दयानंद शिक्षण संस्था, लातूर

"आ नो भद्रा क्रतवो यन्तु विश्वतः"

Dayanand Education Society, Latur.

PCM
(CBSE Board)

: Instructions :

* This question paper set contains 100 questions, each carry 4 marks.
* No negative marking for wrong answer.
* Fill the particulars on Answer Sheet (OMR) with Black or Blue ball point pen. (Do not use Pencil)
* There are four choices for every question out of which only one option is correct.
* Candidate should not carry any printed material, Cell phone and any other electronic device.
* Rough work is to be done on the provided space in question paper.
* Do not fold the answer sheet (OMR)

Wish You All the Best !

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Space for Rough work

PHYSICS

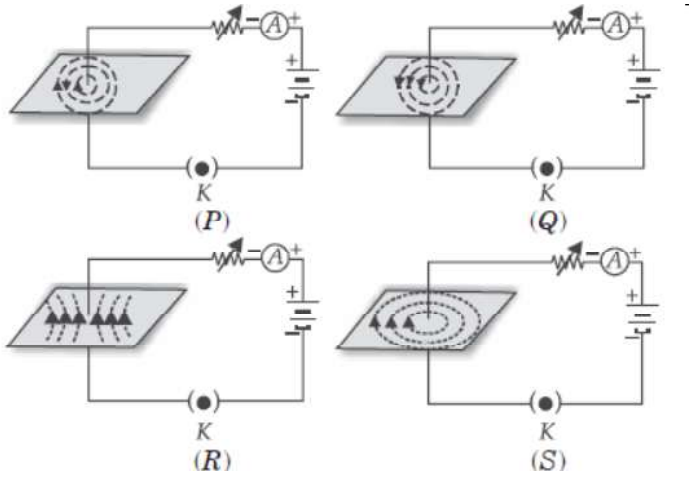
01. The direction of magnetic field around a straight conductor carrying current can be determined by

a) Fleming's left hand rule
b) Lenz's law
c) Right hand thumb rule
d) Fleming's right hadn rule

02. Magnetic field is produced by the flow of current in a straight wire. This phenomenon was discovered by

a) Coulomb b) Oersted c) Faraday d) Maxwell

03. Four students plotted the sketch of the patterns of magnetic field lines representing the magnetic field around a current carrying straight wire as shown in figures A, B, C and D. Which one of the following sketches is correct ?



a) P b) Q c) R d) S

04. Select the correct sequence of light entering the different parts of human eye

a) cornea, lens, iris, pupil, retina
b) pupil, cornea, iris, lens, retina
c) cornea, pupil, iris, lens, retina
d) cornea, iris, pupil, lens, retina

05. Which colour shows maximum deviation when passed through a prism ?

a) Yellow b) Red c) Violet d) Green

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06. Due to which motion of light does the Tyndall effect occur ?

a) Incidence b) Refraction c) Scattering d) Dispersion

07. The amount of heat produced in a conductor is

a) directly proportional to the current flowing through it

b) inversely proportional to the current flowing through it

c) directly proportional to the square of the current flowing through it

d) inversely proportional to the square of current flowing through it

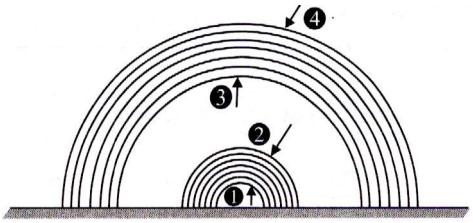
08. Column II gives order of resistivity for materials in column I.

Column – I	**Column – II**
A. Semi-conductor	p) $3\times10^{-3}\,\Omega-m$
B. Conductor	q) $10^{-8}\,\Omega-m$
C. Insulator	r) $10^{16}\,\Omega-m$
D. Super conductor	s) $1\,\Omega-m$

a) A – p, B – s, C – r, D – q b) A – p, B – r, C – s, D – q

c) A – p, B – q, C – s, D – r d) A – s, B – p, c – q, D – r

09. The given figure shows primary and secondary rainbows.



Which of the following options correctly lists the colours of marked rays ?

a) 1 – Violet, 2 – Red, 3 – Red, 4 – Violet b) 1 – Violet, 2 – Red, 3 – Violet, 4 – Red

c) 1 – Red, 2 – Violet, 3 – Violet, 4 – Red d) 1 – Red, 2 – Violet, 3 – Red, 4 – Violet

