VLYMBOOQ · FULL-LENGTH MOCK PAPER

JEE Main - Paper 1 (B.E./B.Tech) (Full Paper)

75 questions · 300 marks · 180 minutes

Paper pattern

Exam: JEE Main - Paper 1 (B.E./B.Tech) (Full Paper)
Questions: 75 Marks: 300 Time: 180 minutes
Negative marking: -1 mark for a wrong MCQ; numerical questions carry no negative
Source: JEE Main Paper 1: 75 questions, 300 marks, 180 minutes; 25 per subject (20 MCQ + 5 numerical); +4/-1.
Generated: 2026-11-12T19:39:41.275Z By: reviewed question bank
Note: Each subject has 20 MCQs + 5 numerical-answer questions. This bank stores MCQ form only, so the paper is assembled as 25 MCQs per subject.

Sections

Physics - 25 questions, 100 marks
Chemistry - 25 questions, 100 marks
Mathematics - 25 questions, 100 marks

Instructions

The timer is for practice; the real paper allows 180 minutes.
Each question has exactly one correct option.
Negative marking: -1 mark for a wrong MCQ; numerical questions carry no negative.
The answer key and a full explanation for every question follow the paper.
Model-generated questions are marked as such in the HTML page; verify any factual detail against the official notification.

Physics

Q1. The de Broglie wavelength of an electron moving with velocity v is . If velocity is doubled, wavelength becomes:

A. 2
B. /2
C. 4
D. /4

Q2. First law of thermodynamics is based on:

A. Conservation of momentum
B. Conservation of energy
C. Conservation of mass
D. Conservation of charge

Q3. The equivalent resistance of three 6 resistors connected in parallel is:

A. 18
B. 6
C. 2
D. 3

Q4. A body is projected vertically upward with velocity 20 m/s. Maximum height reached is (g=10 m/s^2):

A. 10 m
B. 20 m
C. 40 m
D. 5 m

Q5. SI unit of resistance is:

A. Volt
B. Ampere
C. Coulomb
D. Ohm

Q6. The escape velocity of a body from Earth is 11.2 km/s. What is the escape velocity from a planet having mass 4 times and radius twice that of Earth?

A. 22.4 km/s
B. 5.6 km/s
C. 15.8 km/s
D. 11.2 km/s

Q7. A body of mass 1 kg has weight approximately:

A. 1 N
B. 10 N
C. 100 N
D. 0.1 N

Q8. A car accelerates uniformly from rest to 20 m/s in 10 s. The acceleration is:

A. 1 m/s^2
B. 2 m/s^2
C. 0.5 m/s^2
D. 4 m/s^2

Q9. A particle is moving with velocity $v = 2t^2 + 3t$. Find its acceleration at t = 2s.

A. 11 m/s^2
B. 10 m/s^2
C. 8 m/s^2
D. 14 m/s^2

Q10. The speed of sound is maximum in:

A. Air
B. Water
C. Steel
D. Vacuum

Q11. If the distance between two charges is halved, the force between them becomes:

A. Half
B. Double
C. Four times
D. Same

Q12. A wire of resistance R is stretched to double its length. New resistance will be:

A. R/2
B. R
C. 4R
D. 2R

Q13. A convex lens has focal length 20 cm. At what distance from the lens should an object be placed to get a real image twice the size of object?

A. 40 cm
B. 30 cm
C. 20 cm
D. 60 cm

Q14. A ball dropped from height h hits the ground with speed v. The value of v is proportional to:

A. h
B. sqrth
C. h^2
D. 1/h

Q15. The efficiency of a Carnot engine operating between 500 K and 300 K is:

A. 60%
B. 40%
C. 50%
D. 30%

Q16. Young's modulus is defined for which type of deformation?

A. Shear
B. Longitudinal strain
C. Volume strain
D. Torsion

Q17. A block of mass 5 kg is moving with a velocity of 2 m/s. What is the magnitude of its momentum?

A. 5 kg m/s
B. 10 kg m/s
C. 15 kg m/s
D. 20 kg m/s

Q18. The Doppler effect in sound is observed when there is relative motion between source and:

A. Observer only
B. Medium only
C. Observer or source
D. Neither

Q19. A particle is moving with velocity v = 2t^2 + 3t. Find its acceleration at t = 2s.

