

Solutions to JEE(Main)-2020

Test Date: 8th January 2020 (Second Shift)

PHYSICS, CHEMISTRY & MATHEMATICS

Paper - 1

Time Allotted: 3 Hours

Maximum Marks: 300

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

Important Instructions:

1. The test is of **3 hours** duration.
2. This **Test Paper** consists of **75** questions. The maximum marks are **300**.
3. There are **three** parts in the question paper A, B, C consisting of **Physics, Chemistry** and **Mathematics** having 25 questions in each part of equal weightage out of which 20 questions are MCQs and 5 questions are numerical value based. Each question is allotted **4 (four)** marks for correct response.
4. **(Q. No. 01 – 20, 26 – 45, 51 – 70)** contains 60 multiple choice questions which have **only one correct answer**. Each question carries **+4 marks** for correct answer and **–1 mark** for wrong answer.
5. **(Q. No. 21 – 25, 46 – 50, 71 – 75)** contains 15 Numerical based questions with answer as numerical value. Each question carries **+4 marks** for correct answer. There is no negative marking.
6. Candidates will be awarded marks as stated above in **instruction No.3** for correct response of each question. One mark will be deducted for indicating incorrect response of each question. No deduction from the total score will be made if no response is indicated for an item in the answer box.
7. There is only one correct response for each question. Marked up more than one response in any question will be treated as wrong response and marked up for wrong response will be deducted accordingly as per **instruction 6** above.

PART – A (PHYSICS)

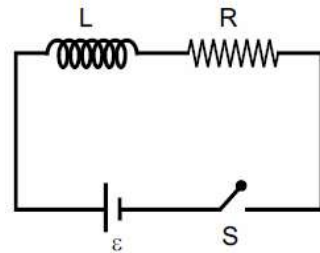
- A simple pendulum is being used to determine the value of gravitational acceleration g at a certain place. The length of the pendulum is 25.0 cm and a stop watch with 1 s resolution measures the time taken for 40 oscillations to be 50 s. The accuracy in g is:

(A) 4.40% (B) 2.40%
(C) 3.40% (D) 5.40%
- A Carnot engine having an efficiency of $\frac{1}{10}$ is being used as a refrigerator. If the work done on the refrigerator is 10 J, the amount of heat absorbed from the reservoir at lower temperature is:

(A) 99 J (B) 100 J
(C) 1 J (D) 90 J
- Consider two charged metallic spheres S_1 and S_2 of radii R_1 and R_2 , respectively. The electric fields E_1 (on S_1) and E_2 (on S_2) on their surfaces are such that $E_1/E_2 = R_1/R_2$. Then the ratio of V_1 (on S_1) / V_2 (on S_2) of the electrostatic potentials on each sphere is:

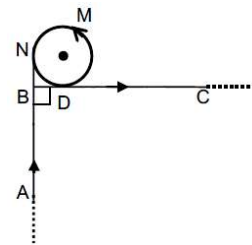
(A) $(R_1/R_2)^2$ (B) $\left(\frac{R_1}{R_2}\right)^3$
(C) (R_2/R_1) (D) R_1/R_2

- As shown in the figure, a battery of emf ϵ is connected to an inductor L and resistance R in series. The switch is closed at $t = 0$. The total charge that flows from the battery, between $t = 0$ and $t = t_c$ (t_c is the time constant of the circuit) is



- (A) $\frac{\epsilon L}{eR^2}$ (B) $\frac{\epsilon L}{R^2} \left(1 - \frac{1}{e}\right)$
(C) $\frac{\epsilon R}{eL^2}$ (D) $\frac{\epsilon L}{R^2}$

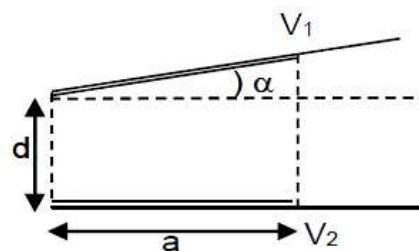
- A very long wire ABADMNDC is shown in figure carrying current I . AB and BC parts are straight, long and at right angle. At D wire forms a circular turn DMND of radius R . AB, BC parts are tangential to circular turn at N and D. Magnetic field at the centre of circle is:



