P33-16

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ADVANCED PATTERN CUMULATIVE TEST-2 (ACT-2)

TARGET : JEE (MAIN+ADVANCED) 2017

PAPER-1 COURSE : VIJETA (ADP), VIJAY (ADR) Revision Plan-2

Date : 07-05-2017 Time: 3 Hours Maximum Marks : 225

Please read the instructions carefully. You are allotted 5 minutes specifically for this purpose.

GENERAL :

1. The sealed booklet is your Question Paper. Do not break the seal till you are instructed to do so.
2. The question paper CODE is printed on the right hand top corner of this sheet and the right hand top corner of the back cover of this booklet.
3. Use the Optical Response Sheet (ORS) provided separately for answering the question.
4. Blank spaces are provided within this booklet for rough work.
5. Write your Name and Roll Number in the space provided on the below cover.
6. After the open booklet, verify that the booklet contains all the **75** questions along with the options are legible.

QUESTION PAPER FORMAT AND MARKING SCHEME :

7. The question paper has three parts : **Mathematics, Physics and Chemistry**. Each part has one section.
8. Each section as detailed in the following table :

Section	Question Type	Number of Questions	Category-wise Marks for Each Question				Maximum Marks of the Section
			Full Marks	Partial Marks	Zero Marks	Negative Marks	
1	Single digit Integer (0-9)	25	+3 If only the bubbles corresponding to the correct answer is darkened	–	0 if not attempted	–1 In all other cases	75

OPTICAL RESPONSE SHEET :

9. Darken the appropriate bubbles on the original by applying sufficient pressure.
10. The original is machine-gradable and will be collected by the invigilator at the end of the examination.
11. Do not tamper with or mutilate the ORS.
12. Write your name, roll number and the name of the examination centre and sign with pen in the space provided for this purpose on the original. **Do not write any of these details anywhere else**. Darken the appropriate bubble under each digit of your roll number.

DARKENING THE BUBBLES ON THE ORS :

13. Use a **BLACK BALL POINT** to darken the bubbles in the upper sheet.
14. Darken the bubble **COMPLETELY.**
15. Darken the bubble **ONLY** if you are sure of the answer.
16. The correct way of darkening a bubble is as shown here : ●
17. There is **NO** way to erase or "un-darkened bubble.
18. The marking scheme given at the beginning of each section gives details of how darkened and **not darkened** bubbles are evaluated.

NAME OF THE CANDIDATE : ……

ROLL NO. : ……

I have read all the instructions and shall abide by them

- -

Signature of the Candidate

I have verified the identity, name and roll number of the candidate.

- -

Signature of the Invigilator

DO NOT BREAK THE SEALS WITHOUT BEING INSTRUCTED TO DO SO BY THE INVIGILATOR

Resonance Eduventures Ltd.

P33.1.16

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PART : I MATHEMATICS

SECTION – 1 : (Maximum Marks : 75)

- This section contains **TWENTY FIVE** questions
- The answer to each question is a **SINGLE DIGIT INTEGER** ranging from 0 to 9, both inclusive
- For each question, darken the bubble corresponding to the correct integer in the ORS
- Marking scheme :
  +3 If the bubble corresponding to the answer is darkened
  0 If none of the bubbles is darkened
  –1 In all other cases

1. Let $x,y,z \in I$ and satisfy $3x – y – z = 0$, $–3x + z = 0$, $–3x + 2y + z = 0$ and $x^2 + y^2 + z^2 \leq 100$ then number of triplet (x, y, z) will be:

2. Number of roots of $x^2 – 4x + [x] + 3 = 0$ is (where [.] denotes greatest integer function)

3. Let P(x) is a polynomial with degree ≤ 5, and leaves remainder –1 and 1 when divided by $(x – 1)^3$ and $(x + 1)^3$ respectively then number of real roots of P(x) = 0 is :

4. Let the equation $(x^2 + a|x| + a + 1)(x^2 + (a + 1) | x| + a) = 0$ has no real root. If the range of values of 'a' contains m number of integers less than 5 then m is

Space for Rough Work

5. If the ordered pair (x, y) lies on the circle $x^2 + y^2 = 9$, then number of different digits the largest value of $x^2 + 2y^2 + 4x$ contains is

6. For any $x, y \in R$, $xy > 0$ then the minimum value of $\frac{2x}{y^3} + \frac{x^3y}{3} + \frac{4y^2}{9x^4}$ equals

7. If p_1, p_2 are the roots of the quadratic equation $ax^2 + bx + c = 0$ and q_1, q_2 are the roots of the quadratic equation $cx^2 + bx + a = 0$ $(a, b, c \in R)$ such that p_1, q_1, p_2, q_2 are in A.P. of distinct terms, then magnitude of $\frac{a}{c}$ equals

8. Let a_1, a_2, a_3, a_4 and b be real numbers such that $b + \sum_{K=1}^{4} a_K = 8$ and $b^2 + \sum_{K=1}^{4} a_K^2 = 16$. The number of possible integral values b can take is

9. Let P be the point (3, 2). Let Q be the reflection of P about x-axis. Let R be the reflection of Q about the line $y = -x$ and let S be the reflection of R through the origin. PQRS is a convex quadrilateral. Then $\frac{1}{3} \cdot$ area of PQRS, equals.

