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JEE / NEET / Olympiads / NTSE / Boards

P-SAT 2025

Pinnacle Scholastic Aptitude Test

For Classes 6th to 11th (Appearing)

Pinnacle Scholastic Aptitude Test

SAMPLE TEST PAPER

Class 11th NM

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INSTRUCTIONS

Duration: 2 Hour | **Maximum Marks: 240**

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

Things NOT ALLOWED in EXAM HALL: Blank Paper, clipboard, log table, slide rule, calculator, camera, mobile and any electronic or electrical gadget. If you are carrying any of these, then keep them at a place specified by invigilator at your own responsibility.

I.General Instructions

1. This Booklet is your question paper. Don`t break the seal of booklet until the invigilator instructs to do so.

2. The answer sheet (ORS) is provided to you separately which is a machine readable optical response sheet. You have to mark your answers in the ORS by darkening bubbles as per your answer choice, by using black or blue ball point pen.

3. This question paper contains three sections as follows:
   a) Section - A contains total 20 questions (Q. No. 1 to 20) of Physics.
   b) Section - B contains total 20 questions (Q. No. 21 to 40) of Chemistry.
   c) Section - C contains total 20 questions (Q. No. 41 to 60) of Mathematics.

4. Rough spaces are provided for rough work inside the question paper. No additional sheets will be provided for rough work.

5. If you are found involved in cheating or disturbing others, then your ORS will be cancelled.

II.Filling of OMR Sheet

1. Ensure matching of OMR sheet with the Question paper before you start marking your answers on OMR sheet.

2. On OMR sheet, darken the appropriate bubble with black/blue pen for each character of your Enrollment No. and your Name, Test Code and other details at the designated places.

3. Think wisely before darkening bubble as there is negative marking for wrong answer. Answer once marked by pen can`t be cancelled.

4. Don`t put any stain on ORS and hand it over back properly to the invigilator.

III.Marking Scheme

1. All the questions of **each Part** have only one correct answer.
2. If darken bubble is RIGHT answer: 4 Marks.
3. If darken bubble is WRONG answer: -1 Marks (Minus One Mark).
4. If no bubble is darkened in any question: No Marks.

JEE MAIN 2024 99.98 %ile | JEE ADV 2024 958 AIR

100 %ile Chemistry

IIT DELHI

BHARTI GARG

JEE MAIN 2024 99.91 %ile | JEE ADV 2024 4217 AIR

100 %ile Physics

IIT ROPAR

VIRAJ MANOCHA

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DTU DELHI

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JEE MAIN 2024 99.54 %ile | JEE ADV 2024 9718 AIR

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NIT JALANDHAR

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Bhumika

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REMARKABLE Results 2024

JEE MAINS & ADVANCE RESULT 2023

JEE ADV AIR * 147 — 99.84 Percentile — IIT DELHI — Mayank Jindal

JEE ADV AIR * 172 — 99.86 Percentile — IIT BOMBAY — Dikshit Singla

JEE ADV AIR * 230 — 99.90 Percentile — IIT ROORKEE — Krish Jindal

JEE ADV AIR 1946 — 99.88 %ile — IIT ROORKEE — Chetanya Jindal

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99.66 %ile — DTU DELHI — Dapinder Kaur

99.61 %ile — DTU DELHI — Jatin Bansal

99.34 %ile — DTU DELHI — Haridyanshu Jindal

98.81 %ile — PEC Chd — Chakshit

99.45 %ile — NIT JALANDHAR — Yog Garg

97.96 %ile — PEC Chd — Lakshita Gupta

97.11 %ile — NIT JALANDHAR — Rimanshu Gupta

IIT ROPAR — Krish Arora

IIT BHU — Krish Kumar

NEET RESULT

670 | 720 — Prachi

705 | 720 — MAULANA AZAD DELHI — Saransh Garg

651 | 720 — GMC PATIALA — Riya

648 | 720 — GMC PATIALA — Priyanka

636 | 720 — GMCH CHD — Bhawna

604 | 720 — GMC PATIALA — Balwinder Singh

599 | 720 — GMCH CHD — Aurya Arrarwal

598 | 720 — GMCH CHD — Chhaavi

685 | 720 — AIIMS-BILASPUR — Nitish Singla

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5. Unlimited Doubt Sessions
6. Best Testing Methodology

- Lecture Recording Lab
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- Extra Support to weaker students
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- Biometric Attendance

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 apprear 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 and 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.

