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PAPER-1

Academic Session: 2015-16

CODE - 0

JEE PREPARATORY TEST-2 (JPT-2)

(JEE ADVANCED PATTERN)

Target : JEE (Main+Advanced) 2016

Date: 15 MAY, 2016 | Duration : 3 Hours | Max. Marks: 180

CLASS XII/XIII | COURSE : ALL INDIA TEST SERIES (VIKALP)

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

Every effort has been taken to keep error free, however any suggestions to improve are welcome at smdd@resonance.ac.in

Please read the last page of this booklet for the instructions.

(कृपया निर्देशों के लिये इस पुस्तिका के अन्तिम पृष्ठ को पढ़े।)

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PART - I : PHYSICS

SECTION – 1 : (Maximum Marks : 30)

- This section contains **TEN** questions
- Each question has **FOUR** options (A), (B), (C) and (D). **ONE OR MORE THAN ONE** of these four option(s) is(are) correct
- For each question, darken the bubble(s) corresponding to all the correct option(s) in the ORS
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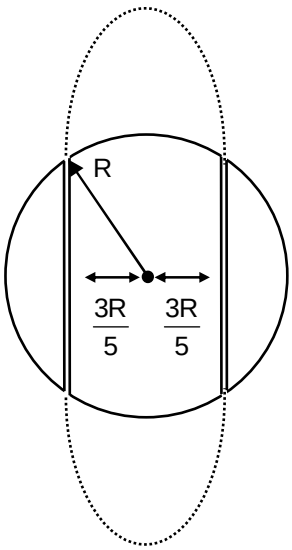
1. Consider a uniform spherical planet of mass M and radius R. Two parallel tunnels are dug at perpendicular distance $\frac{3R}{5}$ symmetrically from centre. A particle is to be thrown from the starting of one tunnel such that it enters in another tunnel without making collision with tunnel wall and continues its motion as shown in figure. Tunnels are friction less and particle just fits inside the tunnel. Consider the planet to be at rest.



Choose the correct options.

(A) Speed with which the particle is to be thrown at starting of one tunnel is $\sqrt{\frac{GM}{R}}$

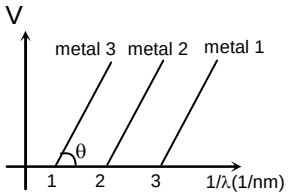
(B) Minimum speed of particle during entire motion is $\sqrt{\frac{GM}{9R}}$

(C) Maximum height achieved by the particle during subsequent motion is $\frac{4R}{5}$

(D) Speed with which the particle is to be thrown at starting of one tunnel is $\sqrt{\frac{GM}{9R}}$

Space for Rough Work

2. The graph between $1/\lambda$, where λ is wavelength of incident light and stopping potential (V) of three metals having threshold wavelengths λ_{th_1}, λ_{th_2} and λ_{th_3} in an experiment of photo-electric effect is plotted as shown in the figure. Which of the following statements is/are correct?



(A) Ratio of work functions $\phi_1 : \phi_2 : \phi_3 = 3 : 2 : 1$

(B) Ratio of work functions $\phi_1 : \phi_2 : \phi_3 = 2 : 3 : 6$

(C) tan θ is directly proportional to $\frac{hc}{e}$, where h is Planck's constant and c is the speed of light

(D) tan θ is inversely proportional to $\frac{hc}{e}$, where h is Planck's constant and c is the speed of light

3. A point charge q is placed at origin let $\vec{E_A}$, $\vec{E_B}$ and $\vec{E_C}$ be the electric field intensity at three points A (1, 2, –3) , B (1, 1, 1) and C (2, 2, 2) respectively due to the charge q. Then choose the correct options :

(A) $\frac{|\vec{E_B}|}{|\vec{E_C}|} = 4$

(B) $\vec{E_A} \parallel \vec{E_C}$, ($\vec{E_A}$ is parallel to $\vec{E_C}$)