Space for Rough Work

10. In Δ ABC, if $\angle C = 3\angle A$, BC = 27 and AB = 48, then $\frac{AC}{7}$ equals

11. If the sides a, b, c of a Δ ABC satisfy the relation, $a^4 + b^4 + c^4 = 2c^2(a^2 + b^2)$, and the angle $C = k\frac{\pi}{4}$ then maximum value of k equal

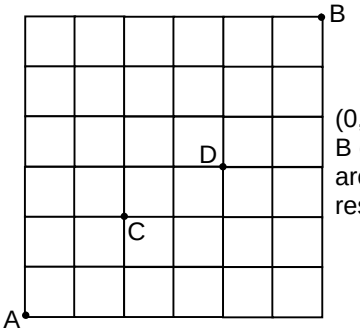
12. Let p(x) be a monic polynomial of degree 2017 such that p(k) = 2016 – k for k = 0, 1, 2, ……, 2016. If p(2017) = (2017) ! – b, then b is equal to

13. Consider all functions $f : A \to A$ where A = {1, 2, 3, 4}. The probability that function satisfies the property, If f (k) is odd, then f(k + 1) is even, for k = 1, 2, 3. given that it is bijective is equal to m/n, where m & n are relatively prime. Value of m + n is equal to.

14. Let a and b are digits. Number of ways to divide set of eight numbers {2, 3,.....9} into 4 pairs such that atleast one pair has HCF equal to 2 is 10a + b, then find the value of b – a. (where HCF is greatest common divisior)

Space for Rough Work

15. A person is to walk from A to B. How ever, he is restricted to walk only to the right of A or upwards of A. but not necessarily in this order. He wants to pass through either C or D. Find the total number of divisors of paths available ?



(0, 0) take A origin & B (6, 6) C, D are (2, 2) & (4, 3) respectively

16. Let a three-dimensional vector $\vec{V}$ satisfy the condition, $2\vec{V}+\vec{V}\times\left(\hat{i}+2\hat{j}\right)=2\hat{i}+\hat{k}$. If $3\left|\vec{V}\right|=\sqrt{m}$. Then find the value of m.

17. The plane denoted by $P_1: 4x+7y+4z+81=0$ is rotated through a right angle about its line of intersection with the plane $P_2: 5x+3y+10z=25$. If the plane in its new position is denoted by P, and the distance of this plane from the origin is d, then find the value of [d/2] (where [.] represents greatest integer function)

18. If $\vec{a}$ and $\vec{b}$ are any two unit vectors, then find the greatest positive integer in the range of $\frac{3\left|\vec{a}+\vec{b}\right|}{2}+2\left|\vec{a}-\vec{b}\right|$.

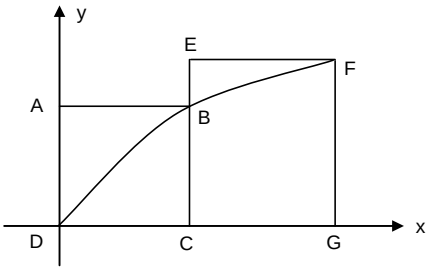
Space for Rough Work

19. If $\vec{x}, \vec{y}$ are two non-zero and non-collinear vectors satisfying
$\left[(a-2)\alpha^2+(b-3)\alpha+c\right]\vec{x}+\left[(a-2)\beta^2+(b-3)\beta+c\right]\vec{y}+\left[(a-2)\gamma^2+(b-3)\gamma+c\right](\vec{x}\times\vec{y})=0,$
where α,β,γ are three distinct real numbers, then find the value of $\left(a^2+b^2+c^2-4\right)$.

20. If α, β are roots of the equation $x^2-2x+2=0$ and $\dfrac{(t+\alpha)^{11}-(t+\beta)^{11}}{\alpha-\beta}=\dfrac{\sin 11\theta}{(\sin\theta)^{11}}$, ($t \in R$) then the value of $\cot\theta - t$ is

21. The remainder obtained when fifth degree polynomial f(x) is divided by $(x-1)^3$ is 8 and when divided by $(x+1)^3$ is – 8, then number of divisors of f '(0) is

22. ABCD and EFGC are squares and the curve y = $k\sqrt{x}$ passes through the origin D and point B and F. Then the value of $\dfrac{BC}{FG}\left(\sqrt{5}+1\right)$ is



Space for Rough Work

23. The line x + y = p meet x-axis and y-axis at A and B respectively. A triangle APQ is inscribed in the triangle OAB, O being origin, with right angle at Q. P and Q lies, respectively on OB and AB. If area of triangle APQ is $\frac{3}{8}^{th}$ of area of ΔOAB then $\frac{AQ}{BQ}$ is equal to

