QUESTION BOOKLET

Diploma Polytechnic Entrance Test – 2012

Paper - I (ENGLISH AND SCIENCE)

Booklet No.

Roll No. | | | | | | |

Series | **B** | 100930 |

(Enter your Roll Number in the above space)

Time Allowed : 2.00 Hours **Max. Marks : 100**

INSTRUCTIONS :

1. Use only BLACK or BLUE Ball Pen.
2. All questions are COMPULSORY.
3. Check the BOOKLET thoroughly.

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4. Before you mark the answer, fill in the particulars in the ANSWER SHEET carefully and correctly. Incomplete and incorrect particulars may result in the non-evaluation of your answer sheet by the technology.
5. Write the SERIES and BOOKLET NO. given at the TOP RIGHT HAND SIDE of the question booklet in the space provided in the answer sheet by darkening the corresponding circles.
6. Do not use any **eraser, fluid pens** etc., otherwise your answer sheet is likely to be rejected.
7. After completing the test, handover the ANSWER SHEET to the Invigilator.

PAPER – I

SECTION I

(ENGLISH)

Choose the most suitable answer in the following questions :

1. "Where's the ———— post office, please"?

   (1) most near (2) near (3) more near (4) nearest

2. Her parents live ———— New Delhi.

   (1) at (2) from (3) in (4) by

3. Joe's parents are sick ———— his behavior.

(1) from (2) at (3) about (4) of

4. Colonel Gurmeet congratulated the soldiers ———— their victory.

(1) for (2) at (3) on (4) about

5. The planet was seen ———— the telescope.

(1) by (2) on (3) from (4) at

6. The news of his promotion came ———— the next day.

(1) by (2) on (3) in (4) at

7. He is not afraid ———— the consequences.

(1) for (2) by (3) of (4) from

8. He rushed ———— the class, as he was late.

(1) for (2) in (3) by (4) to

9. When Simon ———— back tonight, he'll cook dinner.

(1) comes (2) will come (3) come (4) shall come

10. We arrived ———— England two days ago.

(1) to (2) in (3) on (4) at

11. Last night we ———— for a walk after the dinner.

(1) went (2) go (3) will go (4) gone

12. He will return in ———— hour.

(1) a (2) an (3) the (4) by

13. Why are you so hungry? 'Oh, I ———— breakfast this morning'.

(1) hadn't (2) didn't (3) didn't have (4) haven't

14. You ———— better see a doctor

14. You ———— better see a doctor.

(1) did (2) would (3) should (4) had

15. He told me that he ———— in Spain the previous year.

(1) has been working (2) had been working

(3) has worked (4) had been worked

16. She ———— me to go to school.

(1) said (2) told (3) suggested (4) made

17. Our base ball team ———— nine players.

(1) has (2) have

(3) both are correct (4) none of the above

18. I come ———— England.

(1) to (2) from (3) at (4) in

19. There aren't ———— people here.

(1) many (2) a lot (3) more (4) some

20. Tim ———— work tomorrow.

(1) isn't going (2) isn't

(3) isn't going to (4) isn't to

21. I'd like ———— information please.

(1) an (2) some (3) piece (4) a piece

22. I went to the shop ———— some chocolate.

(1) for buying (2) for buy (3) to buy (4) buy

23. Raj said, "I don't like coffee". You replied, " ———— do I".

(1) So (2) Neither (3) Either (4) No

24. The school is famous ———— its sports achievements.

(1) from (2) for (3) by (4) because of

25. How long ———— English?

(1) do you learn (2) are you learning

(3) have you been learning (4) you learn

26 Can you tell me when ————?

(1) the train leaves (2) does the train leave

(3) leaves the train (4) does leave the train

27. The ten day dussehra festival came to an end today when idols of Durga ———— in the Ganges.

(1) immersed (2) had been immersed

(3) would be immersed (4) were immersed

28. Thirty five people ———— in a truck-bus accident when the brakes of bus failed.

(1) had died (2) were dead (3) died (4) are dead

29. A two year old boy ———— into a deep bore well in a village near Jammu.

(1) was fallen (2) fell (3) will fall (4) felled

30. I ———— to bring my lunch today.

(1) forget (2) forgot (3) forgetten (4) forgotten

SECTION II

(PHYSICS)