- (A) $\frac{\mu_0 I}{2R}$ (B) $\frac{\mu_0 I}{2\pi R} \left(\pi - \frac{1}{\sqrt{2}}\right)$
(C) $\frac{\mu_0 I}{2\pi R} (\pi + 1)$ (D) $\frac{\mu_0 I}{2\pi R} \left(\pi + \frac{1}{\sqrt{2}}\right)$

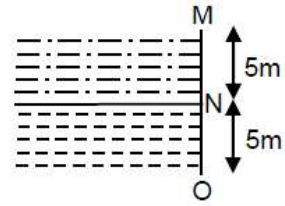
6. A uniform sphere of mass 500 g rolls without slipping on a plane horizontal surface with its centre moving at a speed of 5.00 cm/s. Its kinetic energy is:
 (A) 8.75×10^{-4} J (B) 8.75×10^{-3} J
 (C) 6.25×10^{-4} J (D) 1.13×10^{-3} J
7. In a double-slit experiment, at a certain point on the screen the path difference between the two interfering waves is $\frac{1}{8}$ th of a wavelength. The ratio of the intensity of light at that point to that at the centre of a bright fringe is:
 (A) 0.672 (B) 0.568 (C) 0.760 (D) 0.853
8. A particle of mass m is dropped from a height h above the ground. At the same time another particle of same mass is thrown vertically upwards from the ground with a speed of $\sqrt{2gh}$. If they collide head-on completely inelastically, the time taken for the combined mass to reach the ground, in units of $\sqrt{\frac{h}{g}}$ is:
 (A) $\frac{1}{2}$ (B) $\sqrt{\frac{1}{2}}$ (C) $\sqrt{\frac{3}{4}}$ (D) $\sqrt{\frac{3}{2}}$
9. A particle moves such that its position vector $\vec{r}(t) = \cos \omega \hat{i} + \sin \omega \hat{j}$ where ω is a constant and t is time. Then which of the following statements is true for the velocity $\vec{v}(t)$ and acceleration $\vec{a}(t)$ of the particle:
 (A) \vec{v} is perpendicular to \vec{r} and \vec{a} is directed towards the origin.
 (B) \vec{v} and \vec{a} both are parallel to \vec{r}
 (C) \vec{v} is perpendicular to \vec{r} and \vec{a} is directed away from the origin.
 (D) \vec{v} and \vec{a} both are perpendicular to \vec{r}
10. Consider a mixture of n moles of helium gas and $2n$ moles of oxygen gas (molecules taken to be rigid) as an ideal gas. Its C_p/C_v value will be
 (A) 19/13 (B) 40/27 (C) 67/45 (D) 23/15

11. A capacitor is made of two square plates each of side 'a' making a very small angle α between them, as shown in figure. The capacitance will be close to:

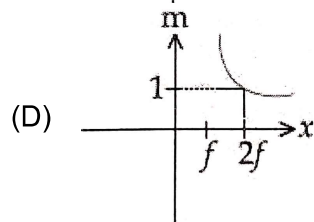
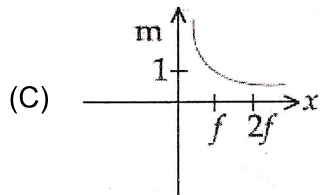
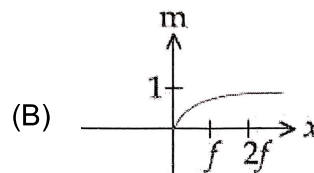
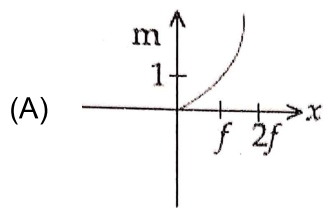