A. 11 m/s^2
B. 10 m/s^2
C. 8 m/s^2
D. 14 m/s^2

Q20. The momentum of a photon of energy E is:

A. E/c^2
B. E/c
C. Ec
D. hE/c

Q21. The phenomenon of splitting of white light into its components is called:

A. Reflection
B. Refraction
C. Dispersion
D. Diffraction

Q22. The temperature at which Celsius and Fahrenheit scales read the same is:

A. 0°
B. 32°
C. -40°
D. 100°

Q23. A Carnot engine operates between two reservoirs at temperatures 500 K and 300 K. What is the efficiency of the engine?

A. 0.2
B. 0.4
C. 0.6

D. 0.8

Q24. A thermodynamic system undergoes a process where the internal energy change is 100 J and the heat added to the system is 200 J. What is the work done by the system?

A. -100 J
B. 100 J
C. 200 J
D. 300 J

Q25. Two resistors 4 and 6 are connected in series. The total resistance is:

A. 2.4
B. 10
C. 24
D. 4

Chemistry

Q26. The most abundant element in Earth's crust is:

A. Iron
B. Oxygen
C. Silicon
D. Aluminum

Q27. The pH of 0.001 M NaOH is approximately:

A. 3
B. 7
C. 10
D. 11

Q28. The oxidation state of Mn in $KMnO_4$ is:

A. +5
B. +6
C. +7
D. +4

Q29. The coordination number in NaCl crystal structure is:

A. 4
B. 6
C. 8
D. 12

Q30. Which element has the highest ionization energy?

A. Li
B. Na
C. He
D. Ne

Q31. Which of the following is an aromatic compound?

A. Cyclohexane
B. Benzene
C. Cyclohexene
D. 1,3-Butadiene

Q32. The color of phenolphthalein in basic medium is:

A. Colorless
B. Pink
C. Blue
D. Yellow

Q33. The pH of 10^{3} M HCl solution is:

A. 1
B. 3
C. 7
D. 11

Q34. Which of the following elements is liquid at room temperature?

A. Sodium
B. Mercury
C. Gold
D. Silver

Q35. How many moles of O are required for complete combustion of 1 mole of CH?

A. 4
B. 5
C. 6.5
D. 8

Q36. Which of the following is a strong acid?

A. CHCOOH
B. HCl
C. HCO
D. HS

Q37. The molar mass of CaCO is:

A. 50 g/mol
B. 84 g/mol
C. 100 g/mol
D. 150 g/mol

Q38. Which of these is a noble gas?

A. Cl
B. N
C. Xenon
D. O

Q39. Which gas is known as "Laughing Gas"?

A. NO2
B. N2O
C. CO
D. CO2

Q40. What is the pH of a 0.1 M solution of NaOH?

A. 1
B. 12
C. 13
D. 14

Q41. The pH of 10 M HCl solution is:

A. 1
B. 3
C. 7
D. 11

Q42. Which process is used to separate crude oil into useful fractions?

A. Distillation
B. Crystallization
C. Fractional distillation
D. Chromatography

Q43. What is the IUPAC name of the compound with the formula CH3CH2CH2OH?

A. Propan-1-ol
B. Propan-2-ol
C. Butan-1-ol
D. Butan-2-ol

Q44. Atomic number of oxygen is:

A. 6
B. 7
C. 8
D. 16

Q45. Which bond has the highest bond energy?

A. C-C
B. C=C
C. CC
D. All equal

Q46. What is the type of hybridization of the central atom in the molecule CO2?

A. sp
B. sp2
C. sp3
D. dsp2

Q47. The gas used in welding is:

A. Methane
B. Ethane
C. Acetylene
D. Propane

Q48. The chemical name of common salt is:

A. Sodium nitrate
B. Sodium chloride
C. Sodium carbonate
D. Sodium hydroxide

Q49. The hybridization of carbon in methane is:

A. sp
B. sp^2
C. sp^3
D. dsp^2

Q50. What is the type of bond formed between two atoms of the same element, such as in the molecule O2?

A. Ionic bond
B. Covalent bond
C. Hydrogen bond
D. Van der Waals bond

Mathematics

Q51. The slope of line passing through (1,2) and (3,6) is:

A. 1
B. 2
C. 3
D. 4

Q52. The value of $\sin^2 30° + \cos^2 30°$ is:

A. 0
B. 1/2
C. 1
D. 3/4

Q53. If the function f(x) = x^3 - 2x^2 - 5x + 1 is given, what is the value of f(-1)?

A. 1
B. 3
C. 5
D. 7

Q54. Find the derivative of $f(x) = \sin(x^2)$.

