दयानंद शिक्षण संस्था, लातूर

"आ नो भद्रा क्रतवो यन्तु विश्वतः"

Dayanand Education Society, Latur.

CET (CBSE) SET - 2

Marks : 400	Date : 16 April 2023	Time : 1.00 pm - 3.00 pm

: 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. (Donot use Pencil)
* Do not open the seal of question paper until you are ask to do so.
* 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)
* Only Name and Roll No. is necessary on answer sheet (OMR).
* In the place of Sub on OMR sheet write **PCB** or **PCM**.

Wish You All the Best !

D-SAT

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PHYSICS

01. A diminished virtual image can be formed only by

a) Plane mirror b) A concave mirror

c) A convex mirror d) Concave-parabolic mirror

02. A concave mirror gives an image three times as large as the object placed at a distance of 20 cm from it. For the image to be real, the focal length should be

a) 10 cm b) 15 cm c) 20 cm d) 30 cm

03. White light is incident normally on a glass slab. Inside the glass slab

a) Red light travels faster than other colours

b) Violet light travels faster than other colours

c) Yellow light travels faster than other colours

d) All colours travel with the same speed

04. A beam of monochromatic blue light of wavelength 4200 Å in air travels in water of refractive index 4/3. Its wavelength in water will be

a) 4200 Å b) 5800 Å c) 4150 Å d) 3150 Å

05. When a light wave goes from air to water, the quantity that remains unchanged is its

a) Speed b) Amplitude c) Frequency d) Wavelength

06. The radius of curvature for a convex lens is 40 cm, for each surface. Its refractive index is 1.5. The focal length will be

a) 40 cm b) 20 cm c) 80 cm d) 30 cm

07. Two lenses of power +12 and –2 dioptres are placed in contact. What will be focal length of combination

a) 10 cm b) 12.5 cm c) 16.6 cm d) 8.33 cm

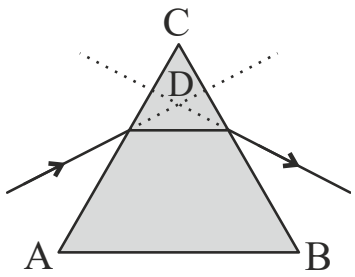
08. Given a point source of light, which of the following can produce a parallel beam of light

a) Convex mirror b) Concave mirror

c) Concave lens d) Two plane mirror inclined at an angle of 90°

Space for Rough work

09. Spectrum of sunlight is an example for
    a) Band emission spectrum
    b) Line absorption spectrum
    c) Continuous emission spectrum
    d) Continuous absorption spectrum
10. When white light enters a prism, it gets split into its constituent colours. This is due to
    a) High density of prism material
    b) Because μ is different for different λ
    c) Diffraction of light
    d) Velocity changes for different frequencies
11. In the given figure, which is the angle of prism



    a) A b) B c) C d) D
12. Colour of the sky is blue due to
    a) Scattering of light
    b) Total internal reflection
    c) Total emission
    d) Total absorption
13. Ability of the eye to see objects at all distances is called
    a) Binocular vision b) Myopia c) Hypermetropia d) Accommodation
14. For the myopic eye, the defect is cured by
    a) Convex lens b) Concave lens c) Cylindrical lens d) Toric lens
15. The hyper-metropia is a
    a) Short-side defect
    b) Long-side defect
    c) Bad vision due to old age
    d) None of these

Space for Rough work

16. What length of the wire of specific resistance $48\times10^{-8}\ \Omega$ m is needed to make a resistance of $4.2\ \Omega$ (diameter of wire = 0.4 mm)

a) 4.1 m b) 3.1 m c) 2.1 m d) 1.1 m

17. The resistance of a wire is R. If the length of the wire is doubled by stretching, then the new resistance will be

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

18. The resistance of a wire is $10\ \Omega$. Its length is increased by 10% by stretching. The new resistance will now be

