FIITJEE PET – I (REG_1ST YEAR)

MAINS_SET–A

DATE: 09.06.2018

Time: 3 hours **Maximum Marks: 360**

INSTRUCTIONS:

Instructions to the Candidates

1. This Test Booklet consists of **90 questions**.

   Use **Blue/Black ball Point Pen only** for writing particulars and bubbling of OMR.

2. For each correct answer **4 Marks** will awarded and for each wrong answer **1 Mark** will be deducted.

3. Attempt all questions.

4. In case you have not darkened any bubble you will be awarded 0 mark for that question.

5. Use of calculator/logarithmic table is not permitted.

Don't write / mark your answers in this question booklet.
If you mark the answers in question booklet, you will not be allowed to continue the exam.

NAME: ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

ENROLLMENT NO.: ☐☐☐☐☐☐☐☐☐☐☐☐

1. $\frac{4x^2-20x+25}{4x^2-12x+9} \le 0$ is satisfied by

(A) no value of x (B) infinite values of x (C) only one value of x (D) only two values of x

2. $\frac{2(x-1)}{(x+2)(x-4)} \le \frac{1}{x+1}$, then $x \in$

(A) $(-\infty, -1) \cup (-2, 4)$ (B) $(-\infty, -2) \cup (1, 4)$ (C) $(-\infty, -2) \cup (-1, 4)$ (D) $(-\infty, -2) \cup (4, \infty)$

3. $\frac{\left(x^2+3x+1\right)\left(x^2-3x+2\right)\left(x^2-5x+8\right)}{\left(x^2-4x+3\right)} \ge 0$

(A) $(-\infty, \infty)$ (B) $(-\infty, \infty) - \{1, 3\}$ (C) $(-\infty, \infty) - \{1, 2, 3\}$ (D) none of these

4. The solution set of $x^2(x + 1)(x – 3) < 0$ is

(A) $(–1, 3)$ (B) $[–1, 3)$ (C) $(–1, 3]$ (D) none of these

5. The inequality $2x + 4 > x^2 – 3x – 10$ is satisfied by

(A) $(–7, 2]$ (B) $[–7, 2)$ (C) $[–2, 7)$ (D) $(–2, 7]$

6. $9x^2 – 6x + 1 \le 0$ is satisfied by

(A) no value of x (B) $x = \frac{1}{3}$ (C) $x < \frac{1}{3}$ (D) $x \ge \frac{1}{3}$

7. $\frac{x^2-2x+1}{(x-1)^2} \ge 0$, then $x \in$

(A) $(-\infty, \infty)$ (B) $(1, \infty)$ (C) $(-\infty, 1)$ (D) $(-\infty, \infty) - \{1\}$

8. The solution set of $x^3 – 6x^2 + 5x \ge 0$ is

(A) $[1, 5]$ (B) $[1, 5] \cup \{0\}$ (C) $[1, 5] - \{0\}$ (D) none of these

9. $x^4 \le 1$, then x lies in the interval

(A) $(-\infty, 1]$ (B) $[–1, 1]$ (C) $(-\infty, –1] \cup [1, \infty)$ (D) none of these

10. $\frac{x-1}{4-x} \ge 0$, then $x \in$

(A) $(1, 4)$ (B) $[1, 4)$ (C) $(1, 4]$ (D) $[1, 4]$

Space for rough work

11. Solve: $\left|\frac{x-3}{x+1}\right| \le 1$

(A) $x \ge 1$ (B) $x > 1$ (C) $x < 1$ (D) $x \le 1$

12. Solve: $\left|1+\frac{3}{x}\right| > 2$

(A) $x \in (-1, 0) \cup (0, 3)$ (B) $x \in [-1, 0] \cup [0, 3]$ (C) $x \in (-1, 3)$ (D) $x \in [-1, 3]$

13. Solve: $|3x - 2| < 4$

(A) $-\frac{2}{3} \le x < 2$ (B) $x \le 2$ (C) $-\frac{2}{3} < x < 2$ (D) $-\frac{2}{3} < x \le 2$

14. Solve for x: $|x - 1| - |2x - 5| = 2x$

(A) $\left\{\frac{4}{3}\right\}$ (B) $\left\{-4, 6, \frac{4}{3}\right\}$ (C) {6, –4} (D) {–4}

15. If $\left|\frac{x+2}{x-1}\right| = 2$, solve for 'x'

(A) 0 (B) 4 (C) both (A) and (B) (D) none of these

16. If $|x - 5| + |x + 4| \le 7$, solve for 'x'.

(A) (4, 5) (B) $(-\infty, 4]$ (C) $[-3, \infty)$ (D) no solution

17. The number of real solutions of the equation $x^2 - 3|x| + 2 = 0$

(A) 4 (B) 1 (C) 2 (D) 3

18. Let –297, –294, –291, ... be in an A.P, then the value of 'n' such that S_n is least.

(A) 100 (B) 101 (C) 99 (D) 99 and 100

19. Solve the equation: $(x + 1) + (x + 4) + (x + 1) + ... + (x + 28) = 155$

(A) 1 (B) 2 (C) –1 (D) –2

20. $\frac{(x-1)^4 (x^2-4)^2 (x^2+1)}{(2-3x)^2 (x-4)^3 (x-2)} \le 0$

(A) [2, 4) (B) (2, 4) (C) (2, 4] (D) $(-\infty, 2) \cup (4, \infty)$

Space for rough work

21. If 10^{th} term of an A.P is 30 and 15^{th} term is 20. Then 4^{th} term is
(A) 21 (B) 42 (C) 24 (D) 40

22. If $\log_4 5 = a$ and $\log_5 6 = b$, then $\log_3 2$ is equal to
(A) $\frac{1}{2a+1}$ (B) $\frac{1}{2b+1}$ (C) $2ab + 1$ (D) $\frac{1}{2ab-1}$

23. The value of $\frac{1+2\log_3 2}{(1+\log_3 2)^2} + (\log_6 2)^2$ is
(A) 2 (B) 3 (C) 4 (D) 1

24. $\log_{x-1} x \cdot \log_{x-2}(x-1) \ldots\ldots \log_{x-12}(x-11) = 2$, x is equal to
(A) 9 (B) 16 (C) 25 (D) none of these

25. If $f(x) = \log\left(\frac{1+x}{1-x}\right)$, then
(A) $f(x_1) \cdot f(x_2) = f(x_1 + x_2)$ (B) $f(x+2) - 2f(x+1) + f(x) = 0$
(C) $f(x) + f(x+1) = f(x^2 + x)$ (D) $f(x_1) + f(x_2) = f\left(\frac{x_1 + x_2}{1 + x_1 x_2}\right)$