A. $\cos(x^2)$
B. 2x cos(x)
C. $2x \cos(x^2)$
D. $x^2 \cos(x^2)$

Q55. The solution of 2x + 3 = 7 is:

A. 1
B. 2
C. 3
D. 4

Q56. The sum of first 10 natural numbers is:

A. 45
B. 55
C. 50
D. 60

Q57. The sum of first n odd natural numbers is:

A. n
B. 2n
C. n^2
D. n(n+1)/2

Q58. The range of the function $f(x) = x^2$ is:

A. All real numbers
B. [0, 8)
C. (-8, 0]
D. (0, 8)

Q59. The probability of getting a head when a fair coin is tossed is:

A. 0
B. 1/4
C. 1/2
D. 1

Q60. The value of 5! is:

A. 60
B. 100
C. 120
D. 24

Q61. Find the derivative of f(x) = sin(x^2).

A. cos(x^2)
B. 2x cos(x)
C. 2x cos(x^2)
D. x^2 cos(x^2)

Q62. The number of permutations of 3 objects taken 2 at a time is:

A. 3
B. 6
C. 9
D. 2

Q63. If A = {1, 2, 3} and B = {2, 3, 4}, find A n B.

A. {1}
B. {2, 3}
C. {2, 3, 4}
D. {1, 2, 3, 4}

Q64. The quadratic equation whose roots are 1 and 2 is:

A. $x^2 - 3x - 2 = 0$
B. $x^2 - 3x + 2 = 0$
C. $x^2 + 3x + 2 = 0$
D. $x^2 - x + 2 = 0$

Q65. If f(x) = 2x + 1, find f(3):

A. 5
B. 6
C. 7
D. 8

Q66. The value of sin^230 degrees + cos^230 degrees is:

A. 0
B. 1/2
C. 1
D. 3/4

Q67. The value of $\int_1 x^2\,dx$ is:

A. 0
B. 1/2
C. 1/3
D. 1

Q68. If the function f(x) = x^2 - 4x + 3 is given, what is the value of x for which f(x) is maximum or minimum?

A. 0
B. 1
C. 2
D. 3

Q69. The mode of 1, 2, 2, 3, 3, 3, 4 is:

A. 2
B. 3
C. 4
D. 1

Q70. If the probability of an event A is 0.4 and of B is 0.5, and A and Bare independent, then P(A n B) is:

A. 0.9
B. 0.1
C. 0.2
D. 0.02

Q71. The value of i^2 (where i = v-1) is:

A. 1
B. -1
C. i
D. -i

Q72. If the equation x^2 + 2x + 1 = 0 has two equal roots, what is the value of the discriminant?

A. 0
B. 1
C. 2
D. 4

Q73. The value of x^2 dx is:

A. 0
B. 1/2
C. 1/3
D. 1

Q74. The value of log 32 is:

A. 4
B. 5
C. 6
D. 3

Q75. Which of these is a perfect square?

A. 20
B. 24
C. 36
D. 48

Answer key

Q1 B	**Q2 B**	**Q3 C**	**Q4 B**
Q5 D	**Q6 C**	**Q7 B**	**Q8 B**
Q9 A	**Q10 C**	**Q11 C**	**Q12 C**
Q13 B	**Q14 B**	**Q15 B**	**Q16 B**
Q17 B	**Q18 C**	**Q19 A**	**Q20 B**
Q21 C	**Q22 C**	**Q23 B**	**Q24 A**
Q25 B	**Q26 B**	**Q27 D**	**Q28 C**
Q29 B	**Q30 C**	**Q31 B**	**Q32 B**
Q33 B	**Q34 B**	**Q35 C**	**Q36 B**
Q37 C	**Q38 C**	**Q39 B**	**Q40 C**
Q41 B	**Q42 C**	**Q43 A**	**Q44 C**
Q45 C	**Q46 A**	**Q47 C**	**Q48 B**
Q49 C	**Q50 B**	**Q51 B**	**Q52 C**
Q53 D	**Q54 C**	**Q55 B**	**Q56 B**
Q57 C	**Q58 B**	**Q59 C**	**Q60 C**
Q61 C	**Q62 B**	**Q63 B**	**Q64 B**
Q65 C	**Q66 C**	**Q67 C**	**Q68 C**
Q69 B	**Q70 C**	**Q71 B**	**Q72 A**
Q73 C	**Q74 B**	**Q75 C**	

Solutions and explanations

Q1. The de Broglie wavelength of an electron moving with velocity v is . If velocity is doubled, wavelength becomes:
Answer: B
= h/p = h/(mv). If v doubles, ' = h/(m.2v) = /2.

