

FIITJEE PET – VI (REG_2ND YEAR)

MAINS_SET-A

DATE: 28.07.2018

Time: 3 hours
INSTRUCTIONS:

Maximum Marks: 360

Instructions to the Candidates

1. This Test Booklet consists of **90 questions**.
Use **Blue/Black ball Point Pen only** for writing particulars and bubbling of OMR.
2. For each correct answer **4 Marks** will awarded and for each wrong answer **1 Mark** will be deducted.
3. Attempt all questions.
4. In case you have not darkened any bubble you will be awarded 0 mark for that question.
5. Use of calculator/logarithmic table is not permitted.

Don't write / mark your answers in this question booklet.
If you mark the answers in question booklet, you will not be allowed to continue the exam.

NAME:

ENROLLMENT NO.:

- If the straight line $4y - 3x + 18 = 0$ cuts the parabola $y^2 = 64x$ in P and Q, then the angle subtended by PQ at the vertex of the parabola is
 (A) $\cos^{-1}\left(\frac{87}{\sqrt{27409}}\right)$ (B) $\tan^{-1}\left(\frac{17}{\sqrt{22409}}\right)$ (C) $\sin^{-1}\left(\frac{28}{\sqrt{17309}}\right)$ (D) $\cos^{-1}\left(\frac{35}{\sqrt{15210}}\right)$
- A focal chord of the parabola $y^2 = 4ax$ meets it at P and Q. If S is the focus then $\frac{1}{SP} + \frac{1}{SQ} =$
 (A) a (B) $\frac{1}{a}$ (C) 2a (D) $\frac{2}{a}$
- The slopes of the focal chords of the parabola $y^2 = 32x$ which are tangents to the circle $x^2 + y^2 = 4$ are
 (A) $\frac{1}{\sqrt{3}}, \frac{-1}{\sqrt{3}}$ (B) $\frac{1}{\sqrt{15}}, \frac{-1}{\sqrt{15}}$ (C) $\frac{2}{\sqrt{5}}, \frac{-2}{\sqrt{5}}$ (D) $\frac{1}{2}, \frac{-1}{2}$
- If the point t is one extremity of a focal chord of the parabola $y^2 = 4ax$, then the length of the chord is
 (A) a (B) at (C) $a\left(t + \frac{1}{t}\right)$ (D) $a\left(t + \frac{1}{t}\right)^2$
- In the parabola $y^2 = 4ax$, the length of the chord passing through the vertex and inclined to the axis at $\frac{\pi}{4}$ is
 (A) $4a\sqrt{2}$ (B) $2a\sqrt{2}$ (C) $a\sqrt{2}$ (D) none of these
- A circle of radius 4, drawn on a chord of the parabola $y^2 = 8x$ as diameter, touches the axis is the parabola. Then, the slope of the chord is
 (A) $\frac{1}{2}$ (B) $\frac{3}{4}$ (C) 1 (D) 2
- The tangents of at the points $(at_1^2, 2at_1)$, $(at_2^2, 2at_2)$ on the parabola $y^2 = 4ax$ are at right angles if
 (A) $t_1t_2 = -1$ (B) $t_1t_2 = 1$ (C) $t_1t_2 = 2$ (D) $t_1t_2 = -2$
- The area of the triangle formed by the tangents and the chord of contact from (x_1, y_1) to the parabola $y^2 = 4ax$ is
 (A) $(y_1^2 - 4ax_1)^{3/2}$ (B) $2a(y_1^2 - 4ax_1)^{3/2}$ (C) $\frac{(y_1^2 - 4ax_1)^{3/2}}{(2a)}$ (D) none of these

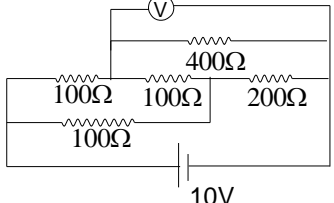
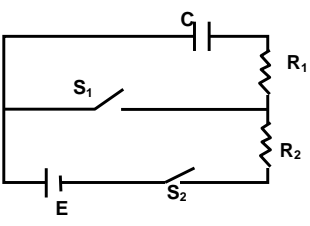
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9. If y_1, y_2 and y_3 are the ordinates of the vertices of a triangle inscribed in the parabola $y^2 = 4ax$, then its area is
 (A) $\frac{1}{2a} |(y_1 - y_2)(y_2 - y_3)(y_3 - y_1)|$ (B) $\frac{1}{4a} |(y_1 - y_2)(y_2 - y_3)(y_3 - y_1)|$
 (C) $\frac{1}{8a} |(y_1 - y_2)(y_2 - y_3)(y_3 - y_1)|$ (D) none of these
10. The circumcircle of the triangle formed by any three tangents to a parabola passes through
 (A) vertex (B) focus (C) foot of the directrix (D) none of these
11. PSQ is a focal chord of a parabola whose focus is S and vertex A. PA and QA are produced to meet the directrix in R and T respectively. Then $\angle RST =$
 (A) 90° (B) 60° (C) 45° (D) 30°
12. The normal at point $(bt_1^2, 2bt_1)$ on a parabola meets the parabola again in the point $(bt_2^2, 2bt_2)$, then
 (A) $t_2 = -t_1 + \frac{2}{t_1}$ (B) $t_2 = t_1 - \frac{2}{t_1}$ (C) $t_2 = t_1 + \frac{2}{t_1}$ (D) $t_2 = -t_1 - \frac{2}{t_1}$
13. The number of normals drawn to the parabola $y^2 = 4x$ from the point $(1, 0)$ is
 (A) 0 (B) 1 (C) 2 (D) 3
14. Let $x + y = k$ be a normal to the parabola $y^2 = 12x$. If p is the length of the perpendicular from the focus of the parabola onto this normal, then $4k - 2p^2 =$
 (A) 1 (B) 0 (C) -1 (D) 2
15. The normals at three points P, Q, R of the parabola $y^2 = 4ax$ meet at (h, k) . The centroid of triangle PQR lies on
 (A) $x = 0$ (B) $y = 0$ (C) $x = -a$ (D) $y = a$
16. If α is the inclination of a tangent to the parabola $y^2 = 4ax$, then the distance between the tangent and a parallel normal is
 (A) $a \operatorname{cosec} \alpha \sec \alpha$ (B) $a \operatorname{cosec} \alpha \sec^2 \alpha$ (C) $a \operatorname{cosec}^2 \alpha \sec \alpha$ (D) $a \operatorname{cosec}^2 \alpha \sec^2 \alpha$
17. The normal at P cuts the axis of the parabola $y^2 = 4ax$ in G and S is the focus of the parabola. If $\triangle SPG$ is equilateral, then each side is of length
 (A) a (B) $2a$ (C) $3a$ (D) $4a$
18. The ordinate of the centroid of the triangle formed by conormal points on the parabola $y^2 = 4ax$ is
 (A) 4 (B) 0 (C) 2 (D) 1

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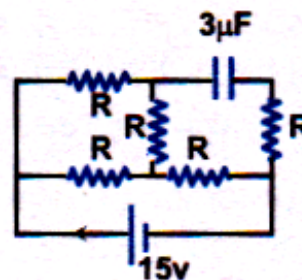
19. The locus of the middle point of the portion of a normal to the parabola $y^2 = 4ax$ intercepted between the curve and the axis is
 (A) $y^2 = a(x - a)$ (B) $y^2 = a(x + a)$ (C) $y^2 = 2a(x - a)$ (D) $y^2 = 2a(x + a)$
20. A is a point on the parabola $y^2 = 4ax$. The normal at A cuts the parabola again at B. If AB subtends a right angle at the vertex of the parabola, then slope of AB is
 (A) $\sqrt{2}$ (B) 2 (C) $\sqrt{3}$ (D) 3
21. An arch is in the shape of a parabola whose axis is vertically downwards and measures 80 mt across its bottom on the ground. Its height point is 24mt. The measure of the horizontal beam across the section at a height of 18 mt is
 (A) 50mt (B) 40mt (C) 45mt (D) 55mt
22. If the tangents and normals at the extremities of a focal chord of the parabola $y^2 = 4ax$ intersect at (x_1, y_1) and (x_2, y_2) respectively, then
 (A) $x_1 = x_2$ (B) $x_1 = y_2$ (C) $y_1 = y_2$ (D) $x_2 = y_1$
23. Equation of the common tangent touching the circle $(x - 3)^2 + y^2 = 9$ and the parabola $y^2 = 4x$ above the x-axis is
 (A) $\sqrt{3}y = 3x + 1$ (B) $\sqrt{3}y = -(x + 3)$ (C) $\sqrt{3}y = x + 3$ (D) $\sqrt{3}y = -(3x + 1)$
24. The slopes of the normals to the parabola $y^2 = 4ax$ intersecting at a point on the axis of the parabola at a distance $4a$ from its vertex are in
 (A) AP (B) GP (C) HP (D) none of these
25. M is the foot of the perpendicular from a point P on the parabola $y^2 = 8(x - 3)$ to its directrix and S is the focus of the parabola. If SPM is an equilateral triangle, the length of each side of the triangle is
 (A) 2 (B) 3 (C) 4 (D) 8
26. PQ is a double ordinate of a parabola $y^2 = 4ax$. If the locus of its points of trisection is another parabola length of whose latus rectum is k times the length of the latus rectum of the given parabola. Then k =
 (A) $\frac{1}{9}$ (B) $\frac{1}{3}$ (C) $\frac{2}{3}$ (D) none of these
27. Equation of the directrix of the parabola whose focus is $(0, 0)$ and the tangent at the vertex is $x - y + 1 = 0$ is
 (A) $x - y = 0$ (B) $x - y - 1 = 0$ (C) $x - y + 2 = 0$ (D) $x + y - 1 = 0$

