FIITJEE RET – 6

(2017 – 2019)(2ND YEAR_REGULAR)

IIT-2015 (P2)_SET–A

DATE: 30.07.2018

Time: 3 hours **Maximum Marks: 240**

INSTRUCTIONS:

A. General

1. This booklet is your Question Paper containing 60 questions.
2. Blank papers, clipboards, log tables, slide rules, calculators, cellular phones, pagers and electronic gadgets in any form are not allowed to be carried inside the examination hall.
3. Fill in the boxes provided for Name and Enrolment No.
4. The answer sheet, a machine-readable Objective Response (ORS), is provided separately.
5. DO NOT TAMPER WITH / MULTILATE THE ORS OR THE BOOKLET.

B. Filling in the OMR:

6. The instructions for the OMR sheet are given on the OMR itself.

C. Question paper format:

7. The question paper consists of **3 parts (Physics, Chemistry and Mathematics)**. Each part consists of **two sections**.
8. **Section I** contains **8 questions**. The answer to each question is a **single digit integer**, ranging from 0 to 9 (both inclusive).
9. **Section II** contains **8 multiple choice questions**. Each question has four choices (A), (B), (C) and (D) out of which **ONE or MORE** are correct.
10. **Section III** contains **2 paragraphs** type questions. Each paragraph describes an experiment, a situation or a problem. Two multiple choice questions will be asked based on this paragraph. One or more than one option can be correct.

D. Marking Scheme

11. For each question in **Section I**, you will be awarded **4 marks** if you darken ALL the bubble(s) corresponding to the correct answer(s) **ONLY**. In all other cases **zero (0) marks** will be awarded. **No negative marks** will be awarded for incorrect answers in this section.
12. For each question in **Section II**, you will be awarded **4 marks** if you darken ALL the bubble(s) corresponding to the correct answer(s) **ONLY**. In all other cases **zero (0) marks** will be awarded. **–2 marks** will be awarded for incorrect answers in this section.
13. For each question in **Section III**, you will be awarded **4 marks** if you darken ALL the bubble(s) corresponding to the correct answer(s) **ONLY**. In all other cases **zero (0) marks** will be awarded. **–2 marks** will be awarded for incorrect answers in this section.

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.: ☐☐☐☐☐☐☐☐☐☐

PAPER – II
PART I: PHYSICS
SECTION 1 (Maximum Marks: 32)

- This section contains **EIGHT** 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:**
  - **+4** If the bubble corresponding to the answer is darkened
  - **0** In all other cases

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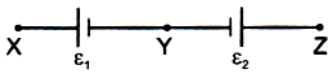
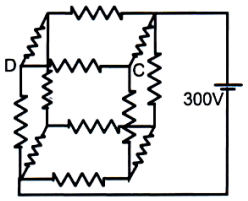
1. Two cells of emf ε_1 and $\varepsilon_2 (\varepsilon_2 < \varepsilon_1)$ are joined as shown in figure
When a potentiometer is connected between X and Y it balance for 300 cm length against ε_1. On connecting the same potentiometer between X and Z it balance for 100 cm length against ε_1 and ε_2.
Find possible number of integer value(s) of $\frac{2\varepsilon_2}{\varepsilon_1}$.



2. A resistance circuit is constructed such that 12 resistance are to form a cube. Each resistor is of 2Ω. A battery of 30 volt is applied across the body diagonal of the cube. Find the current flowing through DC.

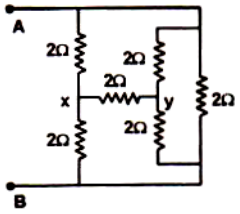


3. Two resistance are measured in Ohm. $R_1 = 3\Omega \pm 1\%$, $R_2 = 6\Omega \pm 2\%$ When they are connected in parallel, maximum percentage error in equivalent resistance is α. Find 3α

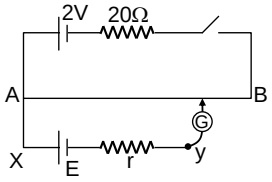
4. Consider a cell of emf E and internal resistance r. The current drawn (i) from cell can be varied. Output power from cell is same when current drawn is $i_1 = 2A$ and $i_2 = 8A$. For what value of current the output power will be maximum.

Space for rough work

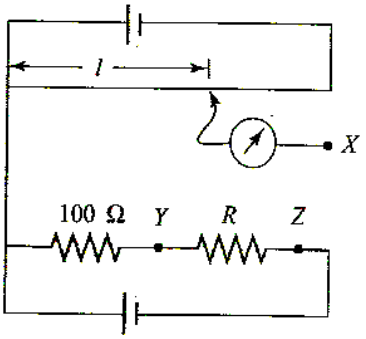
5. For the circuit shown in the adjacent figure, Effective resistance between A and B is .



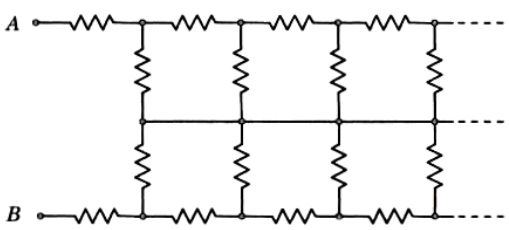
6. In the potentiometer circuit shown, the length of potentiometer wire AB is 400 cm and the resistance per unit length is 0.2 Ω/cm. If a battery of emf E and internal resistance r is connected across XY as shown,
for E = 1 V and r = 25 Ω, balanced point is at 50 X CM FROM a. Then x is



7. Figure shows a circuit which may be used to compare the resistance R of an unknown resistor with a 100 Ω standard. The distances l from one end of the potentiometer slider wire to the balance point are 400 mm and 588 mm when X is connected to Y and Z, respectively. The length of the slide wire is 1.00 m. If the value of resistance R is given by $\frac{94}{n}$. Find n.



8. The circuit shown in the diagram extends to the right into infinity. Each branch resistance is denoted by r. If the resistance between the terminals A and B is given by $\frac{n}{2}\left(\sqrt{5}+1\right)r$, Find n



Space for rough work

SECTION 2 (Maximum Marks: 32)

- This section contains **EIGHT** 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:**
  - **+4** If only the bubble(s) corresponding to all the correct option(s) is(are) darkened
  - **0** If none of the bubbles is darkened
  - **–2** In all other cases

9. Under which of the following conditions, the resistance of cylindrical specimen of an Ohmic material is least affected by small temperature variations.

(A) Temperature coefficient of resistivity is greater than the temperature coefficient of linear expansion

(B) Temperature coefficient of resistivity is lesser than the temperature coefficient of linear expansion

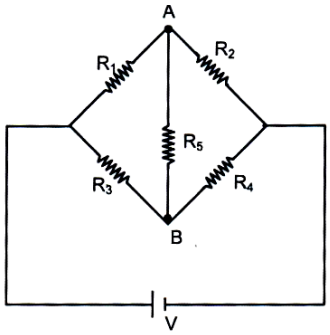
(C) Temperature coefficient of resistivity equals to the temperature coefficient of linear expansion.

(D) None of the above is a required condition.

10. An ideal battery of electromotive force ε is connected in series with an ammeter and a voltmeter of unknown internal resistances. IF a certain resistor is connected in parallel with the voltmeter, the voltmeter and the ammeter readings becomes $1/\eta$ and η times of their respective initial values. What is the initial reading V of the voltmeter ?

(A) $V = \dfrac{\eta\varepsilon}{(\eta+1)}$ (B) $V = \dfrac{(\eta+1)\varepsilon}{\eta}$ (C) $V = \dfrac{\eta\varepsilon}{(\eta-1)}$ (D) $V = \dfrac{(\eta^2-1)\varepsilon}{\eta^2}$

11. Consider the given arrangement of resistance and on ideal battery on shown



Choose the correct option(s) regarding current through resistance R_3

(A) If $\dfrac{R_1}{R_2} > \dfrac{R_3}{R_4}$, current in R_5 will be from A to B

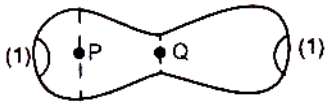
(B) If $\dfrac{R_1}{R_2} > \dfrac{R_3}{R_4}$, current in R_5 will be from B to A

(C) If $\dfrac{R_1}{R_2} < \dfrac{R_3}{R_4}$, current in R_5 will be from A to B

(D) If $\dfrac{R_1}{R_2} < \dfrac{R_3}{R_4}$, current in R_5 will be from B to A

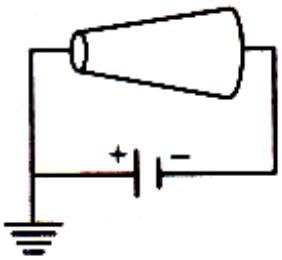
Space for rough work

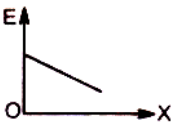
12. A metallic conductor of irregular cross – section is as shown in the figure. A constant potential difference is applied across the ends (1) and (2). Then



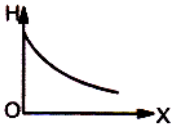
(A) the current at the cross – section P equals the current at the cross section Q
(B) the electric field intensity at P is less than that at Q
(C) the rate of heat generated per unit time at Q is greater than that at P
(D) the number of electrons crossing per unit area of cross –section at P is less than that at Q.