a) $12\ \Omega$ b) $1.2\ \Omega$ c) $13\ \Omega$ d) $11\ \Omega$

19. Two wires A and B of same material and same mass have radii 2r and r respectively. If resistance of wire A is $34\ \Omega$, then resistance of B will be

a) $544\ \Omega$ b) $272\ \Omega$ c) $68\ \Omega$ d) $17\ \Omega$

20. When a current flows through a conductor its temperature

a) May increase or decrease b) Remains same

c) Decreases d) Increases

21. The resistance of a conductor increases with

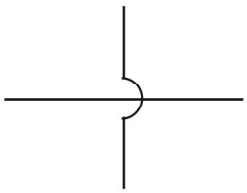
a) Increase in length b) Increase in temperature

c) Decrease in cross-sectional area d) All of these

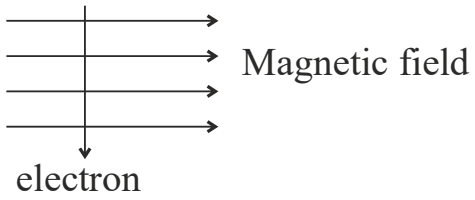
Space for Rough work

22. The symbol of an electric cell is .....

a) 

b) 
c) 
d) 

23. An electron enters a magnetic field at right angles to it, as shown in figure. The direction of force acting on the electron will be



a) to the right b) to the left left c) Out of the page d) into the page

24. The direction fo magnetic lines of forces close to a straight conductor carrying current will be

a) Along the length of the conductor

b) Radially outward

c) Circular in a plane perpendicular to the conductor

d) Helical

25. A current loop in a magnetic field

a) Can be in equilibrium in two orientations, one stable while the other is unstable

b) Experiences a torque whether the field is uniform or non uniform in all orientations

c) Can be in equilibrium in one orientation

d) Can be in equilibrium in two orientations, both the equilibrium states are unstable

Space for Rough work

26. If a long hollow copper pipe carries a direct current, the magnetic field associated with the current will be

a) Only inside the pipe b) Only outside the pipe

c) Neither inside nor outside the pipe d) Both inside and outside the pipe

27. An electron and a proton with equal momentum enter perpendicularly into a uniform magnetic field, then

a) The path of proton shall be more curved than that of electron

b) The path of proton shall be less curved than that of electron

c) Both are equally curved

d) Path of both will be straight line

28. The current is flowing in south direction along a power line. The direction of magnetic field above the power line (neglecting earth`s field) is

a) South b) East c) North d) West

29. A particle is moving in auniform magnetic field, then

a) Its momentum changes but total energy remains the same

b) Both momentum and total energy remain the same

c) Both will change

d) Total energy changes but momentum remains the same

30. Which of the following properly of a proton can change while it moves freely in a magnetic field ?

a) Mass b) Speed c) Velocity d) Charge

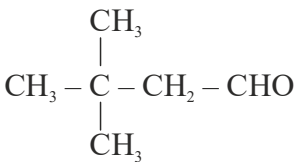
Space for Rough work

CHEMISTRY

31. The reaction in which two compounds exchanges their ions to form two different compounds is known as
    a) Displacement Reaction b) Reduction reaction
    c) Substitution reaction d) Double displacement reaction
32. The process of coating iron with zinc is called as
    a) Reduction b) Galvanisation c) electroplating d) Polishing
33. Oxidation reaction involves
    a) Decrease in the valence of positive part b) Increase in the valence of negative part
    c) Gain of electrons d) Loss of electrons
34. Which of the following is a combustion reaction ?
    a) Rusting of iron b) Melting of iron c) Burning of petrol d) Boiling of water
35. Which of the following metal is protected by the formation of a layer of its oxide ?
    a) Au b) Al c) Cu d) Fe
36. Removal of impurities from ore is known as
    a) Calcination b) Roasting c) Crushing and grinding d) Concentration of ore
37. Which one of the following metal is found in liquid state at room temperature ?
    a) Fe b) Na c) Cr d) Hg
38. Which one of the following metal oxides shows both acidic and basic characters ?
    a) Al_2O_3 b) CuO c) Na_2O d) K_2O
39. The d-block elements are placed from groups
    a) 13 to 18 b) 4 to 12 c) 3 to 12 d) 1 to 2
40. Which element is more electronegative among halogens ?
    a) Cl b) F c) Br d) I
41. Which of the following element has the smallest atomic size ?
    a) Ar b) Si c) Cl d) Na