Pinnacle EduCare
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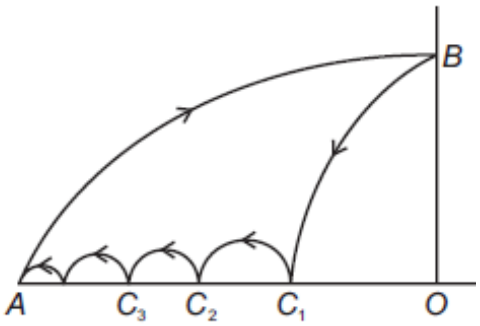
Engineering — JEE Main & Adv.
Medical — NEET
Foundation — VIII, IX, X, NTSE, Olympiads
Subjective — Boards

Section – A
Physics

1. A ball was projected from point *A* and it hit a vertical wall at point *B* horizontally. From *B* the ball flies to point C_1, C_2, ... and finally comes back to the point *A*. The coefficient of restitution is *e* for every collision. Find *e*, if the ball does not bounce up at all when it gets back to the point *A*



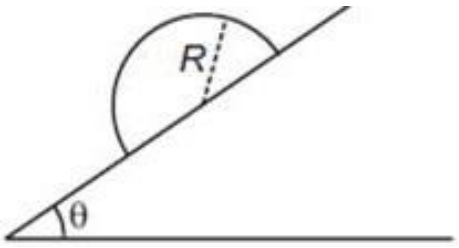
(a) $\frac{\sqrt{2}-1}{2}$

(b) $2-\sqrt{3}$

(c) $\sqrt{2}-1$

(d) $\frac{2}{\sqrt{2}+1}$

2. A uniform hemisphere of radius *R* is placed on rough inclined plane. The coefficient of the friction between the surfaces is μ. The angle of inclination (θ) of the plane is increased. The block will



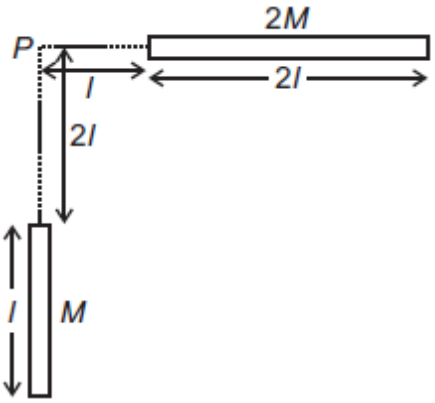
(a) Topple before sliding if $\mu \geq \frac{8}{3}$

(b) Topple before sliding if $\mu \geq \frac{4}{3}$

(c) Slide before toppling if $\mu \geq \frac{8}{3}$

(d) Slide before toppling if $\mu \geq 3$

3. A rod of length *l* and of mass *M* and another rod of length 2*l* and mass 2*M* are arranged as shown below in the figure. The magnitude of gravitational field at point *P* is