24. The sides of triangle have combined equation $x^2 - 3y^2 - 2xy + 8y - 4 = 0$. The third side which is variable always passes through point (–5, –1). If range of values of slope of third line is such that the origin is an interior point at triangle (a, b) then value of $\left(a + \frac{1}{b}\right)$ is

25. In acute angle triangle ABC, the base BC has equation 4x – 3y + 3 = 0. If the co-ordinate of the orthocentre (H) and circumcentre (P) at triangle are (1, 2) and (2, 3) respectively. The radius of circle circumscribing the triangle is $\frac{\sqrt{m}}{n}$ where m and n are relatively prime. Then value of (m – 10n) is

Space for Rough Work

PART - II : PHYSICS

SECTION – 1 : (Maximum Marks : 75)

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- For each question, darken the bubble corresponding to the correct integer in the ORS
- Marking scheme :
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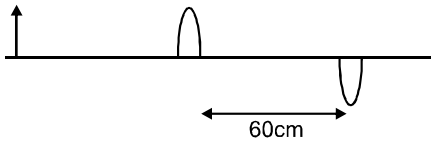
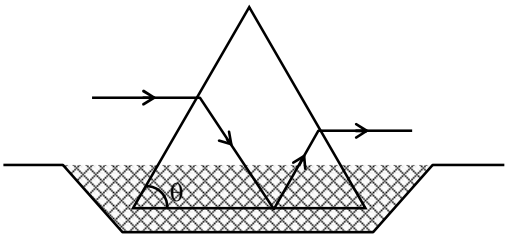
  - 0 If none of the bubbles is darkened
  - –1 In all other cases

26. A converging lens (focal length f) is broken in two equal pieces and placed at 60 cm as shown along with the object. It is found that real images are formed at the same place and ratio of image heights is 9 : 1, if the value of f is $\left(22+\frac{1}{x}\right)$ cm then value of x is :

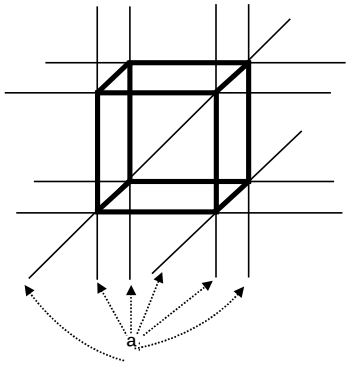


27. An isosceles triangular glass prism stands with its base in water as shown. A ray is incident parallel to base of prism. After refraction through inclined face it just suffers total internal reflection on water glass interface. If value of $\tan\theta$ is $\frac{\lambda}{\sqrt{17}}$ then find λ. (Take $\mu_{glass} = 3/2$, $\mu_{water} = 4/3$)

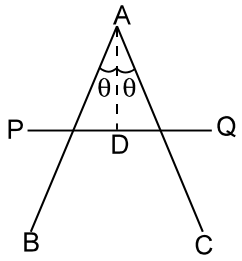


Space for Rough Work

28. Twelve infinite long wire of uniform linear charge density (λ) are passing along the twelve edges of a cube. If electric flux through any face of cube is $\left(\frac{\lambda\ell}{n\varepsilon_0}\right)$. Then value of n is :



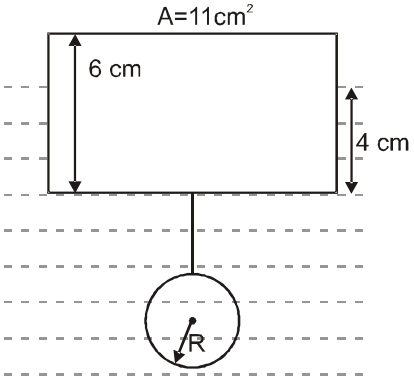
29. In the figure shown AB, BC and PQ are thin, smooth, rigid wires. AB and AC are joined at A and fixed in vertical plane. $\angle BAC = 2\theta = 90°$ and line AD is angle bisector of angle BAC. A liquid of surface tension T = 0.025 N/m forms a thin film in the triangle formed by intersection of the wires AB, AC and PQ. In the figure shown the uniform wire PQ of mass 1 gm is horizontal and in equilibrium under the action of surface tension and gravitational force. Find the time period of SHM of PQ in vertical plane for small displacement from its mean position, in the form $\frac{\pi}{X}$ s and fill value of X.