- (A) $\frac{\epsilon_0 a^2}{d} \left(1 + \frac{\alpha a}{d} \right)$ (B) $\frac{\epsilon_0 a^2}{d} \left(1 - \frac{\alpha a}{4d} \right)$
 (C) $\frac{\epsilon_0 a^2}{d} \left(1 - \frac{3\alpha a}{2d} \right)$ (D) $\frac{\epsilon_0 a^2}{d} \left(1 - \frac{\alpha a}{2d} \right)$

12. Two liquids of densities ρ_1 and ρ_2 ($\rho_2 = 2\rho_1$) are filled up behind a square wall of inside 10 m as shown in figure. Each liquid has a height of 5 m. The ratio of the forces due to these liquids exerted on upper part MN to that at the lower part NO is (Assume that the liquids are not mixing):



- (A) 1/2 (B) 1/4
(C) 2/3 (D) 1/3
13. A plane electromagnetic wave of frequency 25 GHz is propagating in vacuum along the z-direction. At a particular point in space and time, the magnetic field is given by $\vec{B} = 5 \times 10^{-8} \hat{j} \text{ T}$. The corresponding electric field \vec{E} is (speed of light $c = 3 \times 10^8 \text{ ms}^{-1}$)
- (A) $-1.66 \times 10^{-16} \hat{i} \text{ V/m}$ (B) $-15 \hat{i} \text{ V/m}$
(C) $15 \hat{i} \text{ V/m}$ (D) $1.66 \times 10^{-16} \hat{i} \text{ V/m}$
14. An electron (mass m) with initial velocity $\vec{v} = v_0 \hat{i} + v_0 \hat{j}$ is in an electric field $\vec{E} = -E_0 \hat{k}$. If λ_0 is initial de-Broglie wavelength of electron, its de-Broglie wavelength at time t is given by
- (A) $\frac{\lambda_0}{\sqrt{1 + \frac{e^2 E_0^2 t^2}{m^2 v_0^2}}}$ (B) $\frac{\lambda_0}{\sqrt{2 + \frac{e^2 E_0^2 t^2}{m^2 v_0^2}}}$ (C) $\frac{\lambda_0 \sqrt{2}}{\sqrt{1 + \frac{e^2 E_0^2 t^2}{m^2 v_0^2}}}$ (D) $\frac{\lambda_0}{\sqrt{1 + \frac{e^2 E_0^2 t^2}{2m^2 v_0^2}}}$
15. A transverse wave travels on a taut steel wire with a velocity of v when tension in it is $2.06 \times 10^4 \text{ N}$. When the tension is changed to T , the velocity changed to $v/2$. The value of T is close to:
- (A) $10.2 \times 10^2 \text{ N}$ (B) $30.5 \times 10^4 \text{ N}$
(C) $5.15 \times 10^3 \text{ N}$ (D) $2.50 \times 10^4 \text{ N}$
16. An object is gradually moving away from the focal point of a concave mirror along the axis of the mirror. The graphical representation of the magnitude of linear magnification (m) versus distance of the object from the mirror (x) is correctly given by (Graphs are drawn schematically and are not to scale)



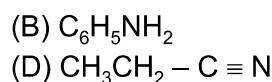
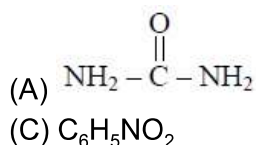
21. A ball is dropped from the top of a 100 m high tower on a planet. In the last $\frac{1}{2}$ s before hitting the ground, it covers a distance of 19 m. Acceleration due to gravity (in ms^{-2}) near the surface on that planet is _____.
22. The first member of the Balmer series of hydrogen atom has a wavelength of 6561 Å. The wavelength of the second member of the Balmer series (in nm) is _____.
23. The series combination of two batteries, both of the same emf 10 V, but different internal resistance of 20Ω and 5Ω , is connected to the parallel combination of two resistors 30Ω and $R \Omega$. The voltage difference across the battery of internal resistance 20Ω is zero, the value of R (in Ω) is _____.
24. An asteroid is moving directly towards the centre of the earth. When at a distance of $10R$ (R is the radius of the earth) from the earth's centre, it has a speed of 12 km/s. Neglecting the effect of earth's atmosphere, what will be the speed of the asteroid when it hits the surface of the earth (escape velocity from the earth is 11.2 km/s)? Give your answer to the nearest integer in kilometer/s _____.
25. Three containers C_1 , C_2 and C_3 have water at different temperatures. The table below shows the final temperature T when different amounts of water (given in liters) are taken from each container and mixed (assume no loss of heat during the process)