Space for Rough Work

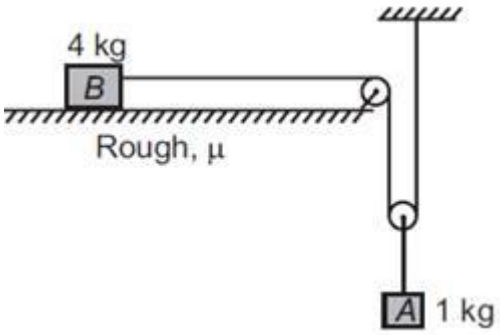
(a) $\frac{\sqrt{5}}{6}\frac{GM}{l^2}$

(b) $\frac{\sqrt{65}}{6}\frac{GM}{l^2}$

(c) $\frac{\sqrt{17}}{6}\frac{GM}{l^2}$

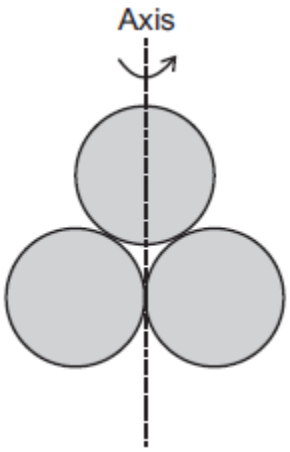
(d) $\frac{3GM}{\sqrt{18}l^2}$

4. In the given arrangement, the pulleys and strings are ideal. The blocks are released from rest and it is found that block *A* has speed 0.3 m/s after it has descended through a distance of 1 m. The coefficient of friction (μ) is (g = 10 m/s^2)



(a) 0.28
(b) 0.12
(c) 0.32
(d) 0.21

5. Three discs each of mass *m* and radius *R* are joined in a plane as shown in figure. The radius of gyration of this system about an axis indicated in the figure is



(a) $\sqrt{\frac{7}{12}}R$

(b) $\sqrt{\frac{11}{12}}R$

(c) $\sqrt{\frac{7}{16}}R$

(d) $\sqrt{\frac{5}{6}}R$

6. Three identical particles each of mass *m* are at the vertices of an equilateral triangle of side length *l*. Two particles are fixed and third particle is released from rest under their gravitational force alone. The maximum speed of third particle in subsequent motion is given by

(a) $2\sqrt{\frac{Gm}{l}}$

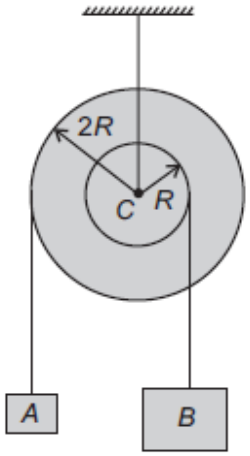
(b) $\sqrt{\frac{Gm}{l}}$

(c) $\sqrt{\frac{2Gm}{l}}$

Space for Rough Work

(d) $\sqrt{\frac{Gm}{2l}}$

7. In the given arrangement, a spool of moment of inertia $I_c = 4\ mR^2$ is connected with two blocks A and B of masses $2m$ and $3m$ respectively and released. Assuming there is no slipping anywhere, then the acceleration of block A is



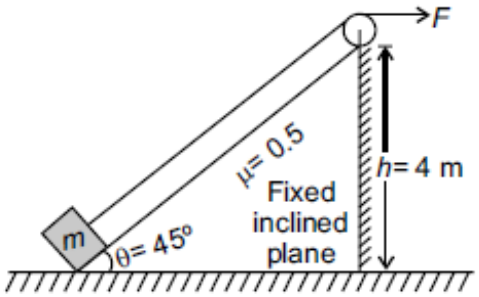
(a) $\frac{g}{5}$

(b) $\frac{2g}{7}$

(c) $\frac{2g}{15}$

(d) $\frac{4g}{13}$

8. A block of mass m = 4 kg is placed near the bottom of a rough (μ = 0.5) inclined plane as shown in figure. The minimum work done by applied force required to raise the block slowly to the top of inclined is (g = 10 m/s^2)



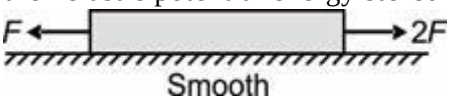
(a) 80 J

(b) 160 J

(c) 240 J

(d) 320 J

9. A uniform rod of mass M, length L and cross-sectional area A moves under the action of two forces on a smooth surface as shown in figure. If Young's modulus of material of rod is Y, then elastic potential energy stored in the rod is



(a) $\frac{7FL^2}{3YA}$

(b) $\frac{3F^2L}{8YA}$

(c) $\frac{7F^2L}{6YA}$

(d) $\frac{13F^2L}{7YA}$

10. An ideal gas whose adiabatic exponent equals γ is expanded so that $\Delta Q + \Delta U = 0$. Then the equation of the process in the variables T and V is