26. The value of x satisfying the equation $\sqrt[3]{5}^{\log_5 5^{\log_5 5^{\log_5 5^{\log_5\left(\frac{x}{2}\right)}}}} = 3$, is
(A) 1 (B) 3 (C) 18 (D) 54

27. If $\log_{10}\left[\frac{1}{2^x + x - 1}\right] = x[\log_{10} 5 - 1]$, then x =
(A) 4 (B) 3 (C) 2 (D) 1

28. If $2x^{\log_4 3} + 3^{\log_4 x} = 27$, then x is equal to
(A) 2 (B) 4 (C) 8 (D) 16

29. The set of all x satisfying the equation $x^{\log_3 x^2 + (\log_3 x)^2 - 10} = \frac{1}{x^2}$ is
(A) {1, 9} (B) $\left\{1, 9, \frac{1}{81}\right\}$ (C) $\left\{1, 4, \frac{1}{81}\right\}$ (D) $\left\{9, \frac{1}{81}\right\}$

Space for rough work

30. Solution set of the inequality $\log_{0.8}\left(\log_6 \frac{x^2+x}{x+4}\right) < 0$ is

(A) (–4, –3) (B) (–3, 4) ∪ (8, ∞) (C) (–3, ∞) (D) (–4, –3) ∪ (8, ∞)

31. The density of mercury is 13600 kg m^{-3}. Its value in CGS system will be
A) 13.6 g cm^{-3} B) 1360 g cm^{-3} C) 136 g cm^{-3} D) 1.36 g cm^{-3}

32. A pressure of 10^6 dynes/cm^2 is equivalent to
A) 10^5 N/m^2 B) 10^4 N/m^2 C) 10^6 N/m^2 D) 10^7 N/m^2

33. Given that $y = a\cos\left(\frac{t}{p} - qx\right)$, where *t* represents time in second and *x* represents distance in metre.
Which of the following statements is true?
A) The unit of *x* is same as that of *q* B) The unit of *x* is same as that of *p*
C) The unit of *t* is same as that of *q* D) The unit of *t* is same as that of *p*

34. If we choose velocity V, acceleration A and force F as the fundamental quantities, then the angular momentum in terms of V, A and F would be __.(Use Angular momentum = mass x velocity x distance)
A) $FA^{-1}V$ B) FV^3A^{-2} C) FV^2A^{-1} D) ML^2T^{-1}

35. The velocity *v* (in cm/sec) of a particle is given in terms of time *t* (in sec) by the equation $v = at + \frac{b}{t+c}$. The dimensions of *a*, *b* and *c* are

	a	*b*	*c*
A)	L^2	T	LT^2
B)	LT^2	LT	L
C)	LT^{-2}	L	T
D)	L	LT	T^2

36. Using dimensional analysis which of the following is correct (m is relativistic mass, m_0 is rest mass, V is the velocity of particle and c is the velocity of light?

A) $m = \frac{m_0}{\sqrt{1-\frac{V^2}{c^2}}}$ B) $m = \frac{m_0}{\sqrt{1-V^2}}$

C) $m = \frac{m_0}{\sqrt{1-c^2V^2}}$ D) $m = \frac{m_0}{\sqrt{1-c^2}}$

Space for rough work

37. The frequency of vibration of a string is given by $V = \frac{P}{2l}\left[\frac{F}{m}\right]^{1/2}$. Here *p* is the number of segments in which the string is divided. F is the tension in the string and *l* is its length. The dimensional formula for *m* is
A) $M^0L^0T^0$ B) $ML^{-1}T^0$ C) ML^0T^{-1} D) M^0LT^{-1}

38. If force (F), acceleration (*a*) and time (T) are used as the fundamental units, the dimensional formula for length will be
A) F^0aT^2 B) Fa^0T^2 C) Fa^2T^0 D) FaT

39. A force F is given by $F = at + bt^2$, where t represents time. What are dimensions of *a* and *b*?
A) MLT^{-1} and ML^2T^4 B) MLT^{-3} and MLT^{-4}
C) MLT^{-1} and MLT^0 D) MLT^{-4} and MLT^1

40. A physical quantity x depends on quantities y and z as follows x = Ay + B tan Cz, where A, B and C are constants. Which of the following do not have the same dimensions?
A) x and B B) C and z^{-1} C) y and B/A D) x and A

41. If the acceleration due to gravity is 10 m s^{-2} and the units of length and time are changed to kilometer and hour, respectively, the numerical value of the acceleration is
A) 360000 B) 72000 C) 36000 D) 129600

42. The velocity of a particle depends upon the time t according to the equation $v = \sqrt{ab} + bt + \frac{c}{d+t}$.
The physical quantities which are represented by a, b, c and d, are in the following order
A) distance, distance, acceleration, time B) distance, acceleration, distance, time
C) acceleration, distance, distance, time D) none of the above

43. The dimensions of angular momentum are (Angular momentum (J) =mvr)
(A) MLT^{-1} (B) ML^2T^{-1} (C) $ML^{-1}T$ (D) ML^0T^{-2}

44. The Vander Waal equation for n moles of real gas is $\left(P + \frac{a}{V^2}\right)(V - b) = nRT$ where P is the pressure, V is the volume, t is the absolute temperature, R is the molar gas constant and a,b are Vander Waal contants. The dimensions of a are the same as those of
(A) PV (B) PV^2 (C) P^2V (D) P/V

Space for rough work

45. The speed of gravity waves in water is proportional to $\lambda^{\alpha}\rho^{\beta}g^{\gamma}$ where λ is the wavelength, ρ is the density of water and g is the acceleration due to gravity. Which of the following relations is correct ?
(A) $\alpha=\beta=\gamma$ (B) $\alpha\neq\beta\neq\gamma$ (C) $\alpha\neq\gamma=\beta$ (D) $\alpha=\gamma\neq\beta$

46. If E, M, J and G respectively denote energy, mass, angular momentum and gravitational constant, then $\frac{EJ^2}{M^5G^2}$ has the dimensions of (Use Angular momentum = mass x velocity x distance)
(A) length (B) angle (C) mass (D) time

47. When a plane wave travels in a medium, the displacement y of a particle located at a distance x at time t is given by $y=a\sin(bt-cx)$ where a, b, and c are constants.
The dimensions of $\frac{b}{c}$ are the same those of
(A) displacement (B) velocity (C) acceleration (D) frequency