C_1	C_2	C_3	T
1 l	2 l	—	60°C
—	1 l	2 l	30°C
2 l	—	1 l	60°C
1 l	1 l	1 l	θ

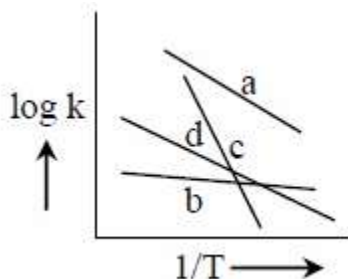
The value of θ (in $^\circ\text{C}$ to the nearest integer) is _____.

PART –B (CHEMISTRY)

26. The increasing order of the atomic radii of the following elements is:
 (a) C (b) O (c) F (d) Cl (e) Br
 (A) (a) < (b) < (c) < (d) < (e) (B) (d) < (c) < (b) < (a) < (e)
 (C) (c) < (b) < (a) < (d) < (e) (D) (b) < (c) < (d) < (a) < (e)
27. Kjeldahl's method cannot be used to estimate nitrogen for which of the following compounds?

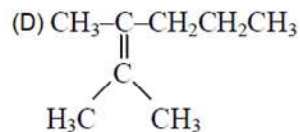
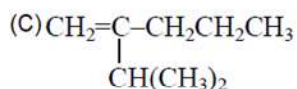
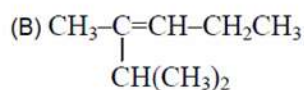
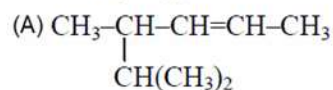
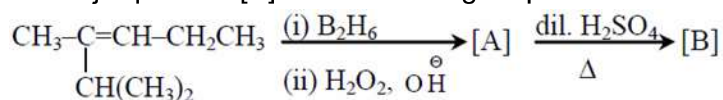


28. Consider the following plots of rate constant versus $\frac{1}{T}$ for four different reactions. Which of the following order is correct for the activation energies of these reactions?

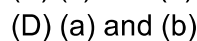
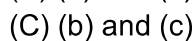
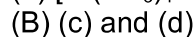
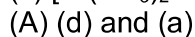
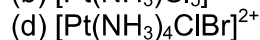
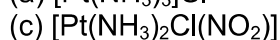
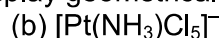
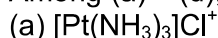


- (A) $E_c > E_a > E_d > E_b$ (B) $E_b > E_d > E_c > E_a$
 (C) $E_a > E_c > E_d > E_b$ (D) $E_b > E_a > E_d > E_c$
29. For the following Assertion and Reason, the correct option is :
- Assertion :** The pH of water increase with increase in temperature.
Reason : The dissociation of water into H^+ and OH^- is an exothermic reaction
- (A) assertion is not true, but reason is true
 (B) both assertion and reason are false
 (C) but the reason is not the correct explanation for the assertion
 (D) both assertion and reason are true, and the reason is the correct explanation for the assertion
30. White phosphorus on reaction with concentrated NaOH solution in an inert atmosphere of CO_2 gives phosphine and compound (X). (X) on acidification with HCl gives compound (Y). The basicity of compound (Y) is :
- (A) 2 (B) 4
 (C) 3 (D) 1

31. The major product [B] in the following sequence is :



32. Among (a) – (d), the complexes that can display geometrical isomerism are:



33. For the following Assertion and Reason, the correct option is :

Assertion: For hydrogenation reactions, the catalytic activity increases from Group 5 to Group 11 metals with maximum activity shown by Group 7-9 elements.