(C) $\frac{|\vec{E_C}|}{|\vec{E_B}|} = \frac{1}{8}$

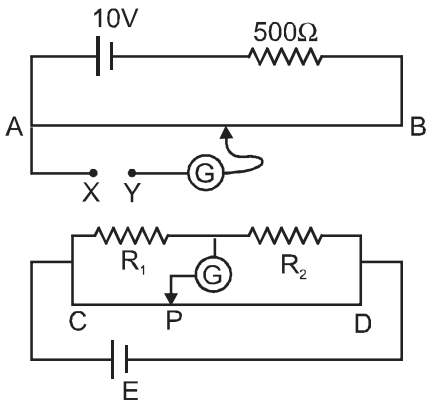
(D) $\vec{E_A} \cdot \vec{E_B} = 0$ (Dot product $\vec{E_A}$ of and $\vec{E_B}$)

Space for Rough Work

4. The diameter of a wire of length 100 cm is measured with the help of a screw gauge. The main scale reading is 1 mm and circular scale is reading is 25. Pitch of the screw gauge is 1 mm and the total number of divisions on the circular scale is 100. This wire is used in an experiment of determination of Young's modulus of a wire by Searle's method. The following data are available: elongation in the wire l = 0.125 cm under the tension of 50 N, least count for measuring normal length of wire is 0.01 cm and for elongation in the wire is 0.001 cm. Possible percentage error in calculating value of Young's modulus (Y) (assuming that the force is measured very accurately) may be

(A) 1 % (B) 2 % (C) 3% (D) 4%

5. In the circuit shown AB is potentiometer wire of length 10m and resistance 500Ω. CD is a 1m wire of meter bridge which is balanced at CP = 20 cm. Given that when the potential difference across R_1 is applied across XY the balancing length on potentiometer is 2m and for potential difference across R_2, the corresponding length is 8m. Then



(A) $\frac{R_1}{R_2} = \frac{1}{4}$

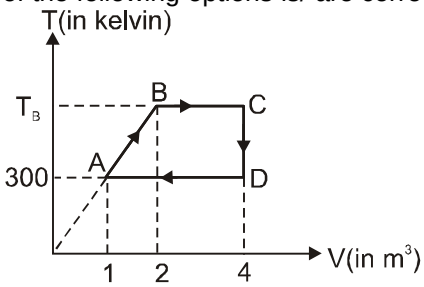
(B) Potential difference across R_1 is 1V

(C) Potential difference across R_2 is 4V

(D) EMF of the battery E = 5V

Space for Rough Work

6. A sample of He gas is undergoes a cyclic process ABCDA as shown. Here symbols have their usual meaning. Then which of the following options is/ are correct.



(A) $\frac{P_A}{P_B} = 1$ (B) $\frac{T_B}{T_A} = 2$ (C) $\frac{|\Delta Q|_{BC}}{|\Delta Q|_{DA}} = 1$ (D) $\frac{P_{max}}{P_{min}} = 3$

7. A black body has a temperature of 'T' (in kelvin) and wavelength 'λ' corresponding to maximum energy density. When body cools, percentage change in the wavelength corresponding to the maximum energy density is 900%. Then choose the correct alternative(s)

(A) Temperature of black body to which it is cooled is $\frac{T}{9}$

(B) Ratio of rate of emission i.e. final to initial will be 1 : 10000

(C) The magnitude of difference in two temperature $\frac{9T}{10}$

(D) Ratio of rate of emission i.e. final to initial will be 1 : 6561

8. Two waves are simultaneously passing through a string, their equations are $y_1 = A_1 \sin k(x - vt)$ and $y_2 = A_2 \sin k(x - vt + x_0)$ respectively, where $k = 3.14\ cm^{-1}$ and $x_0 = 3.0$ cm, $A_1 = 6$ mm, $A_2 = 5.2$ mm, select the **correct** statements.

(A) Their phase difference is 3π

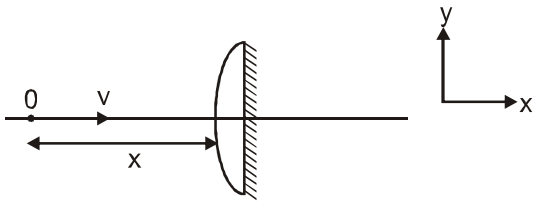
(B) They produce destructive interference

(C) Their resulting amplitude is 0.8 mm

(D) Their resulting amplitude is 11.2 mm

Space for Rough Work

9. When object 'O' moves towards a fixed lens mirror combination, select correct choice / choices :



(A) Image moves towards negative x-axis

(B) Speed of image and object may be same

(C) Image may move faster then object

(D) Image may come closer to arrangement

10. At t = 0, a sample of radionuclide A has the same decay rate as a sample of radionuclide B has at t = 60 min. The disintegration constants of A and B are λ_A and λ_B respectively, with $\lambda_A < \lambda_B$.