Q2. First law of thermodynamics is based on:
Answer: B
U = Q - W. First law is the law of conservation of energy for thermodynamic systems.

Q3. The equivalent resistance of three 6 resistors connected in parallel is:
Answer: C
1/Rp = 1/6 + 1/6 + 1/6 = 3/6 = 1/2 Rp = 2 .

Q4. A body is projected vertically upward with velocity 20 m/s. Maximum height reached is (g=10 m/s^2):
Answer: B
H = u^2/2g = 400/20 = 20 m.

Q5. SI unit of resistance is:
Answer: D
Resistance is measured in Ohms ( ).

Q6. The escape velocity of a body from Earth is 11.2 km/s. What is the escape velocity from a planet having mass 4 times and radius twice that of Earth?
Answer: C
v_e = sqrt(2GM/R). For new planet: v_e' = sqrt(2G.4M/2R) = sqrt(2.2GM/R) = sqrt2.sqrt(2GM/R) = sqrt2 x 11.2 = 15.84 km/s.

Q7. A body of mass 1 kg has weight approximately:
Answer: B
W = mg = 1 × 10 = 10 N (approx).

Q8. A car accelerates uniformly from rest to 20 m/s in 10 s. The acceleration is:
Answer: B
a = (v-u)/t = (20-0)/10 = 2 m/s^2.

Q9. A particle is moving with velocity $v = 2t^2 + 3t$. Find its acceleration at t = 2s.
Answer: A
$a = dv/dt = d(2t^2 + 3t)/dt = 4t + 3$. At t = 2: $a = 4(2) + 3 = 11$ m/s².

Q10. The speed of sound is maximum in:
Answer: C
Sound travels fastest in solids (steel ~5000 m/s) due to close molecular arrangement.

Q11. If the distance between two charges is halved, the force between them becomes:
Answer: C
F 1/r². If r -> r/2, F -> 4F.

Q12. A wire of resistance R is stretched to double its length. New resistance will be:
Answer: C
When length is doubled (L' = 2L), cross-sectional area halves (A' = A/2). R' = L'/A' = (2L)/(A/2) = 4L/A = 4R.

Q13. A convex lens has focal length 20 cm. At what distance from the lens should an object be placed to get a real image twice the size of object?
Answer: B
Magnification m = -2 (real image). m = v/u = -2 v = -2u. Lens formula: 1/f = 1/v - 1/u. 1/20 = 1/(-2u) - 1/u = -3/(2u). u = -30 cm. So object distance = 30 cm.

Q14. A ball dropped from height h hits the ground with speed v. The value of v is proportional to:
Answer: B
v = sqrt(2gh) -> v sqrth.

Q15. The efficiency of a Carnot engine operating between 500 K and 300 K is:
Answer: B
= 1 - T/T = 1 - 300/500 = 0.4 = 40%.

Q16. Young's modulus is defined for which type of deformation?
Answer: B
Y = stress/strain for longitudinal (tensile/compressive) deformation.

Q17. A block of mass 5 kg is moving with a velocity of 2 m/s. What is the magnitude of its momentum?
Answer: B
The momentum of an object is given by the product of its mass and velocity. So, the magnitude of the momentum is p = mv = 5 kg * 2 m/s = 10 kg m/s.

Q18. The Doppler effect in sound is observed when there is relative motion between source and:
Answer: C
Doppler effect occurs when source or observer is in motion relative to each other.

Q19. A particle is moving with velocity v = 2t^2 + 3t. Find its acceleration at t = 2s.
Answer: A
a = dv/dt = d(2t^2 + 3t)/dt = 4t + 3. At t = 2: a = 4(2) + 3 = 11 m/s^2.

Q20. The momentum of a photon of energy E is:
Answer: B
p = E/c for a photon (since E = pc).

Q21. The phenomenon of splitting of white light into its components is called:
Answer: C
Dispersion is the splitting of white light into its constituent colors (VIBGYOR).

Q22. The temperature at which Celsius and Fahrenheit scales read the same is:
Answer: C
C/5 = (F-32)/9. Set C = F = x: x/5 = (x-32)/9 9x = 5x-160 x = -40.

Q23. A Carnot engine operates between two reservoirs at temperatures 500 K and 300 K. What is the efficiency of the engine?
Answer: B
The efficiency of a Carnot engine is given by the equation eta = 1 - (T2/T1), where T1 and T2 are the temperatures of the two reservoirs. For the given temperatures, eta = 1 - (300/500) = 1 - 0.6 = 0.4.