31. Which of the following lens is used to minimize myopia?

(1) convex lens (2) concave lens

(3) cylindrical lens (4) none of these

32. The light which refracts most while passing through a prism is
(1) red (2) violet (3) indigo (4) yellow

33. Under normal conditions, the color of the sky at noon is
(1) blue (2) red (3) yellow (4) none of these

34. The ratio of real depth to apparent depth is called the
(1) refractive index (2) critical angle
(3) lateral displacement (4) none of these

35. There is no flow of current between two charged bodies when connected because
(1) they have the same quantity of charge
(2) they have the same potential
(3) they have the same capacity
(4) they have the same ratio of potential per unit charge

36. Kilowatt hour is a unit of
(1) power (2) energy (3) impulse (4) force

37. A man has five resistors each of value $\frac{1}{5}$ ohm. What is the maximum resistance he can obtain by connecting them?
(1) 1 ohm (2) 5 ohms (3) $\frac{1}{2}$ ohm (4) $\frac{2}{5}$ ohm

38. If the length of a wire is doubled and its cross section is also doubled, then the resistance will
(1) increase eight times (2) decrease four times
(3) become four times (4) remain unchanged

39. In a DC generator the induced e.m.f. in the armature is
(1) DC (2) AC (3) fluctuating DC (4) both AC and DC

40. There will be no force between two wires carrying current if currents are
(1) parallel to each other (2) anti parallel to each other
(3) perpendicular to each other (4) none of the above

41. A wire carrying a current of 5 A is placed perpendicular to a magnetic induction of $2T$. The force on each centimeter of the wire is
(1) 0.1 N (2) 100 N (3) 10 N (4) 1 N

42. Ampere rule is used to find the
(1) direction of current
(2) direction of magnetic field
(3) direction of the motion of the conductor
(4) magnitude of current

43. If the speed of a motor car becomes six times then the kinetic energy becomes
(1) 6 times (2) 36 times (3) 12 times (4) 24 times

44. Which of the following is an example of fossil fuel?
(1) coal gas (2) coke (3) natural gas (4) producer gas

45. Which of the following devices transforms light energy into chemical energy?
(1) car dynamo (2) electric motor (3) electric fan (4) none of these

46. The vast amount of sea weeds present in oceans may provide an endless source of
(1) nuclear energy (2) methane
(3) thermal energy (4) none of these

47. Out of the following, which fuel has the least calorific value?
(1) Petrol (2) Kerosene (3) Diesel (4) Coke

48. Every hot object emits
(1) infra red rays (2) visible rays
(3) X-rays (4) all of the above

49. An incident ray strikes a plane mirror at an angle of 15° with the mirror. The angle between the incident ray and reflected ray is
(1) 15° (2) 30° (3) 150° (4) none of these

50. In case of a real and inverted image, the magnification of a mirror is
(1) positive (2) negative (3) zero (4) infinity

51. If the focal length of a spherical mirror is n times its radius of curvature, then n must be
(1) 2.0 (2) 1.5 (3) 0.2 (4) none of these

52. A boy is standing in front of a plane mirror at a distance of 3 metres from it. What is the distance between the boy and his image?
(1) 3 m (2) 4.5 m (3) 6 m (4) none of these

53. When an object moves towards a convex lens, the size of the image
(1) decreases (2) increases
(3) first decreases then increases (4) remains the same

54. When light travels from one medium into another, it suffers
(1) reflection (2) refraction (3) dispersion (4) none of these

55. The power of a lens is a measure of its degree of

(1) converges only (2) divergence only

(3) convergence or divergence (4) none of these

56. If the focal length of a magnifying glass is 2.5 cms, it can magnify an object

(1) 10 times (2) 11 times (3) 2.5 times (4) none of these

57. The screen behind the eye lens is called the

(1) iris (2) ciliary muscle

(3) retina (4) pupil

58. Five identical resistance coils are connected in the network as shown in Figure (a) below and the resistance measured between A and B is 1 ohm. Then the individual coils must have a resistance of

