AMITY INSTITUTE FOR COMPETITIVE EXAMINATIONS

Time : 3 hrs.	**WEEKLY TEST- XI RANKER BATCH**	**M.M.: 180**
Date : 18/07/2025	**JEE-ADVANCED PATTERN: 9**	

TOPIC COVERED:

Physics: Laws of Motion Including Circular Motion

Chemistry: Hydrogen bonding, Molecular Orbital Theory

Mathematics: Permutation and Combination

GENERAL INSTRUCTIONS :

1. The Test Paper consists of **48** questions

2. There are *Three Subjects (Physics, Chemistry & Mathematics)* in the question paper.

3. *This paper is divided into 3 parts: Physics Section (I), (II), (III) & (IV) Chemistry Section (I), (II), (III) & (IV), Mathematics Section (I), (II), (III) & (IV).*

    ● *Single correct answer type questions:* ***Physics Section-I (1 to 4) Chemistry Section-I (11 to 14) and Mathematics Section-I (21 to 24)***, *3 marks* for each correct answer, and *–1 Negative mark* for incorrect answer.

    ● *Multiple correct answer type questions :* ***Physics Section-II (5 to 7) Chemistry Section-II (15 to 17) and Mathematics Section-II (25 to 27)***, *4 marks* for each correct answer, ***partial marking is applicable each correct option, provided no incorrect option is darkened*** and *–2 marks* for incorrect answer.

    ● *Matrix Matching type questions:* ***Physics Section-III (8 to 10); Chemistry Section-III (18 to 20) and Mathematics Section- III (28 to 30)***, for each question you will be ***awarded 4 marks*** if correct answer and ***zero marks*** otherwise and *–1 Negative marks* for incorrect answer.

    ● *Numerical Based Questions:* ***Physics Section IV (1 to 6); Chemistry Section-IV (7 to 12) and Mathematics Section- IV (13 to 18)***, for each question you will be ***awarded 4 marks*** and ***No Negative marks*** for incorrect answer.

Name of the Student   : _____

Section   :_____   Centre : _____

Invigilator's Signature:_____

PHYSICS

SECTION-1: (Maximum Marks: 12)

- This section contains **FOUR (04)** questions.
- Each question has **FOUR** options (A), (B), (C) and (D). **ONLY ONE** of these four options is the correct answer.
- For each question, choose the option corresponding to the correct answer.
- Answer to each question will be evaluated <u>according to the following marking scheme:</u>

  Full Marks: +3 **ONLY** if the correct option is chosen.

 *Zero Marks:* 0 If none of the options is chosen (*i.e.,* the question is unanswered).

  Negative Marks: –1 In all other cases.

1. In the adjoining figure if acceleration of M with respect to ground is a, then,

   (a) Acceleration of m with respect to M is a

   (b) Acceleration of m with respect to ground is a sin (α/2)

   (c) Acceleration of m with respect to ground is a

   (d) Acceleration of m with respect to ground is a tan α
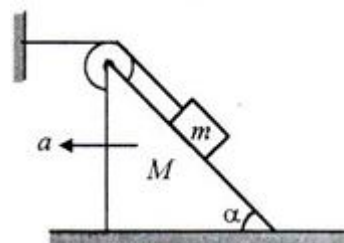
2. A rectangular block weighing 150 N, is lying on a rough inclined plane with inclination angle 45° as shown in the figure. The block is tied up by a horizontal string which has a tension of 50 N to keep the block just in equilibrium, then the coefficient of friction between the block and the inclined surface is :
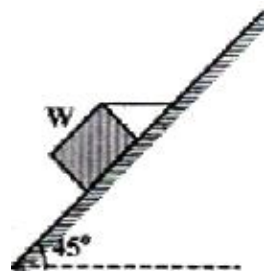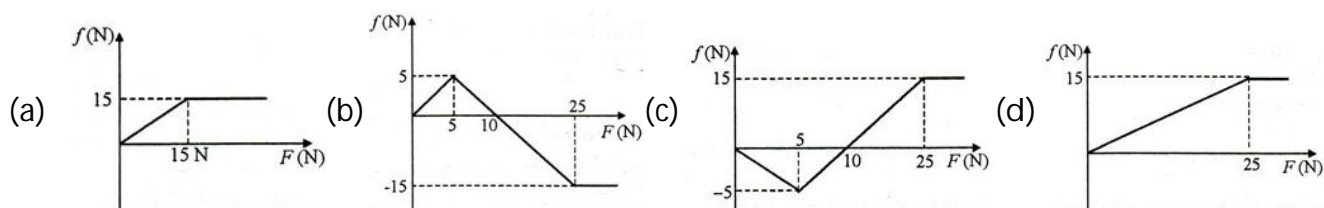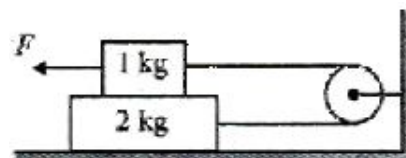
   (a) Zero   (b) 0.33   (c) 0.5   (d) 0.7