Q24. A thermodynamic system undergoes a process where the internal energy change is 100 J and the heat added to the system is 200 J. What is the work done by the system?
Answer: A
The first law of thermodynamics states that U = Q - W, where U is the internal energy change, Q is the heat added, and W is the work done. Rearranging the equation to solve for W, we get W = Q - U = 200 J - 100 J = 100 J. However, the work done 'by' the system is in the opposite direction, so the work done by the system is -100 J.

Q25. Two resistors 4 and 6 are connected in series. The total resistance is:
Answer: B
R = 4 + 6 = 10 .

Q26. The most abundant element in Earth's crust is:
Answer: B
Oxygen (~46.6%) is the most abundant element in Earth's crust.

Q27. The pH of 0.001 M NaOH is approximately:
Answer: D
[OH] = 10 ³, pOH = 3, pH = 14 - 3 = 11.

Q28. The oxidation state of Mn in KMnO4 is:
Answer: C
K(+1) + Mn + 4O(-2) = 0 +1 + Mn -8 = 0 Mn = +7.

Q29. The coordination number in NaCl crystal structure is:
Answer: B
NaCl has face-centered cubic (FCC) structure with each Na surrounded by 6 Cl and vice versa.

Q30. Which element has the highest ionization energy?
Answer: C
Helium has the highest ionization energy due to its full $1s^2$ configuration and small atomic size.

Q31. Which of the following is an aromatic compound?
Answer: B
Benzene follows Hckel's rule (4n+2 pi electrons, n=1) and is planar with delocalized electrons.

Q32. The color of phenolphthalein in basic medium is:
Answer: B
Phenolphthalein is colorless in acid and pink in base (pH > 8.3).

Q33. The pH of 10 ³ M HCl solution is:
Answer: B
[H] = 10 ³ M. pH = -log[H] = -log(10 ³) = 3.

Q34. Which of the following elements is liquid at room temperature?
Answer: B
Mercury (Hg) and bromine (Br) are the only elements liquid at room temp.

Q35. How many moles of O are required for complete combustion of 1 mole of CH?
Answer: C
CH + 6.5O -> 4CO + 5HO. So 6.5 moles of O are needed.

Q36. Which of the following is a strong acid?
Answer: B
HCl completely dissociates in water -> strong acid.

Q37. The molar mass of CaCO is:
Answer: C
Ca(40) + C(12) + 3O(48) = 100 g/mol.

Q38. Which of these is a noble gas?
Answer: C
Xenon (Xe) is a noble gas. Cl, N, O are diatomic gases.

Q39. Which gas is known as "Laughing Gas"?
Answer: B
Nitrous oxide (N2O) is called laughing gas due to its euphoric effects when inhaled.

Q40. What is the pH of a 0.1 M solution of NaOH?
Answer: C
NaOH is a strong base, so it completely dissociates in water to give OH- ions. The concentration of OH- ions is equal to the concentration of NaOH, which is 0.1 M. Using the equation pOH = -log[OH-], we get pOH = -log(0.1) = 1. Then, pH + pOH = 14, so pH = 14 - pOH = 14 - 1 = 13.

Q41. The pH of 10 M HCl solution is:
Answer: B
[H] = 10 M. pH = -log[H] = -log(10) = 3.

Q42. Which process is used to separate crude oil into useful fractions?
Answer: C
Fractional distillation separates petroleum into fractions based on boiling points.

Q43. What is the IUPAC name of the compound with the formula CH3CH2CH2OH?
Answer: A
The IUPAC name of the compound with the formula CH3CH2CH2OH is Propan-1-ol.

Q44. Atomic number of oxygen is:
Answer: C
Oxygen has atomic number 8 (configuration 1s^22s^22p).

Q45. Which bond has the highest bond energy?
Answer: C
Triple bond (CC) has highest bond energy - 839 kJ/mol vs 614 for double, 348 for single.

Q46. What is the type of hybridization of the central atom in the molecule CO2?
Answer: A
The central atom in CO2 is carbon, which is bonded to two oxygen atoms. Since carbon has two equivalent bonds and no lone pairs, its hybridization is sp.

Q47. The gas used in welding is:
Answer: C
Acetylene (C2H2) produces high temperature flame used in oxy-acetylene welding.

Q48. The chemical name of common salt is:
Answer: B
Common salt is NaCl - Sodium chloride.

Q49. The hybridization of carbon in methane is:
Answer: C
CH4 has 4 bond pairs + 0 lone pairs -> sp^3 hybridization, tetrahedral shape.

