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STAGE - 1 & STAGE - 2

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What Makes Pinnacle Unique?

- 1 Best Faculty Team
- 2 Hi-Tech Classrooms
- 3 Customized Study material
- 4 Personal Attention
- 5 Unlimited Doubt Sessions
- 6 Best Testing Methodology



Classroom Program

1 Comprehensive Classroom Lectures

All classes at Pinnacle are conducted by highly qualified and experienced faculty members, mostly IITians. Each chapter is started at the grass root level and is dealt to an extent which is the requirement of competitive examinations, with an aim of enabling the students to develop a comprehensive view of the whole chapter with a thorough understanding.



Doubt Clearance 2

"If you ask a question, you may appear fool for some time, but if you don't, you'll remain a fool for whole life." System at Pinnacle encourages all students to ask their doubts and questions.

3 Regular Tests Online and Offline

As JEE Mains and Advanced have gone completely online and NEET is in the pipeline, we have launched a dedicated online testing platform where students can practise over CBT (Computer Based Tests). The combination of online and offline testing modes based on latest JEE/NEET patterns ensure that students are at par with the recent changes. Students can check their test reports and performance analysis via a unique online login ID. Their results are also communicated to parents via SMS.



Addressing the Board Exam 4

Pinnacle has a very distinct methodology for preparing the students for competitive examinations while in full synchronization with Board Exams as well. Board level tests are conducted alongside the regular JEE/NEET tests and the copies are graded at very meticulous level by teachers. Students receive methodological tips so as to perform excellent in the board Exams as well.

Section - A Science

This section contains **30 Multiple Choice Questions**. Each question has four options out of which **ONLY ONE** is correct.

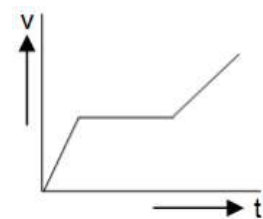
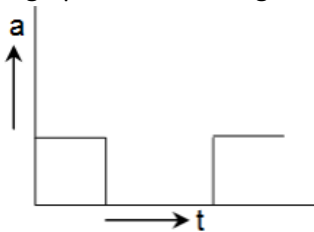
1. The speed of a train increases at a constant rate from zero to v , and then remains constant for an interval, and finally decreases to zero at a constant rate. If L be the total distance travelled, then the total time taken is:

- (a) $\frac{L}{v} + \frac{v}{2} \left(\frac{1}{\alpha} + \frac{1}{\beta} \right)$
 (b) $\frac{L}{v} + \frac{2}{v} \left(\frac{1}{\alpha} + \frac{1}{\beta} \right)$
 (c) $\frac{L}{v} + 2v \left(\frac{1}{\alpha} + \frac{1}{\beta} \right)$
 (d) $\frac{L}{v} + \frac{1}{v} \left(\frac{1}{\alpha} + \frac{1}{\beta} \right)$

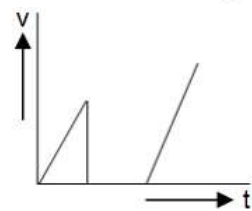
2. A ball is dropped on to the floor from a height of 20 m. It rebounds to a height of 10 m. If the ball is in contact with the floor for 0.2 seconds, what is the average acceleration during contact?

- (a) 169 ms^{-2}
 (b) 285 ms^{-2}
 (c) 338 ms^{-2}
 (d) 564 ms^{-2}

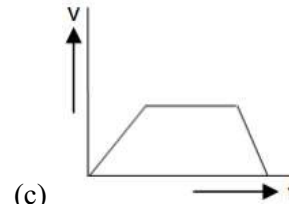
3. Which of the following would probably show the velocity-time graph for a body whose acceleration time graph is shown in figure?



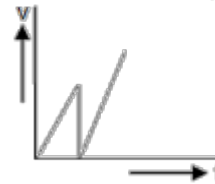
(a)



(b)

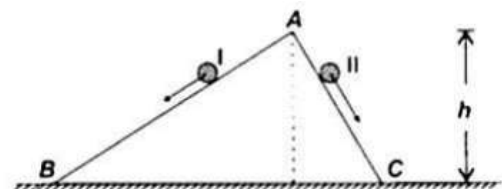


(c)



(d)

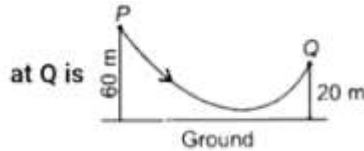
4. Two inclined frictionless tracks, one gradual and the other steep meet at point A from where two stones (I and II) are allowed to slide down from rest, one on each track as shown in figure. Which of the following statements is correct?