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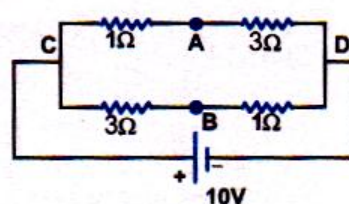
28. The point P on the parabola $y^2 = 4ax$ for which $|PR - PQ|$ is maximum, whose $R(-a, 0)$, $Q(0, a)$ is
 (A) $(a, 2a)$ (B) $(a, -2a)$ (C) $(4a, 4a)$ (D) $(4a, -4a)$
29. The range of values of λ for which the point $(\lambda, -1)$ is exterior to both the parabola $y^2 = |x|$, is
 (A) $(0, 1)$ (B) $(-1, 1)$ (C) $(-1, 0)$ (D) none of these
30. Radius of the circle that passes through origin and touches the parabola $y^2 = 4ax$ at the point $(a, 2a)$ is
 (A) $\frac{5}{\sqrt{2}}a$ (B) $2\sqrt{2}a$ (C) $\frac{\sqrt{5}}{2}a$ (D) $\frac{3}{\sqrt{2}}a$
31. In a potentiometer experiment, two cells connected in series get balanced at 9 m length on the wire. Now the connections of terminals of cell of lower emf are reversed, then the balancing length is obtained at 3 m. The ratio of emf of two cells will be
 (A) 3 : 1 (B) 2 : 1 (C) 4 : 1 (D) none
32. An electrical circuit is given. Calculate the current flowing in the resistor of 400Ω , if voltmeter resistance is 400Ω
 (A) $\frac{1}{60}A$ (B) $\frac{1}{3}A$
 (C) $\frac{20}{3}A$ (D) $\frac{10}{3}A$
- 
33. In a circuit 5 percent of total current passes through a galvanometer. If resistance of the galvanometer is G then value of the shunt is
 (A) $19G$ (B) $20G$ (C) $\frac{G}{20}$ (D) $\frac{G}{19}$
34. A voltmeter has a range $0-V$ with a series resistance R . With a series resistance $2R$, the range is $0-V'$. The correct relation between V and V' is
 (A) $V' = 2V$ (B) $V' > 2V$ (C) $V' \gg 2V$ (D) $V' < 2V$
35. The capacitor shown in the figure has been charged to a potential difference of V volt so that it carries a charge CV with both the switches S_1 and S_2 remaining open. Switch S_1 is closed at $t = 0$.
 What is charge on capacitor at $t = R_1C$.
 (A) $q = CVe^{-\frac{t}{R_1C}}$ (B) $q = CVe^{-\frac{t}{2R_1C}}$
 (C) $q = 2CVe^{-\frac{t}{R_1C}}$ (D) $q = 2CVe^{-\frac{t}{2R_1C}}$
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36. In the circuit shown, the cell is ideal with emf = 15 V and each resistance is of 3Ω . The potential difference across the capacitor in the steady state is
 (A) zero (B) 9 V
 (C) 12 V (D) 15 V

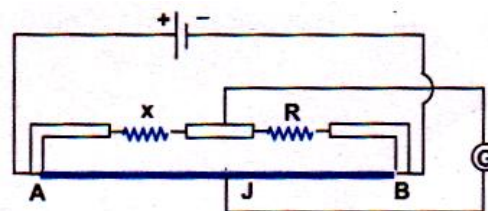


37. A battery of emf 10 V is connected to the network of resistance as shown in the figure. The potential difference between A and B ($V_A - V_B$) is
 (A) -2V (B) 2 V
 (C) 5 V (D) $\left(\frac{20}{11}\right)V$

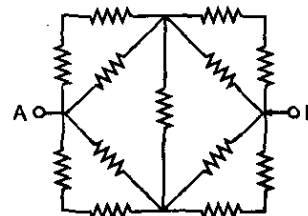


38. The resistivity of a potentiometer wire is $40 \times 10^{-8} \text{ ohm-m}$ and its area of cross-section is $8 \times 10^{-6} \text{ m}^2$. If 0.2 amp current is flowing through the wire, then the potential gradient will be
 (A) 10^{-2} Vm^{-1} (B) 10^{-1} Vm^{-1} (C) $3.2 \times 10^{-2} \text{ Vm}^{-1}$ (D) 1 Vm^{-1}

39. The figure, shows a metre bridge circuit, with $AB = 100\text{cm}$, $x = 12\Omega$ and $R = 18\Omega$ and the jockey J in the position of the balance. If R is now made 8Ω , through what distance will J have to be moved to obtain balance?
 (A) 10 cm (B) 20 cm
 (C) 30 cm (D) 40 cm

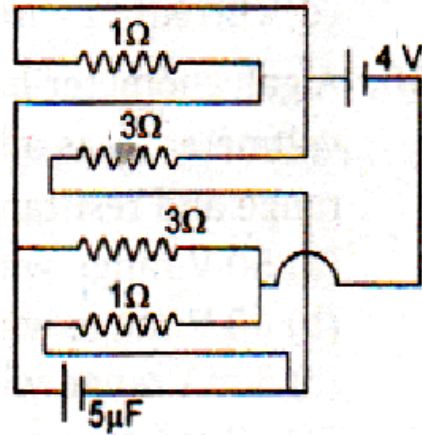


40. Thirteen resistors each of resistance H are connected in the circuit as shown in figure. Net resistance between A and B is:
 (A) 2R (B) $\frac{4R}{3}$
 (C) $\frac{2R}{3}$ (D) R



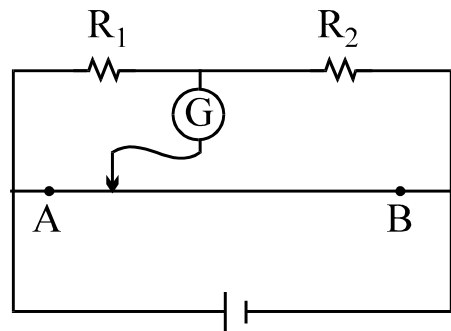
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41. Calculate the charge on the capacitor long time after the assembling of the circuit.
 (A) $5\mu\text{C}$ (B) $10\mu\text{C}$
 (C) $15\mu\text{C}$ (D) zero



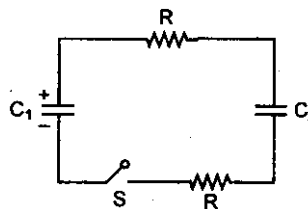
42. In a balanced wheat stone bridge, current in the galvanometer is zero. It remains zero when:
 [1] battery emf is increased
 [2] all resistances are increased by 10 ohms
 [3] all resistances are made five times
 [4] the battery and the galvanometer are interchanged
 (A) only [1] is correct (B) [1], [2] and [3] are correct
 (C) [1], [3] and [4] are correct (D) [1] and [3] are correct

43. In the figure shown for the given values of R_1 and R_2 the balance point for Jockey is at 40 cm from A. When R_2 is shunted by a resistance of $10\ \Omega$, balance shifts to 50 cm. R_1 and R_2 are ($AB = 1\ \text{m}$):
 (A) $10/3\ \Omega$, $5\ \Omega$ (B) $20\ \Omega$, $30\ \Omega$
 (C) $10\ \Omega$, $15\ \Omega$ (D) $5\ \Omega$, $15/2\ \Omega$



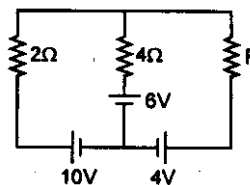
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44. In the circuit shown in figure $C_1 = 2C_2$. Capacitor C_1 is charged to a potential of V . The current in the circuit just after the switch S is closed is:



- (A) zero (B) $\frac{2V}{R}$ (C) infinite (D) $\frac{V}{2R}$

45. For what value of R in the circuit as shown current passing through 4Ω resistance will be zero:

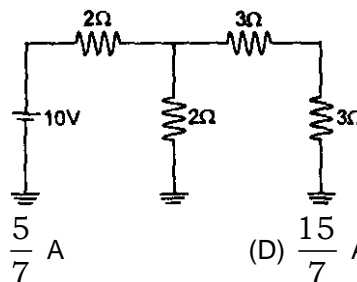


- (A) 1Ω (B) 2Ω (C) 3Ω (D) 4Ω

46. A capacitor of capacitance C is allowed to discharge through a resistance R . The net charge flow through resistance during one time constant is : (I_0 is the maximum current)

- (A) $CR I_0 \left(\frac{1}{e} + 1 \right)$ (B) $CR I_0 \left(1 - \frac{1}{e} \right)$ (C) $CR I_0$ (D) None

47. Current in 3Ω resistance is:

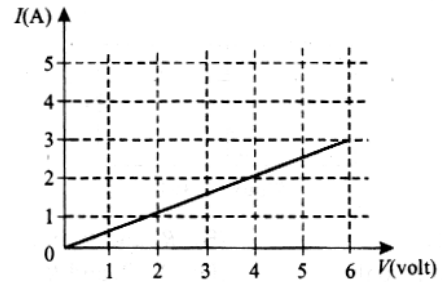


- (A) 1 A (B) $\frac{1}{7}$ A (C) $\frac{5}{7}$ A (D) $\frac{15}{7}$ A

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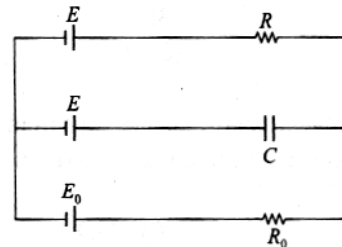
48. A piece of wire is cut into four equal parts and the pieces are bundled together side by side to form a thicker wire. Compared with that of the original wire, the resistance of the bundle is
 (A) The same (B) $\frac{1}{4}$ as much (C) $\frac{1}{8}$ as much (D) $\frac{1}{16}$ as much

49. Variation of current and voltage in a conductor has been shown in figure. The resistance of the conductor is
 (A) 4Ω (B) 2Ω
 (C) 3Ω (D) 1Ω

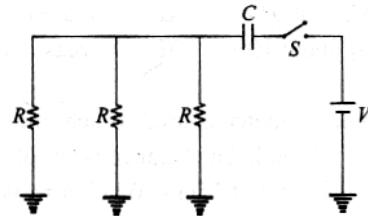


50. A capacitor of capacitance C is charged by a battery of EMF E and internal resistance r . A resistance $2r$ is also connected in series with the capacitor. The amount of heat liberated inside the battery by the time capacitor is charged to 50 % of its steady state value is given as.
 (A) $\frac{3}{8}E^2C$ (B) $\frac{E^2C}{6}$ (C) $\frac{E^2C}{12}$ (D) $\frac{E^2C}{24}$

51. For the circuit shown in the figure, Find the charge stored on capacitor in steady state.
 (A) $\frac{RC}{R+R_0}E$ (B) $\frac{RC}{R_0}(E-E_0)$
 (C) zero (D) $\frac{RC}{R+R_0}(E-E_0)$

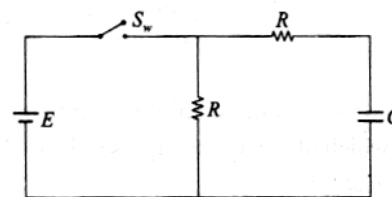


52. The switch shown in the figure is closed at $t=0$. The charge on the capacitor as a function of time is given as
 (A) $CV(1-e^{-t/RC})$ (B) $3CV(1-e^{-t/RC})$
 (C) $CV(1-e^{-3t/RC})$ (D) $CV(1-e^{-t/3RC})$