(a) $TV^{\frac{(\gamma-1)}{2}} = C$

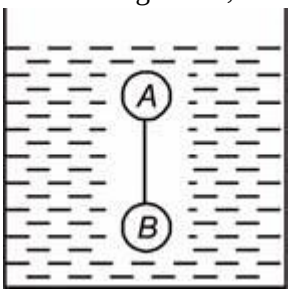
Space for Rough Work

(b) $TV\frac{(\gamma-2)}{2}=C$

(c) $TV\frac{(\gamma-1)}{4}=C$

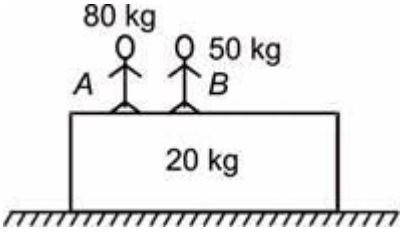
(d) $TV\frac{(\gamma-2)}{4}=C$

11. Two solid spheres *A* and *B* of equal volume but different densities, are connected with a string and placed inside a liquid. They are at equilibrium in the position shown in the figure. If the string is cut, then



(a) A may remain at rest
(b) B may remain at rest
(c) A may move upwards with acceleration more than g
(d) B may move downwards with acceleration more than g

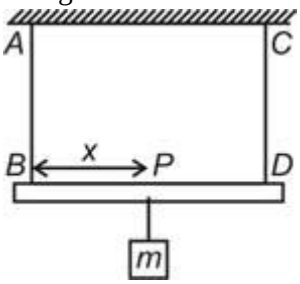
12. Two persons, *A* of mass 80 kg and *B* of mass 50 kg are standing on a horizontal platform of mass 20 kg. The platform is on horizontal frictionless surface and is initially at rest



If both *A* and *B* jump (horizontally) from platform simultaneously and in same direction with 2 m/s each, what would be the velocity of centre of mass of the system of persons and platform?

(a) 1.4 m/s
(b) 3.2 m/s
(c) 2.8 m/s
(d) Zero

13. A massless rod *BD* (length = *l*) is suspended by two identical massless strings *AB* and *CD* of equal lengths. A block of mass *m* is suspended at point *P*. If the fundamental frequency of the left wire is 3 times the fundamental frequency of right wire then determine the value of *x*

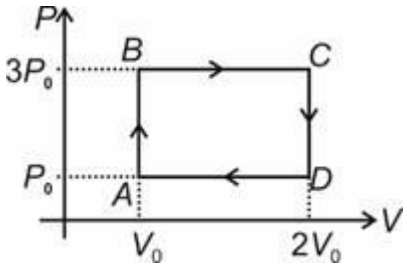


(a) $\frac{l}{5}$
(b) $\frac{3l}{5}$
(c) $\frac{9l}{10}$
(d) $\frac{l}{10}$

14. One mole of an ideal gas $\left(\frac{C_p}{C_v}=\frac{4}{3}\right)$ undergoes a cyclic process *ABCD*, shown by the following indicator diagram. The pressure and volume at certain points have been marked. The

Space for Rough Work

temperature of the gas at state A is T_0, given by the relation $T_0 = \frac{P_0V_0}{R}$



The work done by the gas in one complete cycle is

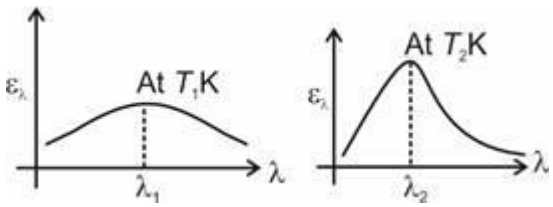
(a) P_0V_0

(b) $2P_0V_0$

(c) $3P_0V_0$

(d) $4P_0V_0$

15. Graph between spectral emissive power (ε_λ) and wavelength λ for a black body at temperatures T_1K and T_2K as shown in figure