(1) 1 ohm (2) $\frac{1}{4}$ ohm (3) $\frac{7}{4}$ ohm (4) $\frac{4}{7}$ ohm

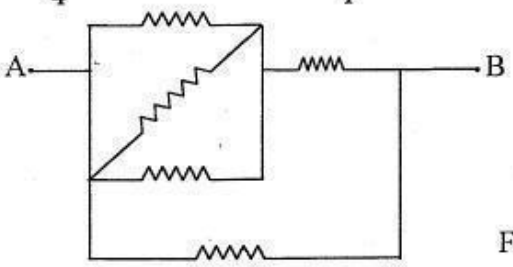


Figure (a)

59. In general, when the temperature of a conductor increases, its resistance

(1) increases (2) decreases

(3) remains the same (4) none of the above

60. The work done in moving a unit positive charge across two points in an electric circuit is a measure of

(1) current (2) resistance

(3) power (4) potential difference

61. Laws of heating are given by

(1) Joule (2) Ohm (3) Maxwell (4) Faraday

62. The frequency of AC mains in India is

(1) 100 Hertz (2) 50 Hertz (3) 60 Hertz (4) 1/50 Hertz

63. The coil of a heater is cut into two equal halves and only one of them is used in the heater. The ratio of the heat produced by this half of the coil to that produced by the original coil is

(1) 2 : 1 (2) 4 : 1 (3) 1 : 2 (4) 1 : 4

64. A circuit has a fuse of 5 A. What is the maximum number of 100 W (220 V) bulbs that can be safely used in the circuit?

(1) 7 (2) 9 (3) 11 (4) 20

65. The force which a magnet exerts on iron and steel is called the

(1) electric force (2) magnetic force
(3) nuclear force (4) gravitational force

SECTION III

(CHEMISTRY)

66. The H+ ion concentration of a solution is 1.0×10^{-5} m. The solution is
(1) Acidic (2) Alkaline (3) Neutral (4) Amphoteric

67. Setting of Plaster of Paris takes place due to
(1) Oxidation (2) Reduction (3) Dehydration (4) Hydration

68. A process employed for the concentration of sulphide ore is
(1) Froth floatation (2) Roasting
(3) Electrolysis (4) Bessemerization

69. The slag obtained during the extraction of copper pyrites is composed mainly of
(1) Cu_2S (2) $FeSiO_3$ (3) $CuSiO_3$ (4) SiO_2

70. The common method for extraction of metals from the oxide ore is
(1) reduction with carbon (2) reduction with hydrogen
(3) reduction with aluminium (4) electrolytic method

71. An iron nail was suspended in $CuSO_4$ solution and kept for a while the solution is
(1) remained blue and coating was found on the nail
(2) turned green and a coating was formed on the nail
(3) remained blue and no coating was formed on the nail
(4) turned green and no coating was formed on the nail

72. The sulphide ore among the following is
(1) hematite (2) bauxite (3) argentite (4) zinc blend

73. Zone refining is used for the
(1) concentration of an ore (2) reduction of metal oxide
(3) purification of metal (4) purification of an ore

74. Which of the following processes is used for the concentration of Bauxite $(Al_2O_3 \cdot 2H_2O)$?
(1) Froth floatation (2) Leaching
(3) Magnetic separation (4) None of the above

75. Which of the following has maximum atomic size?
(1) K (2) Ca (3) Al (4) P

76. The number of periods in the long form of the periodic table is
(1) 6 (2) 7 (3) 10 (4) 18

77. Which of the following elements has maximum metallic character?

77. Which of the following elements has maximum metallic character?
(1) Li (2) N (3) Na (4) P

78. Which of the following is the most reactive halogen?
(1) F (2) Cl (3) Br (4) I

79. Which of the following is not a compound?
(1) Sulphur dioxide (2) Chalk
(3) Lead (4) Sulphuric acid

80. The formula of ethyne is
(1) C_2H_2 (2) C_6H_6 (3) C_2H_4 (4) C_2H_6

81. Which of the substance is present in the photochromatic glass?
(1) PbO (2) Cr_2O_3 (3) Borax (4) Silver bromide

82. Soda acid fire extinguisher, extinguishes the fire
(1) by cutting the supply of air
(2) by removing the combustible substance
(3) by raising the ignition temperature
(4) none of these