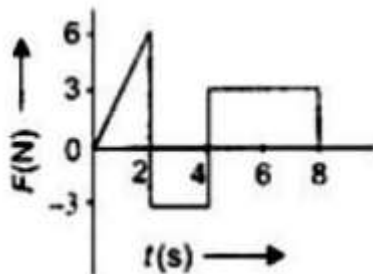
- (a) Both the stones reach the bottom at the same time but not with the same speed
 (b) Both the stones reach the bottom with the same speed and stone I reaches the bottom earlier than stone II
 (c) Both the stones reach the bottom with the same speed and stone II reaches the bottom earlier than stone I
 (d) Both the stones reach the bottom at different times and with different speeds.
5. A mass of M kg is suspended by a weightless string. The horizontal force that is required to displace it until the string making an angle of 30° with the initial vertical direction is:

- (a) $Mg(\sqrt{2} - 1)$
 (b) $Mg(\sqrt{2} + 1)$
 (c) $Mg(2\sqrt{3})$
 (d) $\frac{Mg}{\sqrt{2}}$

6. A skier of mass 50 kg stands at point P at the top of the ski jump and moves from P to Q and takes off his jump at Q as shown in figure. If 60% of the change in the gravitational potential energy of the skier between points P and Q becomes the kinetic energy at Q then the speed at which the skier arrives ($g = 10\text{m/s}^2$) is approximately



- (a) 11
 (b) 22
 (c) 20
 (d) 40
7. Rahul is travelling in a retarding bus. At one point of his journey, he throws a ball vertically upwards to a height 40 cm, the ball will fall (Neglect air friction)
- (a) A short distance behind where he is standing
 (b) A short distance in front of where he is standing
 (c) A long distance behind where he is standing
 (d) At the same spot where he is standing
8. The force F acting on a particle of mass m is indicated by the force-time graph shown below. The change in momentum of the particle over the time interval from zero to 6s is:

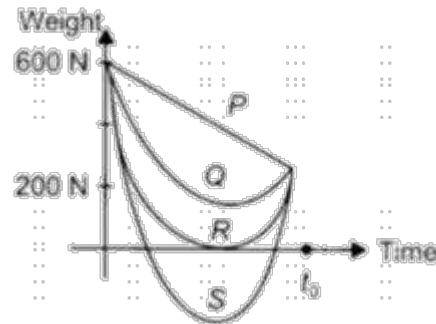


- (a) 24 N s
 (b) 20 N s
 (c) 12 N s
 (d) 6 N s
9. Match the column – I with column –II select the correct option from the codes given below:

Column-I	Column-II
(a) g at height h	(i) $g\left(1 - \frac{2h}{R}\right)$
(b) g at depth h	(ii) $\frac{GM}{R^2}$
(c) g_{poles}	(iii) $g\left(1 - \frac{h}{R}\right)$
(d) g	(iv) Maximum

- (a) a - i; b - ii; c - iii; d - iv
 (b) a - ii; b - iii; c - iv; d - i
 (c) a - i; b - iii; c - iv; d - ii
 (d) a - ii; b - iv; c - i; d - iii

10. If, the acceleration due to gravity at the Earth's surface is 10 m s^{-2} and at the surface of Mass is 4m s^{-2} . A 60 kg passenger goes from the Earth to the Mass in a spaceship moving with a constant velocity. Neglect all other objects in the sky. Which part of figure best represents the weight (net gravitational force) of the passenger as a function of time?



- (a) P
 (b) Q
 (c) R
 (d) S
11. A brief information about three substances is given in the table.

Substance	Melting point	Boiling point
P	23°C	60°C
Q	10°C	20°C
R	65°C	110°C

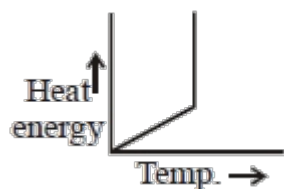
Which of the following is incorrect about these substances?