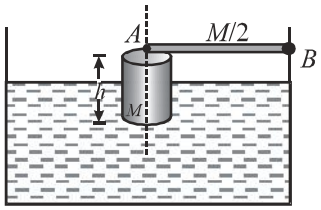
Space for Rough Work

PHYSICS

30. Figure shows a uniform metal ball suspended by thread of negligible mass from an upright cylinder that floats partially submerged in water. The cylinder has height 6 cm, face area 11 cm^2 on the top and bottom and density 0.5 g/cm^3. 4 cm of cylinder's height is inside the water surface. Density of the metal ball is $8gm/cm^3$. R is the radius of the ball. It is found that $R^3 = \frac{3}{\alpha}\ cm^3$, where α is an integer. Find α. ($\rho_w = 1gm/cm^3$) (system is in equilibrium)

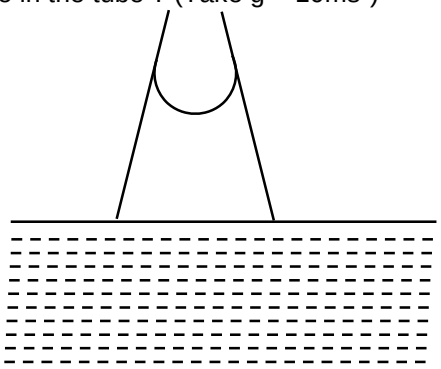


31. A cylindrical block of mass M and height h floats vertically in a liquid which is twice as dense as the block, as shown in the diagram. A uniform rod of mass M/2 and length ℓ is hinged to axis of the cylinder at A and to the walls of the vessel at B. The rod can rotate freely about the point B. It is observed that the rod is horizontal in its equilibrium position. If angular frequency of small vertical oscillations of the cylinder is $\sqrt{\frac{12g}{nh}}$. Then n is :

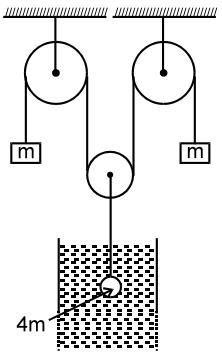


Space for Rough Work

32. Internal diameter of a 10 cm long tapered capillary tube varies unifromly from 1 mm to 0.5 mm from one end to other as shown. The bigger end just touches the surface of a liquid as shown. Surface tension and density of the liuid is 8×10^{-2} N/m and 1000 kg/m^3 respectively. Angle of contact of the lquid is zero with tube and the meniscus can be assumed hemispheric. Up to what height (in cm) liquid will rise in the tube ? (Take g = 10ms^2)



33. A spherical ball of mass 4m, density σ and radius r is attached to a pulley-mass system as shown in figure. The ball is released in a liquid of coefficient of viscosity η and density ρ ($<\frac{\sigma}{2}$). If the length of the liquid column is sufficiently long, if the terminal velocity attained by the ball is $\frac{1}{x}\frac{r^2(\sigma - y\rho)g}{\eta}$. Then value of $(x - y)$ is : (assume all pulleys to be massless and string as massless and inextensible) :



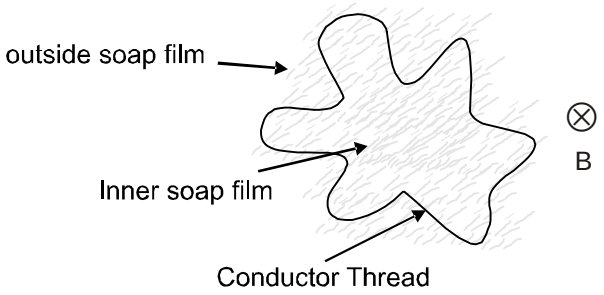
Space for Rough Work

PHYSICS

34. A man starts walking on a circular track of radius R. First half of the distance he walks with speed V_1, half of the remaining distance with speed V_2, then half of the remaining time with V_1 and rest with V_2 and completes the circle. If average speed of the man during entire motion in which he completes the circle is $\frac{x V_1 V_2 (V_1 + V_2)}{V_1^2 + y V_2^2 + z V_1 V_2}$. Then value of (y + z – x) is :

35. A particle of mass m = 1 kg is lying at rest on x-axis, experiences a net force given by law F = x (3x – 2) Newton, where x is the x-coordinate of the particle in meters. The magnitude of minimum velocity in negative x-direction to be imparted to the particle placed at x = 4 meters such that it reaches the origin is $\sqrt{\frac{P}{27}}$ m/s. Find the value of $\frac{P}{1300}$.

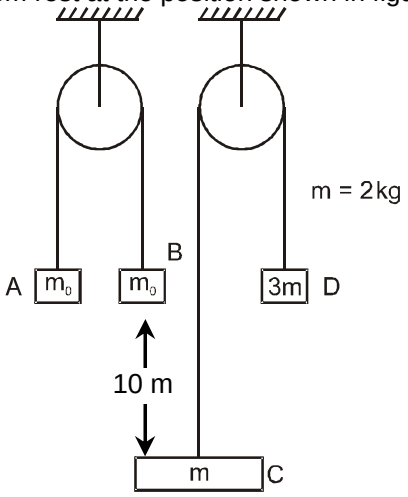
36. A conducting loop made of thin, light thread has a soap film inside and outside it. Length of thread is ℓ, total resistance is R, and initially area enclosed by it is $A_i = \frac{\ell^2}{8\pi}$. It is kept in a uniform magnetic field B directed inwards and then a small puncture is made in inner film. If total charge flown through the loop after the puncture is $\frac{B\ell^2}{n\pi R}$. Then value of n is :