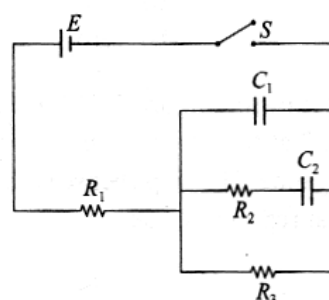


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53. A capacitor C is connected to two equal resistance as shown in the figure. Consider the following statements
- (i) At the time of charging of capacitor time constant of the circuit is $2RC$
 - (ii) At the time discharging of the capacitor the time constant of the circuit is RC
 - (iii) At the time of discharging of the capacitor the time constant of the circuit is $2RC$
 - (iv) At the time of charging of capacitor the time constant of the circuit is RC
- (A) Statement (i) and (ii) only are correct
 (B) Statement (ii) and (iii) only are correct
 (C) Statement (iii) and (iv) only are correct
 (D) Statement (i) and (iii) only are correct



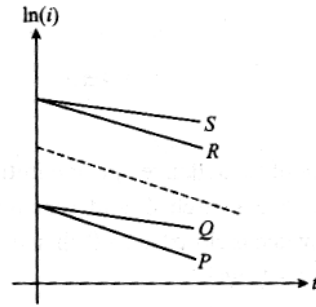
54. In the circuit diagram, the current through the battery immediately after the switch S is closed is given as
- (A) Zero (B) $\frac{E}{R_1}$
- (C) $\frac{E}{R_1 + R_2}$ (D) $\frac{E}{R_1 + \frac{R_2 R_3}{R_2 + R_3}}$



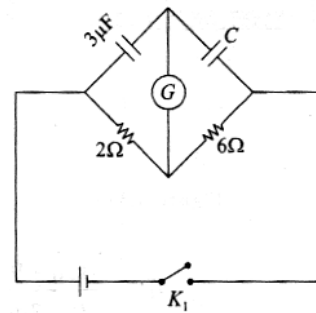
55. Identify the correct statement
- (A) Principle of potentiometer is balancing resistances against known resistance
 - (B) Sensitivity of potentiometer can be increased by increasing emf in primary circuit
 - (C) Potentiometer can be used to measure only “emf” but not P.D. in a circuit
 - (D) Potentiometer can be used for measuring internal resistance and PD in any circuit also
56. A $4\ \mu\text{F}$ capacitor, a resistance of $2.5\ \text{M}\ \Omega$ is in series with $12\ \text{V}$ battery. Find the time after which the potential difference across the capacitor is 3 times the potential difference across the resistor.
- (A) 13.86s (B) 6.93 s (C) 7s (D) 14 s

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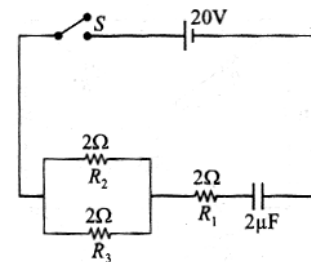
57. In an RC circuit while charging, the graph of $\ln(i)$ versus time as shown by the dotted line in the figure, where i is the current. When the value of the resistance is doubled, which of the solid curve best represents the variation of $\ln(i)$ versus time
- (A) P (B) Q
(C) R (D) S



58. Two resistances are connected in two gaps of a metre bridge. The balance point is 20 cm from the zero end. A resistance of 15 ohms is connected in series with the smaller of the two. The null point shifts to 40 cm from the zero end. The value of the smaller resistance in ohms is
- (A) 3 (B) 6 (C) 9 (D) 12
59. If key K_1 is closed in circuit shown in figure and galvanometer doesn't give deflection at any time, then value of C is
- (A) $3 \mu\text{F}$ (B) $9 \mu\text{F}$
(C) $4 \mu\text{F}$ (D) $1 \mu\text{F}$

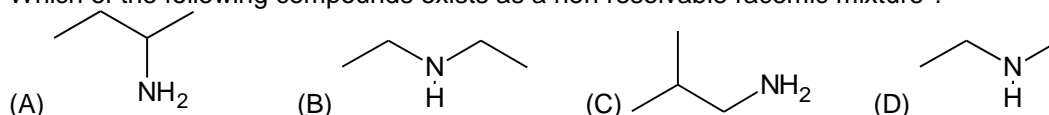


60. The circuit shown in figure is closed at $t=0$. Calculate the total amount of heat generated in R_2 during the time capacitor gets fully charged.
- (A) $\frac{200}{3} \mu\text{J}$ (B) $\frac{400}{3} \mu\text{J}$
(C) $\frac{800}{3} \mu\text{J}$ (D) $400 \mu\text{J}$

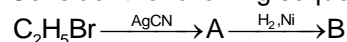


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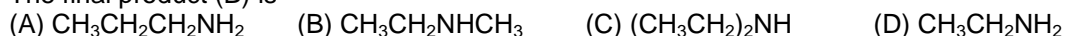
61. Which of the following compounds exists as a non resolvable racemic mixture ?



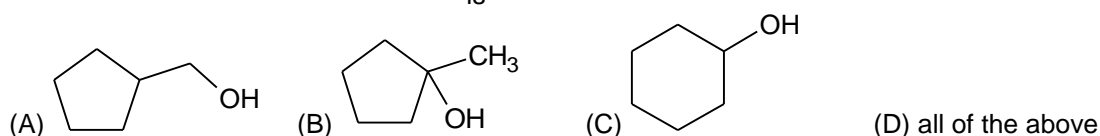
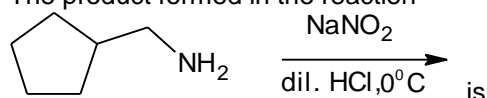
62. Consider the following sequence of reactions.



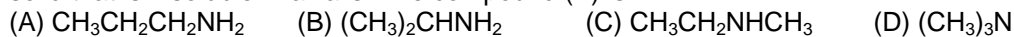
The final product (B) is



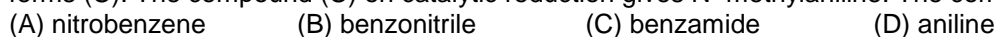
63. The product formed in the reaction



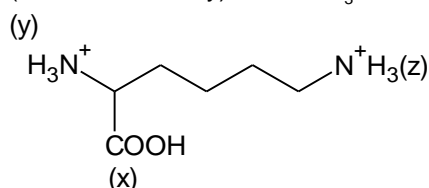
64. A compound (X) having the molecular formula $\text{C}_3\text{H}_9\text{N}$ reacts with benzenesulphonyl chloride to form a solid that is insoluble in alkalis. The compound (X) is



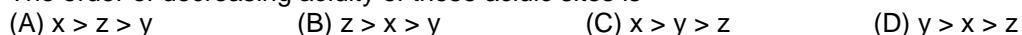
65. An organic compound (A) on reduction gives a compound (B) which on reaction with CHCl_3 and KOH forms (C). The compound (C) on catalytic reduction gives N-methylaniline. The compound (A) is



66. The following species has three acidic sites, namely $-\text{COOH}$ (denoted as site x), $-\text{NH}_3^+$ at C-2 (denoted as site y) and $-\text{NH}_3^+$ at C-6 (denoted as site z)

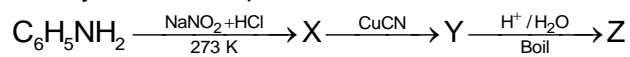


The order of decreasing acidity of these acidic sites is



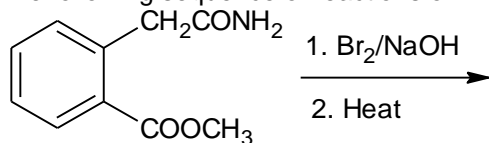
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67. Identify 'Z' in the sequence :



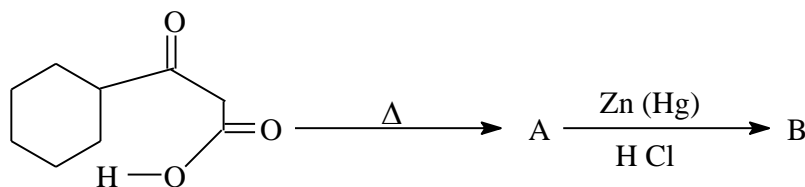
- (A) $\text{C}_6\text{H}_5\text{CN}$ (B) $\text{C}_6\text{H}_5\text{CONH}_2$ (C) $\text{C}_6\text{H}_5\text{COOH}$ (D) $\text{C}_6\text{H}_5\text{CH}_2\text{NH}_2$

68. The following sequence of reactions on A gives



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

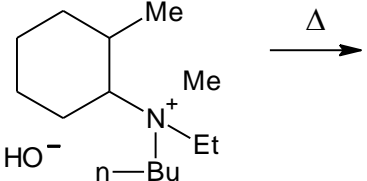
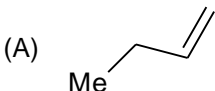
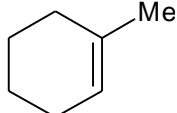
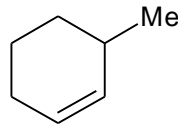
69.



In the above reaction product B is

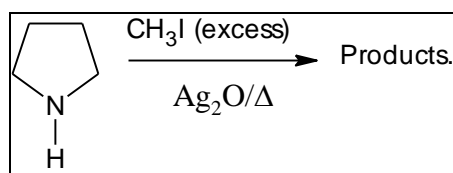
- (A)
- (B)
- (C)
- (D)

Space for rough work

70. $R - \text{CONH}_2 \xrightarrow{R'OH} ?$
 (A) $R - \text{COOR}$ (B) $R - \text{COOR}'$ (C) $R - \text{COOR}$ (D) $R - \text{COOR}$
71. Identify Z in the following reaction sequence $\text{CH}_3\text{CHO} \xrightarrow[\text{Dil. H}_2\text{SO}_4]{\text{MnO}_4^-} \text{X} \xrightarrow{\text{SOCl}_2} \text{Y} \xrightarrow[\Delta]{\text{CH}_3\text{COONa}} \text{Z}$
 (A) $\text{CH}_3\text{COCH}_2\text{COONa}$ (B) $(\text{CH}_3\text{CO})_2\text{O}$
 (C) $\text{CH}_3\text{CO-O-COCH}_2\text{Cl}$ (D) $\text{CH}_3\text{CO-O-COCHCl}_2$.
72. The end product of the reaction sequence $\text{C}_6\text{H}_5\text{NH}_2 \xrightarrow[\Delta]{\text{CHCl}_3, \text{KOH}} \text{A} \xrightarrow[\text{(ii) H}_2\text{O}]{\text{(i) LiAlH}_4} \text{B}$ is
 (A) $\text{C}_6\text{H}_5\text{NHCH}_3$ (B) $\text{C}_6\text{H}_5\text{CH}_2\text{NH}_2$ (C) $\text{C}_6\text{H}_5\text{NHCHO}$ (D) $\text{C}_6\text{H}_5\text{NC}$
73. 
 The alkene formed as a major product in the above elimination reaction is
 (A)  (B) $\text{CH}_2 = \text{CH}_2$ (C)  (D) 
74. Identify Z in the sequence $\text{CH}_3\text{COONH}_4 \xrightarrow{\Delta} \text{X} \xrightarrow[\Delta]{\text{P}_2\text{O}_5} \text{Y} \xrightarrow{\text{H}_2\text{O}/\text{H}^+} \text{Z}$
 (A) $\text{CH}_3\text{CH}_2\text{CONH}_2$ (B) CH_3CN (C) CH_3COOH (D) $(\text{CH}_3\text{CO})_2\text{O}$
75. Given the following sequence of reaction,
 $\text{CH}_3\text{CH}_2\text{I} \xrightarrow{\text{NaCN}} \text{A} \xrightarrow[\text{Partial hydrolysis}]{\text{OH}^-} \text{B} \xrightarrow{\text{Br}_2/\text{NaOH}} \text{C}$
 The major product C is
 (A) $\text{CH}_3\text{CH}_2\text{NH}_2$ (B) $\text{CH}_3\text{CH}_2\text{CONHBr}$ (C) $\text{CH}_3\text{CH}_2\text{COONH}_4$ (D) $\text{CH}_3\text{CH}_2\text{CONBr}_2$

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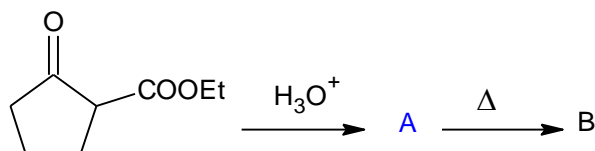
76.