83. The simplest formula of bleaching powder is
(1) $Ca(OCl)_2$ (2) $CaOCl_2$ (3) $CaOCl_2.H_2O$ (4) $CaOCl_2.2H_2O$

84. The correct formula of washing soda is
(1) Na_2CO_3 (2) $Na_2CO_3.H_2O$ (3) $Na_2CO_3.9H_2O$ (4) $Na_2CO_3.10H_2O$

85. 100% pure ethyl alcohol is called
(1) Rectified spirit (2) Absolute alcohol
(3) Denatured alcohol (4) Power alcohol

86. In the equation $NaOH + HNO_3 \rightarrow NaNO_3 + H_2O$ nitric acid is acting as
(1) oxidizing agent (2) an acid
(3) a nitrating agent (4) a dehydrating agent

87. Methane reacts with 1 mole of chlorine in presence of sunlight to give ————; the reaction is called ————.
(1) Chloromethane, substitution (2) Chloromethane, addition
(3) Dichloromethane, addition (4) Trichloromethane, substitution

88. Carboxylic acid containing one carbon atom is called

(1) Formic acid (2) Butyric acid

(3) Acetic acid. (4) Propanoic acid

89. Which of the following statements about graphite and diamond is true?

(1) They have the same crystal structure

(2) They have the same degree of hardness

(3) They have the same electrical conductivity

(4) They can undergo the same chemical reactions

90. The number of isomers of C_6H_{14} is

(1) 4 (2) 5 (3) 6 (4) 3

91. Artificial flavour for orange is obtained from

(1) amyl acetate (2) isoamyl valerate

(3) methyl butyrate (4) octyl acetae

92. During melting, an additional substance is added which combines with impurities to form a fusible product. It is known as

(1) Slag (2) Mud (3) Flux (4) None of the above

93. The lustre of a metal is due to

(1) its high density (2) its high polishing

(3) its chemical inertness (4) presence of free electrons

94. In the thermite process, the reducing agent is

(1) Nickel (2) Zinc (3) Sodium (4) Aluminum

95. When dilute HCl is added to zinc pieces taken in a test tube

(1) No change takes place

(2) The color of the solution becomes yellow

(3) A pungent smelling gas gets liberated

(4) Small bubbles of H_2 gas appear on the surface of zinc pieces

96. PbS reacts with ozone (O_3) and forms $PbSO_4$. As per the balanced equation, molecules of ozone required for every one molecule of PbS is/are

(1) 4 (2) 3 (3) 2 (4) 1

97. Chemically rust is

(1) hydrated ferrous oxide (2) hydrated ferric oxide

(3) only ferric oxide (4) none of these

98. Copper displaces which of the following metals from its salt solution?

(1) $ZnSO_4$ (2) $FeSO_4$ (3) $AgNO_3$ (4) $NiSO_4$

99. The reaction $H_2 + Cl_2 = 2HCl$ represents

(1) Oxidation (2) Reduction (3) Decomposition (4) Combination

100. In the reaction $PbO + C = Pb + CO$

(1) PbO is oxidized

(2) C act as an oxidizing agent

(3) C act as a reduction agent

(4) Reaction does not represent redox reaction

QUESTION BOOKLET

Diploma Polytechnic Entrance Test – 2012

Paper - II (MATHEMATICS)

Booklet No.

Roll No. | | | | | | |

Series D 200076

(Enter your Roll Number in the above space)

Time Allowed : 1.30 Hours **Max. Marks : 70**

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PAPER – II

MATHEMATICS

1. The centre of the circle passing through the points (8, 12), (11, 3) and (0, 14) is

(1) (2, 5) (2) (–2, 5) (3) (3, 5) (4) (4, 6)

2. The co-ordinates of a point R which divides the line joining $A(-3, 3)$ and $B(2, -7)$ internally in the ratio 2 : 3 are

(1) (1, 1) (2) (–1, –1) (3) (2, –2) (4) (3, 3)

3. The co-ordinates of A and B are $(-3, a)$ and $(1, a+4)$ respectively. The mid point of AB is $(-1, 1)$ then the value of a is

