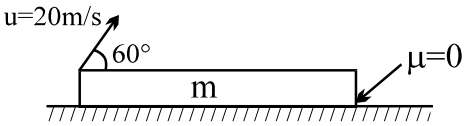
SECTION - 2 (Q.46 - Q.50)

The answer to each question is a SINGLE DIGIT INTEGER ranging from 0 to 9, both inclusive.

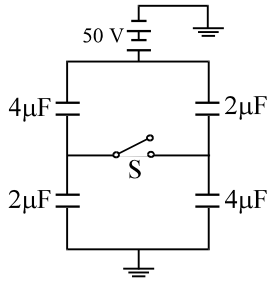
Q.46 Two springs of force constant 100 N/m and 150 N/m are in series as shown. The block is pulled by a distance of 2.5 cm to the right from equilibrium position. The ratio of work done by the spring at left to the work done by the spring at right is 3 : X. Find the value of X.



Q.47 A particle of mass m is projected at an angle of 60° with a velocity of 20 m/s relative to the ground from a plank of same mass m which is placed on smooth surface. Initially plank was at rest. The minimum length of the plank for which the ball will fall on the plank itself is $(40\sqrt{X})$ m. Find the value of X. ($g = 10\ m/s^2$)



Q.48 The circuit was in the shown state from a long time. Now the switch S is closed. The charge that flows through the switch is $(10 \times X)\ \mu C$. Find the value of X.



Q.49 An electron in the hydrogen atom jumps from excited state n to the ground state. The wavelength so emitted illuminates a photosensitive material having work function 2.75 eV. If the stopping potential of the photoelectron is 10 V, then the value of n is :-

Q.50 The wavelength of the first line of Lyman series for hydrogen atom is equal to that of the second line of Balmer series for a hydrogen like ion. The atomic number Z of hydrogen like ion is :-

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PART C – MATHEMATICS

SECTION - 1 (Q.51 - Q.70)

Each question has FOUR options (1), (2), (3) and (4). ONLY ONE of these four options is correct.

Q.51 The maximum value of $(7\cos\theta + 24\sin\theta) \times (7\sin\theta - 24\cos\theta)$ for every $\theta \in R$.

(1) 25 (2) 625

(3) $\frac{625}{2}$ (4) $\frac{625}{4}$

Q.52 An H.M. is inserted between the number 1/3 and an unknown number. If we diminish the reciprocal of the inserted number by 6, it is the G.M. of the reciprocal of both 1/3 and that of the unknown number. If all the terms of the respective H.P. are distinct then

(1) the unknown number is 27

(2) the unknown number is 1/27

(3) the H.M. is 15

(4) the G.M. is 21

Q.53 The locus of the point of intersection of tangents drawn to the circle $x^2 + y^2 = 4$ at the points where it is met by the circles $x^2 + y^2 + (k + 1)x + (2 - k)y - 1 = 0$ (k is real parameter), is equal to

(1) $x + y - 2 = 0$ (2) $x + y + 4 = 0$

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

Q.54 There are six periods in each working day of a school. Number of ways in which 5 subjects can be arranged if each subject is allotted at least one period and no period remains vacant is

(1) 210 (2) 1800

(3) 360 (4) 120

Q.55 If $g(x) = \left(4\cos^4 x - 2\cos 2x - \frac{1}{2}\cos 4x - x^7\right)^{\frac{1}{7}}$, then the value of $g(g(100))$ is equal to

(1) – 1 (2) 0

(3) 1 (4) 100

Q.56 Number of values of x satisfying the equation $\cos\left(3\arccos(x-1)\right) = 0$ is equal to

(1) 0 (2) 1

(3) 2 (4) 4

Q.57 Let $f(x) = \begin{cases} \cos^2 x, & x \notin Q \\ -\cos^2 x, & x \in Q \end{cases}$

then the set of points, where f(x) is continuous, is

(1) ϕ (2) $\{k\pi, k \in I\}$

(3) $\left\{(2k-1)\frac{\pi}{4}, k \in I\right\}$ (4) $\left\{(2k+1)\frac{\pi}{2}, k \in I\right\}$

Q.58 The value of $\lim\limits_{n\to\infty} \sum\limits_{r=1}^{n} \frac{r^2}{n^3 + n^2 + r}$ equals

(1) 1/3 (2) 1/2

(3) 2/3 (4) 1

Q.59 The value of the definite integral $\int\limits_0^{\pi/3} \ln(1 + \sqrt{3}\tan x)\,dx$ equals

(1) $\frac{\pi}{3}\ln 2$ (2) $\frac{\pi}{3}$

(3) $\frac{\pi^2}{6}\ln 2$ (4) $\frac{\pi}{2}\ln 2$

Q.60 The values of α for which the points of extremum of the function $f(x) = x^3 - 3\alpha x^2 + 3(\alpha^2 - 1)x + 1$ lie in the interval $(-2, 4)$ will be equal to

