

FIITJEE SAMPLE PAPER

(Big Bang Edge Test / Talent Recognition Exam-2020)
for students presently in
Class 11 (Paper 2)



Time: 3 Hours (1:45 pm – 4:45 pm)

Code 1111

Maximum Marks: 234

Instructions:

Caution: Class, Paper, Code as given above **MUST** be correctly marked on the answer OMR sheet before attempting the paper. Wrong Class, Paper or Code will give wrong results.

1. You are advised to devote 45 Minutes on Section-I and 135 Minutes on Section-II.
2. This Question paper consists of 2 sections. Marking scheme is given in table below:

Section	Subject	Question no.	Marking Scheme for each question	
			correct answer	wrong answer
SECTION – I	PHYSICS (PART-A)	1 to 9	+2	-0.5
	CHEMISTRY (PART-B)	10 to 18	+2	-0.5
	MATHEMATICS (PART-C)	19 to 27	+2	-0.5
SECTION – II	PHYSICS (PART-A)	28 to 41	+3	-1
	CHEMISTRY (PART-B)	42 to 55	+3	-1
	MATHEMATICS (PART-C)	56 to 69	+3	-1
	PHYSICS (PART-D)	70 to 75	+3	0
	CHEMISTRY (PART-E)	76 to 81	+3	0
	MATHEMATICS (PART-F)	82 to 87	+3	0

3. Answers have to be marked on the OMR sheet. The Question Paper contains blank spaces for your rough work. No additional sheets will be provided for rough work.
4. Blank papers, clip boards, log tables, slide rule, calculator, cellular phones, pagers and electronic devices, in any form, are not allowed.
5. Before attempting paper write your OMR Answer Sheet No., Registration Number, Name and Test Centre in the space provided at the bottom of this sheet.
6. See method of marking of bubbles at the back of cover page for question no. 70 to 87.

Note: Please check this Question Paper contains all **87** questions in serial order. If not so, exchange for the correct Question Paper.

OMR Answer Sheet No. : _____
Registration Number : _____
Name of the Candidate : _____
Test Centre : _____

For questions **70 to 87**

Numerical based questions single digit answer 0 to 9

Example 1:

If answer is 6.

Correct method:

① ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

Example 2:

If answer is 2.

Correct method:

① ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

SAMPLE PAPER

Recommended Time: 45 Minutes for Section – I

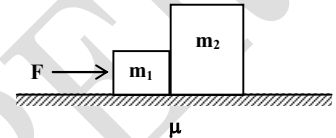
Section – I

PHYSICS – (PART – A)

This part contains **9 Multiple Choice Questions** number **1 to 9**. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.

1. If μ is the coefficient of friction between each block and floor then find the minimum value of F to move the system

- (A) $\mu m_1 g$ (B) $\mu m_2 g$
 (C) $\mu(m_1 + m_2)g$ (D) $\mu(m_1 - m_2)g$



2. A body moves 4 m towards east then 3m north. The displacement and distance covered by the body are

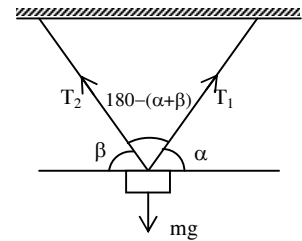
- (A) 7m, 6m (B) 6m, 5m
 (C) 5m, 7m (D) 4m, 3m

3. The dimensions of pressure gradient for a liquid in a cylinder is

- (A) $ML^{-2}T^{-2}$ (B) $ML^{-2}T^{-1}$ (C) $ML^{-1}T^{-1}$ (D) $ML^{-1}T^2$

4. A body of mass m is suspended by two strings making angles α and β with the horizontal. Find the tension in the strings.