- (a) At room temperature, substance P will have fixed volume but no fixed shape.
 (b) At room temperature substance Q will have maximum space between the particles.
 (c) At room temperature substance R will have maximum kinetic energy.
 (d) At room temperature, the substance Q will diffuse faster as compared to substance P and R
12. Riya heated a mixture of iodine and common salt in a china dish by keeping an inverted funnel on it. After some time, she observed that

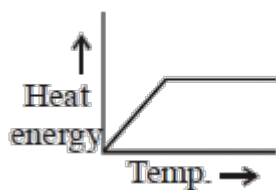


- (a) White fumes come out from the mixture
 (b) Violet particles deposit on the neck of the funnel
 (c) White particles deposit on the neck of the funnel

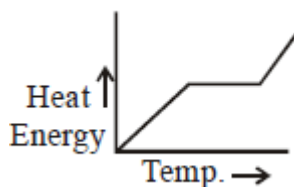
- (d) A gas with popping sound comes out.
13. The number of electrons in an atom carrying 3 negative charge is X and number of neutrons are Y, its mass number is
- $X + Y + 3$
 - $2X - 3$
 - $X - Y + 3$
 - $X + Y - 3$
14. Which of the following statements is/are correct?
- Centrifugation method can be used to separate cream from milk
 - Different colored components of blue ink can be separated by evaporation
 - Chromatography can be used to detect drugs in blood
 - Camphor cannot be separated from salt by sublimation
- ii only
 - i, ii, iii only
 - i and iii only
 - ii and iv only
15. Which of the following is a correct graphical representation of latent heat of fusion of water with respect to temperature?



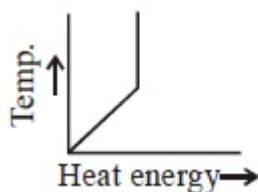
(a)



(b)



(c)



(d)

16. Our hand feels cold when we put some acetone on it, because
- Heat of vaporization of acetone is exothermic process

- Acetone release heat of vaporization on our hand
 - Acetone absorb latent heat of vaporization from our hand
 - Acetone become cooled
17. Which of the following conditions would increase the interparticle distance of a gas?
- Increase of pressure
 - Leaking of some of the gas
 - Increase the volume of container
 - Increase the temperature of the gas
- i and ii
 - ii, iii and iv
 - i and iii
 - ii, iv
18. 15 g of methyl alcohol is present in 100ml of solution. If the density of solution is 0.96 g/ml, Calculate the mass percentage of methyl alcohol in solution
- 15.625%
 - 25.625%
 - 45.625%
 - 35.625%
19. Melting & freezing point of water:
- Are same
 - Have large difference between them
 - Have close difference between them
 - None of these
20. At a constant temperature, volume of a gas was found to be 400 cm³ at a pressure of 760 mm Hg. Of one pressure of one gas is increased by 25%. Find one new volume is
- 300 cm³
 - 320 cm³
 - 200 cm³
 - None of these
21. Cells are of different shapes and sizes. Some cells are irregular in shape such as
- Amoeba
 - Red Blood Cell
 - Leucocyte
 - Both a and c
22. X is a double membraned organelle that oxidises food present in cell to release energy. X is _____.
- Nucleus
 - Endoplasmic reticulum
 - Mitochondrion
 - Chloroplast

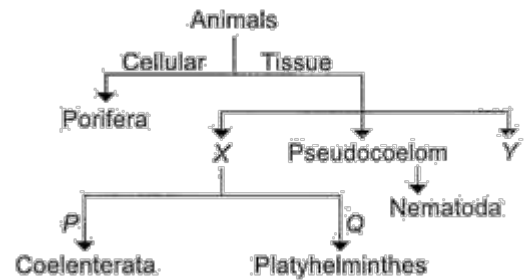
23. Read the following statements carefully. Which of them are true (T) and which of them are false (F)?
- (i) RER function as cytoplasmic framework and is site for lipid synthesis
 - (ii) Lysosomes are formed by the joint activity of endoplasmic reticulum and Golgi complex
 - (iii) Vacuoles are storage sacs for solid or liquid contents
 - (iv) Meiosis involves two consecutive divisions forming 4 daughter cells
- | | | | | |
|-----|-----|------|-------|------|
| | (i) | (ii) | (iii) | (iv) |
| (a) | T | F | F | F |
| (b) | F | T | T | F |
| (c) | F | F | F | T |
| (d) | T | F | T | F |