13. A conductor is made an isotropic material cone. A battery of constant emf is connected across it and its left end is earthed as shown in figure. If at a section distant x from left and , electric field intensity, potential and the rate of generation of heat per unit length are E, V and H respectively, which of the following graphs is / are correct

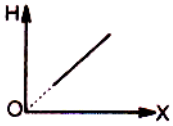




(A)



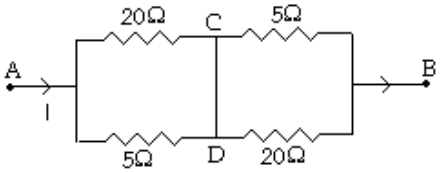
(B)



(C)

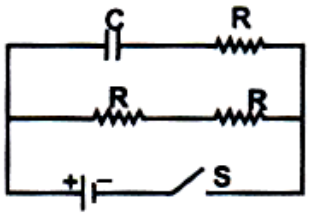
(D)

14. When some potential difference is maintained between A and B, current I enters the network at A and leaves at B
(A) The equivalent resistance between A and B is 8 Ω
(B) C and D are at the same potential
(C) No current flows between C and D
(D) Current (3/5)I flows from D to C

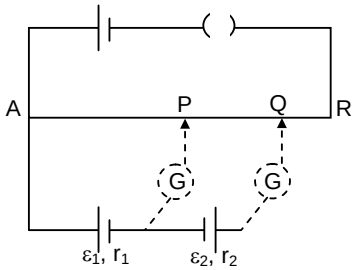


Space for rough work

15. In the circuit shown in the figure, which one of following statement is correct ?
(A) If the switch S is closed, the time constant during charging is RC
(B) IF the switch S is closed, the time constant during charging is RC/2
(C) If the switch is opened again, the time constant during discharging is 3RC
(D) If the switch is opened again, the time constant during discharging is RC /2



16. The adjoining diagram shows a potentiometer circuit. The galvanometer can be connected at two different points as shown in the figure by the dotted lines. Given that $\varepsilon_2 > \varepsilon_1$.
(A) we can find the value of ε_1
(B) we can find the value of ε_2
(C) we cannot find the value of ε_2
(D) we cannot find the value of net of the two cell



SECTION 3 (Maximum Marks: 16)

- This section contains **TWO** paragraphs
- Based on each paragraph, there will be **TWO** 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:**
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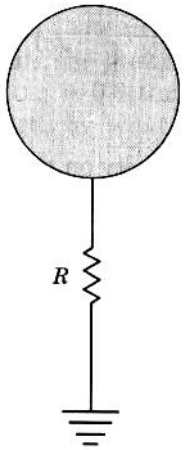
  - **0** If none of the bubbles is darkened
  - **–2** In all other cases

Space for rough work

Paragraph–1

A conducting balloon of radius 'a' is charged to a potential V_0 and held at a large height above the earth surface. The large height of the balloon from the earth ensures that charge distribution on the surface of the balloon remains unaffected by the presence of the earth. It is connected to the earth through a resistance R and a valve in the balloon is opened. The gas inside the balloon escape from the valve and the size of the balloon decreases. The rate of decreases in radius of the balloon in controlled in such a manner that potential of the balloon remains constant. Assume the electric permittivity of the surrounding air equals to that of free space (ε_0) and charge cannot leak to the surrounding air.



17. Rate at which radius r of the balloon changes with time is best represented by the equation

(A) $\frac{dr}{dt} = \frac{1}{4\pi\varepsilon_0 R}$ (B) $\frac{dr}{dt} = -\frac{1}{4\pi\varepsilon_0 R}$

(C) $\frac{dr}{dt} = \frac{r}{4\pi\varepsilon_0 aR}$ (D) $\frac{dr}{dt} = \frac{r}{4\pi\varepsilon_0 aR}$

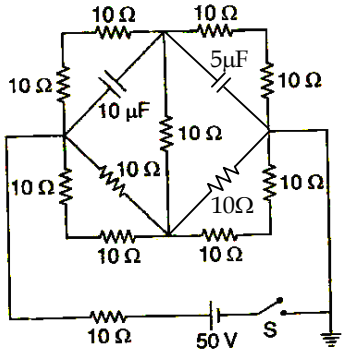
18. How much heat is dissipated in the resistance R till the moment radius of the balloon becomes half ?

(A) $0.5\pi\varepsilon_0 aV_0^2$ (B) $\pi\varepsilon_0 aV_0^2$ (C) $2\pi\varepsilon_0 aV_0^2$ (D) $4\pi\varepsilon_0 aV_0^2$

Space for rough work

Paragraph–2

In the circuit shown in figure, the capacitors are initially uncharged. Based on the facts and figure provided, answer the following questions.



19. The initial value of the battery current when the switch S is closed is
(A) 2A (B) 4A (C) 5A (D) 8A

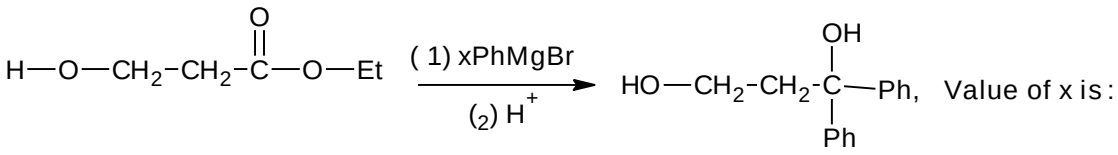
20. The charges on the 10 μF and 5 μF capacitors after the steady state is reached are q_{10} and q_5 respectively. Then

(A) $q_5 = q_{10} = 125\mu C$ (B) $q_5 = q_{10} = 62.5\mu C$ (C) $q_5 = \frac{q_{10}}{2} = 62.5\mu C$ (D) $q_5 = q_{10} = 0$

PART II: CHEMISTRY

SECTION 1 (Maximum Marks: 32)

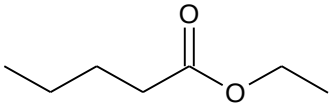
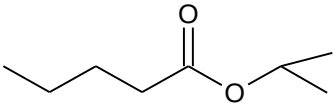
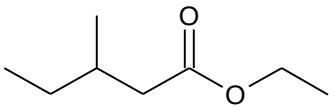
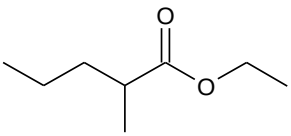
- This section contains **EIGHT** questions
- The answer to each question is a **SINGLE DIGIT INTEGER** ranging from **0 to 9**, both inclusive
- For each question, darken the bubble corresponding to the correct integer in the ORS
- **Marking scheme:**
  - **+4** If the bubble corresponding to the answer is darkened
  - **0** In all other cases

21. 

Value of x is :

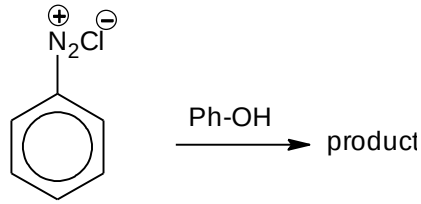
Space for rough work

22. How many of the following compounds shall undergo condensation by reacting with NaOEt/EtOH.

23. CH_3NH_2, $CH_3–CH_2–NH_2$, $Ph–NH_2$, $PH–NH–Ph$, N–3° butyl amine, $CH_3–NH–CH_3$, N, N, N Trimethyl amine. How many amines can be prepared by gabriel pthalimide synthesis

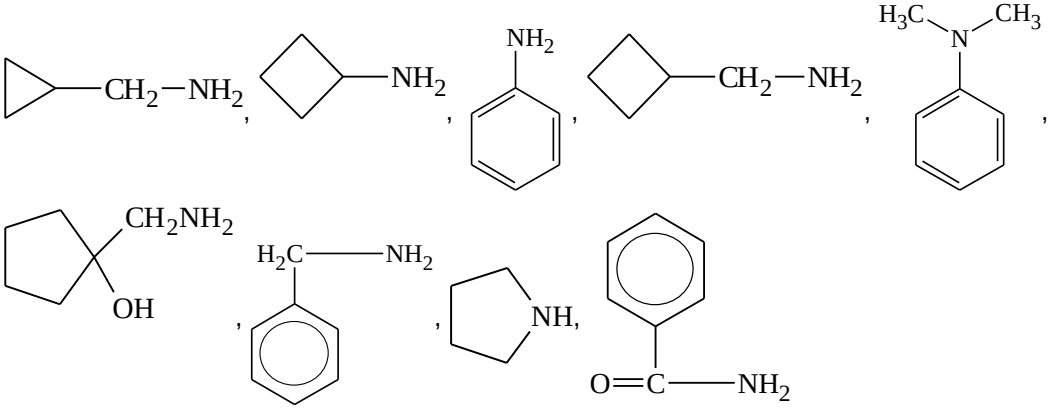
24.