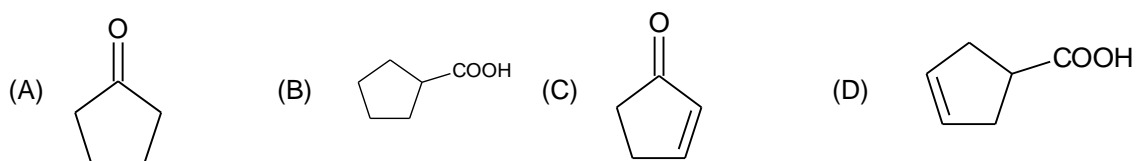
One of the product is

- (A) 1, 3 diene (B) 1, 4 diene (C) Alkyne (D) 1, 2 diene

77.



The compound B is



78. Methane is produced when CH_3MgBr reacts with

- (A) $\text{CH}_3\text{CH}_2\text{NH}_2$ (B) $(\text{CH}_3\text{CH}_2)\text{NH}$ (C) $\text{CH}_3\text{CH}_2\text{OH}$ (D) All the three above.

79. Ethyl amine reacts with nitrous acid to form

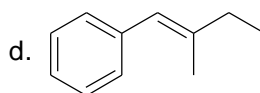
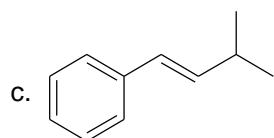
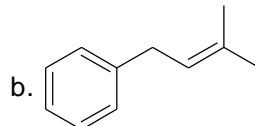
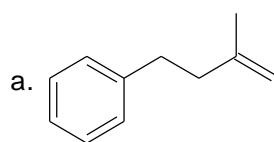
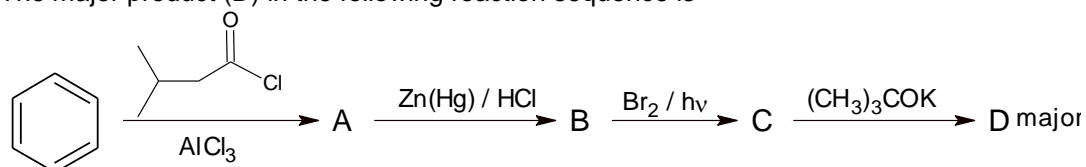
- (A) methyl alcohol (B) ethyl alcohol (C) ethane (D) ethyl nitrite

80. Gabriel phthalimide synthesis is used in the preparation of

- (A) 1^o amine (B) 2^o amine (C) 3^o amine (D) 4^o amine

Space for rough work

81. The major product (D) in the following reaction sequence is



82. Amines are more basic than
 (A) alcohols (B) ethers (C) esters (D) all of these

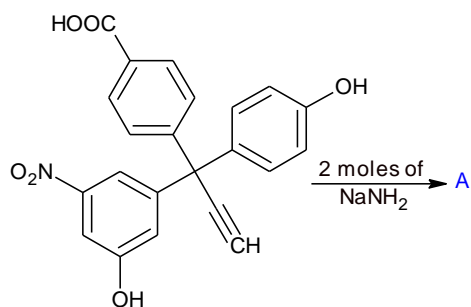
83. The product (D) in the following sequence of reactions is
 $\text{CH}_3\text{COOH} \xrightarrow{\text{NH}_3} \text{(A)} \xrightarrow{\text{Heat}} \text{(B)} \xrightarrow{\text{P}_2\text{O}_5} \text{(C)} \xrightarrow{\text{Na} + \text{C}_2\text{H}_5\text{OH}} \text{(D)}$
 (A) ester (B) amine (C) acid (D) alcohol

84. When methyl iodide is treated with ammonia, the product obtained is
 (A) methylamine (B) dimethylamine (C) trimethylamine (D) all of these

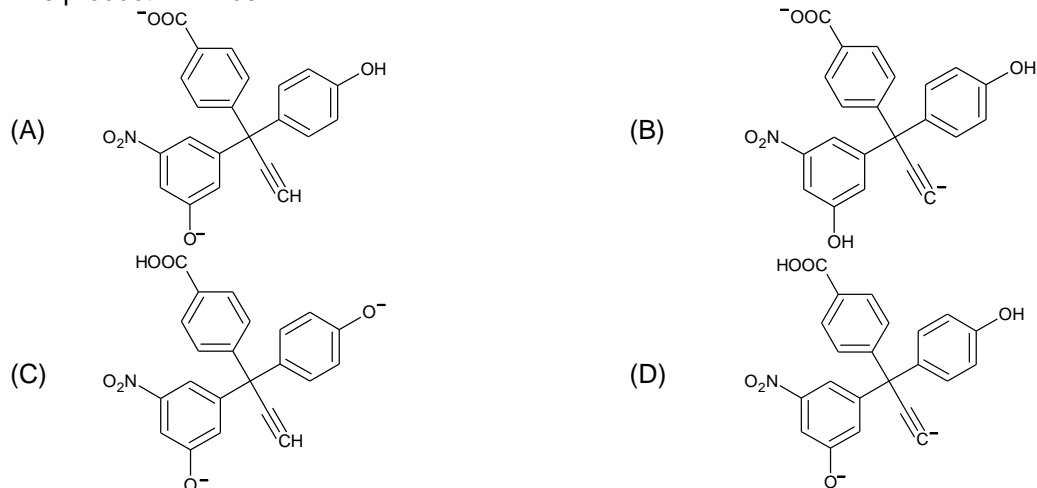
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85. Which of the following does not react with acetyl chloride?
 (A) $(\text{CH}_3)_3\text{N}$ (B) $(\text{CH}_3)_2\text{NH}$ (C) $\text{C}_2\text{H}_5\text{NH}_2$ (D) $\text{C}_2\text{H}_5\text{OH}$

86.



The product A will be



Space for rough work

87. When amine is heated with chloroform and alcohol KOH, a bad odour compound is formed. The compound is
 (A) an alcohol (B) an aldehyde (C) a cyanide (D) an isocyanide
88. The hybridization of nitrogen atom in amines is
 (A) sp (B) sp² (C) sp³ (D) dsp²
89. What is the decreasing order of basicity of pri., sec., tert., ethylamines and NH₃ in polar solvents
 (A) NH₃ > C₂H₅NH₂ > (C₂H₅)₂NH > (C₂H₅)₃N
 (B) (C₂H₅)₃N > (C₂H₅)₂NH > C₂H₅NH₂ > NH₃
 (C) (C₂H₅)₂NH > C₂H₅NH₂ > (C₂H₅)₃N > NH₃
 (D) (C₂H₅)₂NH > C₂H₅NH₂ > NH₃ > (C₂H₅)₃N
90. $\text{H}_2\text{C}=\text{CH}-\text{CH}_3 \xrightarrow{\text{NBS}} \text{A} \xrightarrow{\text{CN}^-} \text{B} \xrightarrow{\text{LAH}} \text{C}$. 'C' is
 (A) H₂C=CH-CH₂-CH₂-NH₂ (B) H₂C=CH-CH₂-NH₂
 (C) H₃C-CH₂-CH₂-CH₂-NH₂ (D) H₃C-CH₂-CH₂-NH₂

Space for rough work

FIITJEE PET – VI (REG_2ND YEAR)

MAINS_SET-A_ANSWERS

DATE: 28.07.2018

MATHEMATICS

1. A	2. B	3. B	4. D
5. A	6. C	7. A	8. C
9. C	10. B	11. A	12. D
13. B	14. B	15. B	16. D
17. D	18. B	19. A	20. A
21. B	22. C	23. C	24. A
25. D	26. A	27. C	28. A
29. B	30. A		

PHYSICS

31. B	32. A	33. D	34. D
35. A	36. C	37. C	38. A
39. B	40. C	41. B	42. C
43. A	44. D	45. A	46. B
47. C	48. D	49. B	50. D
51. D	52. C	53. C	54. B
55. D	56. A	57. B	58. C
59. D	60. A		

CHEMISTRY

61. D	62. B	63. D	64. C
65. A	66. C	67. C	68. C
69. B	70. Bonus	71. B	72. A
73. B	74. C	75. A	76. A
77. A	78. D	79. B	80. A
81. C	82. D	83. B	84. D
85. A	86. A	87. D	88. C
89. Bonus	90. A		

FIITJEE PET – VI (REG_2ND YEAR)

MAINS_SET-B

DATE: 28.07.2018

Time: 3 hours

Maximum Marks: 360

INSTRUCTIONS:

Instructions to the Candidates

1. This Test Booklet consists of **90 questions**.
Use **Blue/Black ball Point Pen only** for writing particulars and bubbling of OMR.
2. For each correct answer **4 Marks** will awarded and for each wrong answer **1 Mark** will be deducted.
3. Attempt all questions.
4. In case you have not darkened any bubble you will be awarded 0 mark for that question.
5. Use of calculator/logarithmic table is not permitted.

Don't write / mark your answers in this question booklet.
If you mark the answers in question booklet, you will not be allowed to continue the exam.