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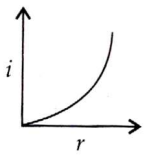
10. Red colour of sun at the time of sunrise and sunset is because

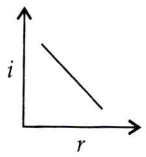
a) Red colour is least scattered
b) Blue colour is least scattered
c) Red colour is scattered the most
d) All colours are equally scattered

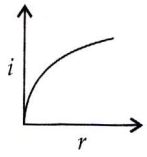
11. Concave lens is used in case of

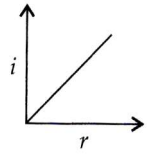
a) Presbyopia
b) Astigmatism
c) Myopia
d) Hypermetropia

12. Which of the following correctly represents graphical relation between the angle of incidence i and the angle of reflection r ?

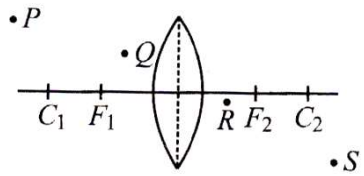
a) 

b) 

c) 

d) 

13. The given figure shows a converging lens. The focal length and centre of curvature of the lens are marked along with four random points, P, Q, R and S. Which of the following set of points correctly represents the position of object and corresponding position of image ?



	Position of object	**Position of image**
a)	P	R
b)	Q	S
c)	P	S
d)	Q	P

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14. A convex lens of focal length f produces a real image of size 'm' times the size of the object. Then the object distance is

a) $\left(\frac{m+1}{m}\right)f$ b) (m + 1)f c) $\left(\frac{m+1}{m}\right)$ d) $\frac{fm}{(m+1)}$

15. In which of the following set, the materials are arranged on the basis of ascending order of their refractive index ?

a) Air, water, silicon, diamond
b) Air, silicon, kerosene, diamond
c) Air, water, diamond, silicon
d) Air, alcohol, silicon, diamond

16. If a 3 cm tall object placed perependicular to principal axis of a convex lens of focal length 15 cm produces a real inverted image of height 15 cm, then its object distance (u) is ..... and image distance (v) is

a) u = –18 m, v = +90 m
b) u = +18 cm, v = –90 cm
c) u = –18 cm, v = +90 cm
d) u = +18 cm, v = +90 cm

17. An object 20 cm from a spherical mirror give rise to a virtual image 15 cm behind the mirror. The type of the mirror and its focal length is

a) concave, 8.5 cm b) convex, 30 cm c) concave, 60 cm d) convex, 60 cm

18. Power of a convex lens of focal length 50 cm is

a) –2D b) –0.5 D c) +2 D d) +0.5 D

19. If an incident ray passes through the centre of curvature of a spherical mirror, the reflected ray will

a) pass through the pole
b) pass through the centre of curvature
c) retrace its path
d) be parallel to the principal axis

20. The magnetic field produced due to a circular wire at its centre is

a) at 45° to the plane of the wire
b) at 60° to the plane of the wire
c) in the plane of the wire
d) perpendicular to the plane of the wire

Space for Rough work

21. The magnetic field lines inside a current carying solenoid are

a) circular and they do not intersect each other

b) circular at the ends but they are parallel to the axis inside the solenoid

c) along the axis and parallel to each other

d) perpendicular to the axis and equidistant from each other

22. When the main switch of the house circuit is put off, it disconnects the

a) earth wire b) live and neutral wires c) live wire d) neutral wire

23. Match the Column – I with Column – II.

Column – I	**Column – II**
A. Law of reflection	p) $\frac{1}{\text{focal length}}$
B. Law of refraction	q) $\angle i = \angle r$
C. Power of lens	r) $\frac{\sin i}{\sin r} = \text{constant}$
D. Absolute refractive index of glass	s) $\frac{\text{Speed of light in air}}{\text{Speed of light in glass}}$

a) A – q, B – r, C – p, D – s b) A – r, B – q, C – p, D – s

c) A – q, B – r, C – s, D – p d) A – r, B – q, C – s, D – p

24. Ampere-second stands for the unit of :

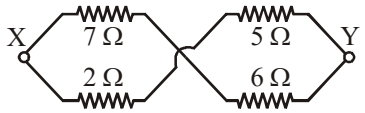
a) Power b) Charge c) e.m.f. d) Energy

25. There are two wires of the same length and of the same material and radius r and 2r. The ratio of their specific resistance is :