Total no. of 'π' bonds present in product is/are

25. Among $R–CH_2–NO_2$, $Ph–NO_2$, $Ph–CH_2–NO_2$, $R_2CH–NO_2$ and $R_3C–NO_2$, how many compounds will give blue colour when treated with HNO_2 followed by NaOH

26. How many of the below listed compounds on treatment with HNO_2 would go for ring expansion?



Space for rough work

27. How many primary amines are possible for the formula $C_4H_{11}N$?

28. During the conversion of an amide to amine by using Hoffmann degradation number of base molecules used

SECTION 2 (Maximum Marks: 32)

- This section contains **EIGHT** 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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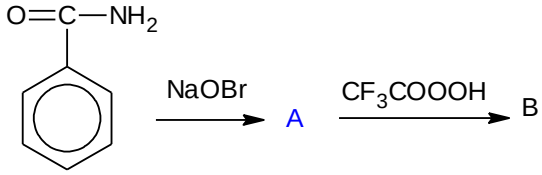
29.



Correct statement are

(A) 'A' doesn't give friedal craft's alkylation (B) 'A' Undergoes friedal craft's acylation

(C) 'A' undergoes friedal craft's alkylation very easily

(D) 'B' on reduction gives A

30. Basicity order for following amines

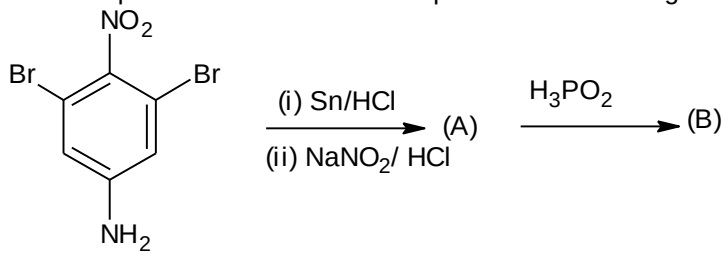
$\underset{(I)}{CH_3CH_2NH_2}, \underset{(II)}{H_5C_2-NH-C_2H_5}, \underset{(III)}{H_5C_2-N(C_2H_5)_2}$

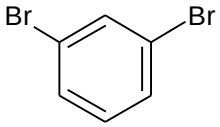
(A) In water II > I > III (B) In water II > III > I

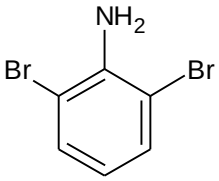
(C) In chloro benzene III > II > I (D) In chloro benzene I > II > III

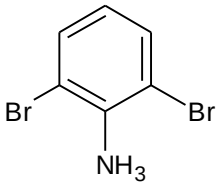
Space for rough work

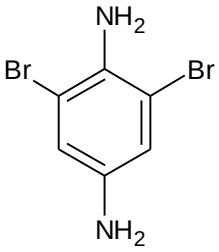
31. The final product obtained in the sequence of reactions given is



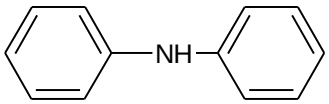
(A) 

(B) 

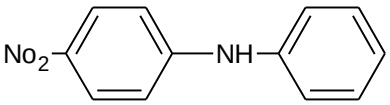
(C) 

(D) 

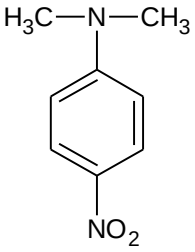
32. A set of four amines are given (I – V)



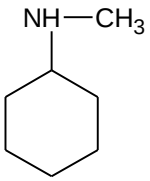
I



II



III



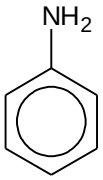
IV

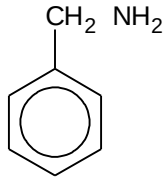
Examine the following and identify the correct statements.
(A) Between I & II, the stronger base is I.
(B) The weakest base among those listed is II and the strongest is IV.
(C) III is a weaker base than 4–nitroaniline.
(D) II is a weaker base because of more electron withdrawing and base weakening effect.

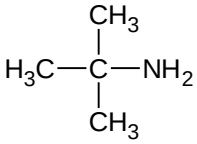
Space for rough work

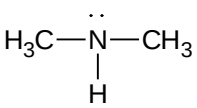
33. Four statements relating to nitrogenous compounds are given below. Choose the incorrect statements.
(A) Allyl isocyanide contains nine σ–bonds and three π–bonds
(B) Methyl isocyanide on reduction with $LiAlH_4$ gives ethylamine.
(C) m–Dinitrobenzene on reduction with NH_4HS gives m–nitro aniline.
(D) Acetaloxime on reaction with P_2O_5 gives acetonitrile.

34. $A + CHCl_3 \xrightarrow{\text{alc.KOH}} R-NC + 3KCl + 3H_2O$. 'A' is

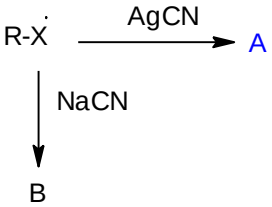
(A) 

(B) 

(C) 

(D) 

35. Alkylation is possible in
(A) primary amines only
(B) secondary amines only
(C) tertiary amines only
(D) quaternary amines

36. 

Correct statements regarding A & B is
(A) both are functional isomers
(B) at high 'T' they are interconvertable
(C) on hydrolysis both gives same product
(D) on LAH both gives same product

Space for rough work

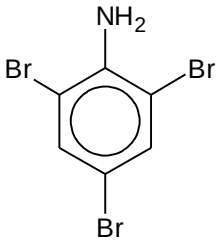
SECTION 3 (Maximum Marks: 16)

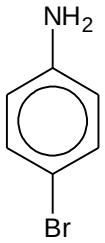
- This section contains **TWO** paragraphs
- Based on each paragraph, there will be **TWO** questions
- Each question has **FOUR** options (A), (B), (C) and (D). **ONE OR MORE THAN ONE** of these four option(s) is(are) correct
- For each question, darken the bubble(s) corresponding to all the correct option(s) in the ORS
- **Marking scheme:**
  - **+4** If only the bubble(s) corresponding to all the correct option(s) is(are) darkened
  - **0** If none of the bubbles is darkened
  - **–2** In all other cases

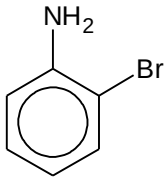
Paragraph–1

Amino group is ortho para directing as it activates the benzene ring towards electrophilic substitution reactions. But in presence of strong acidic conditions. It gets protonated to form anilinium ion and becomes metadirecting group.

37. $Ph-NH_2 \xrightarrow[\approx O^0C]{Br_2/H_2O} A$. Then A is

(A) 

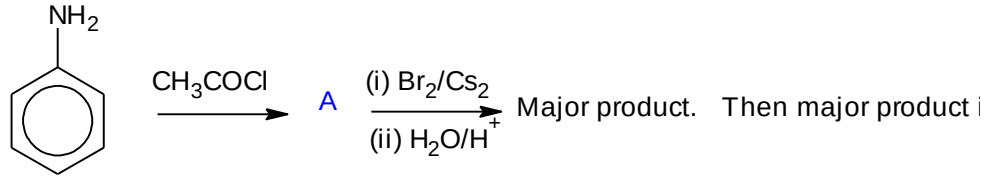
(B) 

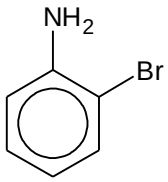
(C) 

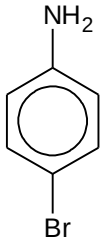
(D) Both b & c

Space for rough work

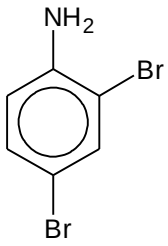
38.