3. A plank is held at an angle α to the horizontal (figure) on two fixed supports A and B. The plank can slide against the supports (without friction) because of its weight Mg. With what acceleration and in what direction, a man of mass *m* should move so that the plank does not move.
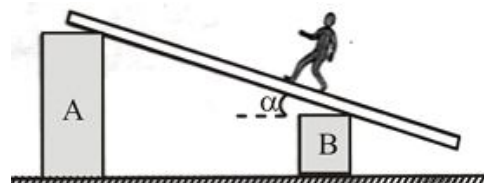
   (a) $g\sin\alpha\left(1+\dfrac{m}{M}\right)$ down the incline   (b) $g\sin\alpha\left(1+\dfrac{M}{m}\right)$ down the incline

   (c) $g\sin\alpha\left(1+\dfrac{m}{M}\right)$ up the incline   (d) $g\sin\alpha\left(1+\dfrac{M}{m}\right)$ up the incline

4. For the arrangement shown in the figure the coefficient of friction between any two surfaces is 0.5. Which of the following graphs shows correct variation of frictional force/between the 2 kg block and floor with the applied force F. (Take leftward direction of F as positive)

(a)   (b)   (c)   (d)

- This section contains THREE **(03)** questions
- Each question has **FOUR** options (A), (B), (C) and (D). **ONE OR MORE THAN ONE** of these four option(s) is (are) correct option(s).
- For each question, choose the option(s) corresponding to (all) the correct answer(s).
- Answer to each question will be evaluated according to the following marking scheme:

Full marks : + 4 if ONLY (all) the correct option(s) is (are) chosen.

Partial Marks : + 3 if all the four options are correct but ONLY three options are chosen.

Partial Marks : + 2 if three or more options are correct but ONLY two options are chosen, both of which are correct options.

Partial Marks : + 1 if two or more options are correct but ONLY one option is chosen, and it is a correct option.

Zero Marks : 0 If none of the options is chosen (i.e., the question is unanswered).

Negative Marks : –2 in all other cases.

For example, in a question, if (A), (B) and (D) are the ONLY three options corresponding to correct answers, then

choosing ONLY (A), (B) and (D) will get +4 marks.

choosing ONLY (A) and (B) will get +2 marks.

choosing ONLY (A) and (D) will get +2 marks.

choosing ONLY (B) and (D) will get +2 marks.

choosing ONLY (A) will get +1 marks.

choosing ONLY (B) will get +1 marks.

choosing ONLY (D) will get +1 marks.

choosing no option (i.e. the question is unanswered) will get 0 marks; and choosing any other combination of options will get –2 marks.

5. In the given figure, a block A rests on a smooth triangular block B and the block B is given an acceleration of $a = 2$ m/s^2 along the plane.
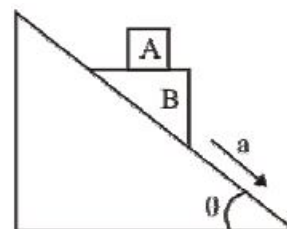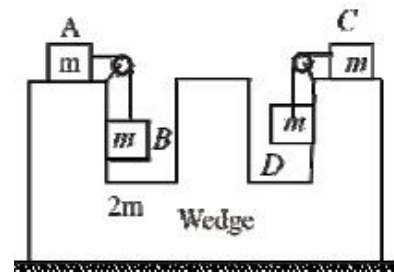
   (a) normal force on block A due to block B is $m(g - a)$

   (b) acceleration of block A relative to block B is $a \cos \theta$

   (c) If friction is present between block and A and B, the coefficient of friction should be greater than $\dfrac{a}{g} \cos \theta$, for no relative motion between A and B