48. The mass of the liquid flowing per second per unit area of cross section of the tube is proportional to P^x and v^y, where P is the pressure difference and v is the velocity, then the relation between x and y is
(A) x=y (B) x=–y (C) $y^2=x$ (D) $y=-x^2$

49. A student writes four different expression for the displacement y in a periodic motion as a function of time t, a as amplitude, T as time period. Which of the following can be correct ?
(A) $y=aT\sin\frac{2\pi t}{T}$ (B) $y=a\sin Vt$
(C) $y=\frac{a}{T}\sin\frac{t}{a}$ (D) $y=\frac{a}{\sqrt{2}}\left[\sin\frac{2\pi t}{T}+\cos\frac{2\pi t}{T}\right]$

50. The equation of the stationary wave is $y=2A\sin\left(\frac{2\pi ct}{\lambda}\right)\cos\left(\frac{2\pi x}{\lambda}\right)$ which of the following statements is wrong ?(Where A is equal amplitude ,λ is wavelength, t is time)
(A) The unit of ct is same as that of λ
(B) The unit of x is same as that of λ
(C) The unit of $2\pi c/\lambda$ is same as that of $2\pi x/\lambda t$
(D) The unit of c/λ is same as that of x/λ

Space for rough work

51. Given that T stands for time period and ℓ stands for the length of simple pendulum. If g is the acceleration due to gravity, then which of the following statements about the relation $T^2 = (\ell / g)$ is correct ?
(A) It is correct both dimensionally as well as numerically.
(B) It is neither dimensionally correct not numerically.
(C) It is dimensionally correct but not numerically
(D) It is numerically correct but not dimensionally.

52. A student when discussing the properties of a medium (except vacuum) writes Velocity of light in vacuum = Velocity of light in medium This formula is
(A) Dimensionally correct (B) Dimensionally incorrect
(C) Numerically incorrect (D) Both a and c

53. A rod of length L is placed along the x –axis with its left end at the origin and has a non – uniform charge density varying as $\lambda = kx$, where k is a positive constant $\left[\lambda = \frac{\text{charge}}{\text{length}}\right]$. Then find the dimension of K.
(A) $M^{-2}T^{-1}A$ (B) $M^0L^{-2}TA$ (C) $M^0L^{-1}T\ A$ (D) $M^0L^{-2}T^{-1}A$

54. In a new unit system, 1 unit of time is equal to 10 second, 1 unit of mass is 5 kg and 1 unit of length is 20 m. In the new system of units, 1 units of energy is equal to:
(A) 20 Joule (B) $\frac{1}{20}$ Joule (C) 4 Joule (D) 163 Joule

55. To measure the radius of curvature with a spherometer, we use the formula (h: height, ℓ: length)
(A) $R = \frac{h^2}{6} + \frac{1}{\ell}$ (B) $R = \frac{\ell^2}{6h} + \frac{h}{2}$ (C) $R = \frac{h^2}{2\ell} + \frac{\ell}{h}$ (D) $R = \frac{2\ell^2}{h} + \frac{6}{\ell}$

56. If the speed of light (C), acceleration due to gravity (g) and pressure (P) are taken as fundamental units, the dimensions of gravitational constant (G) are
(A) $c^2g^3p^2$ (B) $c^0g^2p^{-1}$ (C) $c^2g^2p^{-2}$ (D) $c^0g\ p^{-3}$

57. Which of the following combinations of three dimensionally different physical quantities P,Q,R can never be a meaningful quantity ?
(A) PQ – R (B) PQ / R (C) (P–Q) / R (D) $(PR - Q^2)/QR$

Space for rough work

58. Check for dimensional correctness $\int \frac{dx}{\sqrt{a^2 - x^2}} = \frac{1}{a}\sin^{-1}\left(\frac{x}{a}\right)$ where a and x is measures in the form of distance.
(A) Dimensionally correct (B) Dimensionally incorrect
(C) Can't be determined (D) None of these.

59. Experiment shows that two perfectly neutral parallel metal plates separated by a small distance d, attract each other via a very weak force, known as Casimir force . The force per unit area of the plates, P, depends on the planck constant h, on the speed of light c and on d. Then correct expression is__. For dimensional analysis use formula $E = h\nu$ where h= planck constant, ν = frequency , E = Energy.
(A) $P\alpha\frac{hc}{d^4}$ (B) $P\alpha\frac{hd}{c^4}$ (C) $P\alpha\frac{dc}{h^4}$ (D) None of these

60. Given that *v* is the speed, *r* is radius and *g* is acceleration due to gravity. Which of the following is dimensionless?
A) v^2r/g B) v^2/rg C) v^2g/r D) v^2rg

61. The radius of an nucleous is of the order of:
(A) 10^{-15}cm (B) 10^{-13} cm (C) 10^{-12} cm (D) 10^{-10} cm

62. The ratio of specific charge (e/m) of an electron to that of a hydrogen ion is :
(A) 1 : 1 (B) 1840 : 1 (C) 1 : 1840 (D) 2 : 1

63. Atomic radius is of the order of 10^{-8} cm and nuclear radius is of the order of 10^{-13} cm. The fraction of atom occupied by nucleus is :
(A) 10^{-5} (B) 10^{5} (C) 10^{-15} (D) None of these

64. Which has highest specific charge ?
(A) Na^{+} (mass no. = 23) (B) Mg^{2+} (mass no. = 24)
(C) Al^{3+} (mass no. = 27) (D) Si^{4+} (mass no. =28)

65. The ratio of specific charge of a proton and α – particle is :
(A) 2 : 1 (B) 1 : 2 (C) 1 : 4 (D) 1 : 1

Space for rough work

66. The energy required to break one mole of Cl–Cl bonds in Cl_2 is 242 kJ mol^{-1}. The longest wavelength of light capable of breaking a single Cl–Cl bond is :
($c = 3 \times 10^8$ ms^{-1} and $N_A = 6.02 \times 10^{23}$ mol^{-1})
(A) 594 nm (B) 640 nm (C) 700 nm (D) 494 nm

67. The ratio of speed of γ – rays and X–rays is :
(A) 1 (B) < 1 (C) > 1 (D) none of these

68. If λ_1 and λ_2 are the wavelengths of characteristic X–ray and gamma rays respectively, then the relation between them is :
(A) $\lambda_1 = 1/\lambda_2$ (B) $\lambda_1 = \lambda_2$ (C) $\lambda_1 > \lambda_2$ (D) $\lambda_1 < \lambda_2$