Reason : The reactants are most strongly adsorbed on group 7-9 elements. Both assertion and reason are true and the reason is the correct

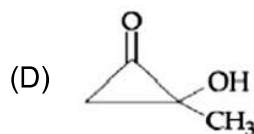
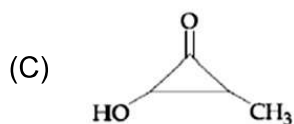
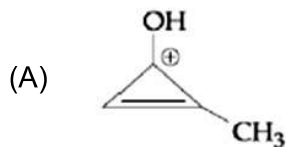
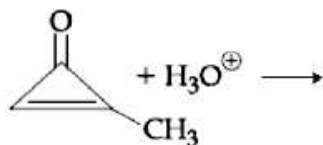
(A) Assertion is not true, but reason is true

(B) Both assertion and reason are false

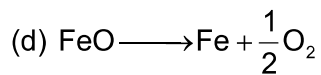
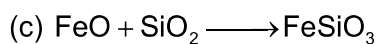
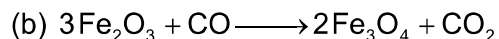
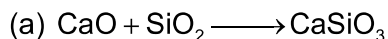
(C) but the reason is not the correct explanation for the assertion

(D) Both assertion and reason are true, and the reason is the correct explanation for the assertion

34. The major product in the following reaction is



35. Among the reactions (a)-(d), the reaction(s) that does/do not occur in the blast furnace during the extraction of iron is/are:



(A) (c) and (d)

(B) (a)

(C) (a) and (d)

(D) (d)

36. A metal (A) on heating in nitrogen gas gives compound B. B on treatment with H_2O gives a colourless gas which when passed through CuSO_4 solution gives a dark blue-violet coloured solution. A and B respectively, are:

(A) Mg and $\text{Mg}(\text{NO}_3)_2$

(B) Na and NaNO_3

(C) Mg and Mg_3N_2

(D) Na and Na_3N

37. Two monomers in maltose are:

(A) α -D-glucose and α -D-galactose

(B) α -D-glucose and β -D-glucose

(C) α -D-glucose and α -D-glucose

(D) α -D-glucose and α -D-Fructose

38. The correct order of the calculated spin-only magnetic moments of complexes (A) to (D) is :

(a) $\text{Ni}(\text{CO})_4$

(b) $[\text{Ni}(\text{H}_2\text{O})_6]\text{Cl}_2$

(c) $\text{Na}_2[\text{Ni}(\text{CN})_4]$

(d) $\text{PdCl}_2(\text{PPh}_3)_2$

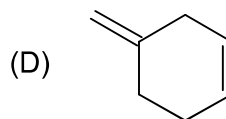
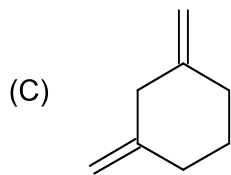
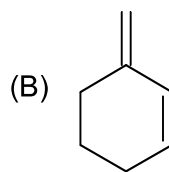
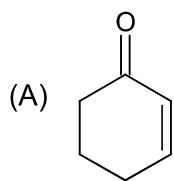
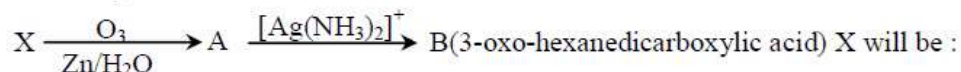
(A) (c) \approx (d) < (b) < (a)

(B) (a) \approx (c) < (b) \approx (d)