- (A) $T_1 = \frac{mg \cos \beta}{\sin(\alpha + \beta)} = T_2$
 (B) $T_1 = T_2 = \frac{mg \sin \beta}{\sin(\alpha + \beta)}$
 (C) $T_1 = \frac{mg \cos \beta}{\sin(\alpha + \beta)}$, $T_2 = \frac{mg \cos \alpha}{\sin(\alpha + \beta)}$
 (D) none of these



Space for Rough Work

SAMPLE PAPER-BBE/TRE-2020-C-XI (Paper-2)-PCM-4

5. Error in the measurement of radius of a sphere is 1%. Then the error in the measurement of volume is
(A) 1% (B) 5%
(C) 3% (D) 8 %
6. The velocity of projection of an oblique projectile is: $\vec{v} = 3\hat{i} + 2\hat{j}$ (in m/s). The speed of the projectile at the highest point of the trajectory is,
(A) 3 ms^{-1} (B) 2 ms^{-1}
(C) 1 ms^{-1} (D) zero
7. A body is acted upon by a force which is inversely proportional to the distance covered. The work done will be proportional to:
(A) s (B) s^2
(C) \sqrt{s} (D) None of the above
8. On a horizontal frictionless frozen lake, a girl (36 kg) and a box (9 kg) are connected to each other by means of a rope. Initially they are 20 m apart. The girl exerts a horizontal force on the box, pulling it towards her. How far has the girl travelled when she meets the box?
(A) 10 m
(B) Since there is not friction, the girl will not move
(C) 16 m
(D) 4 m
9. A 750 W motor drives a pump which lifts 300 litres of water per minute to a height of 6 meters. The efficiency of the motor is nearly (take acceleration due to gravity to be 10 m/s^2)
(A) 30% (B) 40%
(C) 50% (D) 20%

Space for Rough Work

CHEMISTRY – (PART – B)

This part contains **9 Multiple Choice Questions** number **10 to 18**. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.

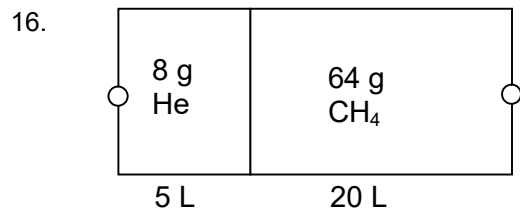
10. How many maximum number of electrons of an atom will have the following set of quantum numbers?
 $n = 4, \ell = 0, 1, 2, m = 0, \pm 1, s = +\frac{1}{2}$
- (A) 18
(B) 7
(C) 14
(D) 9
11. What will be the molarity of 36.5 mass % solution of HCl? The density of the solution is 0.8 g/mL at a certain temperature.
- (A) 0.008 M
(B) 0.8 M
(C) 8 M
(D) 80 M
12. Atoms having which of the following outermost electronic configuration has the highest value of electron gain enthalpy or electron affinity?
- (A) ns^2np^3
(B) ns^2np^2
(C) $(n + 1)s^2(n + 1)p^3$
(D) ns^2np^1
13. The R.M.S velocity of a monoatomic gas was x m/s at T Kelvin. When the temperature is reduced to half of its original value, the atoms dimerise to molecules. What will be the new R.M.S velocity in m/s unit?
- (A) $\frac{x}{4}$
(B) $\frac{x}{2}$
(C) $\frac{x}{\sqrt{2}}$
(D) $4x$

Space for Rough Work

SAMPLE PAPER-BBE/TRE-2020-C-XI (Paper-2)-PCM-6

14. In which of the following molecule the lone pair of the central atom is the most penetrated towards its nucleus or strongly attracted by the nucleus?
(A) NH_3 (B) PH_3
(C) AsH_3 (D) BiH_3

15. In which of the following option, the second ionization energy is given in the correct order.
(A) $\text{B} > \text{Be}$ (B) $\text{N} > \text{O}$
(C) $\text{Mg} > \text{Na}$ (D) $\text{C} > \text{O}$



In the above arrangement the 5 L container contains He and the 20 L container contains CH_4 at constant temperature. What will be the rate of effusion of He to CH_4 through the two identical orifices?