Space for Rough Work

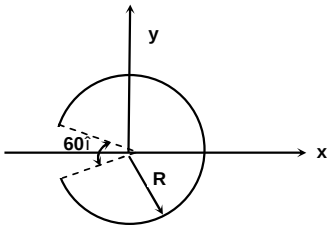
PHYSICS

37. Given system is released from rest at the position shown in figure.



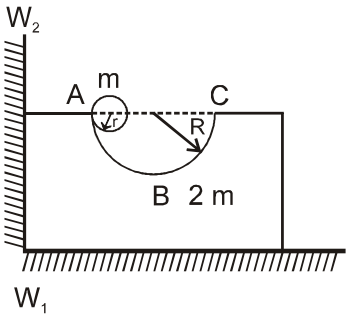
Later on C collides with B and the collision is head on and elastic. 1 sec after the collision string connecting A & B becomes taut again, if the value of m_0 is α Kg. Here α is an integer. Find α.
(Note :- Neglect all rotational effect and space between blocks and pulley is sufficient enough.)

38. Consider the uniform circular arc as shown in figure. Arc is lying in x-y plane and kept symmetrical about x-axis. The x-coordinate of centre of mass of arc is $\frac{\alpha R}{\beta\pi}$. Here α and β are integers. Find minimum value of $\alpha + \beta$.



Space for Rough Work

39. A uniform disc of mass m and radius r is released from a wedge of mass 2m as shown. ABC is hemispherical position of radius R. Impulse imparted to the system consisting wedge and disc by the vertical wall w_1w_2 till the time disc reaches at the bottom most position of spherical portion for the first time is $m\sqrt{\frac{\alpha g\ (R-r)}{\delta}}$. Friction between wedge and horizontal surface is absent and between disc and wedge friction is sufficient to avoid slipping between them. Here α and δ are integer. Find minimum value of $\alpha + \delta$.



40. A hollow cone of radius R and height 2R is placed on inclined plane of inclination θ. If θ is increased gradually, at $\theta = \sin^{-1}\left(\frac{\alpha}{\sqrt{13}}\right)$ the cone just topples. (Assume there is sufficient friction to avoid any slipping). Here α is an integer. Find α.

41. A man crosses a river of width d. Current flow speed is v. Speed of swimmer relative to water is v. Man always heads towards the point exactly opposite to the starting point at the another bank (relative to water). If radius of curvature of the path followed by the swimmer just after he start swimming is $n\sqrt{2}d$, then the value of n is.

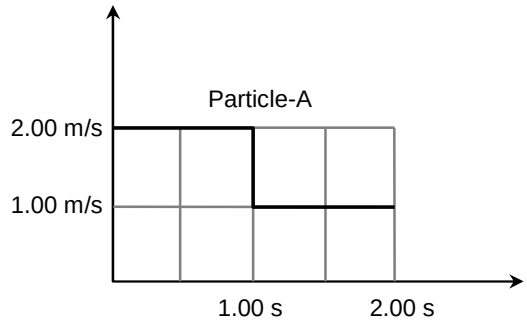
Space for Rough Work

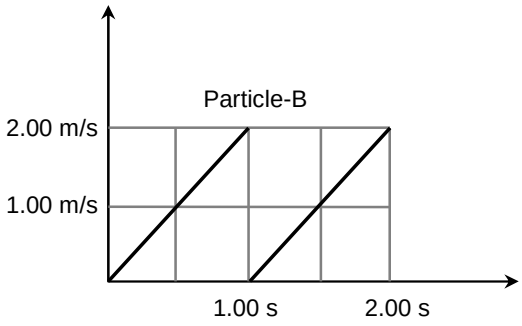
42. Nuclei of radioactive element A are produced at rate ' t^2 ' at any time t. The element A has decay constant λ. Let N be the number of nuclei of element A at any time t. At time $t = t_0$, $\frac{dN}{dt}$ is minimum. If the number of nuclei of element A at time $t = t_0$ is $\frac{\lambda t_0^2 - xt_0}{\lambda^2}$, then x is

43. Interference fringes were produced using white light in a double slit arrangement. When a mica sheet of uniform thickness of refractive index 1.6 (relative to air) is placed in the path of light from one of the slits, the central fringe moves through some distance. This distance is equal to the width of 30 interference bands if light of wavelength 4800 Å is used. If the thickness (in μm) of mica sheet is t then value of $\frac{t}{6}$ is :

44. The ratio of total acceleration of the electron in singly ionized helium atom and hydrogen atom according to bohr model (both in ground state) is x : 1. Find the value of x.

