Max Marks: 75 **Date: 05.10.2022**

BASE SAMPLE PAPER - 1

Q.1 to Q.20 Carrying 1 Mark Each

1. The two fixed points of a faulty celsius the thermometer are wrongly marked as 5ºC and 95ºC. It shows a reading of 41ºC in a room. What is the correct room temperature?

   (a) 41ºC (b) 41.5º (c) 40ºC (d) 40.5ºC

2. The temperature at the surface of a lake is 2ºC. What is the temperature at the bottom of the lake?

   (a) 2ºC (b) 3ºC (c) 4ºC (d) 1ºC

3. Calorie is defined as the quantity of heat required to raise the temperature of 1 g of water by 1ºC. Under which of the following conditions of temperature range and pressure, the above definition is valid?

   (a) From 3.5ºC to 4.5ºC at 76 mm of Hg (b) From 98.5ºC to 99.5ºC at 760 mm of Hg

   (c) From 14.5ºC to 15.5ºC at 760 mm of Hg (d) From 13.5ºC to 14.5ºC at 76 mm of Hg

4. A current of 4 A flows through a nichrome wire under a P.D. pf 4V. If the length of the nichrome wire is 1 m and its area of cross section is 1 mm^2, then its resistivity is

   (a) $2 \times 10^{-6}\ \Omega m$ (b) $2 \times 10^{-7}\ \Omega m$ (c) $10^{-6}\ \Omega m$ (d) $5 \times 10^{-7}\ \Omega m$

5. Find the TRUE statement.

   (a) Ohm's law is applicable to all conductors of electricity

   (b) The resistance of an incandescent lamp is lesser when the lamp is switched on

   (c) Specific resistance of a wire depends upon its dimensions

   (d) The resistance of carbon decreases with the increase of temperature.

6. An object is placed at 50 cm in front of a concave mirror of focal length 25 cm. What is the nature of the image produced by the mirror?

   (a) real and erect and of the same size (b) virtual and inverted and bigger in size

   (c) real, inverted and of the same size (d) real, inverted and smaller in size

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Space for Rough Work

7. A boy stands straight in front of a mirror at a distance of 30 cm from it. He sees his erect image whose height is $\frac{1}{5}$ of his real height. The mirror he is using is

(a) Plane (b) Convex (c) Concave (d) Plano-convex

8. If X^{+2} has 12 electrons, then X belongs to

(a) Period 3, group 2 (b) Period 4, group 13 (c) Period 3, group 14 (d) Period 4 group 2

9. The bonding between X_{12}^{24} and Y_{15}^{31} is due to:

(a) Sharing of 6 electrons (b) Transfer of 6 electrons

(c) Sharing of 3 electrons (d) Transfer of 3 electrons

10. The amount of sulphur required to react with 96g oxygen to form SO_2 is:

(a) 32 g (b) 64 g (c) 96 g (d) 128 g

11. The metal which is soft and violent but fairly lustrous will be found in:

(a) Group 1 (b) Group 2 (c) Group 3 (d) Group 4

12. Equal concentration of which of the given acid will form maximum hydronium ions in solution state.

(a) Boric acid (b) Propanoic acid (c) Perchloric acid (d) Carbonic acid

13. Find % percent loss in mass if 100 g limestone is heated.

(a) 20% (b) 12% (c) 24% (d) 44%

14. The type of reaction which occurs while digestion of food in body is:

(a) Catalytic, reversible and endothermic (b) Non catalytic, reversible and exothermic

(c) Catalytic, irreversible and exothermic (d) Catalytic, irreversible and endothermic

15. Select the correct order of the movement of fresh air into the lungs.

(a) nasal cavity → pharynx → larynx → trachea → bronchi → bronchioles → alveoli

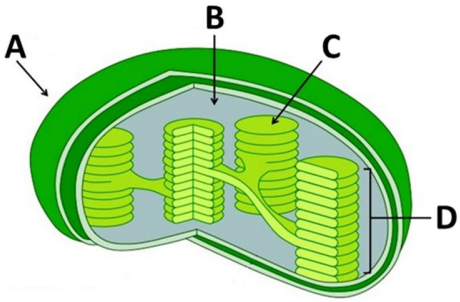
(b) nasal cavity → larynx → pharynx → trachea → bronchioles → bronchi → alveoli

(c) nasal cavity → larynx → trachea → pharynx → bronchioles → bronchi → alveoli

(d) nasal cavity → trachea → pharynx → larynx → bronchioles → bronchi → alveoli

Space for Rough Work

16. Study the diagram and select the correct labelling from the options given below:



Option	A	B	C	D
(a)	Membrane	Grana	Thylakoid	Stroma
(b)	Membrane	Stroma	Grana	Thylakoid
(c)	Membrane	Stroma	Thylakoid	Granum
(d)	Membrane	Stroma	Granum	Thylakoid

17. A plant bends towards the source of light when exposed to the light on only one side. Which of the following is the best explanation of the phenomenon?