- (A) 2 : 1 (B) 4 : 1
(C) 1 : 1 (D) 1 : 2
17. Which of the following contains the strongest B – F bond?
(A) BF_3 (B) BF_4^-
(C) HBF_4 (D) KBF_4
18. The orbital angular momentum vector of which electron of chromium, splits into five components if a magnetic field is applied?
(A) 11th electron (B) 21st electron
(C) 18th electron (D) 10th electron

Space for Rough Work

MATHEMATICS – (PART – C)

This part contains **9 Multiple Choice Questions** number **19 to 27**. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.

19. Two finite sets have m and n elements. The number of subsets of the first set is 112 more than that of the second set. The values of m and n are, respectively
 (A) 4, 7 (B) 7, 4
 (C) 4, 4 (D) 7, 7
20. If $\alpha \neq \beta$ but $\alpha^2 = 5\alpha - 3$ and $\beta^2 = 5\beta - 3$, then the equation with roots $\frac{\alpha}{\beta}, \frac{\beta}{\alpha}$ is
 (A) $3x^2 - 25x + 3 = 0$ (B) $x^2 + 5x - 3 = 0$
 (C) $x^2 - 5x + 3 = 0$ (D) $3x^2 - 19x + 3 = 0$
21. $\sum_{r=2}^{43} \frac{1}{\log_r n} =$
 (A) $\log_n 43$ (B) \log_{43n}
 (C) $\log_{43!} n$ (D) $\frac{1}{\log_{43!} n}$
22. If $x > 1, y > 1, z > 1$ are in G.P., then $\frac{1}{1 + \ln x}, \frac{1}{1 + \ln y}, \frac{1}{1 + \ln z}$ are in
 (A) A.P. (B) G.P.
 (C) H.P. (D) none of these

Space for Rough Work

SAMPLE PAPER-BBE/TRE-2020-C-XI (Paper-2)-PCM-8

23. If $\frac{\cos \theta}{p} = \frac{\sin \theta}{q}$, then $\frac{p}{\sec 2\theta} + \frac{q}{\operatorname{cosec} 2\theta} =$
(A) p (B) q
(C) pq (D) $\frac{p}{q}$
24. $\int \left(x + \frac{1}{x}\right)^{3/2} \left(\frac{x^2 - 1}{x^2}\right) dx$ is equal to
(A) $\frac{5}{2} \left(x + \frac{1}{x}\right)^{5/2} + c$ (B) $\frac{2}{5} \left(x + \frac{1}{x}\right)^{5/2} + c$
(C) $2 \left(x + \frac{1}{x}\right)^{1/2} + c$ (D) none of these
25. If $\langle a_n \rangle$ is an A.P. and $a_1 + a_4 + a_7 + \dots + a_{16} = 147$, then $a_1 + a_6 + a_{11} + a_{16} =$
(A) 96 (B) 98
(C) 100 (D) none of these
26. The equation of the acute angle between the lines $3x - 4y + 7 = 0$ and $12x + 5y - 2 = 0$ is
(A) $21x + 77y - 101 = 0$ (B) $11x + 3y + 20 = 0$
(C) $21x - 7y + 3 = 0$ (D) $11x - 3y + 9 = 0$
27. Orthocentre of triangle with vertices $(0, 0)$, $(3, 4)$ and $(4, 0)$ is
(A) $(3, 5/4)$ (B) $(3, 12)$
(C) $(3, 3/4)$ (D) $(3, 9)$

Space for Rough Work

Recommended Time: 135 Minutes for Section – II

Section – II

PHYSICS – (PART – A)

This part contains **14 Multiple Choice Questions** number **28 to 41**. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.