69. X–rays and γ–rays of same energies may be distinguished by :
(A) velocity (B) ionizing power
(C) intensity (D) method of production

70. Energy of one mole of photon of light having wavelength 3×10^{-7} m.
(A) 39.90×10^4 J mol^{-1} (B) 80.0×10^4 J mol^{-1}
(C) 12.23×10^4 J mol^{-1} (D) 21.26×10^6 J mol^{-1}

71. The number of photons emitted in 10 hours by a 60 W sodium lamp ($\lambda = 5893$ $\overset{0}{A}$) will be
(A) 1.6×10^{24} (B) 2×10^9 (C) 2×10^{20} (D) 2×10^{10}

72. A 600 w mercury lamp emits mono chromatic radiation of wavelength 313.3 nm. How many photons are emitted from the lamp per second. ?
(A) 1×10^9 (B) 1×10^{20} (C) 1×10^{21} (D)1×10^{23}

73. If a species has 16 protons, 18 electrons and 16 neutrons, find the species and its charge
(A) S^{-1} (B) Si^{2+} (C) P^{3-} (D) S^{2-}

74. The speed of a photon is :
(A) independent to its wavelength (B) depends on its wavelength
(C) depends on its source (D) equal to square of its amplitude

75. Minimum number of photons of light of wavelength 4000 $\overset{0}{A}$ which provide 1 J energy :
(A) 2×10^{18} (B) 2×10^9 (C) 2×10^{20} (D) 2×10^{10}

Space for rough work

76. A gas absorbs a photon of 355 nm and emits at two wavelengths. If one of the emission is at 680 nm, the other is at :
(A) 1035 nm (B) 325 nm (C) 743 nm (D) 518 nm

77. Mass of electron is equal to
(A) -1.6×10^{-19} kg (B) 1.6×10^{-18} kg
(C) 9.1094×10^{-31} kg (D) 9.1094×10^{-30} kg

78. Who discovered neutron ?
(A) Langmuir (B) Austen (C) Rutehrford (D) Chadwick

79. Observation(s) made in Rutherford scattering experiment is /are
(A) most of the α – particle passed through the gold foil undeflected
(B) a small fraction of the α – particles was deflected by small angles
(C) a very few α – particles ($\sim$in 20000) bounced back, that is, were deflected by nearly 180°).
(D) All of the above

80. Assertion (A) Most of the space in the atoms is empty.
Reason (R) Most of the α– particles passed through the foil undeflected.
(A) Both A and R are correct ; R is the correct explanation of A
(B) Both A and R are correct ; R is not the correct explanation of A
(C) A is correct ; R is incorrect
(D) R is correct ; A is incorrect

81. $^{14}_{6}C$ and $^{14}_{7}N$ are the examples of
(A) isobars (B) isotopes (C) isonucleons (D) none of the above

82. Isotopes have
(A) same atomic number (B) different atomic mass
(C) both (a) and (b) (D) none of the above

83. Rutherford's scattering experiment is related to the size of the
(A) nucleus (B) atom (C) electron (D) neutron

Space for rough work

84. Increasing order (lowest first) for the values of e/m (charge/mass) for electron (e) proton (p), neutron (n) and α-particle (α) is
(A) e, p, n, α (B) n, p, e, α (C) n, p, α, e (D) n, α, p, e

85. Rutherford's experiment, which established the nuclear model of the atom, used a beam of
(A) cathode rays which impinged on a metal foil and got absorbed
(B) anode rays which impinged on a metal foil and ejected electrons
(C) helium atoms, which impinged on a metal foil and got scattered
(D) helium nuclei, which impinged on a metal foil and got scattered

86. Which of the following is correct ?
(A) ${}_1H^1$ and ${}_2He^3$ are isotopes (B) ${}_6C^{14}$ and ${}_7N^{14}$ are isotopes
(C) ${}_{19}K^{39}$ and ${}_{20}Ca^{40}$` are isotones (D) ${}_9F^{19}$ and ${}_{11}Na^{24}$ are isodiaphers

87. The number of wavelengths per unit length is called
(A) wavelength (v) (B) wavelength (λ)
(C) wave number $(\bar{v})$ (D) wave number (v)

88. One atom of ${}_{19}K^{39}$ contains
(A) 19 protons, 20 neutrons and 19 electrons (B) 19 protons, 20 neutrons and 20 electrons
(C) 20 protons, 19 neutrons and 20 electrons (D) 20 protons, 19 neutrons and 19 electrons

89. Atoms of different elements having identical mass are known as
(A) Isotopes (B) Isobars (C) Isotones (D) Isomers

90. Ratio of energy of a photon of wavelength 3000 $\overset{0}{A}$ and 6000 $\overset{0}{A}$ is
(A) 3 : 1 (B) 2 : 1 (C) 1 : 2 (D) 1 : 3

Space for rough work

FIITJEE PET – I (REG_1ST YEAR)

MAINS_SET–A_ANSWERS

DATE: 09.06.2018

MATHEMATICS

1.	**C**	2.	**C**	3.	**D**	4.	**D**
5.	**D (Bonus)**	6.	**B**	7.	**D**	8.	**B**
9.	**B**	10.	**B**	11.	**A**	12.	**A**
13.	**C**	14.	**D**	15.	**C**	16.	**D**
17.	**A**	18.	**D**	19.	**A (Bonus)**	20.	**B (Bonus)**
21.	**B**	22.	**D**	23.	**D**	24.	**B**
25.	**D**	26.	**D**	27.	**D**	28.	**D**
29.	**B**	30.	**D**				

PHYSICS

31.	**A**	32.	**A**	33.	**D**	34.	**B**
35.	**C**	36.	**A**	37.	**B**	38.	**A**
39.	**B**	40.	**D**	41.	**D**	42.	**B**
43.	**B**	44.	**B**	45.	**D**	46.	**B**
47.	**B**	48.	**B**	49.	B or **D**	50.	**D**
51.	**C**	52.	**D**	53.	**B**	54.	**A**
55.	**B**	56.	**B**	57.	**C**	58.	**B**
59.	**A**	60.	**B**				

CHEMISTRY

61.	**B**	62.	**B**	63.	**C**	64.	**D**
65.	**A**	66.	**D**	67.	**A**	68.	**C**
69.	**B**	70.	**A**	71.	**A**	72.	**C**
73.	**D**	74.	**A**	75.	**A**	76.	**C**
77.	**C**	78.	**D**	79.	**D**	80.	**A**
81.	**A**	82.	**C**	83.	**A**	84.	**D**
85.	**D**	86.	**C**	87.	**C**	88.	**A**
89.	**B**	90.	**B**				

FIITJEE PET – I (REG_1ST YEAR)

MAINS_SET–B

DATE: 09.06.2018

Time: 3 hours **Maximum Marks: 360**

INSTRUCTIONS:

Instructions to the Candidates

1. This Test Booklet consists of **90 questions**.

   Use **Blue/Black ball Point Pen only** for writing particulars and bubbling of OMR.