If area of $\varepsilon_\lambda - \lambda$ graph at T_2K is 4 times the area at T_1K, then

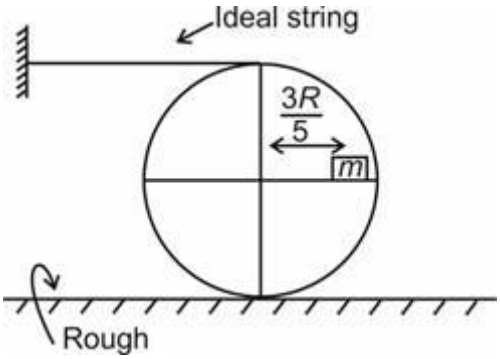
(a) $T_1 : T_2 = 1 : \sqrt{2}$

(b) $T_1 : T_2 = 1 : 2$

(c) $\lambda_1 : \lambda_2 = 2 : 1$

(d) $\lambda_1 : \lambda_2 = 1 : \sqrt{2}$

16. Consider a ring of mass m and radius R with four light spokes. A point mass m is placed on one horizontal spoke. (see the figure)



If the shown system is at rest then minimum value of coefficient of friction will be

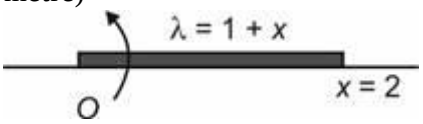
(a) $\frac{3}{20}$

(b) $\frac{1}{10}$

(c) $\frac{1}{4}$

(d) $\frac{2}{5}$

17. A rod of length 2 m has uniform cross- section but linear mass density varies as $\lambda = (1 + x)$ kg/m. It is placed as shown in figure. The moment of inertia of rod about an axis passing through O and perpendicular to rod is (x is in metre)



(a) $\frac{5}{3} kg\ m^2$

(b) $\frac{20}{3} kg\ m^2$

(c) $\frac{3}{5} kg\ m^2$

Space for Rough Work

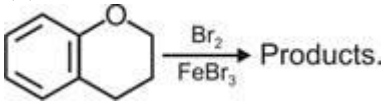
(d) $\frac{8}{3} kg\, m^2$

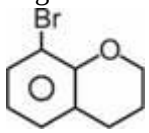
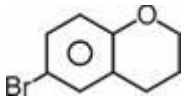
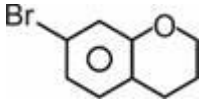
18. A trolley accelerates uniformly from rest and acquires the speed of 72 km h^{-1} on moving 200 m distance, henceforth breaks are applied so that it retards the trolley at a rate which is proportional to the velocity, until its speed is halved, by covering 400 m distance further. The total time of motion described of the trolley from the start (approximately)
    (a) 60 s
    (b) 68 s
    (c) 48 s
    (d) 42 s
19. An ideal gas undergoes a thermodynamic process in which internal energy of the gas depends on pressure of the gas as $U = aP^4$, where a is a positive constant. Assuming gas to be monoatomic, the molar heat capacity of the gas for given process will be
    (a) $\frac{3R}{4}$
    (b) $\frac{2R}{3}$
    (c) $\frac{9R}{4}$
    (d) $\frac{4R}{9}$
20. For an SHM oscillator, the amplitude is 5 cm and its time period is 4 seconds. The minimum time taken by the particle to pass between points which are at distances 4 cm and 3 cm from the centre of oscillation on the same side of it will be
    (a) 0.13 second
    (b) 0.18 second
    (c) 0.26 second
    (d) 0.35 second

Space for Rough Work

Section – B
Chemistry

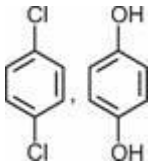
21. 250 mL of KHC_2O_4 required 100 mL of 0.1 M $KMnO_4$ solution in acidic medium for complete oxidation. If the same 250 mL of KHC_2O_4 is neutralised completely using 0.2 M KOH solution, then the volume of KOH solution (in mL) used is
    (a) 100 mL
    (b) 50 mL
    (c) 125 mL
    (d) 150 mL

22. 