(1) (– 1, 3) (2) (3, 4)

(3) (– 4, – 2) (4) (– 2, – 1)

Q.61 A is an involutary matrix given by $A = \begin{bmatrix} 0 & 1 & -1 \\ 4 & -3 & 4 \\ 3 & -3 & 4 \end{bmatrix}$ then the inverse of $\frac{A}{2}$ will be

(1) 2A (2) $\frac{A^{-1}}{2}$

(3) A/2 (4) A^2

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Q.62 Given three non – zero, non – coplanar vectors $\vec{a}, \vec{b}, \vec{c}$ and $\vec{r}_1 = p\vec{a} + q\vec{b} + \vec{c}$ and $\vec{r}_2 = \vec{a} + p\vec{b} + q\vec{c}$ if the vectors $\vec{r}_1 + 2\vec{r}_2$ and $2\vec{r}_1 + \vec{r}_2$ are collinear then (p, q) is

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

Q.63 If a, b and c are three numbers (not necessarily different) chosen randomly and with replacement from the set {1, 2, 3, 4, 5}, the probability that (ab + c) is even, is

(1) 35 / 125 (2) 59 / 125
(3) 64 / 125 (4) 75 / 125

Q.64 The solution of the differential equation $y\,ln y + xy' = 0$, where $y(1) = e$, is

(1) $x(ln\, y) = 1$ (2) $x(ln\, y)^2 = 1$
(3) $(ln\, y)^2 = x$ (4) $(x + ln\, y) = 2$

Q.65 Normals are concurrent drawn at points A, B, and C on the parabola $y^2 = 4x$ at P(h, k). The locus of the point P if the slope of the line joining the feet of two of them is 2, is

(1) x + y = 1 (2) x – y = 3
(3) $y^2 = 2(x - 1)$ (4) $y^2 = 2\left(x - \frac{1}{2}\right)$

Q.66 Let R be the relation on the set of all real numbers defined by aRb iff $|a - b| \le 1$. Then, R is

(1) reflexive and symmetric
(2) symmetric only
(3) transitive only
(4) anti-symmetric only

Q.67 The mean square deviation of a set of n observations $x_1, x_2, \ldots\ldots, x_n$ about a point c is defined as $\frac{1}{n}\sum_{i=1}^{n}(x_i - c)^2$. The mean square deviation about –2 and 2 are 18 and 10 respectively, then standard deviation of this set of observations is

(1) 3 (2) 2
(3) 1 (4) None of these

Q.68 Equation of the rectangular hyperbola whose focus is (1, –1) and the corresponding directrix x – y + 1 = 0 is-

(1) $x^2 - y^2 = 1$
(2) xy = 1
(3) 2xy – 4x + 4y + 1 = 0
(4) 2xy + 4x – 4y – 1 = 0

Q.69 Let $\vec{a} \times (\vec{b} \times \vec{c}) = \frac{\vec{b}}{3} + \frac{\vec{c}}{2}$ and $\vec{b} \times (\vec{c} \times \vec{a}) = -\frac{\vec{c}}{2}$. If $\vec{a}, \vec{b}$ and $\vec{c}$ are non-collinear pair wise unit vectors, then volume of a parallelopiped, whose coterminous edges are $\vec{a}, \vec{b}$ and $\vec{c}$, is-

(1) 11/36 (2) 1/2
(3) 23/36 (4) None of these

Q.70 Image of point P(1,2,3) with respect to plane x + y + z = 12, is-

(1) (5,4,3) (2) (9,6,3)
(3) (5,6,7) (4) (3,4,5)

SECTION - 2 (Q.71 - Q.75)

The answer to each question is a SINGLE DIGIT INTEGER ranging from 0 to 9, both inclusive.

Q.71 If the solution set of $|x - k| < 2$ is a subset of the solution set of the inequality $\frac{2x-1}{x+2} < 1$, then the number of possible integral value(s) of 'k' is/are

Q.72 Number of integral values of p for which the cubic $2x^3 - 3x^2 + p = 0$ has 3 real roots (not necessarily distinct), is

Q.73 For b > 0, let A_1 be the area bounded by x = 0, x + y = 1, $y = bx^2$ and A_2 be the area bounded by y = 0, x + y = 1, $y = bx^2$ such that $A_1 : A_2 = 11 : 16$, then the value of b is

Q.74 Maximum number of common chords of a parabola and a circle can be equal to

Q.75 If z_1, z_2, z_3 are 3 distinct complex numbers such that $\frac{3}{|z_2 - z_3|} = \frac{4}{|z_3 - z_1|} = \frac{5}{|z_1 - z_2|}$, then the value of $\frac{9}{z_2 - z_3} + \frac{16}{z_3 - z_1} + \frac{25}{z_1 - z_2} =$

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