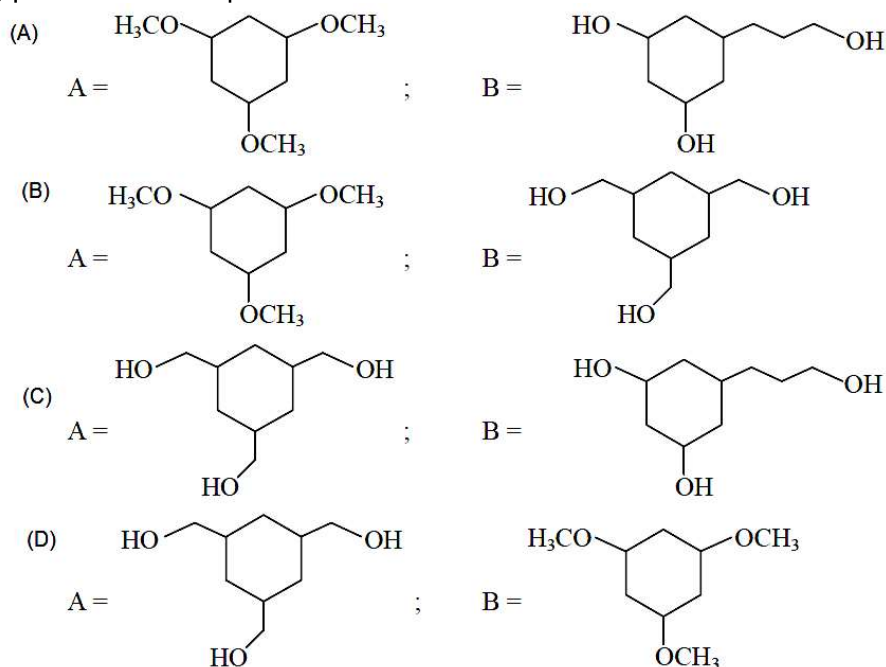
(C) (a) \approx (c) \approx (d) < (b)

(D) (c) < (d) < (b) < (a)

39. An unsaturated hydrocarbon X absorbs two hydrogen molecules on catalytic hydrogenation, and also gives following reaction:



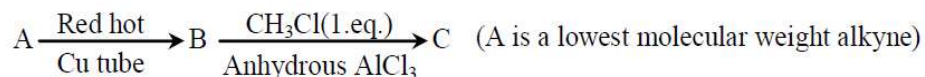
40. Hydrogen has three isotopes (a), (b) and (c). If the number of neutron(s) in (a), (b) and (c) respectively, are (x), (y) and (z), the sum of (x), (y) and (z) is:
 (A) 4 (B) 3
 (C) 2 (D) 1
41. Which of the following compound is likely to show both Frenkel and Schottky defects in its crystalline form?
 (A) CsCl (B) AgBr
 (C) ZnS (D) KBr
42. Arrange the following bonds according to their average bond energies in descending order:
 C-Cl, C-Br, C-F, C-I
 (A) C-F > C-Cl > C-Br > C-I (B) C-I > C-Br > C-Cl > C-F
 (C) C-Cl > C-Br > C-I > C-F (D) C-Br > C-I > C-Cl > C-F
43. Preparation of Bakelite proceeds via reactions:
 (A) Electrophilic substitution and dehydration
 (B) Condensation and elimination
 (C) Electrophilic addition and dehydration
 (D) Nucleophilic addition and dehydration
44. The radius of the second Bohr orbit, in terms of the Bohr radius, a_0 , in Li^{2+} is
 (A) $\frac{4a_0}{3}$ (B) $\frac{2a_0}{9}$
 (C) $\frac{2a_0}{3}$ (D) $\frac{4a_0}{9}$
45. Among the compounds A and B with molecular formula $\text{C}_9\text{H}_{18}\text{O}_3$, A is having higher boiling point than B. The possible structures of A and B are:



46. Complexes (ML_5) of metals Ni and Fe have ideal square pyramidal and trigonal bipyramidal geometries, respectively. The sum of the 90° , 120° and 180° L-M-L angles in the two complexes is _____

47. At constant volume, 4 mol of an ideal gas when heated from 300 K to 500 K changes its internal energy by 5000 J. The molar heat capacity at constant volume is _____

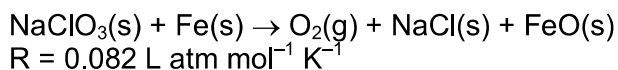
48. In the following sequence of reactions the maximum number of atoms present in molecule 'C' in one plane is