(A) The half life of radionuclide A is greater than that of B.

(B) At t = 60 min, number of atoms in sample of material A is greater than that of sample B.

(C) The two samples will never have the same decay rate simultaneously.

(D) After some time, the two samples will have the same decay rate simultaneously for an instant.

Space for Rough Work

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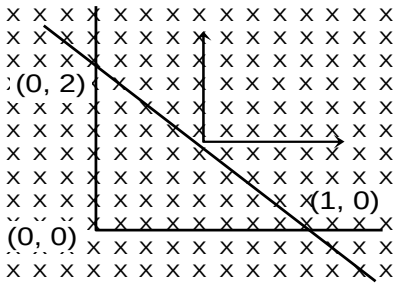
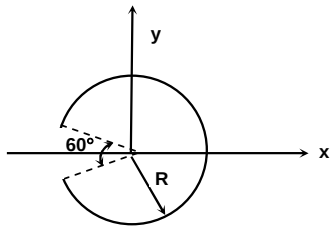
11. In the diagram shown, a conducting rod is being translated on two perpendicular rails with a constant velocity $2\hat{i} + 2\hat{j}$ m/s. A uniform magnetic field B = 1 Tesla is directed perpendicular into the plane of the paper. At certain instant position conducting rod is shown. Find the EMF induced in the triangular loop at the instant shown (in volts).



Space for Rough Work

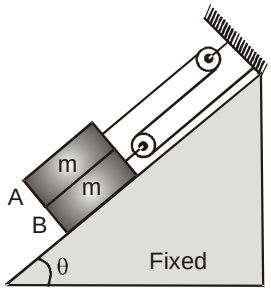
12. Consider the uniform circular arc as shown in figure. Arc is lying in x-y plane and kept symmetrical about x-axis. The x-coordinate of centre of mass of arc is $\frac{\alpha R}{\beta\pi}$. Here α and β are integers. Find minimum value of $\alpha + \beta$.



13. A particle moves in the x-y plane with constant acceleration 'a' directed along the negative y-axis. Relation between x and y co-ordinate of the path followed by the particle is $y = px - qx^2$ where p and q are positive constants. Velocity of the particle at the origin of co-ordinate system is $\sqrt{\frac{a(\alpha + p^2)}{\beta q}}$. Here α and β are integers. Find $\alpha + \beta$.

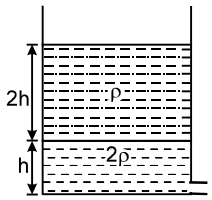
Space for Rough Work

14. Two block each of mass m are connected as shown in figure. Pulley are smooth and light. If the coefficient of static friction at all surfaces is μ_s. If inclination θ is increased gradually then 'θ' at which the blocks begins to slide is given by $\theta = \tan^{-1}(p\mu_s)$. Find value of p.



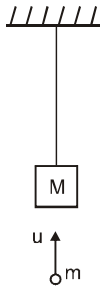
15. A hollow cone of radius R and height 2R is placed on inclined plane of inclination θ. If θ is increased gradually, at $\theta = \sin^{-1}\left(\frac{\alpha}{\sqrt{13}}\right)$ the cone just topples. (Assume there is sufficient friction to avoid any slipping). Here α is an integer. Find α.

16. The speed of the liquid coming out of a small hole of a large vessel containing two different liquids of densities 2ρ and ρ as shown in figure is $\sqrt{\alpha gh}$. Find the value of α.