    Products of given reaction is/are
    (a) Only 
    (b) Only 
    (c) Mixture of a and b
    (d) Only 

23. At 20°C, the concentration of Ag^+ ions in a saturated solution of Ag_2CrO_4 is 1.5×10^{-4} mol/L. The solubility product of Ag_2CrO_4 at 20°C will be
    (a) 2.25×10^{-8}
    (b) 1.687×10^{-12}
    (c) 1.658×10^{-13}
    (d) 13.5×10^{-16}

24. The correct order of increasing *s*-character (in percentage) in the hybrid orbitals of central atom in following molecules/ions is
    (I) CO_3^{2-}
    (II) XeF_4
    (III) I_3^-
    (IV) NO_2^+
    (a) II < III < IV < I < V
    (b) II < IV < III < V < I
    (c) III < II < I < V < IV
    (d) II < IV < III < I < V

25. In which pair the dipole moment of first species is greater than second?
    (a) NH_3, NF_3
    (b) BF_3, BCl_3
    (c) trans-but-2-ene, cis-but-2-ene
    (d) 

26. Two mole of an ideal monoatomic gas expands isothermally and reversibly from 10 L to 50 L at 27°C. From the following select the correct option (Use ln5 = 1.6, notation have their usual meaning)
    (a) W = –0.96 kcal
    (b) ΔS_{Total} = –3.2 cal/K
    (c) ΔS_{sys} = 6.4 cal/K
    (d) q_{sys} = –0.96 kcal

27. The Prussian blue colour obtained during the test of nitrogen by Lassaigne's test is due to the formation of
    (a) $Fe_4[Fe(CN)_6]_3$

Space for Rough Work

(b) $Na_3[Fe(CN)_6]$
(c) $Fe_3[Fe(CN)_6]_2$
(d) $Na_4[Fe(CN)_5NOS]$
Ans. $Fe_4[Fe(CN)_6]_3$

28. If the radius of first Bohr orbit for hydrogen atom is x, then de-Broglie wavelength of electron in 4^{th} orbit of H atom is nearly
(a) πx
(b) $2\pi x$
(c) $6\pi x$
(d) $8\pi x$

29. $A + 2B \rightleftharpoons 2C + D$
The initial conc. of B is 1.5 times the initial conc. of A. At equilibrium, conc. of A is equal to B. The equilibrium constant K_c is
(a) 2
(b) 8
(c) 4
(d) 9

30. Ozone layer is present in
(a) Thermosphere
(b) Mesosphere
(c) Stratosphere
(d) Ionosphere

31. Bond order of CO^+ and N_2^+ are respectively
(a) 3.5 and 2.5
(b) 2.5 and 2.5
(c) 3 and 2.5
(d) 2.5 and 3

32. An open vessel at 27°C contains 28 grams of H_2. Its temperature increases upto 127°C. What fraction of moles of H_2 gas escapes out of vessel?
(a) $\frac{1}{8}$
(b) $\frac{1}{4}$
(c) $\frac{2}{3}$
(d) $\frac{3}{4}$

33. A compound of boron X reacts at high temperature with NH_3 to give another compound Y, which is colourless liquid and is isosteric with benzene. X on reaction with excess NH_3 gives $(BN)_n$. X and Y respectively are
(a) BH_3, B_2H_6
(b) $NaBH_4$, C_6H_6
(c) B_2H_6, $B3N_3H_6$
(d) B4C3, B3N3H6

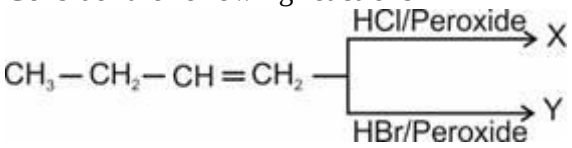
34. The molarity of 20 ml of 10 V H_2O_2 is
(a) 0.45 M
(b) 0.89 M
(c) 1.33 M
(d) 11.2 M

35. For the reaction

$$\underset{(P)}{CH_3-CH_2-CH=CH_2} \xrightarrow{Br_2/CCl_4} x \xrightarrow{2NaNH_2/\Delta} y$$

The incorrect statement is
(a) y has same degree of unsaturation as that of reactant (P)
(b) x is formed by anti-addition
(c) pK_a of y is less than that of reactant (P)
(d) x is vicinal di-halide

36. Consider the following reactions



If X and Y represents the major product of the respective reaction then select the correct statement.