(1) –2 (2) 2 (3) 1 (4) –1

4. If the value of $\sin\theta = \frac{3}{5}$, then the value of $\operatorname{cosec}\theta + \tan\theta$ is

(1) $\frac{13}{5}$ (2) $\frac{1}{5}$ (3) $\frac{5}{3}$ (4) none of the above

5. If $\cos(40^\circ + x) = \sin 30^\circ$ then the value of x is

(1) $\frac{12}{5}$ (2) $\frac{12}{13}$ (3) $\frac{5}{12}$ (4) $\frac{5}{13}$

6. If $\operatorname{cosec}\alpha = \frac{13}{12}$, then the value of $\tan\alpha$ is

(1) $\frac{12}{5}$ (2) $\frac{12}{13}$ (3) $\frac{5}{12}$ (4) $\frac{5}{13}$

7. If $\sin\alpha = \frac{1-x^2}{1+x^2}$, then the value of $\tan\alpha$ is equal to :

(1) $\frac{2x}{1-x^2}$ (2) $\frac{1-x^2}{2x}$ (3) $\frac{1}{1+x^2}$ (4) $\frac{1}{1-x^2}$

8. The value of $x^2 - 6x + 13$ can never be less than

(1) 5 (2) 4 (3) 6 (4) 13

9. If $y = x - x^2 + x^3 - x^4 + \cdots$ upto infinity, the value of x is

(1) $\frac{y}{1+y}$ (2) $\frac{y}{1-y}$ (3) $y - \frac{1}{y}$ (4) $y + \frac{1}{y}$

10. The solution of the equation $7^{1+x} + 7^{1-x} = 50$ is

(1) 0 (2) 2 (3) ± 1 (4) none of these

11. What must be subtracted from $\frac{x}{y}$ to make it $\frac{y}{x}$?

(1) $\frac{x^2 - y^2}{xy}$ (2) $\frac{x - y}{xy}$ (3) $\frac{y^2 - x^2}{xy}$ (4) $\frac{y - x}{xy}$

12. The sum of the roots of $\frac{1}{x+a} + \frac{1}{x+b} = \frac{1}{c}$ is zero. The product of the roots is

(1) $\frac{1}{2}(a^2 + b^2)$ (2) 0 (3) $\frac{1}{2}(a + b)$ (4) $2(a^2 + b^2)$

13. The value of x in the equation $\sqrt{2x+\sqrt{2x+4}} = 4$ is

(1) 6 (2) 7 (3) 8 (4) none of the above

14. If α, β are the roots of equation $ax^2 - bx + b = 0$ then the value of $\sqrt{\frac{\alpha}{\beta}} + \sqrt{\frac{\beta}{\alpha}} - \sqrt{\frac{b}{a}}$ is always equal to

(1) 2 (2) –1 (3) 0 (4) 1

15. If the radius of a circle is increased by 100% then the area is increased by

(1) 100% (2) 200% (3) 300% (4) 400%

16. A rectangular garden has an area of 200 m^2 and its length and breadth are in the ratio 5 : 4. A road of uniform width runs inside the garden around the perimeter and has an area 344 m^2, then the width of the road is

(1) 4 m (2) 3.5 m (3) 3 m (4) 2 m

17. If the circumference of a circle is reduced by 50%, then the area will be reduced by

(1) 50% (2) 25% (3) 75% (4) 12.5%

18. The perimeter of one face of a cube is 20 m, then its volume is

(1) 800 m^3 (2) 1000 m^3 (3) 125 m^3 (4) 400 m^3

19. The volume of a circular cylinder, whose diameter is 10 cms and height 4 cms is

(1) 40 π cm^3 (2) 20 π cm^3 (3) 100 π cm^3 (4) 80 π cm^3

20. A closed box made of steel of uniform thickness has length, breadth and height 12 dm, 10 dm and 8 dm respectively. If the thickness of the steel sheet is 1 dm, then the inner surface area is

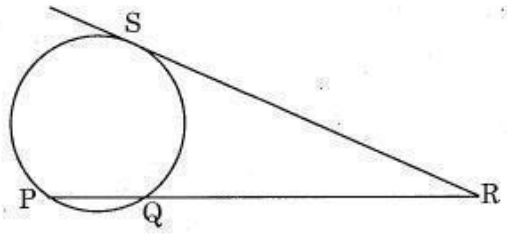
(1) 456 dm^2 (2) 376 dm^2 (3) 264 dm^2 (4) 696 dm^2

21. If AB and CD are two chords of a circle intersecting at P inside the circle such that

$AB = 12$ cms, $AP = 2$ cms and $PD = 4$ cms. Find PC.