   (d) If friction is present between block and A and B, the coefficient of friction should be greater than $\dfrac{a \cos \theta}{g - a \sin \theta}$, for no relative motion between A and B

6. Two blocks each of mass 1 kg are placed as shown. They are connected by a string which passes over a smooth (massless) pulley. There is no friction between m_1 and the ground and the coefficient of friction between m_1 and m_2 is 0.2. A force F is applied to m_2. Which of the following statements is/are correct.
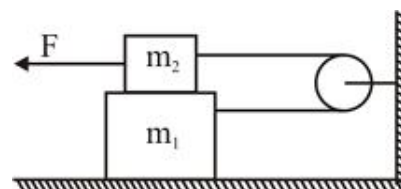
   (a) The system will be in equilibrium if F < 4N

   (b) If F > 4N the tension in the string will be 4N.

   (c) If F > 4N the frictional force between the blocks will be 2N.

   (d) If F = 6N the tension in the string will be 3N.

7. In the given figure, all surface are frictionless and strings and pulleys are massless, then :

(a) acceleration of block B is g/2

(b) acceleration of block B is zero

(c) acceleration of block wedge is zero

(d) acceleration of block wedge is g/2

SECTION- 3: (Maximum Marks: 12)

- This section contains **THREE (03)** Matching List Sets.
- Each set has **ONE** Multiple Choice Question.
- Each set has **TWO** lists: **List-I** and **List-II**.
- **List-I** has **Four** entries (P), (Q), (R) and (S) and **List-II** have **Five** entries (1), (2), (3), (4) and (5).
- **FOUR** options are given in each Multiple-Choice Question based on **List-I** and **List-II** and **ONLY ONE** of these four options satisfies the condition asked in the Multiple-Choice Question.
- Answer to each question will be evaluated **according to the following marking scheme:**

  Full Marks: +4 **ONLY** if the option corresponding to the correct combination is chosen.
  Zero Marks: 0 If none of the options is chosen (i.e. the question is unanswered).
  Negative Marks: –1 In all other cases.

8. In the given figure, coefficient of friction between the 2kg and 3kg blocks are $\mu_S = 0.3$ and $\mu_K = 0.2$, between the 5kg and surface are $\mu_S = \mu_K = 0.1$ and between 3 kg and surface is $\mu_S = \mu_K = 0$, (g = 10 m/s^2).
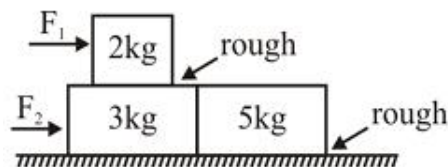
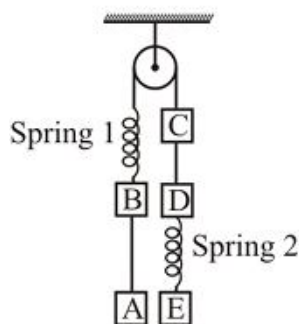| List-I		List-II	
(P)	For $F_1 = 0$, $F_2 = 15$ N	(1)	acceleration of all blocks will be same
(Q)	For $F_1 = 4N$, $F_2 = 0$ N	(2)	acceleration of any two blocks will be different
(R)	For $F_1 = 8$ N, $F_2 = 10$ N	(3)	frictional force between 2kg and 3kg block is less than maximum static friction
(S)	For $F_1 = 16$ N, $F_2 = 8$ N	(4)	contact force between 3kg and 5kg block is less than 10 N.

The correct option is:

(a) P-(1),(3); Q-(1),(4); R-(1),(3); S-(4)

(b) P-(1),(2); Q-(3),(4); R-(4); S-(2),(3)

(c) P-(2),(3); Q-(1),(4); R-(3),(4); S-(2)

(d) P-(2),(3),(4); Q-(1),(3); R-(4); S-(3)

9. The system shown below is initially in equilibrium

$m_A = m_B = 3$ kg

$m_C = m_D = m_E = 2$ kg

List -I		List -II	
(P)	Just after the spring 2 is cut, the block D	(1)	accelerates up
(Q)	Just after the spring 2 is cut, the block B	(2)	accelerates down
(R)	Just after the spring 1 is cut, the block A	(3)	momentarily at rest
(S)	Just after the spring 1 is cut, the block D	(4)	has acceleration g

The correct option is :

(a) P-(2); Q-(3); R-(2),(3); S-(1),(2),(3),(4) (b) P-(1),(3),(4); Q-(3); R-(4); S-(2),(3),(4)