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(a) Both X and Y are formed by radical mechanism
(b) X is formed by radical mechanism while Y is formed by ionic mechanism
(c) Both X and Y are 2°-alkyl halide
(d) X is 2°- alkyl halide while Y is 1°-alkyl halide

37. The equivalent mass of $Na_2S_2O_3$ (molar mass = M) when it reacts with I_2 in acidic medium is
(a) M
(b) $\frac{M}{8}$
(c) $\frac{M}{2}$
(d) $\frac{M}{4}$

38. $S_8(s) + 12OH^-(aq) \rightarrow 4S^{-2}(aq) + 2S_2O_3^{-2} + 6H_2O(l)$ belongs to which class of redox reactions?
(a) Combination reaction
(b) Decomposition reaction
(c) Disproportionation reaction
(d) Displacement reaction

39. How many spectral lines are emitted from a sample of hydrogen gaseous atoms when electrons present in n^{th} energy level return to ground state?
(a) n (n + 2)
(b) $\frac{n(n-1)}{2n}$
(c) $\frac{n(n-1)}{2}$
(d) $\frac{n(n+2)}{2}$

40. $CFCl_3$ is responsible for the decomposition of ozone to oxygen. Which of the following species reacts with ozone to form dioxygen?
(a) Cl_2
(b) Cl^-
(c) $Cl^\bullet$
(d) F^-

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Section – C
Mathematics

41. If the equations $ax^2 + 2bx + 3c = 0$ and $3x^2 + 8x + 15 = 0$ have a common root, where a, b, c are the lengths of sides of a triangle ABC, then $(\sin^2 A + \sin^2 B + \sin^2 C)$ is equal to
    (a) 1
    (b) $\frac{3}{2}$
    (c) $\frac{5}{2}$
    (d) 2

42. Triangles are formed by joining the vertices of a regular polygon of 20 sides. The probability that no side of the polygon is a side of the triangle, is
    (a) $\frac{25}{57}$
    (b) $\frac{30}{57}$
    (c) $\frac{35}{57}$
    (d) $\frac{40}{57}$

43. The value of $\lim_{n \to \infty} \sum_{r=1}^{n} \frac{r}{r^4 + r^2 + 1}$ is equal to
    (a) Zero
    (b) $\frac{1}{3}$
    (c) $\frac{1}{2}$
    (d) 1

44. The focus of the parabola $(y - 3)^2 = 8(x + 2)$ is
    (a) (2, 0)
    (b) (0, 3)
    (c) (0, 2)
    (d) (3, 0)

45. The centres of the circles $x^2 + y^2 = 1$, $x^2 + y^2 + 6x - 2y - 1 = 0$ and $x^2 + y^2 - 12x + 4y - 1 = 0$ are
    (a) The vertices of an equilateral triangle
    (b) The vertices of a right angled triangle
    (c) The vertices of an isosceles triangle
    (d) Collinear

46. The normal to the rectangular hyperbola $xy = 4$ at the point t_1 meets the curve again at the point t_2. Then the value of $t_1^3 t_2$ is
    (a) 1
    (b) 2
    (c) – 2
    (d) – 1

47. The locus of the point representing the complex number z for which $|z + 10i|^2 - |z - 10i|^2 = 20$, is (where $i = \sqrt{-1}$)
    (a) A circle
    (b) A straight line
    (c) A parabola
    (d) A hyperbola

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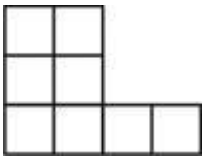
48. The number of ways in which the letters of the word RAMESH can be placed in the squares of the given figure so that no row remains empty, is