24. Which of the following tissues lines body cavities and covers the body surface?
- (a) Nervous
 - (b) Epithelial
 - (c) Muscle
 - (d) Connective

25. Which of the following substances are present as deposition in the cell walls of sclerenchyma?
- (a) Cellulose
 - (b) Pectin
 - (c) Lignin
 - (d) Hemicellulose

26. Which of the following contains living cells in conducting tissue?
- (a) Meristem
 - (b) Phloem
 - (c) Xylem
 - (d) Collenchyma

27. Which of the following does not make a criterion for classification of animals?
- (a) Body cavity organization
 - (b) Symmetry
 - (c) Cell wall structure
 - (d) Presence or absence of notochord
28. Which of the following is an incorrect match
- (a) Meristematic tissue – Growing regions of the plants
 - (b) Xylem and Phloem – Complex tissues
 - (c) Cardiac muscles – Uninucleate and branched
 - (d) Tendons – Fibrous connective tissue with flexibility
29. Riddhi drew a classification chart as shown below.



Now, select the option that correctly identifies the characters X, Y, P or Q

- (a) X is with eucoelomic body cavity.
 - (b) P is with bilateral body symmetry.
 - (c) Q is with radial body symmetry.
 - (d) Y is with coelomic cavity lined by mesoderm
30. Select the incorrect statement out of the following
- (a) Fungi are called saprophytes
 - (b) Thallophytes include algae.
 - (c) Locomotory organs of hydra are cilia.
 - (d) Lichens are symbiotic transient association of fungi and Blue Green Algae

Section - B Mathematics

This section contains **20 Multiple Choice Questions**. Each question has four options out of which **ONLY ONE** is correct.

31. If $x^4 + 1 = 1297$, $y^4 - 1 = 2400$, then $y^2 - x^2 =$

- _____
 (a) 10
 (b) 25
 (c) 13
 (d) 43

32. The surds $\sqrt{2}, \sqrt[3]{3}$ and $\sqrt[5]{5}$, in their descending order are

- (a) $\sqrt[3]{3}, \sqrt[5]{5}, \sqrt{2}$
 (b) $\sqrt{2}, \sqrt[3]{3}, \sqrt[5]{5}$
 (c) $\sqrt{2}, \sqrt[5]{5}, \sqrt[3]{3}$
 (d) $\sqrt[3]{3}, \sqrt{2}, \sqrt[5]{5}$

33. The value of $(x-a)^3 + (x-b)^3 + (x-c)^3 - 3(x-a)(x-b)(x-c)$, when $a + b + c = 3x$ is _____

- (a) 3
 (b) 2
 (c) 1
 (d) 0

34. If $x^n + 1$ is divisible by $x + 1$, n must be

- (a) Any natural number
 (b) An odd natural number
 (c) An even natural number
 (d) None of these

35. The rationalizing factor of $\sqrt[5]{a^2b^3c^4}$ is _____

- (a) $\sqrt[5]{a^3b^2c}$
 (b) $\sqrt[4]{a^3b^2c}$
 (c) $\sqrt[3]{a^3b^2c}$
 (d) $\sqrt{a^3b^2c}$

36. Find the square root of $\frac{x^2}{9} - \frac{9}{4x^2} - \frac{x}{3} - \frac{3}{2x} - \frac{5}{4}$.

- (a) $\frac{2x}{3} - \frac{3}{2x} - \frac{1}{2}$
 (b) $\frac{x}{3} - \frac{3}{2x} - 1$

(c) $\frac{3}{x} - \frac{2}{3x} - \frac{1}{2}$

(d) $\frac{x}{3} - \frac{3}{2x} - \frac{1}{2}$

37. If x be a negative integer, then the solution of the in equation $1 \leq 2x + 8 \leq 11$ is

- (a) $\{-5, -3, -4, -2, -1\}$
 (b) $\{-4, -2, -1\}$
 (c) $\{-6, -3, -1\}$
 (d) $\{-3, -2, -1\}$

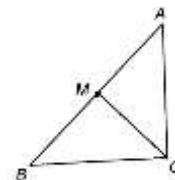
38. If x and y are positive real numbers, then which of the following is CORRECT?