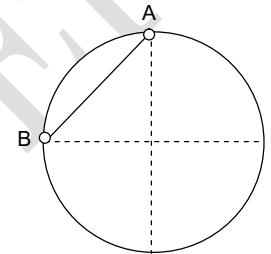
28. Two beads A and B of equal mass are connected by a light inextensible cord. They are constrained to move on a frictionless ring in vertical plane. The beads are released from rest as shown in figure. The tension in the cord just after the release is

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

(B) $\sqrt{2} mg$

(C) $\frac{mg}{2}$

(D) $\frac{mg}{\sqrt{2}}$



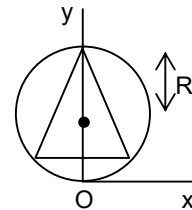
29. From a uniform disc of radius R an equilateral triangle of side $\sqrt{3}R$ is removed as shown. Find out the centre of mass of the remaining figure.

(A) (0, 0)

(B) (0, R)

(C) (R, 0)

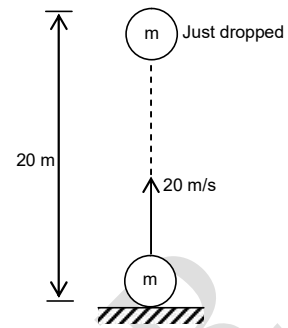
(D) $\left(0, \frac{\sqrt{3}}{2R}\right)$



Space for Rough Work

30. The mass collide in air stick together. After how much time combined mass will fall to the ground (calculate the time from the starting when the motion was started)

- (A) $(1 + \sqrt{2})s$
 (B) $2\sqrt{2}s$
 (C) $(2 + \sqrt{2})s$
 (D) none of these



31. If vectors P, Q and R have magnitude 5, 12 and 13 units and $\vec{P} + \vec{Q} = \vec{R}$, the angle between Q and R is

- (A) $\cos^{-1} \frac{5}{12}$ (B) $\cos^{-1} \frac{5}{13}$
 (C) $\cos^{-1} \frac{12}{13}$ (D) $\cos^{-1} \frac{7}{13}$

32. A spring has a length l_1 when tension in it is n_1 (in N). It has a length l_2 when tension is n_2 (in N). Find its spring constant :

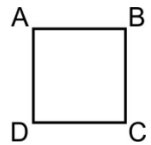
- (A) $\frac{(n_2 l_2 - n_1 l_1)}{(l_1 - l_2)}$ (B) $\frac{(n_1 - n_2)}{(l_1 - l_2)}$
 (C) $\frac{(n_2 - n_1)}{(l_1 - l_2)}$ (D) $\frac{(n_1 l_1 - n_2 l_2)}{(l_1 - l_2)}$

Space for Rough Work

33. A person walking at the rate of 3km/hour, the rain appears to fall vertically when he increase his to speed 6 km/hr it appears to meet him at angle of 45^0 with vertical. The speed of rain is
- (A) $3\sqrt{2}$ km / hr (B) $\frac{3}{\sqrt{2}}$ km / hr
 (C) $6\sqrt{2}$ km / hr (D) $2\sqrt{3}$ km / hr

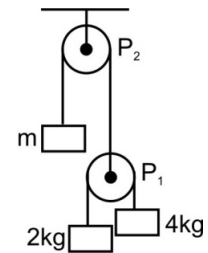
34. Force acting on a particle moving in a straight line varies with the velocity of the particle as $F = \frac{K}{v}$. Here, K is a constant. The work done by this force in time t is:
- (A) $\frac{K}{v^2} \cdot t$ (B) $2Kt$
 (C) Kt (D) $\frac{2Kt}{v^2}$

35. Four identical particles are placed at the corners of a square of side ℓ . If at $t = 0$ all the particles start moving simultaneously with speed v towards each other i.e. A towards B, B towards C and so on. Find the time after which they will combine together



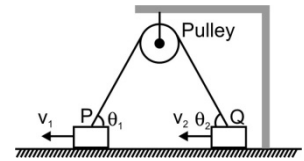
- (A) $\frac{\ell}{v}$ (B) $\frac{\ell}{\sqrt{2}v}$
 (C) $\frac{\sqrt{2}\ell}{v}$ (D) $\frac{2\ell}{v}$