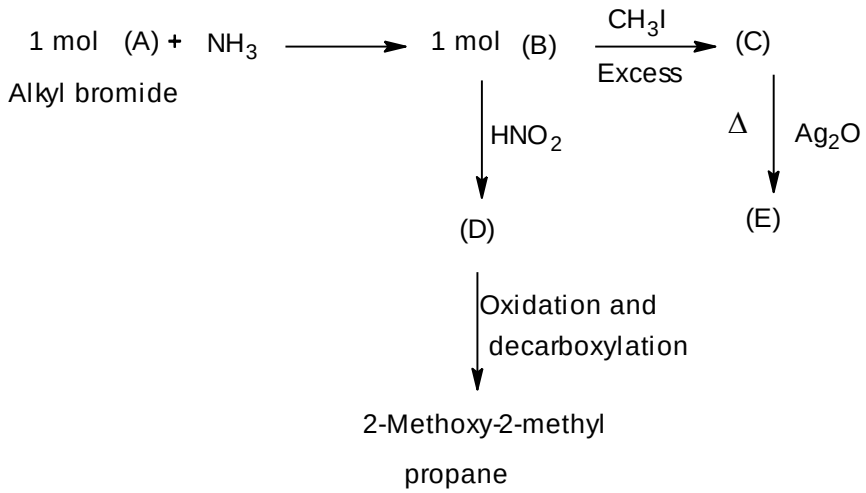
(A) 

(B) 

(C) Both a & b

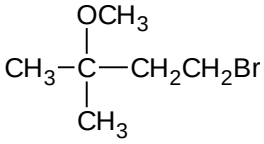
(D) 

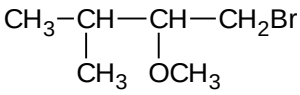
Paragraph–2

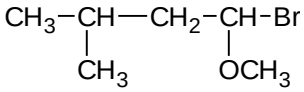


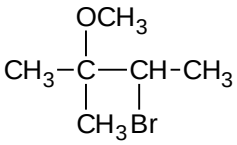
Space for rough work

39. Compound (A) is :

(A) 

(B) 

(C) 

(D) 

40. Compound (E) is

(A) $\left(CH_3\right)_2 C = CH - CH_2OCH_3$

(B) $CH_3 - C\left(OCH_3\right) = CH - CH_3$

(C) $\left(CH_3\right)_2 C\left(OCH_3\right) - CH = CH_2$

(D) None

PART III: MATHEMATICS

SECTION 1 (Maximum Marks: 32)

- This section contains **EIGHT** 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:**
  - **+4** If the bubble corresponding to the answer is darkened
  - **0** In all other cases

41. Tangents to the parabola at the extremities of a common chord AB of the circle $x^2 + y^2 = 5$ and the parabola $y^2 = 4x$ intersect at the point T. A square ABCD is constructed on this chord ly8ing inside the parabola, and $[(TC)^2 + (TD)^2]^2$ is equal to λ, then $\lambda - 6400$ is equal to

42. The point (a, 2a) is an interior point of the region bounded by the parabola $y^2 = 16x$ and the double ordinate through the focus. Then, the number of integral value of a is

43. Latus rectum of the parabola which has axis parallel to y-axis and which passes through points (0, 2), (–1, 0) and (1, 6) is

Space for rough work

44. If a focal chord of $y^2 = 2x$ makes an angle $\alpha \in \left(0, \frac{\pi}{4}\right]$ with the positive direction of the x-axis, then the minimum length of the focal chord is

45. The maximum slope of the normal to $y^2 = 4ax$ passing through the point (15, 12) is

46. If three distinct normal can be drawn to the parabola $y^2 - 2y = 4x - 9$ from the point (2a, b), then the least integral value of a is

47. If the parabola $y^2 = 4ax$ and $y^2 = 4c(x - b)$ have a common normal other than the x-axis, (a, b and c being distinct positive real numbers), then the least integral value of $\frac{b}{(a-c)}$ is

48. From a point A common tangents are drawn to the circle $x^2 + y^2 = \frac{a^2}{2}$ and the parabola $y^2 = 4ax$. If the area of the quadrilateral formed by the common tangents, the chord of contact of the point A, w.r.t. the circle and the parabola is λ square unit, then the value of $\frac{16}{15a^2}\lambda$ must be

SECTION 2 (Maximum Marks: 32)

- This section contains **EIGHT** 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:**
  - **+4** If only the bubble(s) corresponding to all the correct option(s) is(are) darkened
  - **0** If none of the bubbles is darkened
  - **–2** In all other cases

49. The equation of the directrix of the parabola with vertex at the origin and having the axis along the x-axis and a common tangent of slope 2 with the circle $x^2 + y^2 = 5$ is/are
(A) x = 10 (B) x = 20 (C) x = –10 (D) x = –20

Space for rough work

50. Parabola $y^2 = 4x$ and the circle having it's centre at (6, 5) intersect at right angle. Possible point of intersection of these curve can be
(A) (9, 6) (B) $\left(2,\sqrt{8}\right)$ (C) (4, 4) (D) $\left(3,2\sqrt{3}\right)$

51. P is a point which moves in the x-y plane such that the point P is nearer to the centre of a square than any of the sides. The four vertices of the square are $(\pm a, \pm a)$. The region in which P will move is bounded by parts of parabolas of which one has the equation
(A) $y^2 = a^2 + 2ax$ (B) $x^2 = a^2 + 2ay$ (C) $y^2 + 2ax = a^2$ (D) none of these

52. A tangent to a parabola $y^2 = 4ax$ is inclined at $\frac{\pi}{3}$ with the axis of the parabola. The point of contact is
(A) $\left(\frac{a}{3},-\frac{2a}{\sqrt{3}}\right)$ (B) $\left(3a,-2\sqrt{3}a\right)$ (C) $\left(3a,2\sqrt{3}a\right)$ (D) $\left(\frac{a}{3},\frac{2a}{\sqrt{3}}\right)$

53. Equation $x^2 - 2x - 2y + 5 = 0$ represents
(A) a circle with centre (1, 1) (B) a parabola with vertex (1, 2)
(C) a parabola with directrix $y = \frac{5}{2}$ (D) a parabola with directrix $y = -\frac{1}{3}$

54. The mirror image of the parabola $y^2 = 4x$ in the tangent to the parabola at the point (1, 2) is
(A) $(x - 1)^2 = 4(y + 1)$ (B) $(x + 1)^2 = 4(y + 1)$ (C) $(x + 1)^2 = 4(y - 1)$ (D) $(x - 1)^2 = 4(y - 1)$

55. The shortest distance between the parabola $y^2 = 4x$ and $y^2 = 2x - 6$ is
(A) 2 (B) $\sqrt{5}$ (C) 3 (D) none of these

56. Radius of the largest circle which passes through the focus of the parabola $y^2 = 4x$ and contained in it, is
(A) 8 (B) 4 (C) 2 (D) 5

Space for rough work

SECTION 3 (Maximum Marks: 16)

- This section contains **TWO** paragraphs
- Based on each paragraph, there will be **TWO** 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:**
  - **+4** If only the bubble(s) corresponding to all the correct option(s) is(are) darkened
  - **0** If none of the bubbles is darkened
  - **–2** In all other cases

Paragraph–1

If locus of the circumcentre of a variable triangle having sides y-axis, y = 2 and $\ell x + my = 1$, where (ℓ, m) lies on the parabola $y^2 = 4x$ is curve C, then

57. The length of smallest focal chord of this curve C is

(A) $\frac{1}{4}$ (B) $\frac{1}{12}$ (C) $\frac{1}{8}$ (D) $\frac{1}{16}$

58. The curve C is symmetric about the line

(A) $x = \frac{3}{2}$ (B) $y = -\frac{3}{2}$ (C) $x = -\frac{3}{2}$ (D) $y = \frac{1}{2}$

Paragraph–2

Two tangents on a parabola are x – y = 0 and x + y = 0. If (2, 3) is focus of the parabola, then

59. The equation of tangent at vertex is

(A) 4x – 6y + 5 = 0 (B) 4x – 6y + 3 = 0 (C) 4x – 6y + 1 = 0 (D) $4x - 6y + \frac{3}{2} = 0$

60. If P, Q are ends of focal chord of the parabola, then $\frac{1}{SP} + \frac{1}{SQ} =$

(A) $\frac{2\sqrt{13}}{3}$ (B) $2\sqrt{13}$ (C) $\frac{2\sqrt{13}}{5}$ (D) none of these

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space for rough work

FIITJEE RET – 6

(2017 – 2019)(2ND YEAR_REGULAR)

IIT-2015 (P2)_SET–A

DATE: 30.07.2018

ANSWERS

PHYSICS

1.	**Bonus**	2.	**3**	3.	**4**	4.	**5**
5.	**1**	6.	**5**	7.	**2**	8.	**2**
9.	**C**	10.	**A**	11.	**B,C**	12.	**A,B,C,D**
13.	**B**	14.	**A,B,D**	15.	**A,C**	16.	**A,C,D**
17.	**B**	18.	**C**	19.	**C**	20.	**C**

CHEMISTRY

21.	**2**	22.	**3**	23.	**2**	24.	**7**
25.	**1**	26.	**3**	27.	**4or 5**	28.	**4**
29.	**A, D**	30.	**B, C**	31.	**A**	32.	**A, B, D**
33.	**B**	34.	**A, B, C**	35.	**Bonus**	36.	**A, B**
37.	**A**	38.	**B**	39.	**A**	40.	**C**

MATHEMATICS

41.	**0**	42.	**3**	43.	**1**	44.	**4**
45.	**Bonus**	46.	**3**	47.	**3**	48.	**4**
49.	**AC**	50.	**AC**	51.	**ABC**	52.	**AD**
53.	**B**	54.	**C**	55.	**B**	56.	**B**
57.	**C**	58.	**Bonus**	59.	**A**	60.	**C**

FIITJEE RET – 6

(2017 – 2019)(2ND YEAR_REGULAR)

IIT-2015 (P2)_SET–B

DATE: 30.07.2018

Time: 3 hours **Maximum Marks: 240**

INSTRUCTIONS:

A. General

1. This booklet is your Question Paper containing 60 questions.
6. Blank papers, clipboards, log tables, slide rules, calculators, cellular phones, pagers and electronic gadgets in any form are not allowed to be carried inside the examination hall.
7. Fill in the boxes provided for Name and Enrolment No.
8. The answer sheet, a machine-readable Objective Response (ORS), is provided separately.
9. DO NOT TAMPER WITH / MULTILATE THE ORS OR THE BOOKLET.