(1) 3 cms (2) 4 cms (3) 5 cms (4) 6 cms

22. In the following figure, RS is a tangent, $PQ = 12$ cm and $QR = 4$ cm. Then RS is

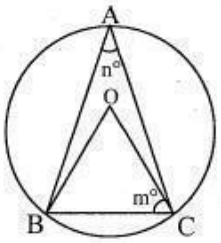


(1) 9 cm (2) 8 cm (3) 10 cm (4) 11 cm

23. If the bases of two similar triangles are in the ratio of 2 : 3, then their areas are in the ratio of

(1) 2 : 3 (2) 3 : 2 (3) 4 : 9 (4) 9 : 4

24. In the figure below, O is the centre of the circle and $\angle BAC = n^\circ$, $\angle OCB = m^\circ$, then



(1) $m + n = 90^\circ$ (2) $m + n = 180^\circ$ (3) $m + n = 120^\circ$ (4) $m + n = 150^\circ$

25. A circle has two equal chords AB and AC, chord AD bisects BC in E. If $AC = 12$ cm and $AE = 8$ cm, then the measure of AD is

(1) 24 cm (2) 18.5 cm (3) 18 cm (4) 19 cm

26. The value of $5\sqrt{3} - 3\sqrt{12} + 2\sqrt{75}$ on simplifying is

(1) $5\sqrt{3}$ (2) $6\sqrt{3}$ (3) $\sqrt{3}$ (4) $9\sqrt{3}$

27. Choose the wrong statement.

(1) There is no largest natural number

(2) There is no largest whole number

(3) Every natural number is a whole number

(4) All natural numbers together with zero are called integers

28. In an arithmetic progression, the 4th term is 11 and the 12th term is 35, then the first term of the series is

(1) 5 (2) 4 (3) 3 (4) 2

29. The first term of A.P. whose third term is 16 and the difference of 5th and 7th term is 12 is

(1) 7 (2) 6 (3) 5 (4) 4

30. If $a^x = b,\ b^y = c,\ c^z = a$, then the value of xyz is

(1) 0 (2) 1 (3) $\frac{1}{abc}$ (4) abc

31. Which one of the following is true?

(1) $\sin(90^\circ - \theta) = \sin\theta$ (2) $\cos(90^\circ - \theta) = \cos\theta$

(3) $\sin(90^\circ - \theta) = \cos\theta$ (4) $\tan(90^\circ + \theta) = \tan\theta$

32. α and β are angles in the first quadrant, $\tan\alpha = \frac{1}{7}$, $\sin\beta = \frac{1}{\sqrt{10}}$. Then using formula $\sin(\alpha + \beta) = \sin\alpha\cos\beta + \cos\alpha\sin\beta$, the value of $\alpha + 2\beta$ is equal to

(1) 0° (2) 45° (3) 60° (4) 90°

33. In an acute angled triangle ΔABC, $a = 4$ cm, $b = 6$ cm. $\sin B = \frac{3}{4}$, then the value of angle A is

(1) 30° (2) 45° (3) 60° (4) none of these

34. The value of $\tan^2 30^\circ + 4 \sin^2 45^\circ + \frac{1}{3}\cos^2 30^\circ$ is

(1) $2\frac{7}{12}$ (2) $1\frac{5}{12}$ (3) $-2\frac{5}{12}$ (4) $-1\frac{5}{12}$

35. Which of the following relation is true?

(1) $\cos^2\theta - \sin^2\theta = 1$ (2) $\text{cosec}^2\theta - \sec^2\theta = 1$

(3) $\cot^2\theta - \tan^2\theta = 1$ (4) $\sec^2\theta - \tan^2\theta = 1$

36. The value of x satisfying the equation $px^2 + (4p - 3q)x - 12pq = 0$ is

(1) $x = \frac{p}{3q}$ (2) $x = \frac{3p}{q}$ (3) $x = \frac{3q}{p}$ (4) $x = \frac{-3q}{p}$