36. For what value of m (in kg), the pulley P_1 remains at rest.
- (A) 6
 (B) 2
 (C) 10.66
 (D) 5.33

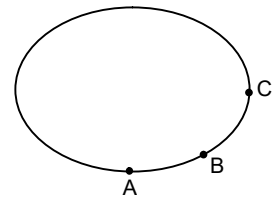


Space for Rough Work

37. In the figure shown, block P and Q move towards left with velocity v_1 and v_2 along horizontal direction respectively, then the ratio of $\frac{v_1}{v_2}$ will be



- (A) $\frac{\cos \theta_1}{\cos \theta_2}$ (B) $\frac{\cos \theta_2}{\cos \theta_1}$
 (C) $\frac{\sin \theta_2}{\sin \theta_1}$ (D) $\frac{\sin \theta_1}{\sin \theta_2}$
38. If a particle moves in such a way that its position vector \vec{r} is given as $\vec{r} = 5[\cos(5t^2)\hat{i} + \sin(5t^2)\hat{j}]$ then
 (A) The magnitude of total acceleration is constant
 (B) The speed is constant
 (C) magnitude of tangential acceleration is constant
 (D) The magnitude of tangential acceleration is zero
39. An object of mass 40 kg and having velocity 4 m/s collides with another object of mass 60 kg, having velocity 2 m/s in the same direction. The loss of energy when the collision is perfectly inelastic is
 (A) 392 J (B) 440J
 (C) 48 J (D) 110J
40. A particle of mass M is moving in a horizontal circle of radius R with uniform speed V. When it moves from one point to a diametrically opposite point its:
 (A) momentum does not change (B) momentum change by 2MV
 (C) KE changes by MV^2 (D) KE changes by $(1/4)MV^2$
41. A particle is moving on an elliptical path as shown, speed of the particle is constant. Its acceleration is maximum at
 (A) A (B) B
 (C) C (D) same everywhere



Space for Rough Work

CHEMISTRY – (PART – B)

This part contains **14 Multiple Choice Questions** number **42 to 55**. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.

42. According to Bohr's theory, the radius of orbits of H or H-like species is expressed as

$$r_n \propto \frac{n^2}{Z}$$

$$\text{or, } r_n = K \times \frac{n^2}{Z}$$

The constant K is given as:

(A) $\frac{h^2}{2\pi^2me^4}$

(B) $\frac{h^2}{4\pi^2me^2}$

(C) $\frac{2\pi^2me^4}{h^2}$

(D) $\frac{4\pi^2me^2}{h^2}$

- 43.

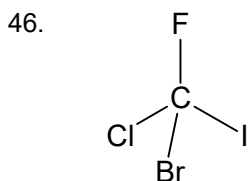
P	Q	R	S	T	U	V
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A part of a period of the periodic table is given above. It contains only successive representative elements which display regular variation in properties. Choose the correct statement.

- (A) R⁻, Q, S²⁺ and P⁺ are isoelectronic species
 (B) The period can contain a maximum number of 18 elements
 (C) The most electronegative element of the period is the smallest atom of the period
 (D) The ionization energy of R is higher than that of U
44. Phosphorus undergoes sp³d hybridization in a series of its compounds containing F and Cl atoms. Choose the correct statement.
- (A) The dipole moment of PF₂Cl₃ is higher than that of PF₃Cl₂
 (B) Phosphorus displays maximum electronegativity in PF₂Cl₃ as compared to other compounds like PF₃Cl₂, PF₄Cl etc.
 (C) The crystal structure of PCl₂F₃ contains [PCl₄]⁺ and [PF₆]⁻
 (D) The bond angle ∠ClPFI in PFCl₄ is 180°

Space for Rough Work

45. What is the oxidation number of lithium in Li_2 molecule?
 (A) +1 (B) -1
 (C) zero (D) +1 or -1



The largest bond angle observed in the above molecule is:

- (A) $\angle \text{FCCI}$ (B) $\angle \text{ICBr}$
 (C) $\angle \text{CICBr}$ (D) $\angle \text{CICI}$
47. 0.98g of a polybasic acid (mol.mass = 98) requires 30 mL of 0.5 M $\text{Ba}(\text{OH})_2$ for complete neutralization. What is the basicity of the acid?
 (A) 4 (B) 2
 (C) 3 (D) 1
48. In which of the following reaction, the equivalent mass of MnO_4^- has the highest value?
 (A) $2\text{MnO}_4^- + 5\text{C}_2\text{O}_4^{2-} + 16\text{H}^+ \longrightarrow 2\text{Mn}^{2+} + 10\text{CO}_2 + 8\text{H}_2\text{O}$
 (B) $8\text{MnO}_4^- + 3\text{S}_2\text{O}_3^{2-} + \text{H}_2\text{O} \longrightarrow 8\text{MnO}_2 + 6\text{SO}_4^{2-} + 2\text{OH}^-$
 (C) $2\text{MnO}_4^- \longrightarrow \text{MnO}_4^{2-} + \text{MnO}_2 + \text{O}_2$
 (D) $2\text{MnO}_4^- + 5\text{SO}_3^{2-} + 6\text{H}^+ \longrightarrow 2\text{Mn}^{2+} + 5\text{SO}_4^{2-} + 3\text{H}_2\text{O}$
49. Which of the following molecule has the lowest value of 'a' (van der Waal's constant)?
 (A) C_2H_4 (B) N_2
 (C) CO (D) B_2H_6 (At. wt. of B = 11)
50. In which state a chlorine atom contains five unpaired electrons?
 (A) Ground state (B) First excited state
 (C) Second excited state (D) Third excited state

Space for Rough Work

51. According to de-Broglie law, the wavelength of a particle is equal to
(A) $E\nu$ (B) $\frac{h}{p}$
(C) $\frac{mv^2}{r}$ (D) mc^2
52. Which of the following molecule has the highest lattice energy?
[Assume the coordination number and Madelung constant for the compounds have same values]
(A) CaO (B) MgO
(C) Al_2O_3 (D) BaO
53. Under which of the following conditions, the density of an ideal gas has maximum value?
(A) 3 atm and 400 K (B) 4 atm and 800 K
(C) 1 atm and 100 K (D) 2 atm and 400 K
54. How many elements are present in the shortest period of the periodic table?
(A) 8 (B) 10
(C) 2 (D) 18
55. Which of the following concentration term does **NOT** depend on temperature?
(A) Molarity (B) Molality
(C) Formality (D) Normality

Space for Rough Work

MATHEMATICS – (PART – C)

This part contains **14 Multiple Choice Questions** number **56 to 69**. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.

56. If x_1, x_2, x_3 as well as y_1, y_2, y_3 are in G.P. with the same common ratio, then the points $(x_1, y_1), (x_2, y_2)$ and (x_3, y_3)
- (A) lie on a straight line
(B) lie on an ellipse
(C) lie on a circle
(D) are vertices of a triangle
57. The diagonals of a parallelogram PQRS are along the lines $x + 3y = 4$ and $6x - 2y = 7$. Then PQRS is
- (A) rectangle
(B) parallelogram
(C) cyclic quadrilateral
(D) rhombus
58. For the equation $3x^2 + px + 3 = 0$, if one root is square of the other root, then $p =$
- (A) $\frac{1}{3}$
(B) 1
(C) 6
(D) 3
59. If $X \cup \{1, 2\} = \{1, 2, 3, 5, 9\}$, then
- (A) the smallest set X is $\{3, 5, 9\}$
(B) the smallest set X is $\{2, 3, 5, 9\}$
(C) the largest set X is $\{1, 2, 5, 9\}$
(D) the largest set X is $\{2, 3, 4, 9\}$
60. If $y = \frac{\sin x + \cos x}{\sin x - \cos x}$, then $\frac{dy}{dx}$ at $x = 0$ is $(-n)$. Find n
- (A) 2
(B) 3
(C) 4
(D) 5