2. For each correct answer **4 Marks** will awarded and for each wrong answer **1 Mark** will be deducted.

3. Attempt all questions.

4. In case you have not darkened any bubble you will be awarded 0 mark for that question.

5. Use of calculator/logarithmic table is not permitted.

Don't write / mark your answers in this question booklet.
If you mark the answers in question booklet, you will not be allowed to continue the exam.

NAME: ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

ENROLLMENT NO.: ☐☐☐☐☐☐☐☐☐☐☐

1. If 10^{th} term of an A.P is 30 and 15^{th} term is 20. Then 4^{th} term is
(A) 21 (B) 42 (C) 24 (D) 40

2. If $\log_4 5 = a$ and $\log_5 6 = b$, then $\log_3 2$ is equal to
(A) $\frac{1}{2a+1}$ (B) $\frac{1}{2b+1}$ (C) 2ab + 1 (D) $\frac{1}{2ab-1}$

3. The value of $\frac{1+2\log_3 2}{(1+\log_3 2)^2}+(\log_6 2)^2$ is
(A) 2 (B) 3 (C) 4 (D) 1

4. $\log_{x-1} x \cdot \log_{x-2}(x-1) \ldots\ldots \log_{x-12}(x-11) = 2$, x is equal to
(A) 9 (B) 16 (C) 25 (D) none of these

5. If $f(x) = \log\left(\frac{1+x}{1-x}\right)$, then
(A) $f(x_1) \cdot f(x_2) = f(x_1 + x_2)$ (B) $f(x+2) - 2f(x+1) + f(x) = 0$
(C) $f(x) + f(x+1) = f(x^2 + x)$ (D) $f(x_1) + f(x_2) = f\left(\frac{x_1 + x_2}{1 + x_1 x_2}\right)$

6. If $|x-5| + |x+4| \le 7$, solve for 'x'.
(A) (4, 5) (B) $(-\infty, 4]$ (C) $[-3, \infty)$ (D) no solution

7. The number of real solutions of the equation $x^2 - 3|x| + 2 = 0$
(A) 4 (B) 1 (C) 2 (D) 3

8. Let –297, –294, –291, ... be in an A.P, then the value of 'n' such that S_n is least.
(A) 100 (B) 101 (C) 99 (D) 99 and 100

9. Solve the equation: (x + 1) + (x + 4) + (x + 1) + ... + (x + 28) = 155
(A) 1 (B) 2 (C) –1 (D) –2

10. $\frac{(x-1)^4(x^2-4)^2(x^2+1)}{(2-3x)^2(x-4)^3(x-2)} \le 0$
(A) [2, 4) (B) (2, 4) (C) (2, 4] (D) $(-\infty, 2) \cup (4, \infty)$

Space for rough work

11. $\frac{4x^2-20x+25}{4x^2-12x+9} \le 0$ is satisfied by

(A) no value of x (B) infinite values of x (C) only one value of x (D) only two values of x

12. $\frac{2(x-1)}{(x+2)(x-4)} \le \frac{1}{x+1}$, then x $\in$

(A) $(-\infty, -1) \cup (-2, 4)$ (B) $(-\infty, -2) \cup (1, 4)$ (C) $(-\infty, -2) \cup (-1, 4)$ (D) $(-\infty, -2) \cup (4, \infty)$

13. $\frac{\left(x^2+3x+1\right)\left(x^2-3x+2\right)\left(x^2-5x+8\right)}{\left(x^2-4x+3\right)} \ge 0$

(A) $(-\infty, \infty)$ (B) $(-\infty, \infty) - \{1, 3\}$ (C) $(-\infty, \infty) - \{1, 2, 3\}$ (D) none of these

14. The solution set of $x^2(x + 1)(x – 3) < 0$ is

(A) (–1, 3) (B) [–1, 3) (C) (–1, 3] (D) none of these

15. The inequality $2x + 4 > x^2 – 3x – 10$ is satisfied by

(A) (–7, 2] (B) [–7, 2) (C) [–2, 7) (D) (–2, 7]

16. The value of x satisfying the equation $\sqrt[3]{5}^{\log_5 5^{\log_5 5^{\log_5\left(\frac{x}{2}\right)}}} = 3$, is

(A) 1 (B) 3 (C) 18 (D) 54

17. If $\log_{10}\left[\frac{1}{2^x+x-1}\right] = x\,[\log_{10}5 – 1]$, then x =

(A) 4 (B) 3 (C) 2 (D) 1

18. If $2x^{\log_4 3} + 3^{\log_4 x} = 27$, then x is equal to

(A) 2 (B) 4 (C) 8 (D) 16

19. The set of all x satisfying the equation $x^{\log_3 x^2+(\log_3 x)^2-10} = \frac{1}{x^2}$ is

(A) {1, 9} (B) $\left\{1, 9, \frac{1}{81}\right\}$ (C) $\left\{1, 4, \frac{1}{81}\right\}$ (D) $\left\{9, \frac{1}{81}\right\}$

Space for rough work

20. Solution set of the inequality $\log_{0\cdot8}\left(\log_6 \frac{x^2+x}{x+4}\right) < 0$ is

(A) (–4, –3) (B) (–3, 4) ∪ (8, ∞) (C) (–3, ∞) (D) (–4, –3) ∪ (8, ∞)

21. Solve: $\left|\frac{x-3}{x+1}\right| \le 1$

(A) $x \ge 1$ (B) $x > 1$ (C) $x < 1$ (D) $x \le 1$

22. Solve: $\left|1+\frac{3}{x}\right| > 2$

(A) $x \in (-1, 0) \cup (0, 3)$ (B) $x \in [-1, 0] \cup [0, 3]$ (C) $x \in (-1, 3)$ (D) $x \in [-1, 3]$

23. Solve: $|3x - 2| < 4$

(A) $-\frac{2}{3} \le x < 2$ (B) $x \le 2$ (C) $-\frac{2}{3} < x < 2$ (D) $-\frac{2}{3} < x \le 2$