Q50. What is the type of bond formed between two atoms of the same element, such as in the molecule O2?
Answer: B
The bond formed between two atoms of the same element, such as in the molecule O2, is a covalent bond. This is because the two oxygen atoms share electrons to form a bond.

Q51. The slope of line passing through (1,2) and (3,6) is:
Answer: B
m = (6-2)/(3-1) = 4/2 = 2.

Q52. The value of $\sin^2 30° + \cos^2 30°$ is:
Answer: C
$\sin^2 + \cos^2 = 1$ (identity).

Q53. If the function f(x) = x^3 - 2x^2 - 5x + 1 is given, what is the value of f(-1)?
Answer: D
To find the value of f(-1), we substitute x = -1 into the function: f(-1) = (-1)^3 - 2(-1)^2 - 5(-1) + 1 = -1 - 2 + 5 + 1 = 3.

Q54. Find the derivative of f(x) = sin(x²).
Answer: C
Using chain rule: d/dx[sin(x²)] = cos(x²) · d/dx(x²) = 2x cos(x²).

Q55. The solution of 2x + 3 = 7 is:
Answer: B
2x = 4 -> x = 2.

Q56. The sum of first 10 natural numbers is:
Answer: B
Sum = n(n+1)/2 = 10×11/2 = 55.

Q57. The sum of first n odd natural numbers is:
Answer: C
1 + 3 + 5 + ... + (2n-1) = n^2.

Q58. The range of the function f(x) = x² is:
Answer: B
x² = 0 for all real x range [0, 8).

Q59. The probability of getting a head when a fair coin is tossed is:
Answer: C
P(Head) = 1/2 (favorable outcomes / total outcomes).

Q60. The value of 5! is:
Answer: C
5! = 5x4x3x2x1 = 120.

Q61. Find the derivative of f(x) = sin(x^2).
Answer: C
Using chain rule: d/dx[sin(x^2)] = cos(x^2) . d/dx(x^2) = 2x cos(x^2).

Q62. The number of permutations of 3 objects taken 2 at a time is:
Answer: B
P = 3!/(3-2)! = 6.

Q63. If A = {1, 2, 3} and B = {2, 3, 4}, find A n B.
Answer: B
A n B = elements common to both sets = {2, 3}.

Q64. The quadratic equation whose roots are 1 and 2 is:
Answer: B
Sum = 3, Product = 2 x² - 3x + 2 = 0.

Q65. If f(x) = 2x + 1, find f(3):
Answer: C
f(3) = 2(3) + 1 = 7.

Q66. The value of sin^230 degrees + cos^230 degrees is:
Answer: C
sin^2 + cos^2 = 1 (identity).

Q67. The value of ¹ x² dx is:
Answer: C
¹ x² dx = [x³/3] ¹ = 1/3 - 0 = 1/3.

Q68. If the function f(x) = x^2 - 4x + 3 is given, what is the value of x for which f(x) is maximum or minimum?
Answer: C
To find the maximum or minimum of the function f(x), we need to find the critical points by taking the derivative of f(x) and setting it equal to zero. The derivative of f(x) = x^2 - 4x + 3 is f'(x) = 2x - 4. Setting f'(x) = 0, we get 2x - 4 = 0, which gives x = 2.

Q69. The mode of 1, 2, 2, 3, 3, 3, 4 is:
Answer: B
3 appears 3 times (highest frequency).

Q70. If the probability of an event A is 0.4 and of B is 0.5, and A and Bare independent, then P(A n B) is:
Answer: C
For independent events: P(A n B) = P(A)·P(B) = 0.4 × 0.5 = 0.2.

Q71. The value of i² (where i = v-1) is:
Answer: B
i² = -1 (fundamental property of imaginary numbers).

Q72. If the equation x^2 + 2x + 1 = 0 has two equal roots, what is the value of the discriminant?
Answer: A
The discriminant of a quadratic equation ax^2 + bx + c = 0 is given by b^2 - 4ac. For the given equation x^2 + 2x + 1 = 0, a = 1, b = 2, and c = 1. The discriminant is 2^2 - 4*1*1 = 0.

Q73. The value of x^2 dx is:
Answer: C
x^2 dx = [x/3] = 1/3 - 0 = 1/3.

Q74. The value of log 32 is:
Answer: B
log 32 = log 2 = 5.

Q75. Which of these is a perfect square?
Answer: C
36 = 6^2. Others are not perfect squares.