49. For an electrochemical cell $\text{Sn(s)}|\text{Sn}^{2+}(\text{aq}, 1\text{M})||\text{Pb}^{2+}(\text{aq}, 1\text{M})|\text{Pb(s)}$ the ratio $\frac{[\text{Sn}^{2+}]}{[\text{Pb}^{2+}]}$ when this cell attains equilibrium is _____.

$$\left(\text{Given: } E_{\text{Sn}^{2+}|\text{Sn}}^0 = -0.14\text{V}, E_{\text{Pb}^{2+}|\text{Pb}}^0 = -0.13\text{V}, \frac{2.303RT}{F} = 0.06 \right)$$

50. NaClO_3 is used, even in spacecraft, to produce O_2 . The daily consumption of pure O_2 by a person is 492L at 1 atm, 300 K. How much amount of NaClO_3 , in grams, is required to produce O_2 for the daily consumption of a person at 1 atm, 300 K? .



$$R = 0.082 \text{ L atm mol}^{-1} \text{ K}^{-1}$$

PART-C (MATHEMATICS)

51. If the 10th term of an A.P. is $\frac{1}{20}$ and its 20th term is $\frac{1}{10}$, then the sum of its first 200 terms is:
- (A) 100 (B) $50\frac{1}{4}$
(C) $100\frac{1}{2}$ (D) 50
52. Which of the following statement is a tautology?
- (A) $\sim(p \wedge \sim q) \rightarrow p \vee q$ (B) $\sim(p \vee \sim q) \rightarrow p \vee q$
(C) $p \vee (\sim q) \rightarrow p \wedge q$ (D) $\sim(p \vee \sim q) \rightarrow p \wedge q$
53. The mean and variance of 20 observations are found to be 10 and 4, respectively. On rechecking, it was found that an observation 9 was incorrect and the correct observation was 11. Then the correct variance is:
- (A) 4.02 (B) 3.98
(C) 4.01 (D) 3.99
54. The mirror image of the point (1, 2, 3) in a plane is $\left(-\frac{7}{3}, -\frac{4}{3}, -\frac{1}{3}\right)$. Which of the following points lies on this plane?
- (A) (1, -1, 1) (B) (1, 1, 1)
(C) (-1, -1, -1) (D) (-1, -1, 1)
55. If a hyperbola passes through the point P (10, 16) and it has vertices at $(\pm 6, 0)$ then the equation of the normal to it at P is:
- (A) $2x + 5y = 100$ (B) $x + 3y = 58$
(C) $3x + 4y = 94$ (D) $x + 2y = 42$
56. If a line, $y = mx + c$ is a tangent to the circle, $(x - 3)^2 + y^2 = 1$ and it is perpendicular to a line L_1 , where L_1 is the tangent to the circle, $x^2 + y^2 = 1$ at the point $\left(\frac{1}{\sqrt{2}}, \frac{1}{\sqrt{2}}\right)$; then:
- (A) $c^2 + 7c + 6 = 0$ (B) $c^2 - 6c + 7 = 0$
(C) $c^2 + 6c + 7 = 0$ (D) $c^2 - 7c + 6 = 0$
57. The area (in sq. units) of the region $\{(x, y) \in \mathbb{R}^2 \mid y \leq 3 - 2x\}$, is
- (A) $\frac{32}{3}$ (B) $\frac{29}{3}$
(C) $\frac{31}{3}$ (D) $\frac{34}{3}$