B. Filling in the OMR:

6. The instructions for the OMR sheet are given on the OMR itself.

C. Question paper format:

14. The question paper consists of **3 parts (Physics, Chemistry and Mathematics)**. Each part consists of **two sections**.
15. **Section I** contains **8 questions**. The answer to each question is a **single digit integer**, ranging from 0 to 9 (both inclusive).
16. **Section II** contains **8 multiple choice questions**. Each question has four choices (A), (B), (C) and (D) out of which **ONE or MORE** are correct.
17. **Section III** contains **2 paragraphs** type questions. Each paragraph describes an experiment, a situation or a problem. Two multiple choice questions will be asked based on this paragraph. One or more than one option can be correct.

D. Marking Scheme

18. For each question in **Section I**, you will be awarded **4 marks** if you darken ALL the bubble(s) corresponding to the correct answer(s) **ONLY**. In all other cases **zero (0) marks** will be awarded. **No negative marks** will be awarded for incorrect answers in this section.
19. For each question in **Section II**, you will be awarded **4 marks** if you darken ALL the bubble(s) corresponding to the correct answer(s) **ONLY**. In all other cases **zero (0) marks** will be awarded. **–2 marks** will be awarded for incorrect answers in this section.
20. For each question in **Section III**, you will be awarded **4 marks** if you darken ALL the bubble(s) corresponding to the correct answer(s) **ONLY**. In all other cases **zero (0) marks** will be awarded. **–2 marks** will be awarded for incorrect answers in this section.

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.: ☐☐☐☐☐☐☐☐☐☐

PAPER – II
PART I: PHYSICS
SECTION 1 (Maximum Marks: 32)

- This section contains **EIGHT** 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:**
  - **+4** If the bubble corresponding to the answer is darkened
  - **0** In all other cases

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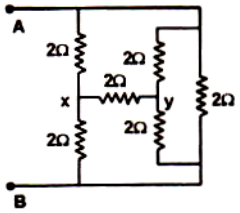
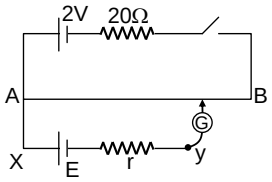
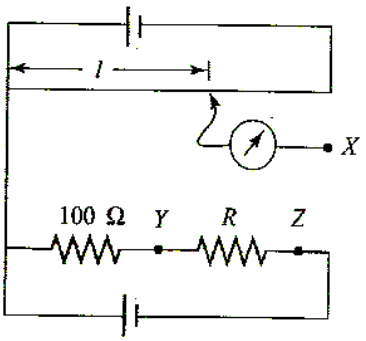
1. For the circuit shown in the adjacent figure, Effective resistance between A and B is .



2. In the potentiometer circuit shown, the length of potentiometer wire AB is 400 cm and the resistance per unit length is 0.2 Ω/cm. If a battery of emf E and internal resistance r is connected across XY as shown, for E = 1 V and r = 25 Ω, balanced point is at 50 X CM FROM a. Then x is

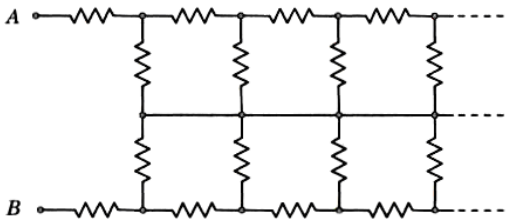


3. Figure shows a circuit which may be used to compare the resistance R of an unknown resistor with a 100 Ω standard. The distances l from one end of the potentiometer slider wire to the balance point are 400 mm and 588 mm when X is connected to Y and Z, respectively. The length of the slide wire is 1.00 m. If the value of resistance R is given by $\frac{94}{n}$. Find n.

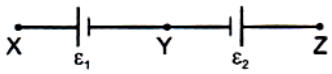


Space for rough work

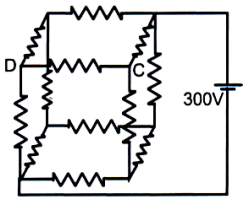
4. The circuit shown in the diagram extends to the right into infinity. Each branch resistance is denoted by r. If the resistance between the terminals A and B is given by $\frac{n}{2}\left(\sqrt{5}+1\right)r$, Find n



5. Two cells of emf ε_1 and $\varepsilon_2\left(\varepsilon_2 < \varepsilon_1\right)$ are joined as shown in figure
When a potentiometer is connected between X and Y it balance for 300 cm length against ε_1. On connecting the same potentiometer between X and Z it balance for 100 cm length against ε_1 and ε_2.
Find possible number of integer value(s) of $\frac{2\varepsilon_2}{\varepsilon_1}$.



6. A resistance circuit is constructed such that 12 resistance are to form a cube. Each resistor is of 2Ω. A battery of 30 volt is applied across the body diagonal of the cube. Find the current flowing through DC.



7. Two resistance are measured in Ohm. $R_1 = 3\Omega \pm 1\%$, $R_2 = 6\Omega \pm 2\%$ When they are connected in parallel, maximum percentage error in equivalent resistance is α. Find 3α

8. Consider a cell of emf E and internal resistance r. The current drawn (i) from cell can be varied. Output power from cell is same when current drawn is $i_1 = 2A$ and $i_2 = 8A$. For what value of current the output power will be maximum.

Space for rough work

SECTION 2 (Maximum Marks: 32)

- This section contains **EIGHT** 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:**
  - **+4** If only the bubble(s) corresponding to all the correct option(s) is(are) darkened
  - **0** If none of the bubbles is darkened
  - **–2** In all other cases

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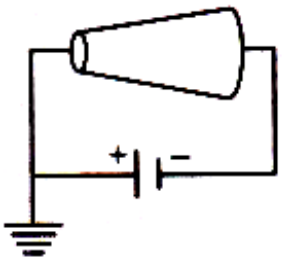
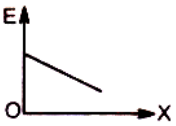
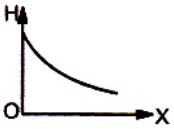
9. A conductor is made an isotropic material cone. A battery of constant emf is connected across it and its left end is earthed as shown in figure. If at a section distant x from left and , electric field intensity, potential and the rate of generation of heat per unit length are E, V and H respectively, which of the following graphs is / are correct

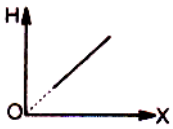




(A)



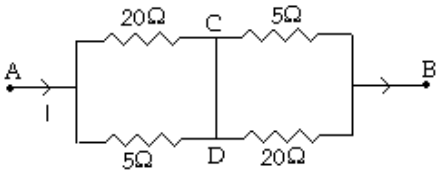
(B)



(C)

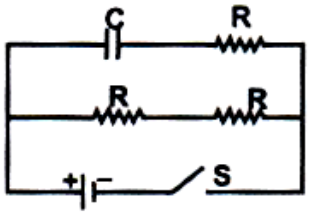
(D)

10. When some potential difference is maintained between A and B, current I enters the network at A and leaves at B
(A) The equivalent resistance between A and B is 8 Ω
(B) C and D are at the same potential
(C) No current flows between C and D
(D) Current (3/5)I flows from D to C

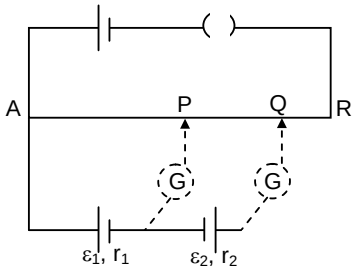


Space for rough work

11. In the circuit shown in the figure, which one of following statement is correct ?
(A) If the switch S is closed, the time constant during charging is RC
(B) IF the switch S is closed, the time constant during charging is RC/2
(C) If the switch is opened again, the time constant during discharging is 3RC
(D) If the switch is opened again, the time constant during discharging is RC /2



12. The adjoining diagram shows a potentiometer circuit. The galvanometer can be connected at two different points as shown in the figure by the dotted lines. Given that $\varepsilon_2 > \varepsilon_1$.
(A) we can find the value of ε_1
(B) we can find the value of ε_2
(C) we cannot find the value of ε_2
(D) we cannot find the value of net of the two cell



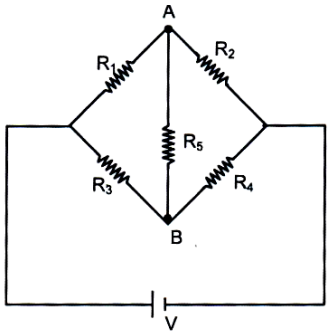
13. Under which of the following conditions, the resistance of cylindrical specimen of an Ohmic material is least affected by small temperature variations.
(A) Temperature coefficient of resistivity is greater than the temperature coefficient of linear expansion
(B) Temperature coefficient of resistivity is lesser than the temperature coefficient of linear expansion
(C) Temperature coefficient of resistivity equals to the temperature coefficient of linear expansion.
(D) None of the above is a required condition.