a) 1 : 2 b) 1 : 1 c) 1 : 4 d) 4 : 1

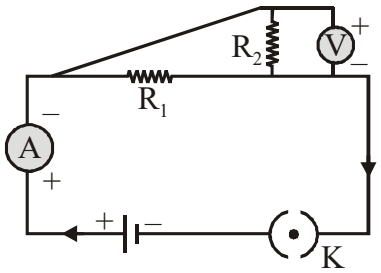
Space for Rough work

26. The equivalent resistance between points X & Y :



a) 4 Ω b) 4.5 Ω c) 2 Ω d) 20 Ω

27. Which of the circuit components in the following circuit diagram and connected in parallel?

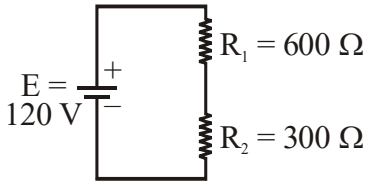


a) R_1 and R_2 only b) R_1, R_2 and V c) R_2 and V only d) R_1 and V only

28. The voltage across a conductor is directly proportional to the current flowing across it under constant conditions of

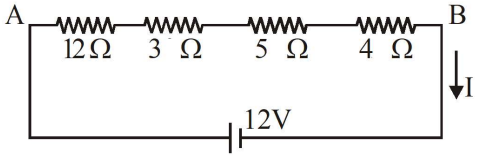
a) Pressure b) Humidity c) Temperature d) Density

29. In the circuit, the battery is ideal. A voltmeter is connected across R_1 and R_2, giving readings V_1 and V_2 respectively. Then



a) $V_1 = 80$ V b) $V_1 = 60$ V c) $V_2 = 30$ V d) $V_2 = 50$ V

30. The potential drop across the 12 Ω resistor is :



a) 12 V b) 6 V c) 8 V d) 0.5 V

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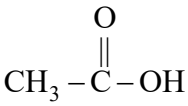
CHEMISTRY

31. The electronic configuration of an element is found to be 2, 4. How many bonds can one carbon atom form in a compound ?

    a) 1 b) 2 c) 4 d) 6

32. Which functional group is present in the following compound ?



    a) Aldehyde b) Carboxylic acid c) Ketone d) Alcohol

33. Which of the following is molecular formula of cyclobutane ?

    a) C_4H_{10} c) C_4H_6 c) C_4H_4 d) C_4H_8

34. How many single bonds are present in methane ?

    a) Four b) Five c) Six d) Three

35. Buckminsterfullerne is an allotropic form of

    a) Phosphorus b) Sulphur c) Carbon d) Tin

36. The process of converting a liquid into gaseous state is called

    a) Sublimation b) Condensation c) Evaporation d) Melting

37. The following chemical reaction shows the addition of chlorine gas to hydrocarbon in the presence of sunlight

$$CHCl_3 + Cl_2 \xrightarrow{\text{Sunlight}} CCl_4 + HCl$$

    How does chlorine react to a hydrocarbon comound in the presence of sunlight ?

    a) It adds hydrogen to the compound

    b) It adds on oxygen atom to the compound

    c) It substitutes hydrogen atom from the compound

    d) It breaks double and triple bonds into a single bond.

Space for Rough work

38. Match the reactions given in column (A) with the names given in column (B).

Column (A)	Column (B)
A) $CH_3OH + CH_3COOH \xrightarrow{H^+} CH_3COOCH_3 + H_2O$	i) Addition Reaction
B) $CH_2 = CH_2 + H_2 \xrightarrow{Ni} CH_3 - CH_3$	ii) Substitution Reaction
C) $CH_4 + Cl_2 \xrightarrow{sunlight} CH_3 - Cl + HCl$	iii) Neutralisation Reaction
D) $CH_3COOH + NaOH \rightarrow CH_3COONa + H_2O$	iv) Esterification Reaction

a) A – iv, B – i, C – ii, D – iii b) A – iv, B – ii, C – i, D – iii

c) A – iv, B – iii, C – ii, D – i d) A – iv, B – i, C – iii, D – i

39. Which of the following is the purest form of carbon

a) Charcoal b) Coal c) Diamond d) Graphite

40. The first member of the alkyne homologous series is

a) Propyne b) Ethyne c) Methane d) Ethene

41. An elment X on exposure to moist air turns reddish brown and a new compound Y is formed. The substance X and Y are

a) $X = Fe, Y = Fe_2O_3$ b) $X = Ag, Y = Ag_2S$ c) $X = Cu, Y = CuO$ d) $X = Al, Y = Al_2O_3$