NAME:

ENROLLMENT NO.:

1. An arch is in the shape of a parabola whose axis is vertically downwards and measures 80 mt across its bottom on the ground. Its height point is 24mt. The measure of the horizontal beam across the section at a height of 18 mt is
 (A) 50mt (B) 40mt (C) 45mt (D) 55mt
2. If the tangents and normals at the extremities of a focal chord of the parabola $y^2 = 4ax$ intersect at (x_1, y_1) and (x_2, y_2) respectively, then
 (A) $x_1 = x_2$ (B) $x_1 = y_2$ (C) $y_1 = y_2$ (D) $x_2 = y_1$
3. Equation of the common tangent touching the circle $(x - 3)^2 + y^2 = 9$ and the parabola $y^2 = 4x$ above the x-axis is
 (A) $\sqrt{3}y = 3x + 1$ (B) $\sqrt{3}y = -(x + 3)$ (C) $\sqrt{3}y = x + 3$ (D) $\sqrt{3}y = -(3x + 1)$
4. The slopes of the normals to the parabola $y^2 = 4ax$ intersecting at a point on the axis of the parabola at a distance $4a$ from its vertex are in
 (A) AP (B) GP (C) HP (D) none of these
5. M is the foot of the perpendicular from a point P on the parabola $y^2 = 8(x - 3)$ to its directrix and S is the focus of the parabola. If SPM is an equilateral triangle, the length of each side of the triangle is
 (A) 2 (B) 3 (C) 4 (D) 8
6. If α is the inclination of a tangent to the parabola $y^2 = 4ax$, then the distance between the tangent and a parallel normal is
 (A) $a \operatorname{cosec} \alpha \sec \alpha$ (B) $a \operatorname{cosec} \alpha \sec^2 \alpha$ (C) $a \operatorname{cosec}^2 \alpha \sec \alpha$ (D) $a \operatorname{cosec}^2 \alpha \sec^2 \alpha$
7. The normal at P cuts the axis of the parabola $y^2 = 4ax$ in G and S is the focus of the parabola. If $\triangle SPG$ is equilateral, then each side is of length
 (A) a (B) $2a$ (C) $3a$ (D) $4a$
8. The ordinate of the centroid of the triangle formed by conormal points on the parabola $y^2 = 4ax$ is
 (A) 4 (B) 0 (C) 2 (D) 1
9. The locus of the middle point of the portion of a normal to the parabola $y^2 = 4ax$ intercepted between the curve and the axis is
 (A) $y^2 = a(x - a)$ (B) $y^2 = a(x + a)$ (C) $y^2 = 2a(x - a)$ (D) $y^2 = 2a(x + a)$
10. A is a point on the parabola $y^2 = 4ax$. The normal at A cuts the parabola again at B. If AB subtends a right angle at the vertex of the parabola, then slope of AB is
 (A) $\sqrt{2}$ (B) 2 (C) $\sqrt{3}$ (D) 3

Space for rough work

11. If the straight line $4y - 3x + 18 = 0$ cuts the parabola $y^2 = 64x$ in P and Q, then the angle subtended by PQ at the vertex of the parabola is
 (A) $\cos^{-1}\left(\frac{87}{\sqrt{27409}}\right)$ (B) $\tan^{-1}\left(\frac{17}{\sqrt{22409}}\right)$ (C) $\sin^{-1}\left(\frac{28}{\sqrt{17309}}\right)$ (D) $\cos^{-1}\left(\frac{35}{\sqrt{15210}}\right)$
12. A focal chord of the parabola $y^2 = 4ax$ meets it at P and Q. If S is the focus then $\frac{1}{SP} + \frac{1}{SQ} =$
 (A) a (B) $\frac{1}{a}$ (C) $2a$ (D) $\frac{2}{a}$
13. The slopes of the focal chords of the parabola $y^2 = 32x$ which are tangents to the circle $x^2 + y^2 = 4$ are
 (A) $\frac{1}{\sqrt{3}}, \frac{-1}{\sqrt{3}}$ (B) $\frac{1}{\sqrt{15}}, \frac{-1}{\sqrt{15}}$ (C) $\frac{2}{\sqrt{5}}, \frac{-2}{\sqrt{5}}$ (D) $\frac{1}{2}, \frac{-1}{2}$
14. If the point t is one extremity of a focal chord of the parabola $y^2 = 4ax$, then the length of the chord is
 (A) a (B) at (C) $a\left(t + \frac{1}{t}\right)$ (D) $a\left(t + \frac{1}{t}\right)^2$
15. In the parabola $y^2 = 4ax$, the length of the chord passing through the vertex and inclined to the axis at $\frac{\pi}{4}$ is
 (A) $4a\sqrt{2}$ (B) $2a\sqrt{2}$ (C) $a\sqrt{2}$ (D) none of these
16. PQ is a double ordinate of a parabola $y^2 = 4ax$. If the locus of its points of trisection is another parabola length of whose latus rectum is k times the length of the latus rectum of the given parabola. Then k =
 (A) $\frac{1}{9}$ (B) $\frac{1}{3}$ (C) $\frac{2}{3}$ (D) none of these
17. Equation of the directrix of the parabola whose focus is (0, 0) and the tangent at the vertex is $x - y + 1 = 0$ is
 (A) $x - y = 0$ (B) $x - y - 1 = 0$ (C) $x - y + 2 = 0$ (D) $x + y - 1 = 0$

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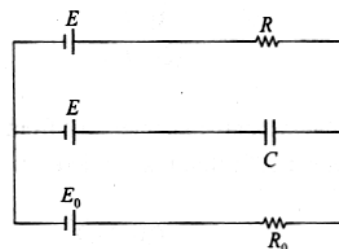
18. The point P on the parabola $y^2 = 4ax$ for which $|PR - PQ|$ is maximum, whose $R(-a, 0)$, $Q(0, a)$ is
 (A) $(a, 2a)$ (B) $(a, -2a)$ (C) $(4a, 4a)$ (D) $(4a, -4a)$
19. The range of values of λ for which the point $(\lambda, -1)$ is exterior to both the parabola $y^2 = |x|$, is
 (A) $(0, 1)$ (B) $(-1, 1)$ (C) $(-1, 0)$ (D) none of these
20. Radius of the circle that passes through origin and touches the parabola $y^2 = 4ax$ at the point $(a, 2a)$ is
 (A) $\frac{5}{\sqrt{2}}a$ (B) $2\sqrt{2}a$ (C) $\frac{\sqrt{5}}{2}a$ (D) $\frac{3}{\sqrt{2}}a$
21. PSQ is a focal chord of a parabola whose focus is S and vertex A. PA and QA are produced to meet the directrix in R and T respectively. Then $\angle RST =$
 (A) 90° (B) 60° (C) 45° (D) 30°
22. The normal at point $(bt_1^2, 2bt_1)$ on a parabola meets the parabola again in the point $(bt_2^2, 2bt_2)$, then
 (A) $t_2 = -t_1 + \frac{2}{t_1}$ (B) $t_2 = t_1 - \frac{2}{t_1}$ (C) $t_2 = t_1 + \frac{2}{t_1}$ (D) $t_2 = -t_1 - \frac{2}{t_1}$
23. The number of normals drawn to the parabola $y^2 = 4x$ from the point $(1, 0)$ is
 (A) 0 (B) 1 (C) 2 (D) 3
24. Let $x + y = k$ be a normal to the parabola $y^2 = 12x$. If p is the length of the perpendicular from the focus of the parabola onto this normal, then $4k - 2p^2 =$
 (A) 1 (B) 0 (C) -1 (D) 2
25. The normals at three points P, Q, R of the parabola $y^2 = 4ax$ meet at (h, k) . The centroid of triangle PQR lies on
 (A) $x = 0$ (B) $y = 0$ (C) $x = -a$ (D) $y = a$
26. A circle of radius 4, drawn on a chord of the parabola $y^2 = 8x$ as diameter, touches the axis is the parabola. Then, the slope of the chord is
 (A) $\frac{1}{2}$ (B) $\frac{3}{4}$ (C) 1 (D) 2

Space for rough work

27. The tangents of at the points $(at_1^2, 2at_1)$, $(at_2^2, 2at_2)$ on the parabola $y^2 = 4ax$ are at right angles if
 (A) $t_1t_2 = -1$ (B) $t_1t_2 = 1$ (C) $t_1t_2 = 2$ (D) $t_1t_2 = -2$
28. The area of the triangle formed by the tangents and the chord of contact from (x_1, y_1) to the parabola $y^2 = 4ax$ is
 (A) $(y_1^2 - 4ax_1)^{3/2}$ (B) $2a(y_1^2 - 4ax_1)^{3/2}$ (C) $\frac{(y_1^2 - 4ax_1)^{3/2}}{(2a)}$ (D) none of these
29. If y_1, y_2 and y_3 are the ordinates of the vertices of a triangle inscribed in the parabola $y^2 = 4ax$, then its area is
 (A) $\frac{1}{2a} |(y_1 - y_2)(y_2 - y_3)(y_3 - y_1)|$ (B) $\frac{1}{4a} |(y_1 - y_2)(y_2 - y_3)(y_3 - y_1)|$
 (C) $\frac{1}{8a} |(y_1 - y_2)(y_2 - y_3)(y_3 - y_1)|$ (D) none of these
30. The circumcircle of the triangle formed by any three tangents to a parabola passes through
 (A) vertex (B) focus (C) foot of the directrix (D) none of these

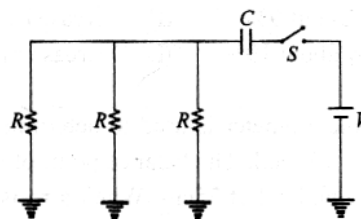
31. For the circuit shown in the figure, Find the charge stored on capacitor in steady state.