45. Two particles A and B Starts from the same point and move in the positive x-direction. Their velocity-time relationships are shown in the following figures. if the maximum separation between them during the time interval shown is $\frac{n}{4}$, then n is

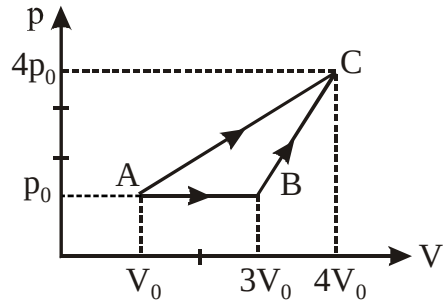




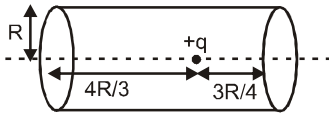
Space for Rough Work

46. A tunnel is dug inside the earth across one of its diameters . Radius of earth is R and its mass is M. A particle is projected inside the tunnel with velocity $\sqrt{\frac{2GM}{R}}$ from one of its ends then maximum velocity attained by the particle in the subsequent motion is $\sqrt{\frac{nGM}{R}}$ (assuming tunnel to be frictionless). Find n.

47. A certain quantity of ideal gas takes up 56 J of heat in the process AB and 360 J in the process AC. What is the number of degrees of freedom of the gas.

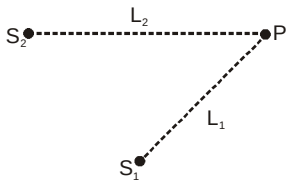


48. A point charge +q is placed on the axis of a closed cylinder of radius R and length $\frac{25R}{12}$ as shown. If electric flux coming out from the curved surface of cylinder is $\frac{xq}{10\,\epsilon_0}$, then calculate x.

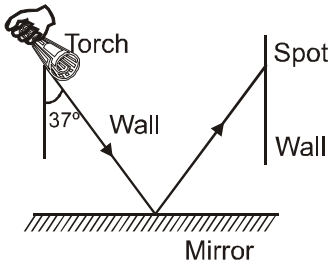


Space for Rough Work

49. Two sound sources shown in the figure vibrate in phase. By moving S_1 along PS_1 consecutive minima are heard when $L_1 - L_2$ has values, 20 cm, 60 cm and 100 cm. If the frequency of sound source is $\frac{1700}{n}$ Hz. Then find the value of n : [Speed of sound is 340 m/s]



50. As shown in the figure a torch is used to send a beam of light on a mirror which forms a spot on a vertical wall. If the mirror is moved 1 cm upwards and the wall 1cm towards right, keeping the direction of beam fixed, the the vertical shift of spot on the wall is $\frac{10}{n}$, then value of n is



Space for Rough Work

PART - III : CHEMISTRY

Atomic masses : [H = 1, D = 2, Li = 7, C = 12, N = 14, O = 16, F = 19, Na = 23, Mg = 24, Al = 27, Si = 28, P = 31, S = 32, Cl = 35.5, K = 39, Ca = 40, Cr = 52, Mn = 55, Fe = 56, Cu = 63.5, Zn = 65, As = 75, Br = 80, Ag = 108, I = 127, Ba = 137, Hg = 200, Pb = 207]

SECTION – 1 : (Maximum Marks : 75)

- This section contains **TWENTY FIVE** questions
- The answer to each question is a **SINGLE DIGIT INTEGER** ranging from 0 to 9, both inclusive
- For each question, darken the bubble corresponding to the correct integer in the ORS
- Marking scheme :

  +3 If the bubble corresponding to the answer is darkened

  0 If none of the bubbles is darkened

  –1 In all other cases

51. 40ml of 0.1M NaH_2PO_4(aq) and 200ml of 0.1 M Na_3PO_4(aq) are mixed, if pH of final solution is y then determine value of (y – 4).

($Ka_1 = 2 \times 10^{-4}$, $Ka_2 = 5\times10^{-8}$, $Ka_3 = 2 \times 10^{-11}$ for H_3PO_4)

52. Number of diatomic gases obtained on heating of ammonium perchlorate = a

Number of diatomic gases obtained on heating lead nitrate = b

Number of diatomic gases obtained on heating potassium nitrate = c

Determine value of (a + b + c).

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53. How many of the following will evolve H_2 gas when dissolved in water under room conditions ?

B_2H_6, SiH_4, CH_4, Al, B, Na, PCl_3, P(white), Fe

54. How many of following aqueous solutions on electrolysis can liberate two or more gases in substantial quantity using Pt electrodes ?