42. When carbon dioxide is passed through lime water ?

a) Calcium hydroxide is formed b) White precipitate of CaO is formed

c) Lime water turns milky d) Colour of lime water disappeaes

43. $Na_2SO_{4(aq)} + BaCl_{2(aq)} \rightarrow BaSO_{4(s)} + 2NaCl_{(aq)}$

Sodium sulphate Barium chloride Barium sulphate Sodium chloride

The above reaction is a example of

a) Displacement reaction b) Double displacement reaction

c) Combination reaction d) Decomposition reaction

Space for Rough work

44. Oxidation is a process which involves

a) Addition of oxygen
b) Addition of hydrogen
c) Removal of oxygen
d) Removal of hydrogen and oxygen

45. Which of the following is an example of a chemical change ?

a) Boiling of water
b) Burning of candle
c) Cutting of paper
d) Melting of ice

46. What is the chemical formula of sodium Hydroxide ?

a) NaOH
b) Na_2CO_3
c) NaCl
d) $NaNO_3$

47. Which of the following statements is true about exothermic reactions ?

a) They absorbs heat
b) They release heat
c) They occur at low temperatures
d) They require energy input

48. Brine is an

a) Aqueous solution of sodium hydroxide
b) Aqueous solution of sodium carbonate
c) Aqueous solution of sodium chloride
d) Aqueous solution of sodium bicarbonate

49. What is the nature of baking soda ?

a) Acidic
b) Basic
c) Neutral
d) None of the above

50. Which acid is found in vinegar ?

a) Citric acid
b) Lactic acid
c) Acetic acid
d) Tactaric acid

51. What color does turmeric turns when it contacts a basic substance ?

a) Red
b) Blue
c) Yellow
d) Green

52. The ability of metals to be drawn into thin wire is known as

a) Ductility
b) Malleability
c) Sonorousity
d) Conductivity

53. The bronze medals are made up of

a) Cu and Zn
b) Zn and Ni
c) Cu and Sn
d) Cu, Zn, Sn

Space for Rough work

54. The composition of aqua-regia is

a) dil. HCl : conc. HNO_3 = 3 : 1 b) conc. HCl : dil. HNO_3 = 3 : 1

c) conc. HCl : conc. HNO_3 = 3 : 1 d) dil. HCl : dil. HNO_3 = 3 : 1

55. Two statements are made.

Statement – A : Zine is used in the galvanization of iron.

Statement – B : Its coating on iron articles increasing the life of it by protecting it from rusting.

a) Both Statement A and Statement B are correct.

b) Both Statement A and Statement B are incorrect.

c) Statement A is correct but Statement B is incorrect.

d) Statement A is incorrect but Statement B is correct.

56. What happens when an acid react with a metal ?

a) Formation of acid and salt b) Release of hydrogen gas

c) Production of oxygen gas d) Formation of carbon dioxide gas

57. What type of reaction occurs when an acid react with a metal ?

a) Acid – Base Reaction b) Oxidation – Reduction Reaction

c) Decomposition Reaction d) Neutralization Reaction

58. What is the chemical formula of plaster of paris (POP) ?

a) $CaSO_4 . 2H_2O$ b) $CaSO_4 . 3H_2O$ c) $CaSO_4 . \frac{1}{2} H_2O$ d) $CaCO_3 . \frac{1}{2} H_2$