14. An ideal battery of electromotive force ε is connected in series with an ammeter and a voltmeter of unknown internal resistances. IF a certain resistor is connected in parallel with the voltmeter, the voltmeter and the ammeter readings becomes $1/\eta$ and η times of their respective initial values. What is the initial reading V of the voltmeter ?

(A) $V = \frac{\eta\varepsilon}{(\eta+1)}$ (B) $V = \frac{(\eta+1)\varepsilon}{\eta}$ (C) $V = \frac{\eta\varepsilon}{(\eta-1)}$ (D) $V = \frac{(\eta^2-1)\varepsilon}{\eta^2}$

Space for rough work

15. Consider the given arrangement of resistance and on ideal battery on shown



Choose the correct option(s) regarding current through resistance R_3

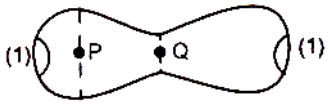
(A) If $\frac{R_1}{R_2} > \frac{R_3}{R_4}$, current in R_5 will be from A to B

(B) If $\frac{R_1}{R_2} > \frac{R_3}{R_4}$, current in R_5 will be from B to A

(C) If $\frac{R_1}{R_2} < \frac{R_3}{R_4}$, current in R_5 will be from A to B

(D) If $\frac{R_1}{R_2} < \frac{R_3}{R_4}$, current in R_5 will be from B to A

16. A metallic conductor of irregular cross – section is as shown in the figure. A constant potential difference is applied across the ends (1) and (2). Then



(A) the current at the cross – section P equals the current at the cross section Q
(B) the electric field intensity at P is less than that at Q
(C) the rate of heat generated per unit time at Q is greater than that at P
(D) the number of electrons crossing per unit area of cross –section at P is less than that at Q.

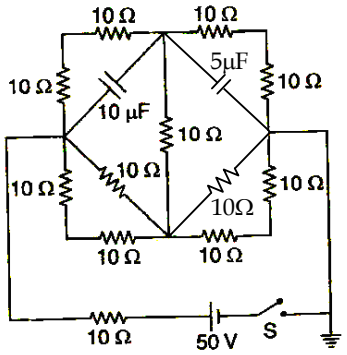
SECTION 3 (Maximum Marks: 16)

- This section contains **TWO** paragraphs
- Based on each paragraph, there will be **TWO** 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:**
  - **+4** If only the bubble(s) corresponding to all the correct option(s) is(are) darkened
  - **0** If none of the bubbles is darkened
  - **–2** In all other cases

Space for rough work

Paragraph–1

In the circuit shown in figure, the capacitors are initially uncharged. Based on the facts and figure provided, answer the following questions.



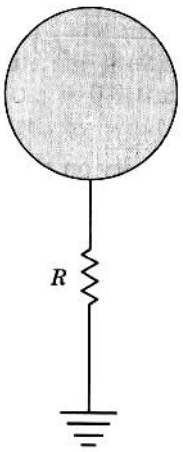
17. The initial value of the battery current when the switch S is closed is
(A) 2A (B) 4A (C) 5A (D) 8A

18. The charges on the 10 μF and 5 μF capacitors after the steady state is reached are q_{10} and q_5 respectively. Then

(A) $q_5 = q_{10} = 125\mu C$ (B) $q_5 = q_{10} = 62.5\mu C$ (C) $q_5 = \frac{q_{10}}{2} = 62.5\mu C$ (D) $q_5 = q_{10} = 0$

Paragraph–2

A conducting balloon of radius 'a' is charged to a potential V_0 and held at a large height above the earth surface. The large height of the balloon from the earth ensures that charge distribution on the surface of the balloon remains unaffected by the presence of the earth. It is connected to the earth through a resistance R and a valve in the balloon is opened. The gas inside the balloon escape from the valve and the size of the balloon decreases. The rate of decreases in radius of the balloon in controlled in such a manner that potential of the balloon remains constant. Assume the electric permittivity of the surrounding air equals to that of free space (ε_0) and charge cannot leak to the surrounding air.



19. Rate at which radius r of the balloon changes with time is best represented by the equation

(A) $\frac{dr}{dt} = \frac{1}{4\pi\varepsilon_0 R}$ (B) $\frac{dr}{dt} = -\frac{1}{4\pi\varepsilon_0 R}$

(C) $\frac{dr}{dt} = \frac{r}{4\pi\varepsilon_0 aR}$ (D) $\frac{dr}{dt} = \frac{r}{4\pi\varepsilon_0 aR}$

Space for rough work

20. How much heat is dissipated in the resistance R till the moment radius of the balloon becomes half ?
(A) $0.5\pi\varepsilon_0 aV_0^2$ (B) $\pi\varepsilon_0 aV_0^2$ (C) $2\pi\varepsilon_0 aV_0^2$ (D) $4\pi\varepsilon_0 aV_0^2$

PART II: CHEMISTRY

SECTION 1 (Maximum Marks: 32)

- This section contains **EIGHT** 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:**
  +4 If the bubble corresponding to the answer is darkened
  0 In all other cases

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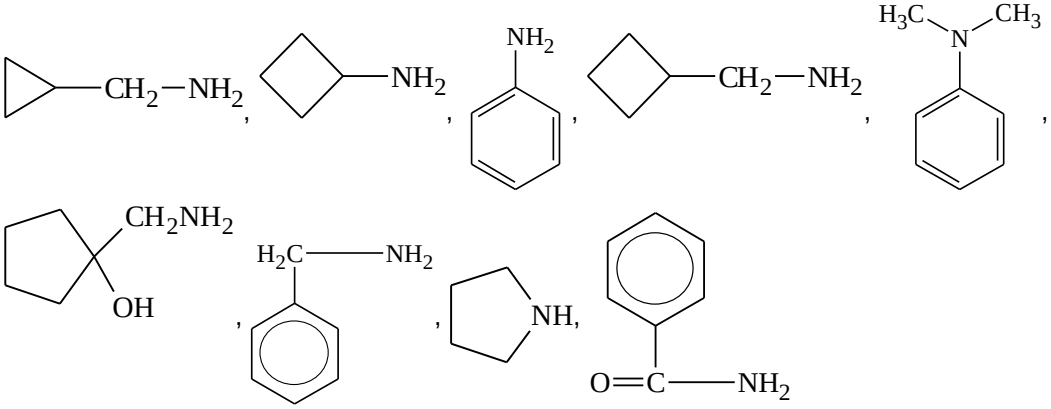
21. Among $R–CH_2–NO_2$, $Ph–NO_2$, $Ph–CH_2–NO_2$, $R_2CH–NO_2$ and $R_3C–NO_2$, how many compounds will give blue colour when treated with HNO_2 followed by NaOH

22. How many of the below listed compounds on treatment with HNO_2 would go for ring expansion?



23. How many primary amines are possible for the formula $C_4H_{11}N$?

24. During the conversion of an amide to amine by using Hoffmann degradation number of base molecules used

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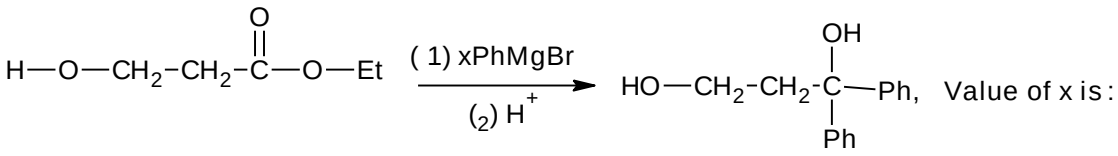
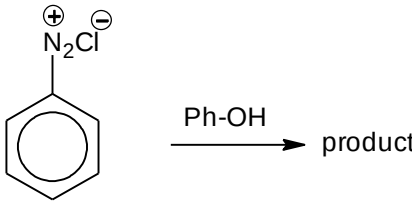
Space for rough work

25. 