64. If α and β be the coefficients of x^4 and x^2 respectively in the expansion of $(x + \sqrt{x^2 - 1})^6 + (x - \sqrt{x^2 - 1})^6$, then:
- (A) $\alpha + \beta = -30$ (B) $\alpha - \beta = 60$
(C) $\alpha - \beta = -132$ (D) $\alpha + \beta = 60$
65. The differential equation of the family of curves, $x^2 = 4b(y + b)$, $b \in \mathbb{R}$, is:
- (A) $xy'' = y'$ (B) $x(y')^2 = x - 2yy'$
(C) $x(y')^2 = x + 2yy'$ (D) $x(y')^2 = 2yy' - x$
66. The length of the perpendicular from the origin, O on the normal to the curve, $x^2 + 2xy - 3y^2 = 0$ at the point $(2, 2)$ is:
- (A) $2\sqrt{2}$ (B) $4\sqrt{2}$
(C) $\sqrt{2}$ (D) 2
67. If $A = \begin{pmatrix} 2 & 2 \\ 9 & 4 \end{pmatrix}$ and $I = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$, then $10A^{-1}$ is equal to:
- (A) $4I - A$ (B) $A - 6I$
(C) $A - 4I$ (D) $6I - A$
68. Let A and B be two events such that the probability that exactly one of them occurs is $\frac{2}{5}$ and the probability that A or B occurs is $\frac{1}{2}$, then the probability of both of them occur together is:
- (A) 0.01 (B) 0.10
(C) 0.20 (D) 0.02
69. If $I = \int_1^2 \frac{dx}{\sqrt{2x^3 - 9x^2 + 12x + 4}}$, then:
- (A) $\frac{1}{16} < I^2 < \frac{1}{9}$ (B) $\frac{1}{9} < I^2 < \frac{1}{8}$
(C) $\frac{1}{8} < I^2 < \frac{1}{4}$ (D) $\frac{1}{6} < I^2 < \frac{1}{2}$
70. Let S be the set of all real roots of the equation, $3^x(3^x - 1) + 2 = |3^x - 1| + |3^x - 2|$. Then S :
- (A) contains at least four elements (B) is a singleton
(C) is an empty set (D) contains exactly two elements

71. Let $f(x)$ be a polynomial of degree 3 such that $f(-1) = 10$, $f(1) = -6$, $f(x)$ has a critical point at $x = -1$ and $f'(x)$ has a critical point at $x = 1$. Then $f(x)$ has a local minima at $x =$ _____.
72. Let a line $y = mx$ ($m > 0$) intersect the parabola, $y^2 = x$ at a point P, other than the origin. Let the tangent to it at P meet the x – axis at the point Q. If area (ΔOPQ) = 4 sq. units, then m is equal to _____.
73. The sum $\sum_{n=1}^7 \frac{n(n+1)(2n+1)}{4}$ is equal to _____.
74. The number of 4 letter words (with or without meaning) that can be formed from the eleven letters of the word 'EXAMINATION' is _____.
75. If $\frac{\sqrt{2} \sin \alpha}{\sqrt{1 + \cos 2\alpha}} = \frac{1}{7}$ and $\sqrt{\frac{1 - \cos 2\beta}{2}} = \frac{1}{\sqrt{10}}$, $\alpha, \beta \in \left(0, \frac{\pi}{2}\right)$, then $\tan(\alpha + 2\beta)$ is equal to _____.

JEE (Main) – 2020

ANSWERS

PART –A (PHYSICS)

1.	A	2.	D	3.	A	4.	A
5.	D	6.	A	7.	D	8.	D
9.	A	10.	A	11.	D	12.	B
13.	C	14.	A	15.	C	16.	D
17.	D	18.	B	19.	A	20.	A
21.	8.00 or 2888.00			22.	486	23.	30
24.	16	25.	50				

PART –B (CHEMISTRY)

26.	C	27.	C	28.	A	29.	B
30.	D	31.	D	32.	B	33.	A
34.	A	35.	A	36.	C	37.	C
38.	C	39.	D	40.	B	41.	B
42.	A	43.	A	44.	A	45.	D
46.	20.00	47.	6.25	48.	13.00	49.	2.15
50.	2130.00						

PART-C (MATHEMATICS)

51.	C	52.	B	53.	D	54.	B
55.	A	56.	C	57.	A	58.	NA
59.	A	60.	B	61.	B	62.	A
63.	C	64.	C	65.	C	66.	A
67.	B	68.	B	69.	B	70.	B
71.	3	72.	0.5	73.	504	74.	2454
75.	1						