(c) P-(1),(3); Q-(3); R-(2),(3),(4); S-(3),(3) (d) P-(3),(4); Q-(1),(2),(3); R-(3),(4); S-(4)

10. Two blocks of mass m_1 and m_2 ($m_2 > m_1$) are placed in contact with each other on an inclined plane as shown in figure. The co-efficient of friction between m_1 and surface is μ_1 and between m_2 and surface is μ_2. ($\tan\theta > \mu$, and $\tan\theta > \mu_2$)
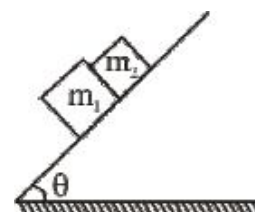
List -I		List -II	
(P)	$\mu_1 = 0.3$, $\mu_2 = 0.2$	(1)	Acceleration of both blocks is different.
(Q)	$\mu_1 = 0.2$, $\mu_2 = 0.3$	(2)	Acceleration of both blocks is same
(R)	$\mu_1 = 0.3$, $\mu_2 = 0.3$	(3)	Normal reaction between both the blocks is zero.
(S)	$\mu_1 = 0.3$, $\mu_2 = 0.2$ and the inclined plane starts moving up with acceleration g/2.	(4)	Normal reaction between both the blocks is non-zero.

The correct option is :

(a) P-(2); Q-(3); R-(1),(3),(4); S-(4) (b) P-(2),(4); Q-(1),(3); R-(2),(3); S-(2),(4)

(c) P-(1),(2),(4); Q-(2); R-(3); S-(4) (d) P-(3),(4); Q-(1),(2),(4); R-(3),(4); S-(4)

CHEMISTRY

SECTION-1 : (Maximum Marks : 12)

- This section contains **FOUR (04)** questions.
- Each question has **FOUR** options (A), (B), (C) and (D). **ONLY ONE** of these four options is the correct answer.
- For each question, choose the option corresponding to the correct answer.
- Answer to each question will be evaluated <u>according to the following marking scheme:</u>

  Full Marks : +3 **ONLY** if the correct option is chosen;

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  Negative Marks : –1 In all other cases.

11. Among the following, the weakest bond is

    (a) Covalent bond (b) hydrogen bond (c) Metallic bond (d) Ionic bond

12. The bond strengths of O_2, O_2^+, O_2^- and O_2^{2-} decrease in the order

    (a) $O_2^- > O_2 > O_2^+ > O_2^{2-}$ (b) $O_2^{2-} > O_2^- > O_2^+ > O_2$

    (c) $O_2^+ > O_2 > O_2^- > O_2^{2-}$ (d) $O_2 > O_2^+ > O_2^{2-} > O_2^-$

13. The compound having the least tendency to form hydrogen bonds among its molecules, among the following is

    (a) H_2NOH (b) HF (c) CH_3OH (d) CH_3Cl

14. The correct molecular orbital configuration of B_2 (Boron molecule) is

    (a) $(\sigma 1s)^2 (\sigma 1s^*)^2 (\sigma 2s)^2 (\sigma 2s^*)^2 (\pi 2p_x)^1 (\pi 2p_y)^1$

    (b) $(\sigma 1s)^2 (\sigma 1s^*)^2 (\sigma 2s)^2 (\sigma 2s^*)^2 (\pi 2p_x)^2$

    (c) $(\sigma 1s)^2 (\sigma 1s^*)^2 (\sigma 2p_x)^1 (\pi 2p_x)^1$

    (d) $(\sigma 1s)^2 (\sigma 1s^*)^2 (\sigma 2s)^2 (\sigma 2s^*)^2 (\sigma 2p_z)^2$

SECTION-2: (Maximum Marks : 12)

- This section contains THREE **(03)** questions
- Each question has **FOUR** options (A), (B), (C) and (D). **ONE OR MORE THAN ONE** of these four option(s) is (are) correct option(s).
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  For example, in a question, if (A), (B) and (D) are the ONLY three options corresponding to correct answers, then

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choosing ONLY (D) will get +1 marks.
choosing no option (i.e. the question is unanswered) will get 0 marks; and choosing any other combination of options will get –2 marks.
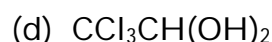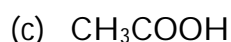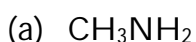
15. In which of the following pairs hybridisation of the central atom is same