Value of x is :

26. How many of the following compounds shall undergo condensation by reacting with NaOEt/EtOH.

27. CH_3NH_2, $CH_3–CH_2–NH_2$, $Ph–NH_2$, PH–NH–Ph, N–3° butyl amine, $CH_3–NH–CH_3$, N, N, N Trimethyl amine. How many amines can be prepared by gabriel pthalimide synthesis

28. 

Total no. of 'π' bonds present in product is/are

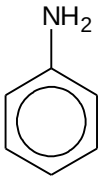
Space for rough work

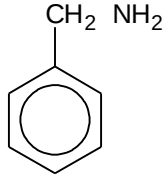
SECTION 2 (Maximum Marks: 32)

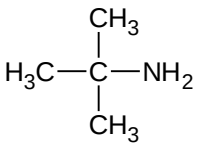
- This section contains **EIGHT** questions
- Each question has FOUR options (A), (B), (C) and (D). **ONE OR MORE THAN ONE** of these four option(s) is(are) correct
- For each question, darken the bubble(s) corresponding to all the correct option(s) in the ORS
- **Marking scheme:**
  - **+4** If only the bubble(s) corresponding to all the correct option(s) is(are) darkened
  - **0** If none of the bubbles is darkened
  - **–2** In all other cases

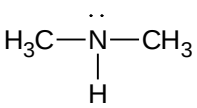
29. Four statements relating to nitrogenous compounds are given below. Choose the incorrect statements.
(A) Allyl isocyanide contains nine σ–bonds and three π–bonds
(B) Methyl isocyanide on reduction with $LiAlH_4$ gives ethylamine.
(C) m–Dinitrobenzene on reduction with NH_4HS gives m–nitro aniline.
(D) Acetaloxime on reaction with P_2O_5 gives acetonitrile.

30. $A + CHCl_3 \xrightarrow{\text{alc.KOH}} R - NC + 3KCl + 3H_2O$. 'A' is

(A) 

(B) 

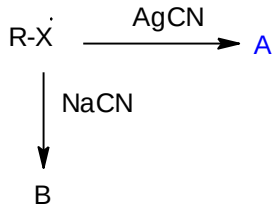
(C) 

(D) 

31. Alkylation is possible in
(A) primary amines only
(B) secondary amines only
(C) tertiary amines only
(D) quaternary amines

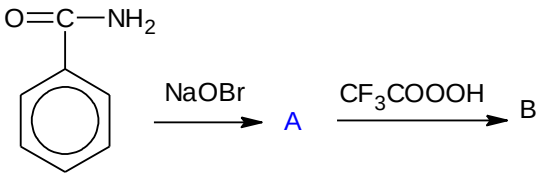
Space for rough work

32.



Correct statements regarding A & B is
(A) both are functional isomers
(B) at high 'T' they are interconvertable
(C) on hydrolysis both gives same product
(D) on LAH both gives same product

33.



Correct statement are
(A) 'A' doesn't give friedal craft's alkylation (B) 'A' Undergoes friedal craft's acylation
(C) 'A' undergoes friedal craft's alkylation very easily
(D) 'B' on reduction gives A

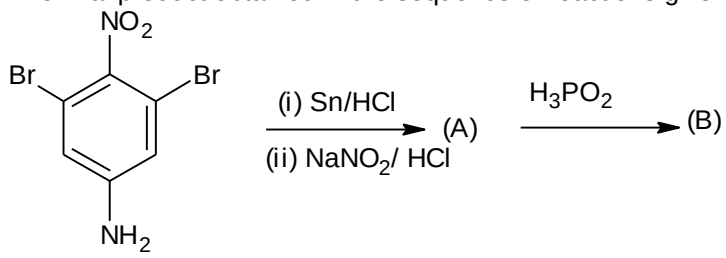
34. Basicity order for following amines

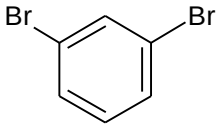
$\underset{(I)}{CH_3CH_2NH_2}, \underset{(II)}{H_5C_2-NH-C_2H_5}, \underset{(III)}{H_5C_2-N(C_2H_5)_2}$

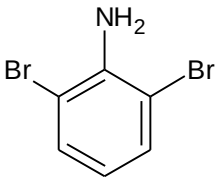
(A) In water II > I > III (B) In water II > III > I
(C) In chloro benzene III > II > I (D) In chloro benzene I > II > III

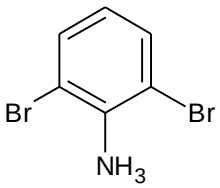
Space for rough work

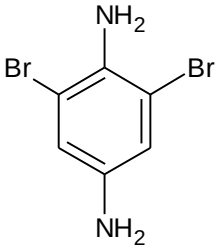
35. The final product obtained in the sequence of reactions given is



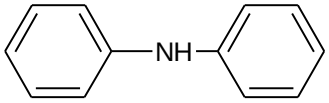
(A) 

(B) 

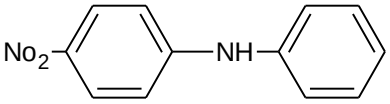
(C) 

(D) 

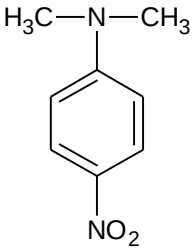
36. A set of four amines are given (I – V)



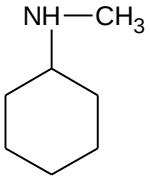
I



II



III



IV

Examine the following and identify the correct statements.
(A) Between I & II, the stronger base is I.
(B) The weakest base among those listed is II and the strongest is IV.
(C) III is a weaker base than 4–nitroaniline.
(D) II is a weaker base because of more electron withdrawing and base weakening effect.

Space for rough work

SECTION 3 (Maximum Marks: 16)

- This section contains **TWO** paragraphs
- Based on each paragraph, there will be **TWO** 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:**
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  - **0** If none of the bubbles is darkened
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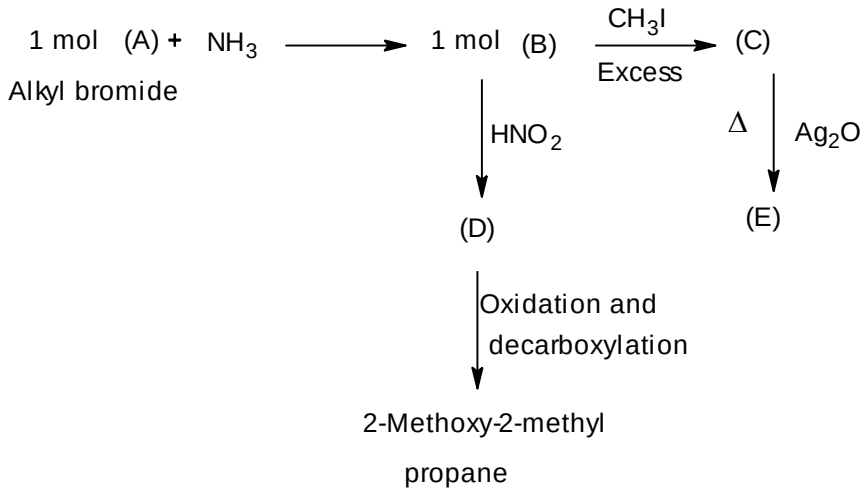
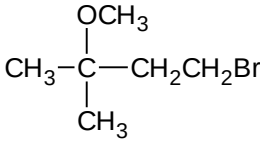
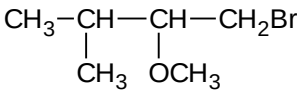
Paragraph–1

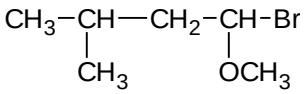


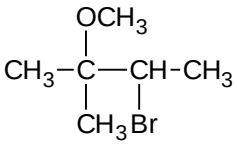
Space for rough work

37. Compound (A) is :

(A) 

(B) 

(C) 

(D) 

38. Compound (E) is

(A) $\left(CH_3\right)_2 C = CH - CH_2OCH_3$

(B) $CH_3 - C\left(OCH_3\right) = CH - CH_3$

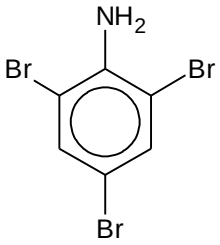
(C) $\left(CH_3\right)_2 C\left(OCH_3\right) - CH = CH_2$

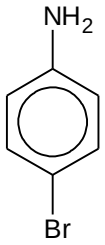
(D) None

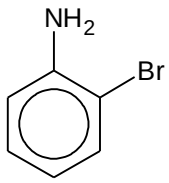
Paragraph–2

Amino group is ortho para directing as it activates the benzene ring towards electrophilic substitution reactions. But in presence of strong acidic conditions. It gets protonated to form anilinium ion and becomes metadirecting group.