Space for Rough work

42. The total number of elements present in the 6^{th} period is .....
    a) 32 b) 36 c) 18 d) 14

43. IUPAC name of the compound 
    a) 3, 3 – dimethyl butanal b) 1, 1 – dimethyl butanal
    c) 2, 2 – dimethyl butanal d) 3, 3, 3 – dimethyl propanal

44. Oils on treating with hydrogen in the presence of palladium or nickel catalyst forms fats. This is an example of
    a) Substitution b) Oxidation c) Displacement d) Addition

45. Which of the following compounds cannot exhibit chain isomerism ?
    a) Propane b) Pentane c) Hexane d) Butane

46. Which of the following is not a saturated hydrocarbon ?
    a) Butane b) Cyclohexane c) Isobutane d) Benzene

47. The type of medicine used to treat acidity in stomach is .....
    a) Antibiotic b) Antacid c) Antihistamine d) Sulpha drug

48. The acid used as dehydrating agent is
    a) H_2SO_4 b) HBr c) HI d) HNO_3

49. If pH of solution is 13, it means that it is .....
    a) Strongly acidic b) Weakly acidic c) Strongly basic d) Weakly basic

50. Limestone, chalk and marble are different forms of .....
    a) Sodium carbonate b) Zinc carbonate
    c) Sodium hydrogen carbonate d) Calcium carbonate

51. The acid used for washing eyes is .....
    a) Boric acid b) Carbonic acid c) Acetic acid d) Oxalic acid

Space for Rough work

52. Basic salts are formed by neutralisation of
    a) Strong acid and strong base
    b) Weak acid and weak base
    c) Strong base and weak acid
    d) Strong acid and weak base

53. The reaction $2C_2H_5OH + 2Na \rightarrow 2C_2H_5ONa + H_2$ suggest that ethanol is .....
    a) Neutral in nature b) Acidic in nature c) Basic in nature d) Amphoteric in nature

54. Ethanol is oxidised with alkaline $KMnO_4$ to give
    a) Ethanoic acid b) Methanoic acid c) Propanoic acid d) n – Butyric acid

55. 5f series elements are known as
    a) Actinides
    b) Lanthanides
    c) Representative elements
    d) Transition elements

56. Which of the following elements has maximum metallic character ?
    a) P b) N c) Li d) Na

57. Copper on exposure to air reacts with moisture and CO_2 to form a green layer on the surface which is chemically.
    a) Copper sulphate
    b) Copper nitrate
    c) Basic copper carbonate
    d) Copper chloride

58. Which of the following are exothermic processes ?
    i) Reaction of water with quick lime
    ii) Dilution of an acid
    iii) Evaporation of water
    iv) Sublimation of camphor
    a) (i) & (ii) b) (ii) & (iii) c) (i) & (iv) d) (iii) & (iv)

59. The products formed when zinc reacts with steam are
    a) ZnH_2 & O_2 b) ZnO & H_2 c) ZnO_2 & O_2 d) $ZnO_2 + H_2$

60. IUPAC name of $CH_3 - CO - CH_3$
    a) Propane b) Acetone c) Propanone d) Ethanal

Space for Rough work

MATHEMATICS

61. If $f(x) = 4x^4 + x^2 + 5b$ and $f(1) = f(-1)$, then what is the value of b ?

a) $b \neq 0$ b) $b \in R$

c) no value of b is possible d) noe of these

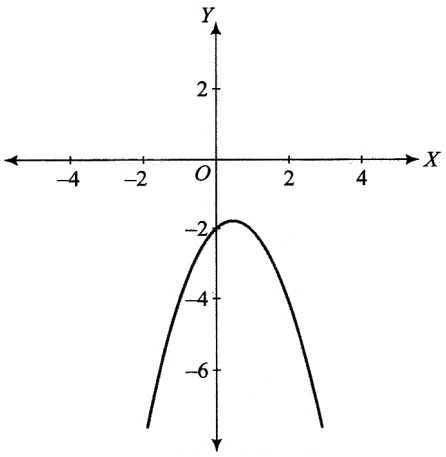
62. If one root of the equation $x^2 - dx + 12 = 0$ is even prime, while $x^2 + dx + \mu = 0$ has equal roots then μ is