(a) ClF_3, ClF_3O

(b) ClF_3O, ClF_3O_2

(c) $(ClF_2O)^+$, $(ClF_4O)^-$

(d) $(ClF_4O)^-$ $(XeOF_4)$
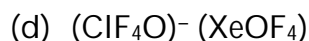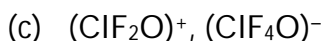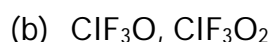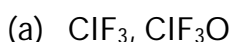
16. The pair(s) of molecules with different state of the hybridisation of the central atom but with the same shape is (are) :

(a) $[XeF_2, Br_3^-]$ (b) $[CO_2, I_3^-]$ (c) $[XeF_4, Ni(CN)_4]$ (d) $[H_2O, SO_2]$
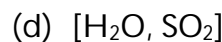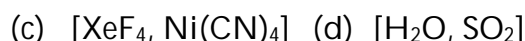
17. Hydrogen bonding is present in the following

(a) CH_3NH_2 (b) CH_3^- (c) CH_3COOH (d) $CCl_3CH(OH)_2$

SECTION- 3: (Maximum Marks: 12)

- This section contains **THREE (03)** Matching List Sets.
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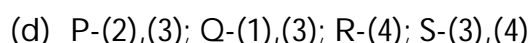
18. **Match the following**
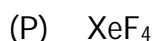
	List-I		List-II
(P)	XeF_4	(1)	Central atom has sp^3d^2 hybridisation and + 6 oxidation state.
(Q)	XeO_2F_2	(2)	Central atom has sp^3d hybridisation and + 6 oxidation state.
(R)	SF_6	(3)	Central atom has sp^3d^2 hybridisation and + 4 oxidation state.
(S)	OsF_4	(4)	Bonding involves two excitation stages

The correct option is:

(a) P-(3),(4); Q-(2); R-(1),(4); S-(2),(4)

(b) P-(1),(3); Q-(3),(4); R-(4); S-(2),(3)

(c) P-(1),(2); Q-(3),(4); R-(1),(2); S-(3)

(d) P-(2),(3); Q-(1),(3); R-(4); S-(3),(4)
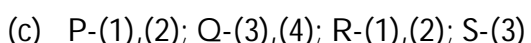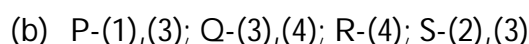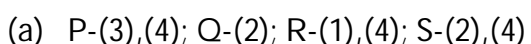
19. Match the following

	List -I		List -II
(P)	ClO_3^-	(1)	sp^3 hybridisation
(Q)	XeO_3	(2)	lp-bp repulsion present
(R)	B_2H_6	(3)	multi centre bond are present
(S)	ClF_3	(4)	pyramidal shape

The correct option is :

(a) P-(2); Q-(3),(4); R-(1),(2); S-(1),(3),(4) (b) P-(1),(2),(4); Q-(1),(2),(4); R-(1),(3); S-(2)

(c) P-(1),(3),(4); Q-(2); R-(3); S-(1),(2),(4) (d) P-(3),(4); Q-(1),(3); R-(1),(2),(4); S-(2),(4)

20. Match the following

	List -I		List -II
(P)	CO_2	(1)	diamagnetic
(Q)	NO_2	(2)	paramagnetic
(R)	BH_3	(3)	dimer is possible
(S)	SO_3	(4)	bond angle $\approx 132°$

The correct option is :

(a) P-(2),(4); Q-(3),(4); R-(1),(3); S-(4) (b) P-(2),(3); Q-(3); R-(4); S-(1),(3),(4)

(c) P-(1); Q-(2),(3),(4); R-(1),(3); S-(1) (d) P-(3),(4); Q-(1),(3); R-(2),(3); S-(4)

MATHEMATICS

SECTION-1 : (Maximum Marks : 12)

- This section contains **FOUR (04)** questions.
- Each question has **FOUR** options (A), (B), (C) and (D). **ONLY ONE** of these four options is the correct answer.
- For each question, choose the option corresponding to the correct answer.
- Answer to each question will be evaluated <u>according to the following marking scheme:</u>

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  Negative Marks : –1 In all other cases.