NaCl, K_2SO_4, $Cu(NO_3)_2$, dil H_2SO_4, HCOOH, CH_3COOH, $Al_2(SO_4)_3$, $AuCl_3$

55. How many of the following involve use of $d_{x^2-y^2}$ orbital in hybridisation of central atom :

$[Cu(NH_3)_4]^{2+}$, $AuCl_4^-$, AgF_4^-, $[Ni(CN)_4]^{2-}$, $[Zn(CN)_4]^{2-}$, MnO_4^-, $TiCl_4$, I_3^-, I_2Cl_6

56. The concentration of CH_3COO^- ion in a solution prepared by adding 0.1 mole of CH_3COOAg(s) in 1L of 0.1 M – HCl solution is expressed as 10^{-x}, x is :

[Given : $K_a(CH_3COOH) = 10^{-5}$, $K_{sp}(AgCl) = 10^{-10}$, K_{sp} $(CH_3COOAg) = 10^{-8}$]

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57. A mixture of 32 gm of O_2 gas and 16 gm D_2 gas is allowed to effuse through an orifice. If the relative rate of effusion $\left(\frac{r_{D_2}}{r_{O_2}}\right)$ at the start of effusion is expressed as $p \times \sqrt{2}$, then the value of p is:

58. If certain decomposition reaction found to obey equation in term of partial pressure (P) of reactant : $\frac{a - p^2}{p^2}$ = b kt, what is order of reaction if a, b and k are constant (t represents time) ?

59. It is observed that functioning of neuronal circuits in our brain is driven by the energy available from combustion of glucose. Calculate the amount of glucose (in gm) which should be burnt per hour to produce sufficient energy for brain which operates at $\frac{128}{9}$ watts.

Given : ΔH at 300 K for combustion of Glucose = –3000 KJ/mol

ΔS at 300 K for combustion of Glucose = 180 J/mol K

60. If Aufbau rule is not obeyed and instead electronic filling occurs orbit by orbit till saturation is reached. The percentage change in sum of all (n + ℓ) values for unpaired electrons in an atom of iron is 10 x. What is the value of x ?

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61. Consider the following compounds:

(i) ICl (ii) IBr (iii) ICl_3 (iv) SF_4

(v) BrF_3 (vi) IF_3 (vii) BrF_5 (viii) IF_7

Calculate the value of (P – S).

P : Total number of polar compounds

S : Total number of non planar compounds

62. EMF of the following cell is 0.575 volt at 298 K Pt(s) | H_2 (1atm) | H^+ (aq) || Hg_2^{2+}(aq,1M) | Hg(ℓ).

The pH of anode compartment is: (Give your answer to nearest integer)

Given $E^0_{Hg_2^{2+}|Hg} = 0.28\,V$ and $\frac{2.303RT}{F}$ = 0.06 V.

63. Out of the following how many IUPAC names of the given complexes is/are correct ?

(1) $[Ni(CN)_4]^{2-}$ - Tetracyanonickel(II)ion

(2) $[Pt(Py)_4][PtCl_4]$ – Tetrapyridineplatinum(II) tetrachlorideplatinate(II)

(3) $[Ni(dmg)_2]$ – Bis(dimethylglyoximato)nickel(II)

(4) $[Fe(CO)_5]$ – Pentacyanocarbonylferrate(0)

(5) $K_2[HgI_4]$ – Potassium tetraiodidomercurate(II)

(6) $[Pt(NH_3)_4][CuCl_4]$ – Tetraammineplatinum(IV) tetrachloridocuprate(II)

(7) $[Cu(gly)_2]$ – Diglycinatecopper(II)

(8) $K_4[Fe(CN)_6]$ – Potassium hexacyanidoferrate(II)

(9) $[Pt(NH_3)_6]Cl_4$ – Hexaammineplatinum(IV) chloride

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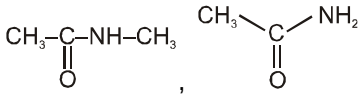
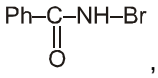
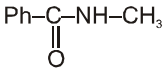
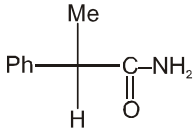
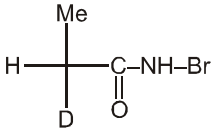
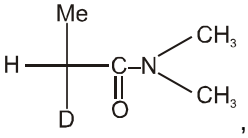
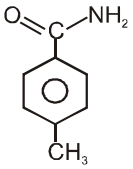
64. A 0.001 molal solution of a complex $[M(NH_3)_4Cl_2]Cl_x$ in water had a freezing point depression of 0.0058ºC. Given K_f of H_2O = 1.86 K/m. Assuming 100% ionization of the complex, calculate the oxidation number of 'M'.

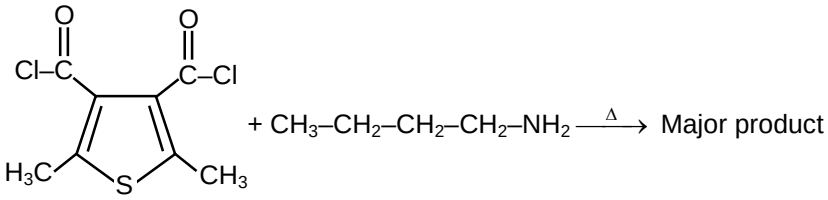
65. What is the co-ordination number of an atom in its layer in Hexagonal close packing (HCP).