24. Solve for x: $|x - 1| - |2x - 5| = 2x$

(A) $\left\{\frac{4}{3}\right\}$ (B) $\left\{-4, 6, \frac{4}{3}\right\}$ (C) {6, –4} (D) {–4}

25. If $\left|\frac{x+2}{x-1}\right| = 2$, solve for 'x'

(A) 0 (B) 4 (C) both (A) and (B) (D) none of these

26. $9x^2 - 6x + 1 \le 0$ is satisfied by

(A) no value of x (B) $x = \frac{1}{3}$ (C) $x < \frac{1}{3}$ (D) $x \ge \frac{1}{3}$

27. $\frac{x^2-2x+1}{(x-1)^2} \ge 0$, then $x \in$

(A) (–∞, ∞) (B) (1, ∞) (C) (–∞, 1) (D) (–∞, ∞) – {1}

28. The solution set of $x^3 - 6x^2 + 5x \ge 0$ is

(A) [1, 5] (B) [1, 5] ∪ {0} (C) [1, 5] – {0} (D) none of these

Space for rough work

29. $x^4 \le 1$, then x lies in the interval
(A) $(-\infty, 1]$ (B) $[-1, 1]$ (C) $(-\infty, -1] \cup [1, \infty)$ (D) none of these

30. $\frac{x-1}{4-x} \ge 0$, then $x \in$
(A) (1, 4) (B) [1, 4) (C) (1, 4] (D) [1, 4]

31. Given that T stands for time period and ℓ stands for the length of simple pendulum. If g is the acceleration due to gravity, then which of the following statements about the relation $T^2 = (\ell / g)$ is correct ?
(A) It is correct both dimensionally as well as numerically.
(B) It is neither dimensionally correct not numerically.
(C) It is dimensionally correct but not numerically
(D) It is numerically correct but not dimensionally.

32. A student when discussing the properties of a medium (except vacuum) writes Velocity of light in vacuum = Velocity of light in medium This formula is
(A) Dimensionally correct (B) Dimensionally incorrect
(C) Numerically incorrect (D) Both a and c

33. A rod of length L is placed along the x –axis with its left end at the origin and has a non – uniform charge density varying as $\lambda = kx$, where k is a positive constant $\left[\lambda = \frac{\text{charge}}{\text{length}}\right]$. Then find the dimension of K.
(A) $M^{-2}T^{-1}A$ (B) $M^0L^{-2}TA$ (C) $M^0L^{-1}T\ A$ (D) $M^0L^{-2}T^{-1}A$

34. In a new unit system, 1 unit of time is equal to 10 second, 1 unit of mass is 5 kg and 1 unit of length is 20 m. In the new system of units, 1 units of energy is equal to:
(A) 20 Joule (B) $\frac{1}{20}$ Joule (C) 4 Joule (D) 163 Joule

35. To measure the radius of curvature with a spherometer, we use the formula (h: height, ℓ: length)
(A) $R = \frac{h^2}{6} + \frac{1}{\ell}$ (B) $R = \frac{\ell^2}{6h} + \frac{h}{2}$ (C) $R = \frac{h^2}{2\ell} + \frac{\ell}{h}$ (D) $R = \frac{2\ell^2}{h} + \frac{6}{\ell}$

36. If E, M, J and G respectively denote energy, mass, angular momentum and gravitational constant, then $\frac{EJ^2}{M^5G^2}$ has the dimensions of (Use Angular momentum = mass x velocity x distance)
(A) length (B) angle (C) mass (D) time

Space for rough work

37. When a plane wave travels in a medium, the displacement y of a particle located at a distance x at time t is given by $y = a\sin(bt - cx)$ where a, b, and c are constants.

The dimensions of $\frac{b}{c}$ are the same those of

(A) displacement (B) velocity (C) acceleration (D) frequency

38. The mass of the liquid flowing per second per unit area of cross section of the tube is proportional to P^x and v^y, where P is the pressure difference and v is the velocity, then the relation between x and y is

(A) x=y (B) x=–y (C) $y^2 = x$ (D) $y = -x^2$

39. A student writes four different expression for the displacement y in a periodic motion as a function of time t, a as amplitude, T as time period. Which of the following can be correct ?

(A) $y = aT\sin\frac{2\pi t}{T}$ (B) $y = a\sin Vt$

(C) $y = \frac{a}{T}\sin\frac{t}{a}$ (D) $y = \frac{a}{\sqrt{2}}\left[\sin\frac{2\pi t}{T} + \cos\frac{2\pi t}{T}\right]$

40. The equation of the stationary wave is $y = 2A\sin\left(\frac{2\pi ct}{\lambda}\right)\cos\left(\frac{2\pi x}{\lambda}\right)$ which of the following statements is wrong ?(Where A is equal amplitude ,λ is wavelength, t is time)

(A) The unit of ct is same as that of λ
(B) The unit of x is same as that of λ
(C) The unit of $2\pi c/\lambda$ is same as that of $2\pi x/\lambda t$
(D) The unit of c/λ is same as that of x/λ

41. The density of mercury is 13600 kg m^{-3}. Its value in CGS system will be
A) 13.6 g cm^{-3} B) 1360 g cm^{-3} C) 136 g cm^{-3} D) 1.36 g cm^{-3}

42. A pressure of 10^6 dynes/cm^2 is equivalent to
A) 10^5 N/m^2 B) 10^4 N/m^2 C) 10^6 N/m^2 D) 10^7 N/m^2

43. Given that $y = a\cos\left(\frac{t}{p} - qx\right)$, where *t* represents time in second and *x* represents distance in metre.

Which of the following statements is true?
A) The unit of *x* is same as that of *q* B) The unit of *x* is same as that of *p*
C) The unit of *t* is same as that of *q* D) The unit of *t* is same as that of *p*

44. If we choose velocity V, acceleration A and force F as the fundamental quantities, then the angular momentum in terms of V, A and F would be __.(Use Angular momentum = mass x velocity x distance)
A) $FA^{-1}V$ B) FV^3A^{-2} C) FV^2A^{-1} D) ML^2T^{-1}

Space for rough work

45. The velocity *v* (in cm/sec) of a particle is given in terms of time *t* (in sec) by the equation $v = at + \frac{b}{t+c}$. The dimensions of *a*, *b* and *c* are

	a	*b*	*c*
A)	L^2	T	LT^2
B)	LT^2	LT	L
C)	LT^{-2}	L	T
D)	L	LT	T^2

46. If the speed of light (C), acceleration due to gravity (g) and pressure (P) are taken as fundamental units, the dimensions of gravitational constant (G) are
(A) $c^2g^3p^2$ (B) $c^0g^2p^{-1}$ (C) $c^2g^2p^{-2}$ (D) $c^0g\,p^{-3}$

47. Which of the following combinations of three dimensionally different physical quantities P,Q,R can never be a meaningful quantity ?
(A) PQ – R (B) PQ / R (C) (P–Q) / R (D) $\left(PR - Q^2\right)/QR$

48. Check for dimensional correctness $\int \frac{dx}{\sqrt{a^2 - x^2}} = \frac{1}{a}\sin^{-1}\left(\frac{x}{a}\right)$ where a and x is measures in the form of distance.
(A) Dimensionally correct (B) Dimensionally incorrect
(C) Can't be determined (D) None of these.