(a) 17280
(b) 18720
(c) 15840
(d) 14400

49. The sum of the series ${}^{2020}C_0 - {}^{2020}C_1 + {}^{2020}C_2 - {}^{2020}C_3 + \ldots + {}^{2020}C_{1010}$ is

(a) $\frac{1}{2}\,{}^{2020}C_{1010}$
(b) ${}^{2020}C_{1010}$
(c) Zero
(d) $\frac{-1}{2}\,{}^{2020}C_{1010}$

50. If

$$\sum_{i=1}^{9}(x_i - 5) = 9 \text{ and } \sum_{i=1}^{9}(x_i - 5)^2 = 45,$$

hen the standard deviation of the nine items $x_1, x_2, \ldots, x_9$ is

(a) 2
(b) 3
(c) 4
(d) 9

51. The domain of $f(x) = e^{\sin(x-[x])} + [x]\cos\left(\frac{\pi}{[x+1]}\right)$, where $[\cdot]$ represents greatest integer function, is

(a) R
(b) R – [–1, 0]
(c) R – [0, 1]
(d) R – [–1, 0)

52. If $1 + \cos\alpha + \cos^2\alpha + \cos^3\alpha + \ldots + \infty = 2 - \sqrt{2}$, $(\pi < \alpha < 2\pi)$, then the value of α is

(a) $\frac{5\pi}{4}$
(b) $\frac{7\pi}{4}$
(c) $\frac{4\pi}{3}$
(d) $\frac{5\pi}{3}$

53. Which of the following propositions is a contradiction?

(a) $(\sim p \vee \sim q) \vee (p \vee \sim q)$
(b) $(p \rightarrow q) \vee (p \wedge \sim q)$
(c) $(\sim p \wedge q) \wedge (\sim q)$
(d) $(\sim p \wedge q) \vee (\sim q)$

54. The point A is symmetric to $B(4, -1)$ with respect to the bisector of the first quadrant then AB is equal to

(a) 5 units
(b) $4\sqrt{5}$ units
(c) $5\sqrt{2}$ units
(d) $2\sqrt{5}$ units

55. Let p and q be two statements. Amongst the following, the statement that is equivalent to $p \rightarrow q$, is

(a) $p \wedge \sim q$
(b) $\sim p \wedge q$
(c) $\sim p \vee q$
(d) $p \vee \sim q$

56. If A and B are the vertices of the triangle ABC and are given by (2, 5) and (4, –

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11) respectively, and C moves along the line $L \equiv -9x + 7y + 4 = 0$, then the locus of the centroid of the triangle ABC is

(a) $9x + 7y - 8 = 0$
(b) $27x + 21y - 8 = 0$
(c) $7x - 9y - 8 = 0$
(d) $27x - 21y = 100$

57. The equation of the curve whose parametric equation is $x = 2t - 3$ and $y = 4t^2 - 1$, is given by

(a) $y^2 + 6x - y + 8 = 0$
(b) $x^2 + 6x - y + 8 = 0$
(c) $x^2 + y^2 - 6x - y - 8 = 0$
(d) $x^2 + y^2 - 6x + y - 8 = 0$

58. The equation $\frac{x^2}{16-x} + \frac{y^2}{k-9} = 1$ represents an ellipse if

(a) $k > 9$
(b) $k > 16$
(c) $k \in (9,16) - \left\{\frac{25}{2}\right\}$
(d) $k \in (-16,-9) - \left\{-\frac{25}{2}\right\}$

59. Let α, β be real and z be a non-real complex number. If $z^2 + \alpha z + \beta = 0$ has two distinct roots on line $\text{Re}(z) = 1$, then it is necessary that

(a) $\beta \in (-1, 0)$
(b) $|\beta| = 1$
(c) $\beta \in (1, \infty)$
(d) $\beta \in (0, 1)$

60. The value of $\lim_{x \to \infty} \left(\frac{x+5}{x-7}\right)^x$ is

(a) e^{12}
(b) e^{-12}
(c) 12
(d) –12

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ANSWER KEY

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

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