21. The sum of the divisors of $2^5.3^4.5^2$ is:

(a) $3^3.7^1.11^2$ (b) $3^2.7^1.11^2.31$ (c) $3.7.11.31$ (d) none of these

22. The number of times the digit 5 will be written when listing the integers from 1 to 1000 is:

(a) 271   (b) 272   (c) 300   (d) none of these

23. The number of ways in which 7 different books can be given to 5 students if each can receive none, one or more thing are

(a) 5^7 (b) 7^5 (c) $^{11}C_5$ (d) $12!$

24. The number of ways in which 20 different things can be divided into three sets of 7, 7 and 6 things.

(a) $\dfrac{20!}{7!7!6!2!}$　　(b) $\dfrac{20!}{7!7!6!}$　　(c) 1　　(d) $\dfrac{20!}{7!7!6!3!}$

25. The number of ways in which we can arrange the $2n$ students with n boys $b_1, b_2, \ldots, b_n$, and n girls $g_1, g_2, \ldots, g_n$ in a line so that all the boys and all the girls stand in increasing order of their age (Assume they all are different age)

(a) $({}^nC_0)^2 + ({}^nC_1)^2 + \ldots + ({}^nC_n)^2$　　　　(b) ${}^{2n}C_n$

(c) $2^n [1.3.5\ldots(2n-1)]/n!$　　　　(d) ${}^{2n}C_{n-1}$

26. Let N denote the number of ways in which $3n$ persons can be selected from $2n$ men, $2n$ women and $2n$ kinds. Then

(a) N = coefficient t^{3n} in $(1 - t^{2n-1})^3(1 - t)^{-3}$

(b) N = ${}^{3n+2}C_{3n} - 3 \cdot {}^{n+1}C_{n}-1$

(c) N = coefficient of t^{3n} in $(1 - 3t^{2n+1})(1 + {}^3C_1 t + {}^4C_2 t^2 + {}^5C_3 t^3 + \ldots)$

(d) $N - 1 > 3n^2$

27. If 'K' is the number of ways in which we can choose 5 letters from the word INTERNATIONAL then

(a) K is a three digit number　　　　(b) K is divisible by 4

(c) K is divisible by 11　　　　(d) K is divisible by 9

- This section contains **THREE (03)** Matching List Sets.
- Each set has **ONE** Multiple Choice Question.
- Each set has **TWO** lists: **List-I** and **List-II**.
- **List-I** has **Four** entries (P), (Q), (R) and (S) and **List-II** have **Five** entries (1), (2), (3), (4) and (5).
- **FOUR** options are given in each Multiple-Choice Question based on **List-I** and **List-II** and **ONLY ONE** of these four options satisfies the condition asked in the Multiple-Choice Question.
- Answer to each question will be evaluated **according to the following marking scheme:**

  Full Marks: +4 **ONLY** if the option corresponding to the correct combination is chosen.

  Zero Marks: 0 If none of the options is chosen (i.e. the question is unanswered).

  Negative Marks: –1 In all other cases.

28. **Match the following**

	Column-I		**Column-II**
(P)	In a class of 10 students 6 are boys and 4 are girls, in how many ways class teacher can select student/s for a project such that the group has at least 2 boys and 2 girls?	(1)	80
(Q)	In a fruit basket 4 mangoes, 5 bananas, and 4 apples are kept, in how many ways one can select fruits from this fruit basket such that at least one fruit of each type is always selected?	(2)	22
(R)	In a fruit basket 4 mangoes, 5 bananas, and 4 apples are kept, in how many ways one can select fruits from this fruit basket such that at least one 1 mango, 2 bananas and 3 apples are always selected?	(3)	627
(S)	There are 6 questions in an examination, a student has to answer at least three question to pass the exam, in how many ways student can fail the exam?	(4)	32

The correct option is:

(a) P-(3); Q-(1); R-(4); S-(2)   (b) P-(1); Q-(2); R-(3); S-(4)

(c) P-(4); Q-(3); R-(2); S-(1)   (d) P-(2); Q-(4); R-(1); S-(3)

29. **Match the following**

	Column-I		**Column-II**
(P)	Find the number of rectangles in a chess board of 10×10 gird instead of 8×8 gird	(1)	4356
(Q)	Find the number of squares in a chess board of 10×12 gird instead of 8×8 gird	(2)	1568
(R)	Find the number of rectangles in a chess board of 11×11 gird instead of 8×8 gird	(3)	495
(S)	In how many ways can you place 2 rooks on a chessboard such that they are not in attacking positions, if rooks can attack only in a same row or in a same column?	(4)	3025