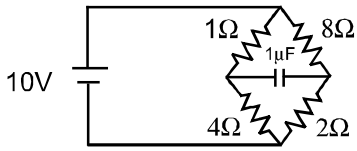


Space for Rough Work

17. A block of mass M is suspended by a string. Bullets each of mass m are fired vertically upwards towards the centre of the block at speed u. If the bullets rebound after striking the block and coefficient of restitution for each collision is same and equal to e, how many bullets per second are to be fired so that the string just becomes slack ? (Use M = m, g = 10 m/s^2, u = $\frac{4}{3}$ m/s, e = $\frac{1}{2}$)



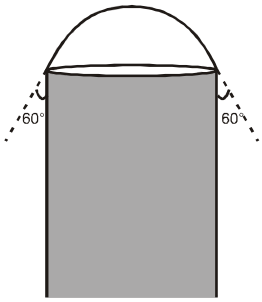
18. In the given circuit potential difference across the capacitor in steady state is α volts. Find α.



Space for Rough Work

19. When a non-isotropic cube is heated its length expands with coefficient of linear expansion α, breadth expands with coefficient of linear expansion 2α and height expands with coefficient of linear expansion 3α. The coefficient of volume expansion is γ. Find $\frac{\gamma}{\alpha}$

20. A soap bubble is being blown slowly on a tube of radius 1 cm. The surface tension of the soap solution is 0.05 N/m and surface of the bubble makes an angle of 60° with the tube as shown. The excess pressure over the atmospheric pressure in the tube is 2n pascal. Find n.



Space for Rough Work

PART - II : 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]

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21. In a 7.0 L evacuated chamber, 0.50 mol H_2 and 0.50 mole I_2 react at 427ºC according to reaction $H_2(g) + I_2(g) \rightleftharpoons 2HI(g)$. At the given temperature, K_c = 49 for the reaction. Choose the correct option(s) :

(R=0.0821 lit-atm $mol^{-1}K^{-1}$) :

(A) Value of K_p is 49.

(B) The total pressure in the chamber is 8.21 atm.

(C) At equilibrium total mole of mixture is 1.

(D) Concentration of HI at equilibrium is $\frac{1}{9}$ M.

Space for Rough Work

22. For the following reaction, C (diamond) + $O_2 \longrightarrow CO_2(g)$; $\Delta H = -97.6$ Kcal

C (graphite) + $O_2 \longrightarrow CO_2(g)$; $\Delta H = -94.3$ Kcal

The heat required to change 1 g of C (diamond) $\longrightarrow$ C (graphite) is

(A) 1.59 Kcal (B) –0.1375 Kcal (C) –0.275 Kcal (D) None of these

23. The **incorrect** statement(s) is/are -

(A) For coagulation of As_2S_3 sol, +ve ions are effective.

(B) For coagulation of aluminium hydroxide sol Ba^{2+} ions are more effective than Na^+

(C) Cellulose solution is an example of multimolecular colloid system

(D) Colloidal sol of metals such as gold, silver etc are prepared by Bredig's arc method.

24. The wave functions of 3s and $3p_z$ orbitals are given by

$$\Psi_{3s} = \frac{1}{9\sqrt{3}}\left(\frac{1}{4\pi}\right)^{1/2}\left(\frac{z}{a_0}\right)^{3/2}\left(6 - \frac{4zr}{a_0} + \frac{4}{9}\frac{z^2r^2}{a_0^2}\right)e^{-zr/3a_0}$$

$$\Psi_{3p} = \frac{1}{9\sqrt{3}}\left(\frac{3}{4\pi}\right)^{1/2}\left(\frac{z}{a_0}\right)^{3/2}\left(4 - \frac{2zr}{3a_0}\right)\left(\frac{2zr}{3a_0}\right)e^{-zr/3a_0}\cos\theta$$

From these we can conclude :

(A) Number of nodal surface for $3p_z$ & 3s orbitals is equal.

(B) The angular nodal surface of $3p_z$ orbital has the equation $\theta = \pi/2$.

(C) The radial nodal surfaces of 3s orbital and $3p_z$ orbital are at equal distance from the nucleus.

(D) 3s electron have greater penetrating power into the nucleus in comparison to 3p electrons.