59. Which of the following is endothermic process ?

a) Dilution of sulphuric acid b) Sublimation of dry ice

c) Condensation of water vapours d) Respiration is human beings

60. What happens when a pallet of sodium is dropped in water ?

a) It catches fire and forms oxide b) It absorbs heat and forms oxide

c) It catches fire and forms hydroxide d) It absorbs heat and forms hydroxide

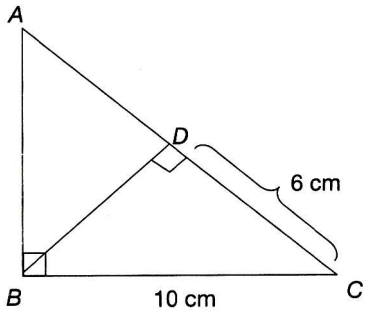
Space for Rough work

MATHEMATICS

61. If $\theta = 60°$ then $\sin^2 2\theta + \cos^2 2\theta$ is equal to

a) 0 b) 1 c) 2 d) $\frac{1}{4}$

62. In the following figure, $\angle ABC = 90°, BC = 10\text{cm}, CD = 6\text{cm}$, then $AD =$ .....



a) $\frac{32}{3}$ cm b) $\frac{32}{5}$cm c) $\frac{32}{11}$cm d) 9 cm

63. HCF of two co- primes (say x and y) is ..... .

a) x b) y c) xy d) 1

64. The HCF of the polynomials $70(x^3 - 1)$ and $105(x^2 - 1)$ is ..... .

a) $15(x-1)$ b) $35(x-1)$ c) $35(x^2-1)(x^2+x+1)$ d) $15(x^2-1)$

65. The volume of a cone whose height is seven times its base radius r is

a) $\frac{41}{3}r^3$ b) $\frac{22}{3}r^3$ c) $\frac{21}{3}r^3$ d) $\frac{44}{3}r^3$

66. Find the value of a if $ax^3 - (a+1)x^2 + 3x - 5a$ is divisible by $(x-2)$.

a) 2 b) 3 c) 4 d) 5

67. A number is selected from the numbers 1 to 20. What is the probability that it will be a prime number ?

a) $\frac{2}{5}$ b) 1 c) $\frac{1}{6}$ d) $\frac{1}{5}$

Space for Rough work

68. The number of common solution(s) for the system of linear equation $2x+3y+5=0$ and $4x+6y-10=0$ is .....

a) 0 b) 1 c) 2 d) infinite

69. For what value of k, will the following pair of linear equations have no solution ?

$3x+4y=5$ and $(3k+1)x+8y=k+2$

a) $\frac{5}{3}$ b) $\frac{5}{13}$ c) $\frac{2}{3}$ d) $\frac{4}{3}$

70. If sum of first n terms of an AP is $3n^2+2$ then its common difference is

a) 4 b) 6 c) 5 d) 3

71. If the sum of the roots of the equation $kx^2-3x+9=0$ is $\frac{3}{11}$, then find the product of the roots of that equation.

a) $\frac{1}{11}$ b) $\frac{9}{11}$ c) $\frac{2}{11}$ d) 4

72. The quadratic equation whose roots are 2 and 7 is

a) $x^2-9x+14=0$ b) $x^2+9x+14=0$ c) $x^2+9x-14=0$ d) $x^2-9x-14=0$

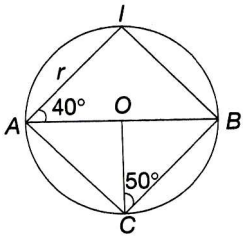
73. If $\tan\theta=\frac{3}{4}$ where $0<\theta<90°$, then $\sin\theta+\cos\theta$ equal to