a) 8 b) 20 c) 32 d) 16

63. The centroid of the triangle with vertices A(–7, 6), B(2, –2), C(8, 5) is

a) (1, 3) b) (3, 1) c) (2, 2) d) NOT

64. The graph of a quadratic polynomialy $y = ax^2 + bx + c$; $a, b, c \in R$ is as shown.



Which one of the following is NOT correct ?

a) $b^2 - 4ac < 0$ b) $\frac{c}{a} < 0$

c) c is negative d) abscissa corresponding to the vertex is $\left(\frac{-b}{2a}\right)$

Space for Rough work

65. If one root of the equation $x^2 + px + 12 = 0$ is 4, while the equation $x^2 + px + q = 0$ has equal roots then the value of q is

a) 4 b) 49/4 c) 4/49 d) None of these

66. Which of the following can't be an AP(n^{th} term is given) ?

a) $3n + 2$ b) $3n^2 + 2$ c) $4n + 5$ d) $7n + 2$

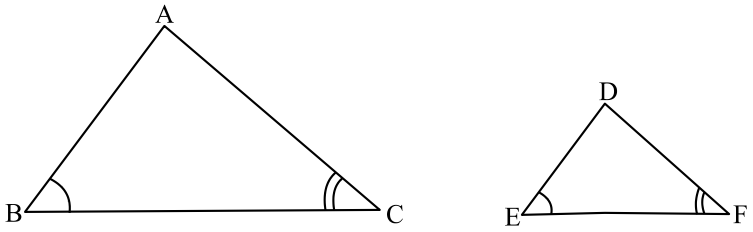
67. If m^{th} term of an AP is $\frac{1}{n}$ and n^{th} term is $\frac{1}{m}$ then mn^{th} term of the AP is

a) $\frac{1}{mn}$ b) mn c) 1 d) none of these

68. The sum of 24 terms of the following sereis $\sqrt{2} + \sqrt{8} + \sqrt{18} + \sqrt{32} + ...$ is

a) 300 b) $300\sqrt{2}$ c) $200\sqrt{2}$ d) none of these

69. In Δ ABC and Δ DEF $\angle B = \angle E$, $\angle F = \angle C$ and AB = 3DE then which of the statements regarding the two triangles is true ?



a) The triangles are not congruent and not similar

b) The triangles are similar but not congurent

c) The triangles are congruent and similar

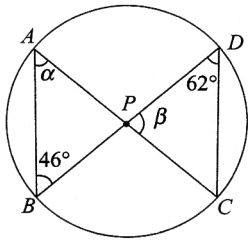
d) None of the statements above is true

Space for Rough work

70. In a circle of radius r and arc length l the ratio $\frac{\text{Length of an arc}}{\text{Circumference}} =$

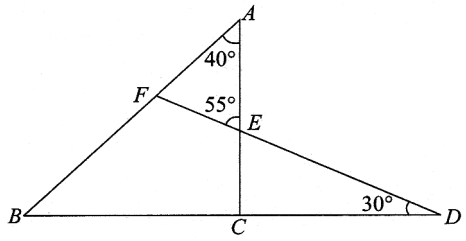
a) $\frac{180}{\theta}$ b) $\frac{\theta}{180}$ c) $\frac{\theta}{360}$ d) $\frac{360}{\theta}$