Space for Rough Work

25. Which of the following isomerisms is/are shown by the complex $[CoCl_2(OH_2)_2(NH_3)_2]Br$?

(A) Ionization (B) Linkage (C) Geometrical (D) optical

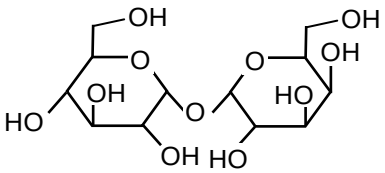
26. Nitric acid usually turns yellow on standing. This is due to :

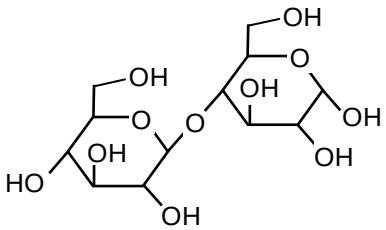
(A) absorption of yellow wavelength
(B) slow decomposition of HNO_3 into NO_2
(C) its oxidation by atmospheric air
(D) absorption of moisture by it

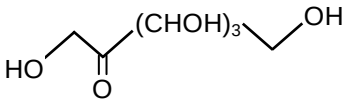
27. Which statement(s) is/are correct in the following ?

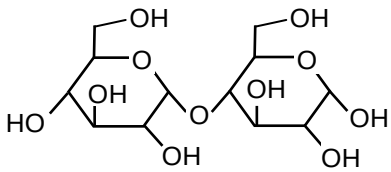
(A) Cyclopentadiene reacts with $NaNH_2$ and release NH_3 gas however cyclopropene does not.
(B) Cyclopropenone has a greater dipole moment than acetone.
(C) Cyclobutadiene does not exist at room temperature but cyclobutene exists at room temperature.
(D) 7-Bromocyclohepta-1,3,5-triene ionizes faster however 5-Bromocyclopenta-1,3-diene does not.

28. Which of the following is/are reducing sugar ?

(A) 

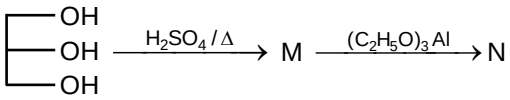
(B) 

(C) 

(D) 

Space for Rough Work

29. Observe the following reaction



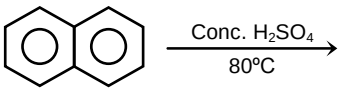
Choose the correct option(s) :

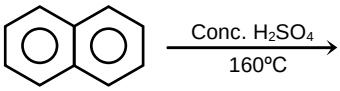
(A) M is $CH_2=CH–CH=O$

(B) Conversion of M to N is a nucleophilic addition reaction.

(C) N is $CH_2=CH–\underset{\underset{O}{\|}}{C}–O–CH_2–CH=CH_2$

(D) M is $CH_2=CH–\underset{\underset{OH}{|}}{C}H_2$

30. Reaction-I 

Reaction-II 

Which of the following option(s) is/are correct for above give reactions –

(A) In the reaction-I product is formed by most stable carbon intermediate.

(B) In the reaction-II product is α-naphthalene sulphonic acid.

(C) Product 'X' is converted into product Y by conc.H_2SO_4 / Δ and it is a thermodynamically controlled process.

(D) In the reaction I & II electrophile attacks on naphthalene with same regioselectivity.

Space for Rough Work

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31. In He^+ ion sample electrons make transition from 5th excited state to 2nd state only, all different types of photons are observed. Then change in angular momentum of electrons producing 3rd highest energy photon is how much times of angular momentum of electron in first orbit.

32. Equivalent conductance of 0.2 M aqueous solution of a weak monobasic acid (HA) is 10 S cm^2 $equiv^{-1}$ and that at infinite dilution is 200 S cm^2 $equiv^{-1}$. Hence pH of this solution is :

33. How many of following will produce atleast one coloured gas on heating?

$FeSO_4$, $LiNO_3$, KNO_3, $Co(NO_3)_2$, H_3BO_3, $K_2Cr_2O_7$, $KMnO_4$,

NH_4NO_3, NH_4NO_2, $(NH_4)_2CO_3$, $AlCl_3.6H_2O$, NaN_3, BI_3

Space for Rough Work

34. Find number of molecules of NaOH consumed in the disproportionation reaction with one molecule of P_4.

35. How many of the following orders are incorrect with respect to property indicated ?

(1) $Al^{3+} < Mg^{2+} < Li^{+} < K^{+}$ - ionic size.

(2) B < C < N > O - ionization energy.

(3) F < Cl > Br < I - electron affinity.