49. Experiment shows that two perfectly neutral parallel metal plates separated by a small distance d, attract each other via a very weak force, known as Casimir force . The force per unit area of the plates, P, depends on the planck constant h, on the speed of light c and on d. Then correct expression is__. For dimensional analysis use formula $E = h\nu$ where h= planck constant, ν = frequency , E = Energy.
(A) $P\alpha\frac{hc}{d^4}$ (B) $P\alpha\frac{hd}{c^4}$ (C) $P\alpha\frac{dc}{h^4}$ (D) None of these

50. Given that *v* is the speed, *r* is radius and *g* is acceleration due to gravity. Which of the following is dimensionless?
A) v^2r/g B) v^2/rg C) v^2g/r D) v^2rg

51. If the acceleration due to gravity is 10 m s^{-2} and the units of length and time are changed to kilometer and hour, respectively, the numerical value of the acceleration is
A) 360000 B) 72000 C) 36000 D) 129600

Space for rough work

52. The velocity of a particle depends upon the time t according to the equation $v = \sqrt{ab} + bt + \frac{c}{d+t}$.
The physical quantities which are represented by a, b, c and d, are in the following order
A) distance, distance, acceleration, time B) distance, acceleration, distance, time
C) acceleration, distance, distance, time D) none of the above

53. The dimensions of angular momentum are (Angular momentum (J) =mvr)
(A) MLT^{-1} (B) ML^2T^{-1} (C) $ML^{-1}T$ (D) ML^0T^{-2}

54. The Vander Waal equation for n moles of real gas is $\left(P + \frac{a}{V^2}\right)(V - b) = nRT$ where P is the pressure, V is the volume, t is the absolute temperature, R is the molar gas constant and a,b are Vander Waal contants. The dimensions of a are the same as those of
(A) PV (B) PV^2 (C) P^2V (D) P/V

55. The speed of gravity waves in water is proportional to $\lambda^\alpha \rho^\beta g^\gamma$ where λ is the wavelength, ρ is the density of water and g is the acceleration due to gravity. Which of the following relations is correct ?
(A) $\alpha = \beta = \gamma$ (B) $\alpha \neq \beta \neq \gamma$ (C) $\alpha \neq \gamma = \beta$ (D) $\alpha = \gamma \neq \beta$

56. Using dimensional analysis which of the following is correct (m is relativistic mass, m_0 is rest mass, V is the velocity of particle and c is the velocity of light?
A) $m = \frac{m_0}{\sqrt{1 - \frac{V^2}{c^2}}}$ B) $m = \frac{m_0}{\sqrt{1 - V^2}}$
C) $m = \frac{m_0}{\sqrt{1 - c^2V^2}}$ D) $m = \frac{m_0}{\sqrt{1 - c^2}}$

57. The frequency of vibration of a string is given by $V = \frac{P}{2l}\left[\frac{F}{m}\right]^{1/2}$. Here *p* is the number of segments in which the string is divided. F is the tension in the string and *l* is its length. The dimensional formula for *m* is
A) $M^0L^0T^0$ B) $ML^{-1}T^0$ C) ML^0T^{-1} D) M^0LT^{-1}

58. If force (F), acceleration (*a*) and time (T) are used as the fundamental units, the dimensional formula for length will be
A) F^0aT^2 B) Fa^0T^2 C) Fa^2T^0 D) FaT

Space for rough work

59. A force F is given by $F = at + bt^2$, where t represents time. What are dimensions of *a* and *b*?
A) MLT^{-1} and ML^2T^4 B) MLT^{-3} and MLT^{-4}
C) MLT^{-1} and MLT^0 D) MLT^{-4} and MLT^1

60. A physical quantity x depends on quantities y and z as follows x = Ay + B tan Cz, where A, B and C are constants. Which of the following do not have the same dimensions?
A) x and B B) C and z^{-1} C) y and B/A D) x and A

61. $^{14}_{6}C$ and $^{14}_{7}N$ are the examples of
(A) isobars (B) isotopes (C) isonucleons (D) none of the above

62. Isotopes have
(A) same atomic number (B) different atomic mass
(C) both (a) and (b) (D) none of the above

63. Rutherford's scattering experiment is related to the size of the
(A) nucleus (B) atom (C) electron (D) neutron

64. Increasing order (lowest first) for the values of e/m (charge/mass) for electron (e) proton (p), neutron (n) and α-particle (α) is
(A) e, p, n, α (B) n, p, e, α (C) n, p, α, e (D) n, α, p, e

65. Rutherford's experiment, which established the nuclear model of the atom, used a beam of
(A) cathode rays which impinged on a metal foil and got absorbed
(B) anode rays which impinged on a metal foil and ejected electrons
(C) helium atoms, which impinged on a metal foil and got scattered
(D) helium nuclei, which impinged on a metal foil and got scattered

66. A gas absorbs a photon of 355 nm and emits at two wavelengths. If one of the emission is at 680 nm, the other is at :
(A) 1035 nm (B) 325 nm (C) 743 nm (D) 518 nm

Space for rough work

67. Mass of electron is equal to
(A) -1.6×10^{-19} kg (B) 1.6×10^{-18} kg
(C) 9.1094×10^{-31} kg (D) 9.1094×10^{-30} kg

68. Who discovered neutron ?
(A) Langmuir (B) Austen (C) Rutehrford (D) Chadwick

69. Observation(s) made in Rutherford scattering experiment is /are
(A) most of the α – particle passed through the gold foil undeflected
(B) a small fraction of the α – particles was deflected by small angles
(C) a very few α – particles ($\sim$in 20000) bounced back, that is, were deflected by nearly 180°).
(D) All of the above