Space for Rough Work

61. $\sin^2 \frac{\pi}{8} + \sin^2 \frac{3\pi}{8} + \sin^2 \frac{5\pi}{8} + \sin^2 \frac{7\pi}{8}$ is equal to
 (A) 1 (B) -1
 (C) 0 (D) 2
62. The distance between the lines $4x + 3y = 7$ and $8x + 6y = 15$ is
 (A) $\frac{1}{10}$ (B) $\frac{8}{10}$
 (C) 1 (D) none of these
63. If $\log_4 5 = a$ & $\log_5 6 = b$, then $\log_3 2 =$
 (A) $\frac{1}{2a+1}$ (B) $\frac{1}{2b+1}$
 (C) $2ab+1$ (D) $\frac{1}{2ab-1}$
64. The sum of the series $\frac{5}{13} + \frac{55}{13^2} + \frac{555}{13^3} + \dots \infty$ is
 (A) $50/27$ (B) $13/36$
 (C) $65/36$ (D) none of these
65. The value of $81^{\left(\frac{1}{\log_5 3}\right)} + 27^{\log_9 36} + 3^{\frac{4}{\log_7 9}}$ is equal to
 (A) 49 (B) 625
 (C) 216 (D) 890

Space for Rough Work

SAMPLE PAPER-BBE/TRE-2020-C-XI (Paper-2)-PCM-18

66. If the roots of the equation $a(b - c)x^2 + b(c - a)x + c(a - b) = 0$ are equal, then a, b, c are in
(A) A.P. (B) G.P.
(C) H.P. (D) none of these
67. The sum of infinite series $1/1.4 + 1/4.7 + 1/7.10 + \dots \infty$ is
(A) $1/3$ (B) 3
(C) $1/4$ (D) ∞
68. $\sin 163^\circ \cos 347^\circ + \sin 73^\circ \sin 167^\circ =$
(A) 0 (B) $\frac{1}{2}$
(C) 1 (D) none of these
69. $\lim_{x \rightarrow 1} \frac{x^3 - 1}{x^2 - 1}$
(A) $\frac{3}{2}$ (B) $\frac{2}{3}$
(C) 1 (D) -1

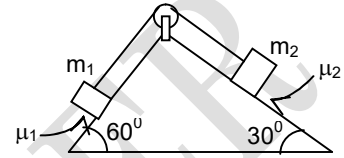
Space for Rough Work

PHYSICS – (PART – D)

This part contains **6 Numerical Based Questions** number **70 to 75**. Each question has **Single Digit Answer 0 to 9**.

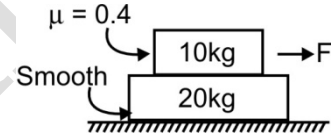
70. The displacement x (in m) of particle of mass m (in kg) is related to time t (in second) by $x = t^2 + 3$. Find the work (in J) done in the first two seconds. (take $m = 0.5$ kg)

71. Two particles of masses m_1 and m_2 connected by an inextensible massless string are kept on a fixed wedge. If $\mu_1 = \frac{1}{2}, \mu_2 = \frac{1}{3}, m_1 = 1\text{kg}, m_2 = 2\text{kg}$. Find the acceleration of the particles



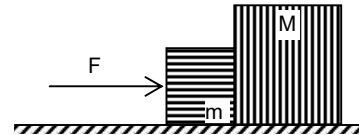
72. A car driver applies the brakes which retards the car at a rate of 8 m/s^2 . If the initial velocity of the car is 10 m/s , the speed of the car after 5 s will be

73. Coefficient of friction between 10 kg block and 20 kg is 0.4 . If the friction between them is 30 N . If the value of the force being applied on 10 kg , (the floor is smooth) is $9K$, then find the value of K .



74. The length of the component of $\vec{A} = 3\hat{i} + 4\hat{j} - \hat{k}$ along the direction of $\vec{B} = \hat{i} + \hat{j} + \hat{k}$ is given by $\sqrt{3}x$ then what is x ?