(4) Si < P < C < N - electronegativity.

(5) $N_2O_3 > CO_2 > B_2O_3 > BeO > Li_2O$ - acidic character.

(6) Na > Mg > Al > Si - metallic character.

(7) $F_2 < Cl_2 < Br_2 < I_2$ - oxidising power.

36. In how many of the following reactions, one of the products is obtained as a yellow precipitate ?

$Ba^{2+} + CrO_4^{2-} \longrightarrow$ Product

$Hg^{2+} + Co^{2+} + SCN^{-} \longrightarrow$ Product

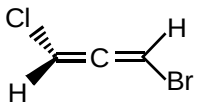
$NH_4^{+} + [PtCl_6]^{2-} \longrightarrow$ Product

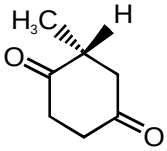
$Ag^{+} + CrO_4^{2-} \longrightarrow$ Product

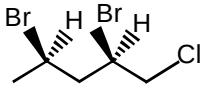
$NH_4^{+} + [Co(NO_2)_6]^{3-} \longrightarrow$ Product

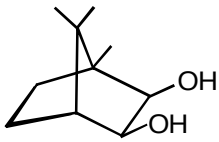
Space for Rough Work

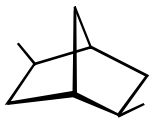
37. In following, how many molecule(s) is/are chiral ?

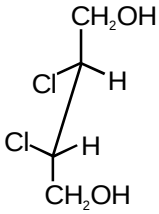
1. 

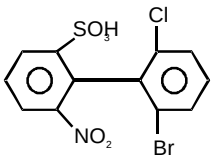
2. 

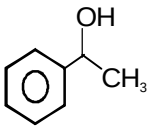
3. 

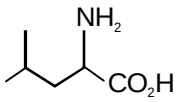
4. 

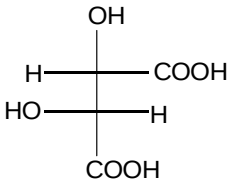
5. 

6. 

7. 

8. 

9. 

10. 

38. How many reactions will proceed through free radical addition mechanism ?

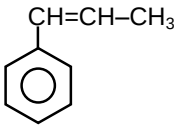
(i) $\xrightarrow{\text{NBS}}$

(ii) $\xrightarrow[R_2O_2]{\text{HCl}}$

(iii) $CH_3-\underset{\underset{CH_3}{|}}{C}=CH-CH_3 \xrightarrow[h\nu]{\text{HBr}}$

(iv) $CH_3-C\equiv C-CH_2-CH_3 \xrightarrow[R_2O_2]{\text{HI}}$

(v) $CH_3-CH=CH_2 \xrightarrow[R_2O_2]{\text{HBr}}$

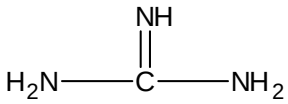
(vi) 

$\xrightarrow{\text{NBS}}$

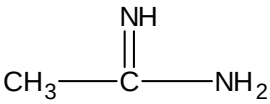
Space for Rough Work

39. How many positional isomer(s) of dichlorobiphenyl is possible if each ring of biphenyl has only one chlorine?

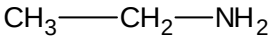
40. How many molecules given below are more basic than aniline ?



(I)

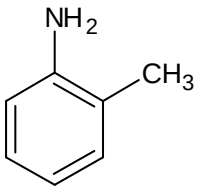


(II)

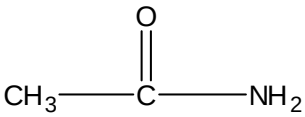


(III)

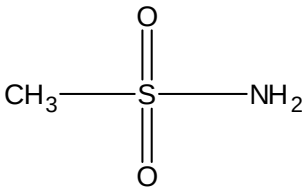
(IV)



(V)



(VI)



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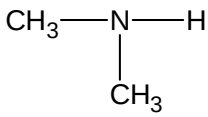
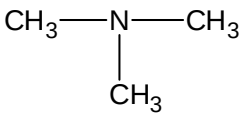


(VIII)



(IX)

Space for Rough Work

PART : III MATHEMATICS

SECTION – 1 : (Maximum Marks : 30)