70. Assertion (A) Most of the space in the atoms is empty.
Reason (R) Most of the α– particles passed through the foil undeflected.
(A) Both A and R are correct ; R is the correct explanation of A
(B) Both A and R are correct ; R is not the correct explanation of A
(C) A is correct ; R is incorrect
(D) R is correct ; A is incorrect

71. The radius of an nucleous is of the order of:
(A) 10^{-15}cm (B) 10^{-13} cm (C) 10^{-12} cm (D) 10^{-10} cm

72. The ratio of specific charge (e/m) of an electron to that of a hydrogen ion is :
(A) 1 : 1 (B) 1840 : 1 (C) 1 : 1840 (D) 2 : 1

73. Atomic radius is of the order of 10^{-8} cm and nuclear radius is of the order of 10^{-13} cm. The fraction of atom occupied by nucleus is :
(A) 10^{-5} (B) 10^{5} (C) 10^{-15} (D) None of these

74. Which has highest specific charge ?
(A) Na^{+} (mass no. = 23) (B) Mg^{2+} (mass no. = 24)
(C) Al^{3+} (mass no. = 27) (D) Si^{4+} (mass no. =28)

Space for rough work

75. The ratio of specific charge of a proton and α – particle is :
(A) 2 : 1 (B) 1 : 2 (C) 1 : 4 (D) 1 : 1

76. Which of the following is correct ?
(A) $_1H^1$ and $_2He^3$ are isotopes (B) $_6C^{14}$ and $_7N^{14}$ are isotopes
(C) $_{19}K^{39}$ and $_{20}Ca^{40}$` are isotones (D) $_9F^{19}$ and $_{11}Na^{24}$ are isodiaphers

77. The number of wavelengths per unit length is called
(A) wavelength (v) (B) wavelength (λ)
(C) wave number $(\bar{v})$ (D) wave number (v)

78. One atom of $_{19}K^{39}$ contains
(A) 19 protons, 20 neutrons and 19 electrons (B) 19 protons, 20 neutrons and 20 electrons
(C) 20 protons, 19 neutrons and 20 electrons (D) 20 protons, 19 neutrons and 19 electrons

79. Atoms of different elements having identical mass are known as
(A) Isotopes (B) Isobars (C) Isotones (D) Isomers

80. Ratio of energy of a photon of wavelength 3000 $\overset{0}{A}$ and 6000 $\overset{0}{A}$ is
(A) 3 : 1 (B) 2 : 1 (C) 1 : 2 (D) 1 : 3

81. The number of photons emitted in 10 hours by a 60 W sodium lamp (λ = 5893 $\overset{0}{A}$) will be
(A) 1.6 x 10^{24} (B) 2 x 10^9 (C) 2 x 10^{20} (D) 2 x 10^{10}

82. A 600 w mercury lamp emits mono chromatic radiation of wavelength 313.3 nm. How many photons are emitted from the lamp per second. ?
(A) 1 x 10^9 (B) 1 x 10^{20} (C) 1 x 10^{21} (D)1 x 10^{23}

83. If a species has 16 protons, 18 electrons and 16 neutrons, find the species and its charge
(A) S^{-1} (B) Si^{2+} (C) P^{3-} (D) S^{2-}

Space for rough work

84. The speed of a photon is :
(A) independent to its wavelength (B) depends on its wavelength
(C) depends on its source (D) equal to square of its amplitude

85. Minimum number of photons of light of wavelength 4000 $\overset{0}{A}$ which provide 1 J energy :
(A) 2×10^{18} (B) 2×10^{9} (C) 2×10^{20} (D) 2×10^{10}

86. The energy required to break one mole of Cl–Cl bonds in Cl_2 is 242 kJ mol^{-1}. The longest wavelength of light capable of breaking a single Cl–Cl bond is :
($c = 3 \times 10^8$ ms^{-1} and $N_A = 6.02 \times 10^{23}$ mol^{-1})
(A) 594 nm (B) 640 nm (C) 700 nm (D) 494 nm

87. The ratio of speed of γ – rays and X–rays is :
(A) 1 (B) < 1 (C) > 1 (D) none of these

88. If λ_1 and λ_2 are the wavelengths of characteristic X–ray and gamma rays respectively, then the relation between them is :
(A) $\lambda_1 = 1/\lambda_2$ (B) $\lambda_1 = \lambda_2$ (C) $\lambda_1 > \lambda_2$ (D) $\lambda_1 < \lambda_2$

89. X–rays and γ–rays of same energies may be distinguished by :
(A) velocity (B) ionizing power
(C) intensity (D) method of production

90. Energy of one mole of photon of light having wavelength 3×10^{-7} m.
(A) 39.90×10^4 J mol^{-1} (B) 80.0×10^4 J mol^{-1}
(C) 12.23×10^4 J mol^{-1} (D) 21.26×10^6 J mol^{-1}

Space for rough work

FIITJEE PET – I (REG_1ST YEAR)

MAINS_SET–B_ANSWERS

DATE: 09.06.2018

MATHEMATICS

1.	**B**	2.	**D**	3.	**D**	4.	**B**
5.	**D**	6.	**D**	7.	**A**	8.	**D**
9.	**A (Bonus)**	10.	**B (Bonus)**	11.	**C**	12.	**C**
13.	**D**	14.	**D**	15.	**D (Bonus)**	16.	**D**
17.	**D**	18.	**D**	19.	**B**	20.	**D**
21.	**A**	22.	**A**	23.	**C**	24.	**D**
25.	**C**	26.	**B**	27.	**D**	28.	**B**
29.	**B**	30.	**B**				

PHYSICS

31.	**C**	32.	**D**	33.	**B**	34.	**A**
35.	**B**	36.	**B**	37.	**B**	38.	**B**
39.	B OR **D**	40.	**D**	41.	**A**	42.	**A**
43.	**D**	44.	**B**	45.	**C**	46.	**B**
47.	**C**	48.	**B**	49.	**A**	50.	**B**
51.	**D**	52.	**B**	53.	**B**	54.	**B**
55.	**D**	56.	**A**	57.	**B**	58.	**A**
59.	**B**	60.	**D**				

CHEMISTRY

61.	**A**	62.	**C**	63.	**A**	64.	**D**
65.	**D**	66.	**C**	67.	**C**	68.	**D**
69.	**D**	70.	**A**	71.	**B**	72.	**B**
73.	**C**	74.	**D**	75.	**A**	76.	**C**
77.	**C**	78.	**A**	79.	**B**	80.	**B**
81.	**A**	82.	**C**	83.	**D**	84.	**A**
85.	**A**	86.	**D**	87.	**A**	88.	**C**
89.	**B**	90.	**A**				