71. In the given figure, the value of β is



a) 36° b) 72° c) 54° d) 90°

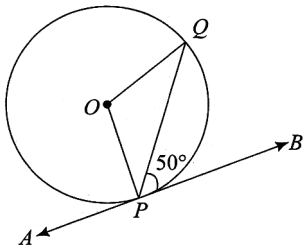
72. In the given figure, *BCEF* is



a) cyclic quadrilateral b) rhombs
c) rectangle d) None

Space for Rough work

73. In figure, APB is a tangent to a circle with centre O at point P. If $\angle QPB = 50°$, then the measure of $\angle POQ$ is

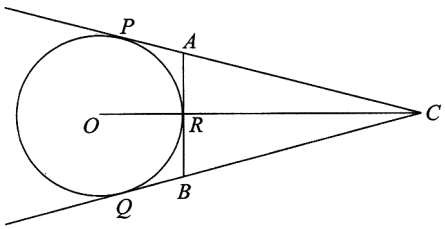


a) 100° b) 120° c) 140° d) 150°

74. The side of a cube of volume 1 m^3 =

a) 1 cm b) 10 cm c) 100 cm d) 1000 cm

75. If the figure, CP and CQ are tangents from an external point C to a circle with centre O. AB is another tangent which touches the circle at R. If $CP = 11$ cm and $BR = 4$ cm, find the length of BC.



a) 6 cm b) 7 cm c) 8 cm d) 9 cm

76. The distance between the points $P(\sqrt{5}+1, \sqrt{3}-1)$ and $Q(\sqrt{5}-2, \sqrt{3}+2)$ is

a) $3\sqrt{2}$ units b) $4\sqrt{2}$ units c) $3\sqrt{5}$ units d) $2\sqrt{6}$ units

77. If the distance between the points $A(-3, 4)$ and $B(x, 7)$ is 5 units, then x =

a) –1 or 7 b) 1 or –7 c) 5 or –3 d) –5 or 3

Space for Rough work

78. The ratio in which the line segment joining the points $A(-12, 2)$ and $B(8, 3)$ is divided by the y-axis is

a) 2 : 1 b) 1 : 4 c) 1 : 3 d) 3 : 2

79. If $\sec\theta + \tan\theta = a$, then the value of $\sec\theta - \tan\theta$ is

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

80. What is the value of $\frac{\sin\theta}{1+\cos\theta} + \frac{1+\cos\theta}{\sin\theta}$?

a) 2 b) 2 cosec θ c) 2 sec θ d) $\tan\theta$

81. What is the value of $\frac{1}{1-\sin\alpha} + \frac{1}{1+\sin\alpha}$?

a) $2\tan^2\alpha$ b) $2\cos^2\alpha$ c) $\sec^2\alpha$ d) $2\sec^2\alpha$

82. The horizontal distance between two towers is 60 m and the angular depression of the top of the second tower which is 150 m high is 30°. The height of the first is

a) 120 m b) $10(15+2\sqrt{3})$ m c) $10(15-2\sqrt{3})$ m d) $10(15+\sqrt{3})$ m

83. The angle of elevation of the top of a tower from top of a house is 60° and the angle of depression of its base is 30°. If the horizontal distance between the house and the tower is 12 m, then the height of the tower is