- This section contains **TEN** questions
- Each question has **FOUR** options (A), (B), (C) and (D). **ONE OR MORE THAN ONE** of these four option(s) is(are) correct
- For each question, darken the bubble(s) corresponding to all the correct option(s) in the ORS
- Marking scheme :
  +3 If only the bubble(s) corresponding to all the correct option(s) is(are) darkened
  0 If none of the bubbles is darkened
  0 In all other cases

41. Consider two lines $\vec{r} = \hat{i} + \hat{j} + \lambda_1(\hat{i} - \hat{k})$ and $\vec{r} = \hat{j} + \hat{k} + \lambda_2(\hat{i} + \hat{j})$. If PQ is the shortest distance between these two lines then :

(A) Their shortest distance is $\sqrt{26}$

(B) Their point of intersection is $\hat{j} + \hat{k}$

(C) Their shortest distance is zero

(D) the length of projection of $\overrightarrow{OP}$ on $\hat{i} + \hat{j} + \hat{k}$ is $\frac{2}{\sqrt{3}}$

42. If distinct and positive quantities a, b, c are in H.P. then

(A) $b > \frac{a+c}{2}$

(B) $\frac{1}{a-b} - \frac{1}{b-c} < 0$

(C) $ac > b^2$

(D) bc(1 – a), ac(1 – b), ab(1 – c) are in A.P.

Space for Rough Work

43. If equation of ellipse is $(3x - 9)^2 + 9y^2 = (x + \sqrt{2}\,y + 1)^2$ then

(A) its eccentricity is $\frac{1}{\sqrt{3}}$

(B) its eccentricity is $\frac{1}{\sqrt{2}}$

(C) length of major axis is 4

(D) length of minor axis is 4

44. $f : R \to [-1, \infty)$ and $f(x) = \ell n([|\sin 2x| + |\cos 2x|])$ (where [.] is greatest integer function) then

(A) $R^- \cap$ (range of 'f') is null set

(B) f(x) is periodic but fundamental period not defined

(C) f(x) is invertible in $\left[0, \frac{\pi}{4}\right]$

(D) f(x) is into function

45. If $\int_0^x \left(x - [x] - \frac{1}{2}\right) dx = f(x).g(x)$ where [x] and {x} are integral and fractional parts of x, respectively, then which one of following may be correct.

(A) $f(x) = \frac{\{x\}}{2}$, $g(x) = (\{x\} - 1)$

(B) $f(x) = (\{x\} - 1)$, $g(x) = \frac{\{x\}}{2}$

(C) $f(x) = (\{x\} - 1)\{x\}$, $g(x) = \frac{1}{2}$

(D) $f(x) = \{x\}$, $g(x) = ([x] - 1)$

46. The value(s) of k for which the equation $x^2 - 2kx + 1 = 0$ and $(\log_{10}(x^2 - x - 6)) - x = \log_{10}(x + 2) - 4$ has a common root, may be :

(A) $\frac{7}{4}$

(B) $\frac{7}{18}$

(C) $\frac{11}{8}$

(D) $\frac{17}{8}$

Space for Rough Work

47. If z_1, z_2, z_3, z_4 are complex numbers satisfying $|z - 25i| = r$ where z_1 and z_2 are complex numbers having maximum and minimum modulus and z_3 and z_4 are complex numbers having maximum and minimum arguments respectively. If $z_1 - z_2 = 30i$ then

(A) $z_1 = 25 + 15i$ (B) $z_2 = 25 - 15i$ (C) $z_3 = -12 + 16i$ (D) $z_4 = 12 + 16i$

48. If abc = p and $A = \begin{bmatrix} a & b & c \\ c & a & b \\ b & c & a \end{bmatrix}$ and $AA' = I$ then a, b, c are roots of equation :

(A) $x^3 - p = 0$ (B) $x^3 - x^2 - p = 0$ (C) $x^3 + x^2 - p = 0$ (D) $x^3 + 3x^2 + 3x - p = 0$

49. A six faces die has 4 blank spaces, one face marked 2, another face marked as 3 then in three throws :

(A) Probability of getting sum 6 is $\frac{13}{216}$ (B) Probability of getting sum 6 is $\frac{11}{216}$