75. Two blocks of mass $m = 1\text{kg}$ and $M = 2\text{kg}$ are in contact on a frictionless table. A horizontal force $F (=3\text{N})$ is applied to m . The force (In N) of contact between the blocks will be



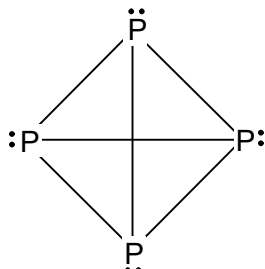
Space for Rough Work

CHEMISTRY – (PART – E)

This part contains **6 Numerical Based Questions** number **76 to 81**. Each question has **Single Digit Answer 0 to 9**.

76. How many vacant atomic orbital(s) is/are present in the outermost orbit of Na atom?

77.



If the ratio of the percentage of s-orbital character to the percentage of p-orbital character in a P – P bond in the above figure, is expressed as $x : y$, the value of $(x + y)$ will be

78. How many moles of electron(s) is/are present in 1.8 mL of water ($d = 1 \text{ g/cc}$)?

79. Element(X) is present in group-2 and element(Y) is present in group-15 of the periodic table. How many atoms will be present in the compound formed between X and Y?

80. A mixture containing 4 g NaOH, 10.6 g Na₂CO₃ and 8.4 g NaHCO₃ required 100 mL of HCl solution for complete reaction in presence of phenolphthalein indicator. If the molarity of the HCl solution is $x \text{ M}$, the value of x is

81. The sum of the number of unpaired electrons present in an oxygen atom and an oxygen molecule according to molecular orbital theory is:

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MATHEMATICS – (PART – F)

This part contains **6 Numerical Based Questions** number **82 to 87**. Each question has **Single Digit Answer 0 to 9**.

82. If $x^2 + ax + 2 = 0$ and $x^2 + bx - 2 = 0$ have a common root, then $(a^2 - b^2)$ is
83. If $\frac{5 + 9 + 13 + \dots \text{to } n \text{ terms}}{7 + 9 + 11 + \dots \text{to } (n+1) \text{ terms}} = \frac{17}{16}$, then n is
84. The circumradius of the triangle with vertices $(0, 0)$, $(3, -1)$ and $(-2, 4)$ is _____.
85. The number of values of x such that $\log_3 2, \log_3 (2^x - 5), \log_3 \left(2^x - \frac{7}{2}\right)$ are in A.P. is ___
86. The number of integral values of x satisfying $\frac{(x-2)(2x-3)^2(x-6)^3}{(x+5)^4} < 0$ is _____
87. Let a and b be constants and $f(x) = a \sin x + bx \cos x + 3x^2$. If $f(2) = 15$, then $f(-2)$ is

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FIITJEE SAMPLE PAPER – 2020

(Big Bang Edge Test / Talent Recognition Exam)

for students presently in

Class 11 (Paper 2)

ANSWERS

1.	C	2.	C	3.	A	4.	C
5.	C	6.	A	7.	D	8.	D
9.	B	10.	B	11.	C	12.	B
13.	B	14.	D	15.	A	16.	B
17.	A	18.	B	19.	B	20.	D
21.	D	22.	C	23.	A	24.	B
25.	B	26.	D	27.	C	28.	D
29.	B	30.	D	31.	C	32.	B
33.	A	34.	C	35.	A	36.	D
37.	B	38.	C	39.	C	40.	B
41.	C	42.	B	43.	C	44.	C
45.	C	46.	B	47.	C	48.	C
49.	B	50.	C	51.	B	52.	C
53.	C	54.	C	55.	B	56.	A
57.	D	58.	D	59.	A	60.	A
61.	D	62.	A	63.	D	64.	C
65.	D	66.	C	67.	A	68.	B
69.	A	70.	4	71.	0	72.	0
73.	5	74.	2	75.	2	76.	8
77.	4	78.	1	79.	5	80.	2
81.	4	82.	8	83.	7	84.	5
85.	1	86.	3	87.	9		