- (a) $x > y \implies x > y$
 (b) $x > y \implies x > y^a$
 (c) $x > y \implies \frac{1}{x} > \frac{1}{y}$
 (d) $x > y \implies \frac{1}{x} > \frac{1}{y}$

39. Krishna and Sudheer have some marbles with them. If sudheer gives 10 marbles to Krishna, Krishna will have 40 more marbles than Sudheer. If Sudheer gives 40 marbles to Krishna, Krishna will have 5 times as many marbles as Sudheer. Find the number of marbles with Sudheer.

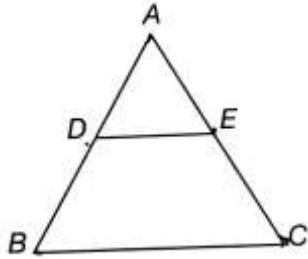
- (a) 65
 (b) 55
 (c) 70
 (d) 50

40. In the following figure, ΔABC is right – angled at C , and M is the mid point of hypotenuse AB . If $AC = 32$ cm and $BC = 60$ cm, then find the length of \overline{CM} .

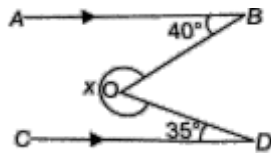


- (a) 32 cm
 (b) 30 cm
 (c) 17 cm
 (d) 34 cm

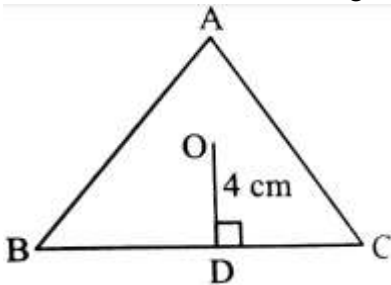
41. In the following figure, ABC is an equilateral triangle. DE is parallel to BC and equal to half the length of BC. If $AD + EC + CB = 24$ cm, then what is the perimeter of triangle ADE?



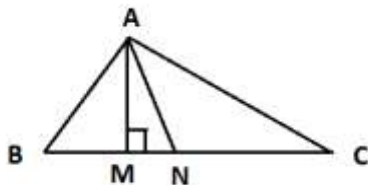
- (a) 12 cm
 (b) 16 cm
 (c) 18 cm
 (d) Cannot be determined
42. In the given figure (not drawn to scale), $AB \parallel CD$. Find the value of x .



- (a) 189°
 (b) 215°
 (c) 285°
 (d) 280°
43. In above diagram O is circumcenter. If circumradius is 5 cm then length of BC is



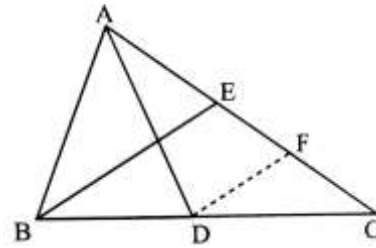
- (a) 10 cm
 (b) 8 cm
 (c) 6 cm
 (d) 12 cm
44. In the above figure AM \perp BC and AN is internal angular bisector of $\angle BAC$. If $\angle MAN = K(\angle B - \angle C)$ then value of k is



- (a) 1
 (b) $1/2$

- (c) $1/3$
 (d) $1/4$

45. In the above triangle, D and E are mid points of BC and AC, respectively. If $DF \parallel BE$ and $\text{ar}(\triangle DCF) = 2\text{cm}^2$ then area of $\triangle ABC$ is



- (a) 8cm^2
 (b) 4cm^2
 (c) 16cm^2
 (d) 64cm^2
46. $(a+b)(a-b)(a^2-ab+b^2)(a^2+ab+b^2)$ is equal to _____

- (a) $a^6 + b^6$
 (b) $a^6 - b^6$
 (c) $a^3 - b^3$
 (d) $a^3 + b^3$

47. The area of the triangle formed by the points P (0,1), Q, (0,5) and R (3,4) is _____
- (a) 16 sq. units
 (b) 8 sq. units
 (c) 4 sq. units
 (d) 6 sq. units

48. Study the following statements.
 Statement I: A square is a rhombus.
 Statement II: Bisectors of the angles of a rectangle form a parallelogram.
 Which of the following options holds?
 (a) Both statement I and statement II are true.
 (b) Statement I is true but statement II is false.
 (c) Statement I is false but statement II is true.
 (d) Both statement I and Statement II are false.