37. The sum of two numbers is 20 and their product is 40. The sum of their reciprocals is

(1) $\frac{1}{10}$ (2) $\frac{1}{2}$ (3) 2 (4) 14

38. If D is any point on the side BC of ΔABC such that ΔADB and ΔADC are equal in area, then

(1) AD is the median (2) AD is the altitude

(3) AD is an angle bisector (4) AD is any line

39. The sides of a triangle are 5 cms, 6 cms and 7 cms. One more triangle is formed by joining the mid points of the sides. The perimeter of the second triangle is

(1) 18 cms (2) 12 cms (3) 9 cms (4) 6 cms

40. In a right angled triangle the square of the hypotenuse is twice the product of the square of the other sides. Then the triangle is

(1) equilateral (2) isosceles

(3) of $\angle$s 30°, 60°, 90° (4) of $\angle$s 40°, 50°, 90°

41. If the three altitudes of a triangle are equal, then the triangle is

(1) isosceles (2) right angled triangle

(3) equilateral (4) none of these

42. A rectangular paper of dimensions 6 cm and 3 cm is rolled to form a cylinder with height equal to the width of the paper, then its base radius is

(1) $\frac{6}{\pi}$ cm (2) $\frac{3}{2\pi}$ cm (3) $\frac{6}{2\pi}$ cm (4) $\frac{9}{2\pi}$ cm

43. The difference between the maximum and the minimum observations in the data is

(1) class interval (2) frequency

(3) cummulative frequency (4) range

44. For two events A and B, $P(A) = 0.5$, $P(B) = 0.4$ and $P(A \cup B) = 0.6$ then $P(A/B)$ is

(1) 0.75 (2) 0.60 (3) 0.80 (4) 0.30

45. A school has 20 teachers, one of them retires at the age of 60 years and a new teacher replaces him, this change reduces the average age of the staff by 2 years, the age of the new teacher is

(1) 28 years (2) 25 years (3) 20 years (4) 18 years

46. If A and B are two independent events such that the probability that both A and B occur is $\frac{1}{8}$, $P(B) = \frac{1}{2}$ and the probability that neither of them occurs is $\frac{3}{8}$ then the probability of the occurrence of A is

(1) $\frac{1}{2}$ (2) $\frac{1}{3}$ (3) $\frac{1}{4}$ (4) $\frac{1}{5}$.

47. A circle is entirely in another circle. It is possible to draw

(1) only one common tangent (2) two common tangents

(3) no common tangent (4) infinite number of tangents

48. In an equiangular triangle incentre, circumcentre and orthocentre are

(1) collinear (2) concyclic (3) coincident (4) none of these

49. In ΔABC, AD is drawn such that ΔABD and ΔACD are equal in area then AD is

(1) any segment drawn from A to BC (2) the bisector of $\angle BAC$

(3) A median of ΔABC (4) none of these

50. What points on the X-axis are at a distance of 5 units from the point $(5, -4)$?

(1) $(2, 0), (-8, 0)$ (2) $(2, 1), (8, 1)$

(3) $(-2, 0), (-8, 0)$ (4) none of these

51. The centre of the circle passing through the points $(5, 7)$, $(6, 6)$ and $(2, -2)$ is

(1) $(2, -3)$ (2) $(2, -1)$ (3) $(2, 3)$ (4) none of these

52. The length of a line segment is of 10 units and the co-ordinates of one end point are $(2, -3)$. If the abscissa of the other end is 10, then the ordinate of the other end is

(1) 3 or -9 (2) 3 or 9 (3) -3 or 9 (4) -3 or -9

53. If x and y are positive with $x - y = 2$ and $xy = 24$ then $\frac{1}{x} + \frac{1}{y}$ is equal to

(1) $\frac{5}{12}$ (2) $\frac{1}{12}$ (3) $\frac{1}{6}$ (4) $\frac{25}{6}$

54. If one root of $x^2 - 4x + K = 0$ is 6, then the value of K is

(1) 12 (2) 2 (3) -2 (4) -12

55. The number of solutions of the equations $3x - 5y = 9$ and $24x - 72 = 42y$ is

(1) 1 (2) 2 (3) 3 (4) no solution

56. A man's age is six times that of his son's age. In six years the father's age will be three times of the son's age. The age of the father and the son are respectively