66. How many of the following compounds gives, Hoffman's bromamide reaction with Br_2 + NaOH ?



67. Calculate total number of delocalised lone pairs in the major product.



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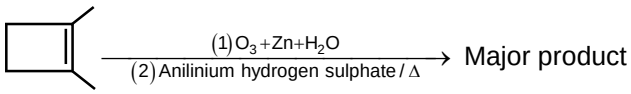
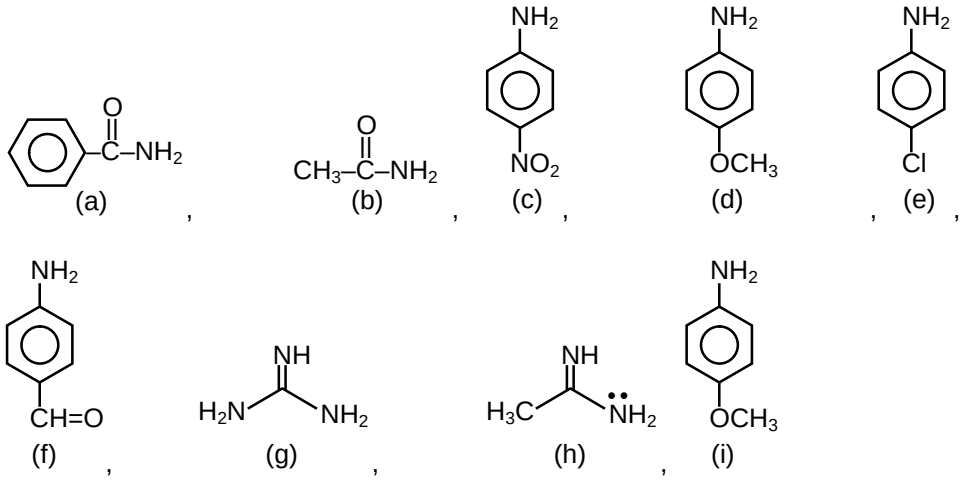
68. Aromatic compound Y, C_7H_8O is insoluble in water, dil HCl, aqueous $NaHCO_3$, aqueous NaOH solution. When Y is brominated in excess of Br_2 with anhydrous $AlBr_3$ then $C_7H_5OBr_3$ is formed. Find the sum of position of side chain attached with benzene ring in the Y ?

69. Calculate total number of delocalised electron pairs in the major product ?



70. Calculate total structures given below having pK_b more than aniline.



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71. $CH_3–\underset{\underset{CH_3}{|}}{C}=CH–\underset{\underset{CH_3}{|}}{C}=CH–\underset{\underset{CH_3}{|}}{C}=CH–\underset{\underset{CH_3}{|}}{C}=CH–\underset{\underset{O}{||}}{C}–CH_3$

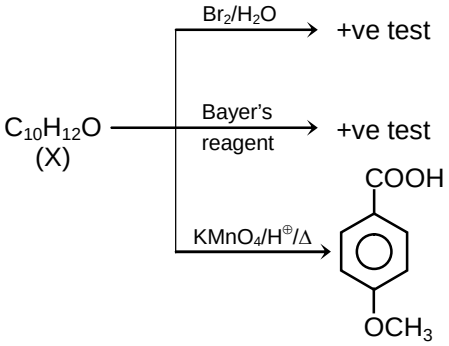
Find (X + Y – Z) for the above given product which is formed by aldol condensation :

X = total products (including stereoisomers)

Y = Number of acetone molecules used in the reaction

Z = Number of aldol condensation reaction.

72.



Find total possible structure of compound X (including stereoisomers).

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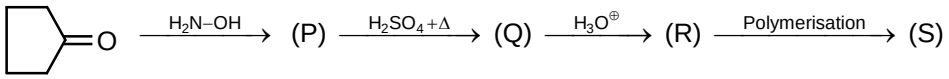
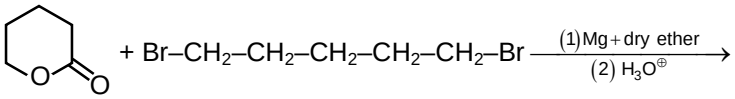
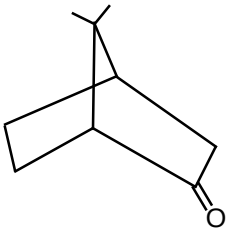
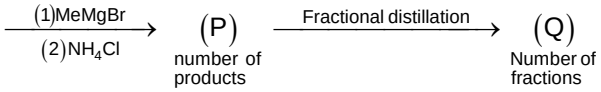
73. 

Condensation polymer (S) have X number of carbons in its monomer. Find the value of X ?

74. Total number of carbon atoms present in the side chain of the given reaction major product.



75. 



(Enantiomerically pure)

Write the value of sum of (P + Q).

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