- (A) $\frac{RC}{R + R_0} E$ (B) $\frac{RC}{R_0} (E - E_0)$
 (C) zero (D) $\frac{RC}{R + R_0} (E - E_0)$



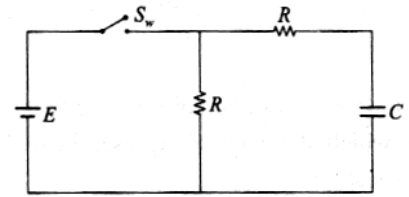
32. The switch shown in the figure is closed at $t=0$. The charge on the capacitor as a function of time is given as

- (A) $CV(1 - e^{-t/RC})$ (B) $3CV(1 - e^{-t/RC})$
 (C) $CV(1 - e^{-3t/RC})$ (D) $CV(1 - e^{-t/3RC})$

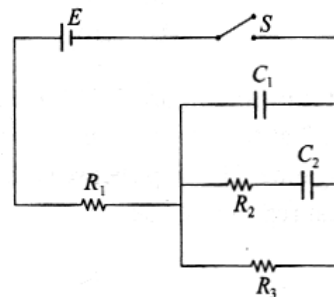


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33. A capacitor C is connected to two equal resistance as shown in the figure. Consider the following statements
- At the time of charging of capacitor time constant of the circuit is $2RC$
 - At the time discharging of the capacitor the time constant of the circuit is RC
 - At the time of discharging of the capacitor the time constant of the circuit is $2RC$
 - At the time of charging of capacitor the time constant of the circuit is RC
- (A) Statement (i) and (ii) only are correct
 (B) Statement (ii) and (iii) only are correct
 (C) Statement (iii) and (iv) only are correct
 (D) Statement (i) and (iii) only are correct



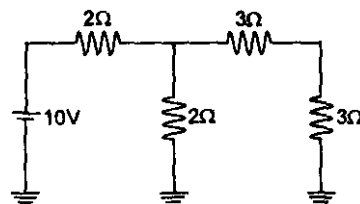
34. In the circuit diagram, the current through the battery immediately after the switch S is closed is given as
- (A) Zero (B) $\frac{E}{R_1}$
- (C) $\frac{E}{R_1 + R_2}$ (D) $\frac{E}{R_1 + \frac{R_2 R_3}{R_2 + R_3}}$



35. Identify the correct statement
- (A) Principle of potentiometer is balancing resistances against known resistance
 (B) Sensitivity of potentiometer can be increased by increasing emf in primary circuit
 (C) Potentiometer can be used to measure only “emf” but not P.D. in a circuit
 (D) Potentiometer can be used for measuring internal resistance and PD in any circuit also
36. A capacitor of capacitance C is allowed to discharge through a resistance R. The net charge flow through resistance during one time constant is : (I_0 is the maximum current)
- (A) $CR I_0 \left(\frac{1}{e} + 1 \right)$ (B) $CR I_0 \left(1 - \frac{1}{e} \right)$ (C) $CR I_0$ (D) None

Space for rough work

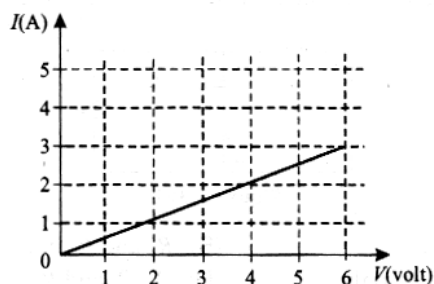
37. Current in 3 Ω resistance is:



- (A) 1 A (B) $\frac{1}{7}$ A (C) $\frac{5}{7}$ A (D) $\frac{15}{7}$ A

38. A piece of wire is cut into four equal parts and the pieces are bundled together side by side to form a thicker wire. Compared with that of the original wire, the resistance of the bundle is
 (A) The same (B) $\frac{1}{4}$ as much (C) $\frac{1}{8}$ as much (D) $\frac{1}{16}$ as much

39. Variation of current and voltage in a conductor has been shown in figure. The resistance of the conductor is



- (A) 4 Ω (B) 2 Ω
 (C) 3 Ω (D) 1 Ω

40. A capacitor of capacitance C is charged by a battery of EMF E and internal resistance r. A resistance 2r is also connected in series with the capacitor. The amount of heat liberated inside the battery by the time capacitor is charged to 50 % of its steady state value is given as.

- (A) $\frac{3}{8}E^2C$ (B) $\frac{E^2C}{6}$ (C) $\frac{E^2C}{12}$ (D) $\frac{E^2C}{24}$

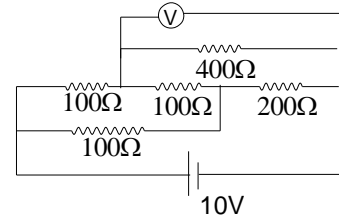
41. In a potentiometer experiment, two cells connected in series get balanced at 9 m length on the wire. Now the connections of terminals of cell of lower emf are reversed, then the balancing length is obtained at 3 m. The ratio of emf of two cells will be

- (A) 3 : 1 (B) 2 : 1 (C) 4 : 1 (D) none

Space for rough work

42. An electrical circuit is given. Calculate the current flowing in the resistor of 400Ω , if voltmeter resistance is 400Ω

- (A) $\frac{1}{60} A$ (B) $\frac{1}{3} A$
 (C) $\frac{20}{3} A$ (D) $\frac{10}{3} A$



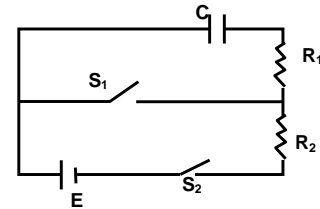
43. In a circuit 5 percent of total current passes through a galvanometer. If resistance of the galvanometer is G then value of the shunt is

- (A) $19 G$ (B) $20 G$ (C) $\frac{G}{20}$ (D) $\frac{G}{19}$

44. A voltmeter has a range $0-V$ with a series resistance R . With a series resistance $2R$, the range is $0-V'$. The correct relation between V and V' is

- (A) $V' = 2V$ (B) $V' > 2V$ (C) $V' \gg 2V$ (D) $V' < 2V$

45. The capacitor shown in the figure has been charged to a potential difference of V volt so that it carries a charge CV with both the switches S_1 and S_2 remaining open. Switch S_1 is closed at $t = 0$. What is charge on capacitor at $t = R_1C$.



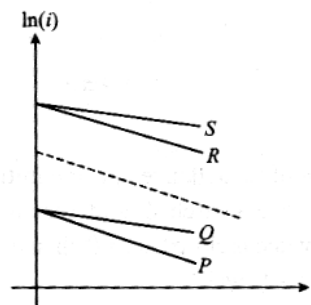
- (A) $q = CVe^{\frac{-t}{R_1C}}$ (B) $q = CVe^{\frac{-t}{2R_1C}}$
 (C) $q = 2CVe^{\frac{-t}{R_1C}}$ (D) $q = 2CVe^{\frac{-t}{2R_1C}}$

46. A $4 \mu F$ capacitor, a resistance of $2.5 M \Omega$ is in series with $12 V$ battery. Find the time after which the potential difference across the capacitor is 3 times the potential difference across the resistor.

- (A) $13.86s$ (B) $6.93 s$ (C) $7s$ (D) $14 s$

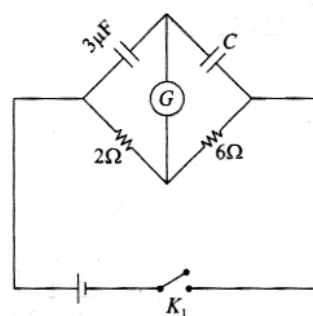
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47. In an RC circuit while charging, the graph of $\ln(i)$ versus time as shown by the dotted line in the figure, where i is the current. When the value of the resistance is doubled, which of the solid curve best represents the variation of $\ln(i)$ versus time
- (A) P (B) Q
(C) R (D) S

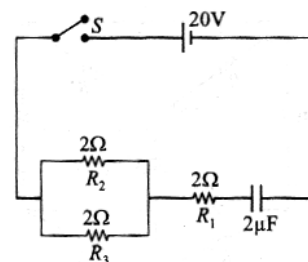


48. Two resistances are connected in two gaps of a metre bridge. The balance point is 20 cm from the zero end. A resistance of 15 ohms is connected in series with the smaller of the two. The null point shifts to 40 cm from the zero end. The value of the smaller resistance in ohms is
- (A) 3 (B) 6 (C) 9 (D) 12

49. If key K_1 is closed in circuit shown in figure and galvanometer doesn't give deflection at any time, then value of C is
- (A) $3 \mu\text{F}$ (B) $9 \mu\text{F}$
(C) $4 \mu\text{F}$ (D) $1 \mu\text{F}$

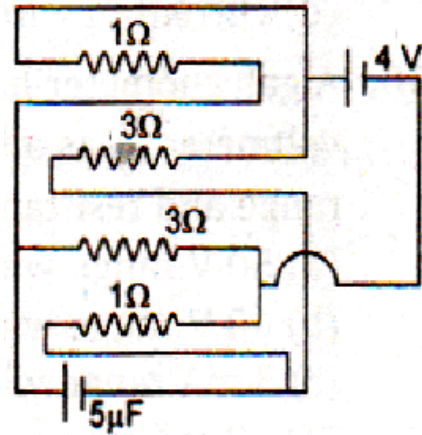


50. The circuit shown in figure is closed at $t=0$. Calculate the total amount of heat generated in R_2 during the time capacitor gets fully charged.
- (A) $\frac{200}{3} \mu\text{J}$ (B) $\frac{400}{3} \mu\text{J}$
(C) $\frac{800}{3} \mu\text{J}$ (D) $400 \mu\text{J}$



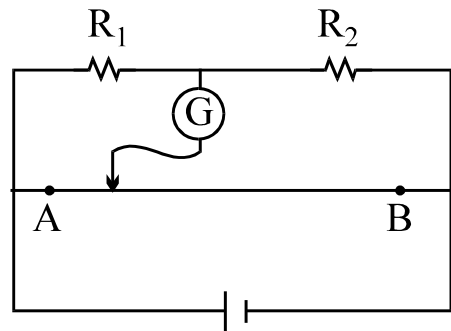
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51. Calculate the charge on the capacitor long time after the assembling of the circuit.
 (A) $5\mu\text{C}$ (B) $10\mu\text{C}$
 (C) $15\mu\text{C}$ (D) zero



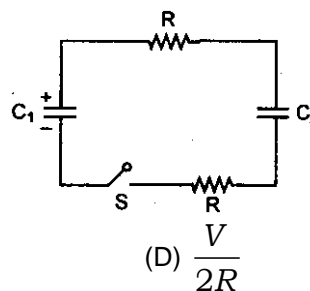
52. In a balanced wheat stone bridge, current in the galvanometer is zero. It remains zero when:
 [1] battery emf is increased
 [2] all resistances are increased by 10 ohms
 [3] all resistances are made five times
 [4] the battery and the galvanometer are interchanged
 (A) only [1] is correct (B) [1], [2] and [3] are correct
 (C) [1], [3] and [4] are correct (D) [1] and [3] are correct

53. In the figure shown for the given values of R_1 and R_2 the balance point for Jockey is at 40 cm from A. When R_2 is shunted by a resistance of $10\ \Omega$, balance shifts to 50 cm. R_1 and R_2 are ($AB = 1\ \text{m}$):
 (A) $10/3\ \Omega, 5\ \Omega$ (B) $20\ \Omega, 30\ \Omega$
 (C) $10\ \Omega, 15\ \Omega$ (D) $5\ \Omega, 15/2\ \Omega$



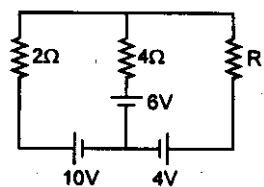
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54. In the circuit shown in figure $C_1 = 2C_2$. Capacitor C_1 is charged to a potential of V . The current in the circuit just after the switch S is closed is:



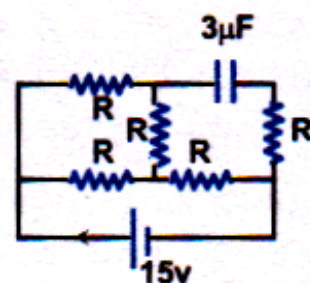
- (A) zero (B) $\frac{2V}{R}$ (C) infinite (D) $\frac{V}{2R}$

55. For what value of R in the circuit as shown current passing through 4Ω resistance will be zero:



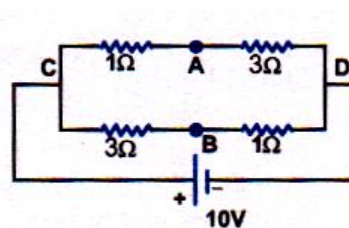
- (A) 1Ω (B) 2Ω (C) 3Ω (D) 4Ω

56. In the circuit shown, the cell is ideal with $\text{emf} = 15\text{ V}$ and each resistance is of 3Ω . The potential difference across the capacitor in the steady state is



- (A) zero (B) 9 V
(C) 12 V (D) 15 V

57. A battery of $\text{emf} 10\text{ V}$ is connected to the network of resistance as shown in the figure. The potential difference between A and B ($V_A - V_B$) is

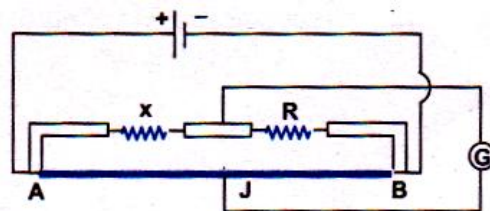


- (A) -2 V (B) 2 V
(C) 5 V (D) $\left(\frac{20}{11}\right)\text{ V}$

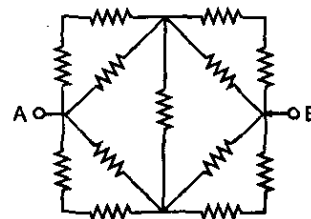
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58. The resistivity of a potentiometer wire is 40×10^{-8} ohm-m and its area of cross-section is 8×10^{-6} m². If 0.2 amp current is flowing through the wire, then the potential gradient will be
 (A) 10^{-2} Vm⁻¹ (B) 10^{-1} Vm⁻¹ (C) 3.2×10^{-2} Vm⁻¹ (D) 1 Vm⁻¹

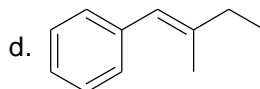
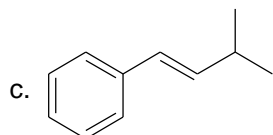
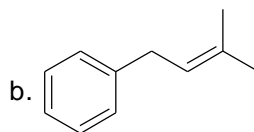
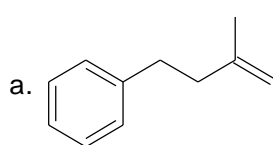
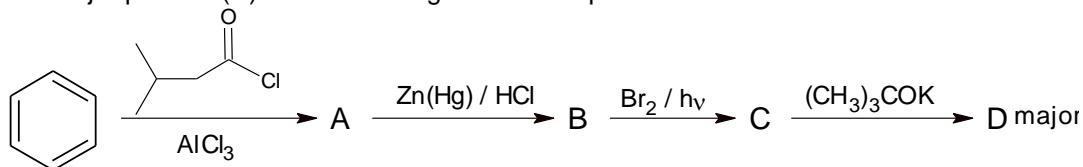
59. The figure, shows a metre bridge circuit, with AB = 100cm, $x = 12 \Omega$ and $R = 18 \Omega$ and the jockey J in the position of the balance. If R is now made 8Ω , through what distance will J have to be moved to obtain balance?
 (A) 10 cm (B) 20 cm
 (C) 30 cm (D) 40 cm



60. Thirteen resistors each of resistance H are connected in the circuit as shown in figure. Net resistance between A and B is:
 (A) $2R$ (B) $\frac{4R}{3}$
 (C) $\frac{2R}{3}$ (D) R



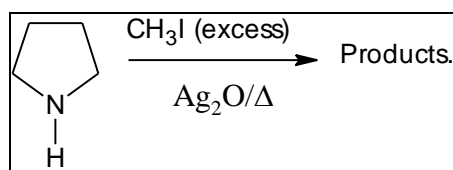
61. The major product (D) in the following reaction sequence is



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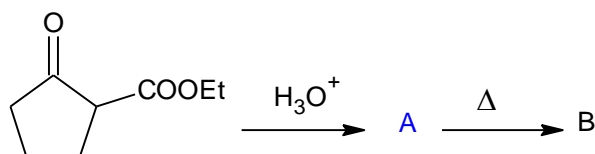
62. Amines are more basic than
 (A) alcohols (B) ethers (C) esters (D) all of these
63. The product (D) in the following sequence of reactions is
 $\text{CH}_3\text{COOH} \xrightarrow{\text{NH}_3} \text{(A)} \xrightarrow{\text{Heat}} \text{(B)} \xrightarrow{\text{P}_2\text{O}_5} \text{(C)} \xrightarrow{\text{Na}+\text{C}_2\text{H}_5\text{OH}} \text{(D)}$
 (A) ester (B) amine (C) acid (D) alcohol
64. When methyl iodide is treated with ammonia, the product obtained is
 (A) methylamine (B) dimethylamine (C) trimethylamine (D) all of these
65. Which of the following does not react with acetyl chloride?
 (A) $(\text{CH}_3)_3\text{N}$ (B) $(\text{CH}_3)_2\text{NH}$ (C) $\text{C}_2\text{H}_5\text{NH}_2$ (D) $\text{C}_2\text{H}_5\text{OH}$

66.

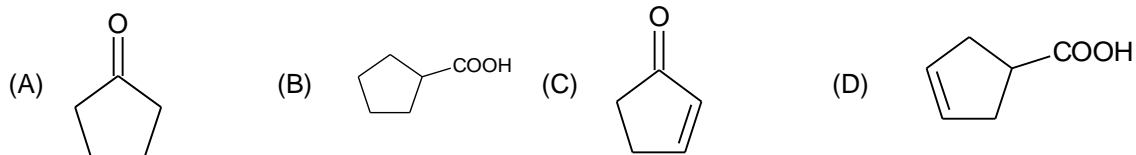


One of the product is

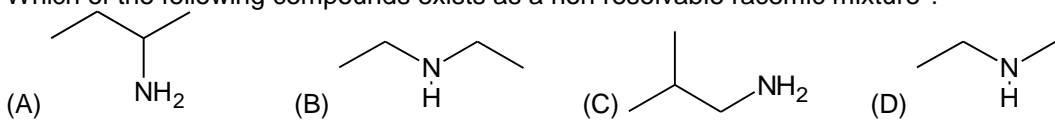
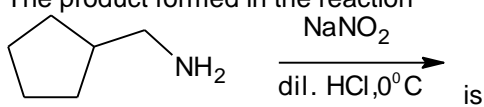
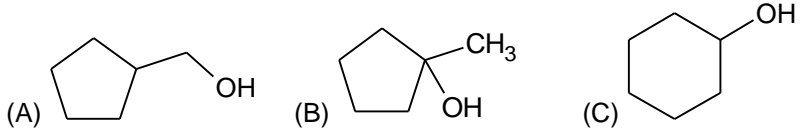
- (A) 1, 3 diene (B) 1, 4 diene (C) Alkyne (D) 1, 2 diene
- 67.



The compound B is

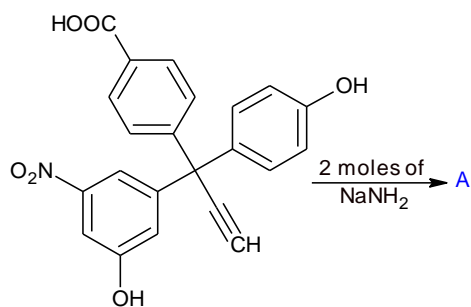


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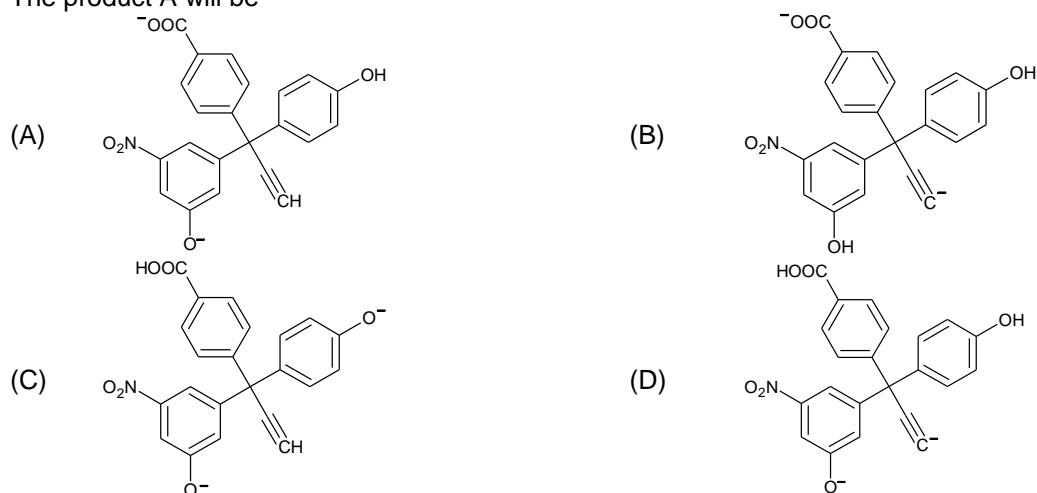
68. Methane is produced when CH_3MgBr reacts with
 (A) $\text{CH}_3\text{CH}_2\text{NH}_2$ (B) $(\text{CH}_3\text{CH}_2)\text{NH}$ (C) $\text{CH}_3\text{CH}_2\text{OH}$ (D) All the three above.
69. Ethyl amine reacts with nitrous acid to form
 (A) methyl alcohol (B) ethyl alcohol (C) ethane (D) ethyl nitrite
70. Gabriel phthalimide synthesis is used in the preparation of
 (A) 1° amine (B) 2° amine (C) 3° amine (D) 4° amine
71. Which of the following compounds exists as a non resolvable racemic mixture ?