a) $48\sqrt{3}$ m b) $\frac{16}{\sqrt{3}}$ m c) $24\sqrt{3}$ m d) $16\sqrt{3}$ m

84. If the system of equations $2x + 3y = 7$ and $(a + b)\,x + (2a - b)\,y = 21$ has infinite number of solutions, then

a) $a = -1, b = 5$ b) $a = 1, b = 5$ c) $a = 5, b = -1$ d) $a = 5, b = 1$

85. The value of k for which the system of equations $x + 2y - 3 = 0$ and $5x + ky + 7 = 0$ has no solution is

a) 1 b) 3 c) 6 d) 10

Space for Rough work

86. If $a^2 + b^2 + c^2 = 250$ and $ab + bc + ca = 3$, then $a + b + c =$

a) -16 b) 14 c) 15 d) 16

87. If $\sqrt{22^{4x-8}} = 22$, then $x =$

a) 1 b) 2 c) 2.5 d) 5

88. If $2500000 = \frac{10^m}{4}$, then $m =$

a) 10 b) 7 c) 5 d) $\frac{1}{2}$

89. $\sqrt{14+\sqrt{2+\sqrt{1+\sqrt{9}}}}$

a) 1 b) 4 c) 9 d) 14

90. If $x = 7 + 4\sqrt{3}$, then $x^2 + \frac{1}{x^2} =$

a) 196 b) 195 c) 194 d) 193

91. If $a^2 + 4b^2 = 4ab$, then $a : b =$

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

92. The next term of an AP $\sqrt{7}, \sqrt{28}, \sqrt{63}, \ldots\ldots$ is

a) $\sqrt{97}$ b) $\sqrt{112}$ c) $\sqrt{70}$ d) $\sqrt{84}$

93. The sum to n terms of the series $\sqrt{5}, \sqrt{20}, \sqrt{45}, \sqrt{80}, \ldots\ldots$ is

a) $\frac{n(n+1)}{2\sqrt{5}}$ b) $\frac{n(n+1)\sqrt{5}}{2}$ c) $n(n+1)\sqrt{5}$ d) $\frac{n(n+1)}{\sqrt{2}}$

94. If an angle is five times its supplementary angle, then the angle is

a) 50° b) 75° c) 135° d) 150°

Space for Rough work

95. The perimeter of an isosceles right triangle the length of whose hypotenuse is 10 cm, is

a) $10\sqrt{2}+10$ cm b) $10\sqrt{2}+9$ cm c) $20\sqrt{2}$ cm d) 20 cm

96. If D, E, F are the midpoints of sides BC, CA, AB respectively of Δ ABC, then the ratio of the areas of triangles DEF and ABC is

a) 4 : 5 b) 2 : 3 c) 1 : 4 d) 1 : 2

97. If Δ ABC and Δ DEF are similar such that $\angle A = 47°$ and $\angle E = 83°$, then $\angle C =$

a) 70° b) 80° c) 50° d) 60°

98. In Δ ABC and Δ DEF, if $\frac{AB}{DE} = \frac{BC}{EF} = \frac{CA}{FD}$, then

a) $\Delta FDE \sim \Delta CBA$ b) $\Delta FDE \sim \Delta CAB$ c) $\Delta FDE \sim \Delta BCA$ d) $\Delta FDE \sim \Delta ABC$

99. If $n(A) = 2$, $P(A) = \frac{1}{5}$, then $n(S) =$

a) $\frac{5}{2}$ b) $\frac{2}{5}$ c) 10 d) 5

100. If $\sin\theta = \frac{a}{b}$, then $\tan\theta =$

a) $\frac{a}{\sqrt{a^2-b^2}}$ b) $\frac{a}{\sqrt{b^2-a^2}}$ c) $\frac{b}{\sqrt{a^2-b^2}}$ d) $\frac{b}{\sqrt{b^2-a^2}}$

Space for Rough work

DAYANAND SCIENCE COLLEGE, LATUR
D-SAT - 2023 (SET - 2)
CET - CBSE

PHYSICS
KEY TO THE QUESTION BOOKLET

01. C	02. B	03. A	04. D	05. C	06. A	07. A	08. B	09. B	10. B
11. C	12. A	13. D	14. B	15. B	16. D	17. B	18. A	19. A	20. D
21. D	22. A	23. D	24. C	25. A	26. B	27. C	28. D	29. B	30. C

CHEMISTRY
KEY TO THE QUESTION BOOKLET

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

MATHEMATICS
KEY TO THE QUESTION BOOKLET

61. B	62. D	63. A	64. B	65. B	66. B	67. C	68. B	69. B	70. C
71. B	72. A	73. A	74. C	75. B	76. A	77. B	78. D	79. B	80. B
81. D	82. B	83. D	84. D	85. D	86. D	87. C	88. B	89. B	90. C
91. C	92. B	93. B	94. D	95. A	96. C	97. C	98. B	99. C	100. B