a) $\frac{7}{5}$ b) $\frac{1}{5}$ c) $\frac{5}{7}$ d) $\frac{6}{5}$

74. Third term of the sequence whose nth term is $2n+5$ is ..... .

a) 13 b) 11 c) 14 d) 15

75. In the given figure, AB is a diameter, O is the centre of the circle and $\angle OCB=50°$, then find $\angle DBC$.



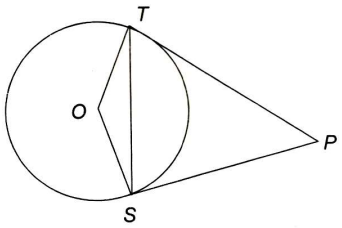
a) 80° b) 100° c) 120° d) 140°

Space for Rough work

76. If $\sin A = \frac{1}{2}$ then the value of $\sec A$ is

a) $\frac{2}{\sqrt{3}}$ b) $\frac{\sqrt{3}}{2}$ c) $\frac{1}{2}$ d) 2

77. PT and PS are the tangents to the circle with centre O.If $\angle TPS = 65°$, then $\angle OTS =$ ..... .



a) $32°$ b) $45°$ c) $57\frac{1}{2}°$ d) $32\frac{1}{2}°$

78. The side of an equilateral triangle is 2 cm. Find its area (in cm^2).

a) $12\sqrt{3}$ b) $\sqrt{3}$ c) $16\sqrt{3}$ d) $18\sqrt{3}$

79. The area of an equilateral triangle is $18\sqrt{3}$ cm^2. Find its height (in cm).

a) $6\sqrt{2}$ b) $2\sqrt{6}$ c) $3\sqrt{6}$ d) $6\sqrt{3}$

80. When a card is selected at random from a pack of cards, find the probability that it is a king.

a) 0 b) $\frac{1}{13}$ c) $\frac{1}{2}$ d) $\frac{1}{4}$

81. The distance of a point (4, 3) from (0,0) is .....

a) 4 b) 5 c) 3 d) 1

82. The slope of the line $5x + 3y + 1 = 0$ is..... .

a) $\frac{3}{5}$ b) $\frac{5}{3}$ c) $-\frac{5}{3}$ d) $-\frac{3}{5}$

83. Find the area of the triangle formed by the line $5x + 4y - 20 = 0$ with the coordinate axes (in square units).

a) 10 b) 12 c) 15 d) 20

84. The values of $\frac{\tan 60° - \tan 30°}{1 + \tan 60° \tan 30°}$ is

a) $\sqrt{3}$ b) $\frac{1}{\sqrt{3}}$ c) 1 d) $-\frac{1}{\sqrt{3}}$

85. The area of a triangle whose sides are 3, 4 and 5 units is

a) 7 b) 6 c) 8 d) 5

Space for Rough work

86. Point of intersection of $2x - y + 1 = 0$ and $x + y + 2 = 0$ is
a) $(-1, -1)$ b) $(1, -1)$ c) $(-1, 1)$ d) $(3, 4)$

87. Find the value of $\tan 180° + \tan 45°$.
a) 0 b) 1 c) 2 d) –1

88. In ΔPQR, $PQ = 6$ cm, $PR = 9$ cm and M is a point on QR such that it divides QR in the ratio 1 : 2. $PM \perp QR$. Find QR.
a) $\sqrt{18}$ cm b) $3\sqrt{12}$ cm c) $3\sqrt{15}$ cm d) $\sqrt{20}$ cm

89. The volume of a hemisphere is 18π cm^3. What is the total surface area of the hemisphere ?
a) 18π cm^2 b) 27π cm^2 c) 21π cm^2 d) 24π cm^2

90. Find the mean of the first 10 natural numbers.
a) 4.5 b) 5.5 c) 5 d) 6.5

91. P is an interior point of an equilatreal triangle ABC. If P is equidistant from AB, BC and AC, then $\angle BPC = ...$
a) 120° b) 90° c) 60° d) 150°

92. The value of $\tan 15° \tan 20° \tan 70° \tan 75°$ is
a) –1 b) 2 c) 0 d) 1

93. Find the set of values of k for which the equation $x^2 - 2x + k = 0$ has imaginary roots.
a) $[1, \infty)$ b) $(1, \infty)$ c) $(-1, \infty)$ d) None of these

94. A bag contains 3 red, 5 blue, and 7 green coloured balls. Find the probability of selecting a blue ball from the bag.
a) $\frac{3}{15}$ b) $\frac{1}{3}$ c) $\frac{1}{4}$ d) $\frac{2}{3}$

95. If $\tan\theta + \cot\theta = 2$, then $\tan^{10}\theta + \cot^{10}\theta = ...$
a) 2 b) 3 c) 4 d) 5

96. What is the remainder when $(x + 1)(x + 2)(x + 3)(x + 4)$ is divided by $(x + 2)$?
a) 0 b) $-k$ c) k d) 1

97. The volume of a hollow hemisphere whose thickness is equal to inner radius r is
a) $\frac{44}{3}r^3$ b) $\frac{41}{3}r^3$ c) $\frac{21}{3}r^3$ d) $\frac{22}{3}r^3$

98. If the zeroes of the rational expression $(3x + 2a)(2x + 1)$ are $\frac{-1}{2}$ and $\frac{b}{3}$, then the value of a is ..... .
a) $-2b$ b) $\frac{-b}{2}$ c) $\frac{-b}{3}$ d) $\frac{b}{3}$

99. If α and β are the roots of $x^2 - 5x + 7 = 0$, then $\alpha^2 + \beta^2$ is
a) 11 b) 14 c) 18 d) 20

100. $\sqrt{4} =$
a) 2 b) ± 2 c) -2 d) All of the above

Space for Rough work