The correct option is:

(a) P-(3); Q-(1); R-(4); S-(2)   (b) P-(1); Q-(2); R-(3); S-(4)

(c) P-(4); Q-(3); R-(1); S-(2)   (d) P-(2); Q-(4); R-(1); S-(3)

30. Match the following

	List-I		List-II
(P)	The number of squares of any size in a chessboard is	(1)	1092
(Q)	The number of rectangles of any size which are not squares in a chessboard is	(2)	204
(R)	The number of squares of size 3 × 3 in a chessboard is	(3)	36
(S)	The number of rectangles of size 5 × 4 in a chessboard is	(4)	40

The correct option is:

(a) P-(3); Q-(1); R-(4); S-(2)   (b) P-(2); Q-(1); R-(3); S-(4)

(c) P-(4); Q-(3); R-(2); S-(1)   (d) P-(2); Q-(4); R-(1); S-(3)

NUMERICAL BASED QUESTIONS

Physics

SECTION-4 : (Maximum Marks : 72)

- This section contains **EIGHTEEN (18)** questions.
- The answer to each question is a **NUMERICAL BASED QUESTIONS**
- For each question, enter the correct integer corresponding to the answer using the mouse and the on-screen virtual numeric keypad in the place designated to enter the answer.
- Answer to each question will be evaluated <u>according to the following marking scheme:</u>

   Full Marks : + 4 **ONLY** if the correct integer is entered;

   Zero Marks : 0 In all other cases.

1. A body of mass 2 *kg* moving on a horizontal surface with an initial velocity of 4 *m/sec* comes to rest after 2 sec. If one wants to keep this body moving on the same surface with a velocity of 4 *m/sec*, the force required is.........N

2. At a place where the acceleration due to gravity is 10 m sec^{-2} a net force of 5 *kg-wt* acts on a body of mass 10 *kg* initially at rest. The velocity of the body after 4 *second* is .... m sec^{-1}.

3. A man is standing on a weighing machine placed in a lift. When stationary his weight is recorded as 40 *kg*. If the lift is accelerated upwards with an acceleration of 2 m/s^2, then the weight(in kg) recorded in the machine will be (g = 10 m/s^2)

4. A ball of mass 0.2 *kg* moves with a velocity of 20 *m/sec* and it stops in 0.1 *sec*; then the force on the ball is .....N

5. A cricket ball of mass 250 *g* collides with a bat with velocity 10 *m/s* and returns with the same velocity within 0.01 second. The force acted on bat is........ N

6. A body of mass 2 *kg* is moving with a velocity 8 *m/s* on a smooth surface. If it is to be brought to rest in 4 seconds, then the force to be applied is ....N

Chemistry

7. The bond order of N_2^- ion is

8. The compound MX_4 is tetrahedral. The number of $\angle XMX$ angles in the compound is –

9. Among H_2, He_2^+, Li_2, Be_2, B_2, C_2, N_2, O_2^- and F_2, the number of diamagnetic species is (Atomic numbers: H = 1, He = 2, Li = 3, Be = 4, B = 5, C = 6, N = 7, O = 8, F =9)

10. The number of nodal planes present in $\pi^*_{2p_y}$ molecular orbitals is

11. How many of the following species exhibit hydrogen bonding?

Benzaldehyde, sulphuric acid, nitric acid, aniline, chloroform, hydrochloric acid, formic acid, ethyl acetate

12. The number of species among the following which have fractional bond order is

Li_2, He_2^+, N_2^+, N_2^{2-}, O_2^+, O_2^{2-}, O_2^-

Mathematics

13. The number of ordered triplets (*a, b,c*) such that L.C.M. (*a, b*) = 1000, L.C.M. (*b, c*) = 2000 and LCM (*a,c*) = 2000 is *k*, then $\dfrac{k}{10}$ is *k*, then $\dfrac{k}{10}$ is

14. Find the rank of the word "GREAT" if all the possible permutations of the words are written down as in a dictionary.

15. There are 5 letters and 5 directed envelopes. Find the number of ways in which all letters are put in the wrong envelopes.

16. Find the exponent of 15 in 100!

17. The number of ways in which a student can answer four questions from a paper containing 3 sections of 5 questions each are

18. If the permutations of a, b, c, d, e taken all together be written down in alphabetical order as in dictionary and numbered, then the rank of the permutation debac is :