(1) 18, 3 (2) 30, 5 (3) 24, 4 (4) 42, 7

57. If sum of the roots is p and sum of their squares is q^2, the equation is

(1) $x^2 - px + p^2q^3 = 0$ (2) $x^2 - px + q^3 = 0$

(3) $x^2 - px + (p^2 - q^2)/2 = 0$ (4) none of these

58. If $f(x) = x^2 - 2x + 1$ and $x \in R$, the minimum value of $f(x)$ is

(1) 0 (2) -10 (3) -1000 (4) not defined

59. If one root of the quadratic equation is $\sqrt{3} + 1$, the equation is

(1) $x^2 - 2x - \sqrt{3} = 0$ (2) $x^2 - 2\sqrt{3}x + 2 = 0$

(3) $x^2 - 2x - 2 = 0$ (4) $x^2 + 2\sqrt{3}x + 23 = 0$

60. If $\cos\theta = \frac{3}{5}$, then the value of $\frac{\sin\theta \cdot \tan\theta + 1}{2\tan^2\theta}$ is

(1) $\frac{88}{166}$ (2) $\frac{91}{160}$ (3) $\frac{92}{160}$ (4) $\frac{93}{160}$

61. On the level of ground, the angle of elevation of the top of a town is 30°, on moving 20 metres nearer to it the angle of elevation is 60°. The height of the tower is

(1) 10 mts (2) 15 mts (3) 20 mts (4) $10\sqrt{3}$ mts

62. What is the angle of elevation of the sun, when the length of the shadow of a pole is $\sqrt{3}$ times the height of the pole?

(1) 30° (2) 45° (3) 60° (4) 75°

63. One side of a parallelogram is 8 cm. If the corresponding altitude is 6 cm, then its area is given by

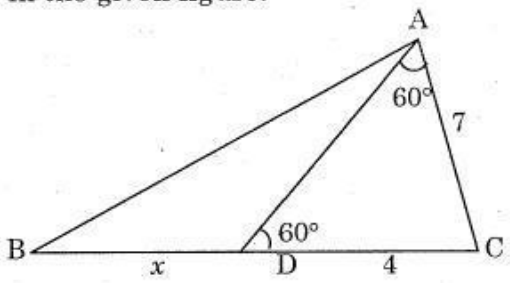
(1) 24 cm^2 (2) 36 cm^2 (3) 40 cm^2 (4) 48 cm^2

64. A rectangle is 8 cm longer than its width. A square of side x cm has been cut out of it. If x cm is half the width of the rectangle, then the remaining area is

(1) $(2x^2 + 8x)$ cm^2 (2) $(2x^2 + 16x)$ cm^2

(3) $(3x^2 + 8x)$ cm^2 (4) $(3x^2 + 16x)$ cm^2

65. Find the value of x in the given figure.



(1) 8 (2) 8.25 (3) 9.25 (4) 6.4

66. Sides of various triangles are given below. Which of them is not a right triangle?

(1) 3, 4, 5 (2) 8, 6, 10 (3) 6, 12, 16 (4) 15, 20, 25

67. If corresponding sides of two similar triangles are in the ratio of 5 : 6, then ratio of their areas will be

(1) 5 : 6 (2) 25 : 36 (3) 8 : 12 (4) none of these

68. If hypotenuse of an isosceles right triangle is $8\sqrt{2}$ cm, find its area

(1) 32 cm^2 (2) 64 cm^2 (3) $64\sqrt{2}$ cm^2 (4) none of these

69. In a ΔABC if $\angle B = 90^\circ$ and D is the mid point of AC then BD = ?

(1) AD only (2) $AD = DC$ (3) $\sqrt{AD \times DC}$ (4) none of these

70. The distance between centres of two circles is 2.5 cm. The radii are 1 cm and 3.5 cm. Where do they touch?

(1) at a point externally

(2) at two distinct points

(3) at only one point

(4) they do not touch anywhere