(C) Probability of getting sum 5 is $\frac{2}{9}$ (D) Probability of getting sum 5 is $\frac{1}{9}$

50. Two equal sides of a triangle are $(a + b)x + (a - b)y - 2ab = 0$ and $(a - b)x + (a + b)y - 2ab = 0$. If the third side passes through $(b - a, a - b)$ then equation of third side can be :

(A) $x - y = 2(b - a)$ (B) $x + y = 0$ (C) $x - y = 2(b + a)$ (D) none of these

Space for Rough Work

SECTION – 2 : (Maximum Marks : 30)

- This section contains **TEN** 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

  0 In all other cases

51. If the parabola $y = ax^2 + bx + c$, where a, b, c $\in$ {1, 2, 3, 4, 5, 6} pass through (1, 8), then number of such parabola is k the k – 12

52. Let A = {x : x is a prime number less than 30}. The number of rational numbers of the form $\frac{p}{q}$, where p, q $\in$ A is λ. Find the value of $\frac{\lambda}{13}$.

53. All the values of parameter m for which the functions $f(x) = \frac{x^3}{3} + (m-1)x^2 + (m+5)x + 7$ is increasing for all x > 0 lie in the interval $[-k, \infty)$, then the numerical value of k is equal to

Space for Rough Work

54. Find the value of $\int_{-4}^{-5} \sin(x^2 - 3)\,dx + \int_{-2}^{-1} \sin(x^2 + 12x + 33)\,dx$

55. Find the value of |a| + |b| such that the identity |ax + by| + |bx + ay| = |x| + |y| holds $\forall$ x, y $\in$ R

56. Number of tangent(s) which can be drawn to the ellipse $16x^2 + 25y^2 = 400$ such that sum of perpendicular distance from the foci to the tangent is 8.

57. A person starts writing numbers from 1 to n in a row such that i^{th} number is written i^2 times then find 500th digit from the starting.

Space for Rough Work

58. The graph of a function y = f(x) passes through P(1, 2) and Q(s, r). The equation of secant line through P and Q is $y = \left(\frac{s^2 + 2s - 3}{s - 1}\right)x - (1 + s)$, then the value of f '(1) is

59. If 84^n divides, (496)!, and the maximum value of n is 'k'; then $\frac{k}{9}$ is equal to :

60. If the area bounded by the curves $f(x) = \sin^{-1}(\sin x)$ and $g(x) = [\sin^{-1}(\sin x)]$ in the interval $[0, \pi]$ is $\left(\frac{\pi}{k} - 1\right)^2$, then value of k is (where [.] is a greatest integer function)

Space for Rough Work

PAPER-1
DATE : 15-05-2016

JEE PREPARATORY TEST-2 (JPT-2) (JEE ADVANCED PATTERN)
COURSE : CLASS XII/XIII | COURSE : ALL INDIA TEST SERIES (VIKALP)

CODE - 0

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 **60** questions along with the options are legible.

QUESTION PAPER FORMAT AND MARKING SCHEME :

7. The question paper has three parts : **Physics, Chemistry and Mathematics.** Each part has two sections.
8. Carefully read the instructions given at the beginning of each section.
9. Section 1 contains 10 multiple Choice question with one or more than one correct option.
   Marking scheme: +3 for correct answer, 0 if not attempted and 0 in all other cases.
10. Section 2 contains 10 question. The answer to each question is a single digit integer ranging from 0 to 9 (both inclusive).
    Marking scheme: +3 for correct answer, 0 if not attempted and 0 in all other cases.

OPTICAL RESPONSE SHEET :

11. Darken the appropriate bubbles on the original by applying sufficient pressure.
12. The original is machine-gradable and will be collected by the invigilator at the end of the examination.
13. Do not tamper with or mutilate the ORS.
14. 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 :

15. Use a **BLACK BALL POINT** to darken the bubbles in the upper sheet.
16. Darken the bubble **COMPLETELY.**
17. Darken the bubble **ONLY** if you are sure of the answer.
18. The correct way of darkening a bubble is as shown here : ●
19. There is **NO** way to erase or "un-darkened bubble.
20. 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

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

- -
Signature of the Candidate

- -
Signature of the Invigilator

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