49. If $x = \sqrt{13} - \sqrt{11}$ and $y = \sqrt{35} - \sqrt{33}$ then which of the following is correct?

- (a) $x > y$
 (b) $x < y$
 (c) $x = y$
 (d) None of these

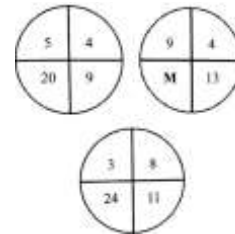
50. A five – digit number abcde is such that the number abcde1 is the product of 1abcde and 3. The sum of the digits of abcde is

- (a) 25
 (b) 26
 (c) 27
 (d) 28

Section - C Mental Ability

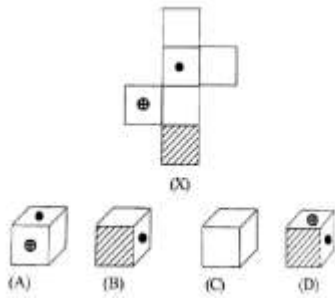
This section contains **10 Multiple Choice Questions**. Each question has four options out of which **ONLY**

51. Complete the series
7,13,27,53,?,213
(a) 106
(b) 107
(c) 105
(d) 108
52. If the English letters A to Z are written in a reverse order then what is the fourth letter to the right of 12th letter from the left?
(a) K
(b) J
(c) R
(d) L
53. Direction: In a certain code language; '782' means Flowers are beautiful; '692' means 'Roses are red', '628' means 'Roses are beautiful'
What does number '9' denote?
(a) Roses
(b) Flowers
(c) Red
(d) are
54. Pointing out to a lady, a girl said " she is the daughter-in-law of the grandmother of my father's only son." How is the lady related to the girl?
(a) Sister-in-law
(b) Mother
(c) Aunt
(d) Mother-in-law
55. If + means \div , - means \times , \div means + and \times mean, then $36 \times 8 + 4 \div 6 + 2 - 3 = ?$
(a) 2
(b) 18
(c) 43
(d) $6\frac{1}{2}$
56. Raj travelled from a point X straight to Y at a distance of 80 metres. He turned right and walked 50 metres, then again turned right and walked 70 metres. Finally, he turned right and walked 50 metres. How far is he from the starting point
(a) 10 metres
(b) 20 metres
(c) 50 metres
(d) 70 metres
57. Find the missing number at the place of 'M'?



- (a) 36
(b) 52
(c) 81
(d) 117

58. Select from the alternative, the box that can be formed by folding the sheet shown in figure (X)



- (a) A only
- (b) A and C only
- (c) A, C and D only
- (d) A, B, C and D

59. Raman remembers that the examination is after 15th May but before 18th May, while Deep remembers that the examination is before 21st May but after

16th May. On which date of May is the examination?

- (a) 17
- (b) 18
- (c) 19
- (d) 20

60. A monkey climb 30 feet at the beginning of each hour and rests for a while when he slips back 20 feet before he again starts climbing in the beginning of the next hour. If he begins his ascent at 8.00 am, at what time will he first touch flag at 120 feet from the ground?

- (a) 4pm
- (b) 5pm
- (c) 6pm
- (d) None of these

SPACE FOR ROUGH WORK

Answer Key

1	a	21	d	41	c
2	a	22	c	42	c
2	a	23	b	43	c
4	c	24	b	44	b
5	c	25	c	45	c
6	b	26	b	46	b
7	b	27	c	47	d
8	d	28	d	48	a
9	c	29	d	49	a
10	c	30	c	50	b
11	c	31	c	51	b
12	b	32	d	52	a
13	d	33	d	53	c
14	c	34	b	54	b
15	c	35	a	55	c
16	c	36	d	56	a
17	b	37	d	57	a
18	a	38	b	58	a
19	a	39	a	59	a
20	b	40	d	60	b