72. Consider the following sequence of reactions.
 $\text{C}_2\text{H}_5\text{Br} \xrightarrow{\text{AgCN}} \text{A} \xrightarrow{\text{H}_2, \text{Ni}} \text{B}$
 The final product (B) is
 (A) $\text{CH}_3\text{CH}_2\text{CH}_2\text{NH}_2$ (B) $\text{CH}_3\text{CH}_2\text{NHCH}_3$ (C) $(\text{CH}_3\text{CH}_2)_2\text{NH}$ (D) $\text{CH}_3\text{CH}_2\text{NH}_2$
73. The product formed in the reaction
 is
 (D) all of the above
74. A compound (X) having the molecular formula $\text{C}_3\text{H}_9\text{N}$ reacts with benzenesulphonyl chloride to form a solid that is insoluble in alkalis. The compound (X) is
 (A) $\text{CH}_3\text{CH}_2\text{CH}_2\text{NH}_2$ (B) $(\text{CH}_3)_2\text{CHNH}_2$ (C) $\text{CH}_3\text{CH}_2\text{NHCH}_3$ (D) $(\text{CH}_3)_3\text{N}$
75. An organic compound (A) on reduction gives a compound (B) which on reaction with CHCl_3 and KOH forms (C). The compound (C) on catalytic reduction gives N-methylaniline. The compound (A) is
 (A) nitrobenzene (B) benzonitrile (C) benzamide (D) aniline

Space for rough work

76.



The product A will be



77. When amine is heated with chloroform and alcohol KOH, a bad odour compound is formed. The compound is
 (A) an alcohol (B) an aldehyde (C) a cyanide (D) an isocyanide
78. The hybridization of nitrogen atom in amines is
 (A) sp (B) sp² (C) sp³ (D) dsp²

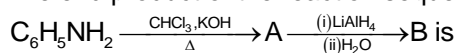
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79. What is the decreasing order of basicity of pri., sec., tert., ethylamines and NH_3 in polar solvents
- (A) $\text{NH}_3 > \text{C}_2\text{H}_5\text{NH}_2 > (\text{C}_2\text{H}_5)_2\text{NH} > (\text{C}_2\text{H}_5)_3\text{N}$
 (B) $(\text{C}_2\text{H}_5)_3\text{N} > (\text{C}_2\text{H}_5)_2\text{NH} > \text{C}_2\text{H}_5\text{NH}_2 > \text{NH}_3$
 (C) $(\text{C}_2\text{H}_5)_2\text{NH} > \text{C}_2\text{H}_5\text{NH}_2 > (\text{C}_2\text{H}_5)_3\text{N} > \text{NH}_3$
 (D) $(\text{C}_2\text{H}_5)_2\text{NH} > \text{C}_2\text{H}_5\text{NH}_2 > \text{NH}_3 > (\text{C}_2\text{H}_5)_3\text{N}$

80. $\text{H}_2\text{C}=\text{CH}-\text{CH}_3 \xrightarrow{\text{NBS}} \text{A} \xrightarrow{\text{CN}^-} \text{B} \xrightarrow{\text{LAH}} \text{C}$. 'C' is
- (A) $\text{H}_2\text{C}=\text{CH}-\text{CH}_2-\text{CH}_2-\text{NH}_2$ (B) $\text{H}_2\text{C}=\text{CH}-\text{CH}_2-\text{NH}_2$
 (C) $\text{H}_3\text{C}-\text{CH}_2-\text{CH}_2-\text{CH}_2-\text{NH}_2$ (D) $\text{H}_3\text{C}-\text{CH}_2-\text{CH}_2-\text{NH}_2$

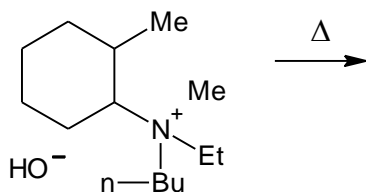
81. Identify Z in the following reaction sequence $\text{CH}_3\text{CHO} \xrightarrow[\text{Dil. H}_2\text{SO}_4]{\text{MnO}_4^-} \text{X} \xrightarrow{\text{SOCl}_2} \text{Y} \xrightarrow[\Delta]{\text{CH}_3\text{COONa}} \text{Z}$
- (A) $\text{CH}_3\text{COCH}_2\text{COONa}$ (B) $(\text{CH}_3\text{CO})_2\text{O}$
 (C) $\text{CH}_3\text{CO}-\text{O}-\text{COCH}_2\text{Cl}$ (D) $\text{CH}_3\text{CO}-\text{O}-\text{COCHCl}_2$.

82. The end product of the reaction sequence

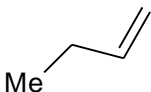
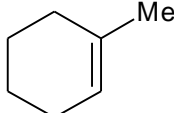
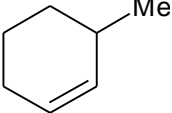


- (A) $\text{C}_6\text{H}_5\text{NHCH}_3$ (B) $\text{C}_6\text{H}_5\text{CH}_2\text{NH}_2$ (C) $\text{C}_6\text{H}_5\text{NHCHO}$ (D) $\text{C}_6\text{H}_5\text{NC}$

- 83.

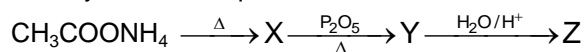


The alkene formed as a major product in the above elimination reaction is

- (A)  (B) $\text{CH}_2 = \text{CH}_2$ (C)  (D) 

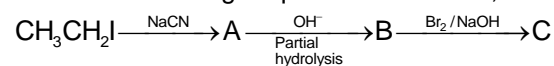
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84. Identify Z in the sequence



- (A) $\text{CH}_3\text{CH}_2\text{CONH}_2$ (B) CH_3CN (C) CH_3COOH (D) $(\text{CH}_3\text{CO})_2\text{O}$

85. Given the following sequence of reaction,

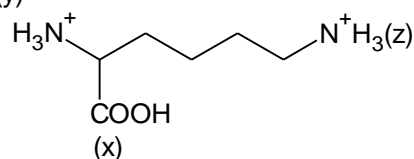


The major product C is

- (A) $\text{CH}_3\text{CH}_2\text{NH}_2$ (B) $\text{CH}_3\text{CH}_2\text{CONHBr}$ (C) $\text{CH}_3\text{CH}_2\text{COONH}_4$ (D) $\text{CH}_3\text{CH}_2\text{CONBr}_2$

86. The following species has three acidic sites, namely $-\text{COOH}$ (denoted as site x), $-\text{NH}_3^+$ at C-2 (denoted as site y) and $-\text{NH}_3^+$ at C-6 (denoted as site z)

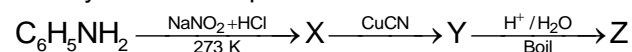
(y)



The order of decreasing acidity of these acidic sites is

- (A) $x > z > y$ (B) $z > x > y$ (C) $x > y > z$ (D) $y > x > z$

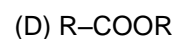
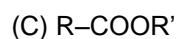
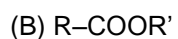
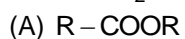
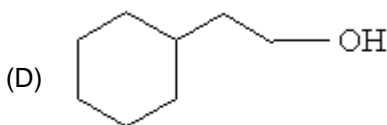
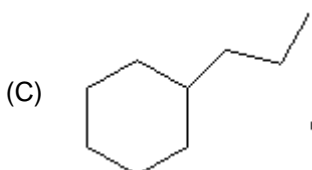
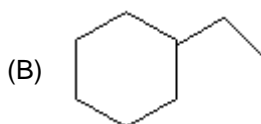
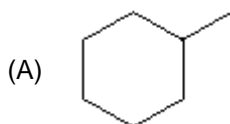
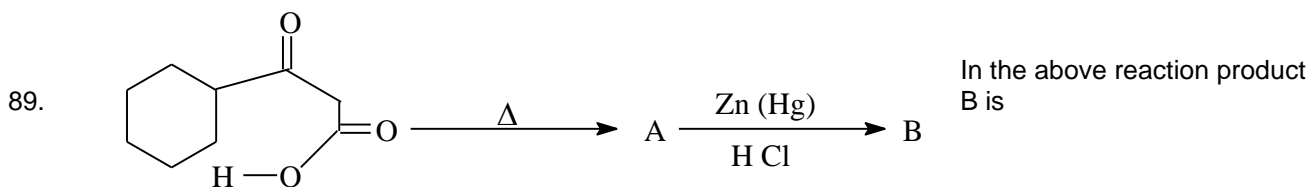
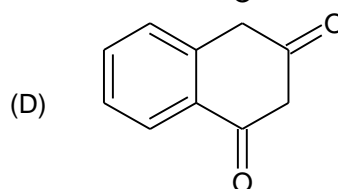
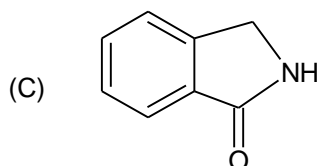
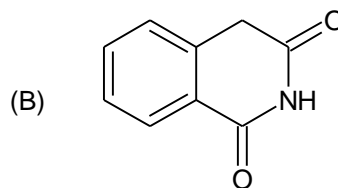
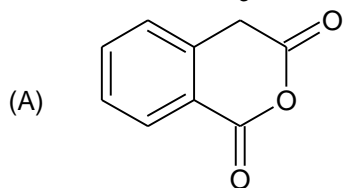
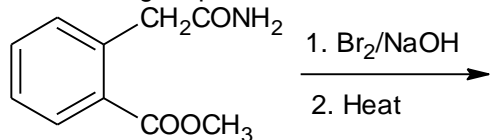
87. Identify 'Z' in the sequence :



- (A) $\text{C}_6\text{H}_5\text{CN}$ (B) $\text{C}_6\text{H}_5\text{CONH}_2$ (C) $\text{C}_6\text{H}_5\text{COOH}$ (D) $\text{C}_6\text{H}_5\text{CH}_2\text{NH}_2$

Space for rough work

88. The following sequence of reactions on A gives



Space for rough work

FIITJEE PET – VI (REG_2ND YEAR)

MAINS_SET-B_ANSWERS

DATE: 28.07.2018

MATHEMATICS

1.	B	2.	C	3.	C	4.	A
5.	D	6.	D	7.	D	8.	B
9.	A	10.	A	11.	A	12.	B
13.	B	14.	D	15.	A	16.	A
17.	C	18.	A	19.	B	20.	A
21.	A	22.	D	23.	B	24.	B
25.	B	26.	C	27.	A	28.	C
29.	C	30.	B				

PHYSICS

31.	D	32.	C	33.	C	34.	B
35.	D	36.	B	37.	C	38.	D
39.	B	40.	D	41.	B	42.	A
43.	D	44.	D	45.	A	46.	A
47.	B	48.	C	49.	D	50.	A
51.	B	52.	C	53.	A	54.	D
55.	A	56.	C	57.	C	58.	A
59.	B	60.	C				

CHEMISTRY

61.	C	62.	D	63.	B	64.	D
65.	A	66.	A	67.	A	68.	D
69.	B	70.	A	71.	D	72.	B
73.	D	74.	C	75.	A	76.	A
77.	D	78.	C	79.	Bonus	80.	A
81.	B	82.	A	83.	B	84.	C
85.	A	86.	C	87.	C	88.	C
89.	B	90.	Bonus				