39. $Ph - NH_2 \xrightarrow[\approx O^0C]{Br_2/H_2O} A$. Then A is

(A) 

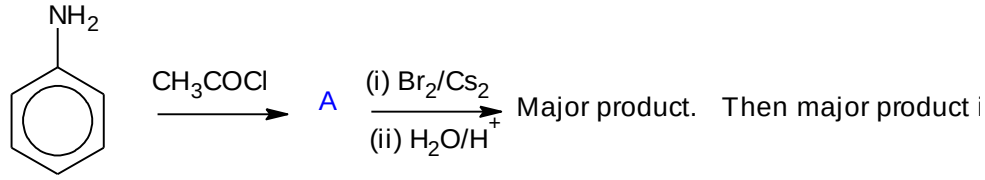
(B) 

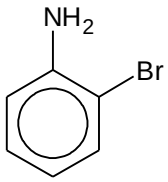
(C) 

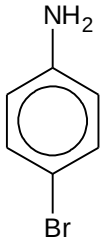
(D) Both b & c

Space for rough work

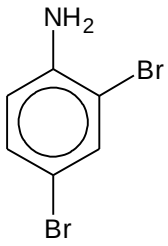
40.



(A) 

(B) 

(C) Both a & b

(D) 

PART III: MATHEMATICS

SECTION 1 (Maximum Marks: 32)

- This section contains **EIGHT** 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:**
  - **+4** If the bubble corresponding to the answer is darkened
  - **0** In all other cases

41. The maximum slope of the normal to $y^2 = 4ax$ passing through the point (15, 12) is

42. If three distinct normal can be drawn to the parabola $y^2 - 2y = 4x - 9$ from the point (2a, b), then the least integral value of a is

43. If the parabola $y^2 = 4ax$ and $y^2 = 4c(x - b)$ have a common normal other than the x-axis, (a, b and c being distinct positive real numbers), then the least integral value of $\frac{b}{(a-c)}$ is

Space for rough work

44. From a point A common tangents are drawn to the circle $x^2 + y^2 = \frac{a^2}{2}$ and the parabola $y^2 = 4ax$. If the area of the quadrilateral formed by the common tangents, the chord of contact of the point A, w.r.t. the circle and the parabola is λ square unit, then the value of $\frac{16}{15a^2}\lambda$ must be

45. Tangents to the parabola at the extremities of a common chord AB of the circle $x^2 + y^2 = 5$ and the parabola $y^2 = 4x$ intersect at the point T. A square ABCD is constructed on this chord ly8ing inside the parabola, and $[(TC)^2 + (TD)^2]^2$ is equal to λ, then $\lambda - 6400$ is equal to

46. The point (a, 2a) is an interior point of the region bounded by the parabola $y^2 = 16x$ and the double ordinate through the focus. Then, the number of integral value of a is

47. Latus rectum of the parabola which has axis parallel to y-axis and which passes through points (0, 2), (–1, 0) and (1, 6) is

48. If a focal chord of $y^2 = 2x$ makes an angle $\alpha \in \left(0, \frac{\pi}{4}\right]$ with the positive direction of the x-axis, then the minimum length of the focal chord is

SECTION 2 (Maximum Marks: 32)

- This section contains **EIGHT** 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:**
  - **+4** If only the bubble(s) corresponding to all the correct option(s) is(are) darkened
  - **0** If none of the bubbles is darkened
  - **–2** In all other cases

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49. Equation $x^2 - 2x - 2y + 5 = 0$ represents
(A) a circle with centre (1, 1) (B) a parabola with vertex (1, 2)
(C) a parabola with directrix $y = \frac{5}{2}$ (D) a parabola with directrix $y = -\frac{1}{3}$

Space for rough work

50. The mirror image of the parabola $y^2 = 4x$ in the tangent to the parabola at the point (1, 2) is
(A) $(x-1)^2 = 4(y+1)$ (B) $(x+1)^2 = 4(y+1)$ (C) $(x+1)^2 = 4(y-1)$ (D) $(x-1)^2 = 4(y-1)$

51. The shortest distance between the parabola $y^2 = 4x$ and $y^2 = 2x - 6$ is
(A) 2 (B) $\sqrt{5}$ (C) 3 (D) none of these

52. Radius of the largest circle which passes through the focus of the parabola $y^2 = 4x$ and contained in it, is
(A) 8 (B) 4 (C) 2 (D) 5

53. The equation of the directrix of the parabola with vertex at the origin and having the axis along the x-axis and a common tangent of slope 2 with the circle $x^2 + y^2 = 5$ is/are
(A) $x = 10$ (B) $x = 20$ (C) $x = -10$ (D) $x = -20$

54. Parabola $y^2 = 4x$ and the circle having it's centre at (6, 5) intersect at right angle. Possible point of intersection of these curve can be
(A) (9, 6) (B) $\left(2, \sqrt{8}\right)$ (C) (4, 4) (D) $\left(3, 2\sqrt{3}\right)$

55. P is a point which moves in the x-y plane such that the point P is nearer to the centre of a square than any of the sides. The four vertices of the square are $(\pm a, \pm a)$. The region in which P will move is bounded by parts of parabolas of which one has the equation
(A) $y^2 = a^2 + 2ax$ (B) $x^2 = a^2 + 2ay$ (C) $y^2 + 2ax = a^2$ (D) none of these

56. A tangent to a parabola $y^2 = 4ax$ is inclined at $\frac{\pi}{3}$ with the axis of the parabola. The point of contact is
(A) $\left(\frac{a}{3}, -\frac{2a}{\sqrt{3}}\right)$ (B) $\left(3a, -2\sqrt{3}a\right)$ (C) $\left(3a, 2\sqrt{3}a\right)$ (D) $\left(\frac{a}{3}, \frac{2a}{\sqrt{3}}\right)$

Space for rough work

SECTION 3 (Maximum Marks: 16)

- This section contains **TWO** paragraphs
- Based on each paragraph, there will be **TWO** 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:**
  - **+4** If only the bubble(s) corresponding to all the correct option(s) is(are) darkened
  - **0** If none of the bubbles is darkened
  - **–2** In all other cases

Paragraph–1

Two tangents on a parabola are x – y = 0 and x + y = 0. If (2, 3) is focus of the parabola, then

57. The equation of tangent at vertex is

(A) $4x - 6y + 5 = 0$ (B) $4x - 6y + 3 = 0$ (C) $4x - 6y + 1 = 0$ (D) $4x - 6y + \frac{3}{2} = 0$

58. If P, Q are ends of focal chord of the parabola, then $\frac{1}{SP} + \frac{1}{SQ} =$

(A) $\frac{2\sqrt{13}}{3}$ (B) $2\sqrt{13}$ (C) $\frac{2\sqrt{13}}{5}$ (D) none of these

Paragraph–2

If locus of the circumcentre of a variable triangle having sides y-axis, y = 2 and $\ell x + my = 1$, where (ℓ, m) lies on the parabola $y^2 = 4x$ is curve C, then

59. The length of smallest focal chord of this curve C is

(A) $\frac{1}{4}$ (B) $\frac{1}{12}$ (C) $\frac{1}{8}$ (D) $\frac{1}{16}$

60. The curve C is symmetric about the line

(A) $x = \frac{3}{2}$ (B) $y = -\frac{3}{2}$ (C) $x = -\frac{3}{2}$ (D) $y = \frac{1}{2}$

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space for rough work

FIITJEE RET – 6

(2017 – 2019)(2ND YEAR_REGULAR)

IIT-2015 (P2)_SET–B

DATE: 30.07.2018

ANSWERS

PHYSICS

1.	**1**	2.	**5**	3.	**2**	4.	**2**
5.	**Bonus**	6.	**3**	7.	**4**	8.	**5**
9.	**B**	10.	**A,B,D**	11.	**A,C**	12.	**A,C,D**
13.	**C**	14.	**A**	15.	**B,C**	16.	**A,B,C,D**
17.	**C**	18.	**C**	19.	**B**	20.	**C**

CHEMISTRY

21.	**1**	22.	**3**	23.	**4 or 5**	24.	**4**
25.	**2**	26.	**3**	27.	**2**	28.	**7**
29.	**B**	30.	**A, B, C**	31.	**Bonus**	32.	**A, B**
33.	**A, D**	34.	**B, C**	35.	**A**	36.	**A, B, D**
37.	**A**	38.	**C**	39.	**A**	40.	**B**

MATHEMATICS

41.	**Bonus**	42.	**3**	43.	**3**	44.	**4**
45.	**0**	46.	**3**	47.	**1**	48.	**4**
49.	**B**	50.	**C**	51.	**B**	52.	**B**
53.	**AC**	54.	**AC**	55.	**ABC**	56.	**AD**
57.	**A**	58.	**C**	59.	**C**	60.	**Bonus**