(a) It needs light for photosynthesis

(b) The apices of their stems are attracted by light

(c) Some auxin accumulates on the shaded side to induce greater cell elongation on that side

(d) Light stimulates the cells on the illuminated side to increase in length

18. Find out the correct sequence of a simple reflex arc:

(a) Brain-spinal cord-nerves-effector

(b) Effector-spinal cord-brain-receptor

(c) Muscles-spinal cord-brain-receptor

(d) Receptor-sensory nerves-CNS-effector

19. Seminal fluid has sperms and secretions of:

(a) Prostate, Cowper's & Bertholin glands

(b) Seminal vesicle, prostate & cowper's glands

(c) Seminal vesicle, ureter & prostate gland

(d) Follicles, ureters and prostate gland

Space for Rough Work

20. Match the columns and select the correct option from the given codes.

	Column I		Column II
A.	Parturition	(i)	The act of expulsion of fully grown foetus from mother's uterus
B.	Menopause	(ii)	Release of one ovum from one of the ovaries every month
C.	Gestation	(iii)	Phase during which menstruation ceases
D.	Ovulation	(iv)	Complete development of the foetus inside the womb

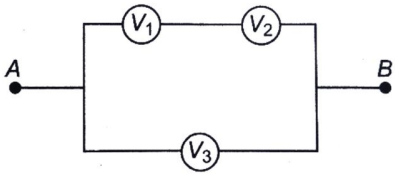
(a) A - (iv), B - (ii), C - (i), D - (iii) (b) A - (i), B - (iii), C - (iv), D - (ii)

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

MORE THAN ONE CORRECT OPTIONS

Q.21 to Q.23 Carrying 2 Mark Each

21. Three voltmeters all having different resistances, are joined as shown. When some potential difference is applied across A and B, their readings are V_1, V_2 and V_3. Then,



(a) $V_1 = V_2$ (b) $V_1 \neq V_2$ (c) $V_1 + V_2 = V_3$ (d) $V_1 + V_2 > V_3$

22. Which of the following will react with dil. Sulphuric acid to produce a gas:

(a) Washing soda (b) Zinc blend

(c) Hydrated copper sulphate (d) Egg shell

23. When we breathe out or exhale the mechanism which happens at the same time:

(a) Rib cage move downward and inward

(b) Downward movement of diaphragm

(c) Chest cavity become smaller and diaphragm moves upward and relaxes

(d) Air enters inside the lungs

Space for Rough Work

CASE STUDY QUESTION

24. Attempt Any One of the below (4 Marks)

I. According to ohm's law, the current flowing through a conductor is directly proportional to the potential difference across the end of the conductor

i.e. $I \propto V \rightarrow \frac{V}{I} = R$

where R is the resistance of the conductor electrical resistance of a conductor is the obstruction posed by the conductor to the flow of electric current through it depend upon the length, area of cross-section, nature of material and temperature of the conductor we can write

$R \propto \frac{\ell}{A}$ or $R = \frac{P\ell}{A}$ where P

is electrical resistivity of the material of the conductor

1. If 1 μA current flows through a conductor when potential difference of 2 V is applied across it and then the resistance of the conductor is

(a) $2 \times 10^6\ \Omega$ (b) $3 \times 10^5\ \Omega$

(c) $1.5 \times 10^5\ \Omega$ (d) $2 \times 10^5\ \Omega$

2. Specific resistance of a wire depends on

(a) length (b) cross-sectional area

(c) mass (d) none of these

3. The slope of the graph between potential difference and current through a conductor is

(a) A straight line (b) Curve

(c) First curve then straight line (d) First straight line then curve

4. Relation between resistance and radius of wire is

(a) $\frac{1}{r^2}$ (b) $\frac{1}{r^3}$

(c) r^{-2} (d) Both (a) and (b)

II. With reference to period 3, answer the below given questions:

1. Which element will be the best reducing agent:

(a) Cl (b) P

(c) Na (d) Ar

Space for Rough Work

2. Which element will most easily form ionic bond by loosing electron:

(a) Cl (b) S

(c) Si (d) Na

3. Which element will show property of catenation:

(a) Mg (b) Al

(c) Si (d) S

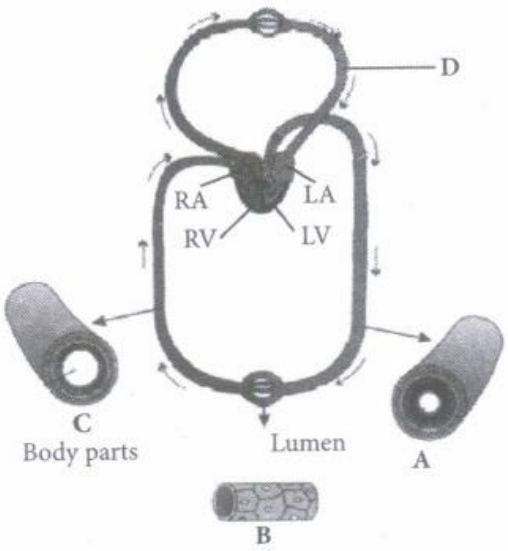
4. Element that can react with both acid and bases

(a) Mg (b) S

(c) Al (d) Na

III. Double circulation is a type of circulating system in which the blood passes through the heart twice before completing a full circuit of the body. Blood is pumped from the heart to the lungs and returns to the heart before being distributed to other organs and tissues of the body.

1. The figure shows blood circulation in humans with labels A to D. Select the option which gives correct identification of label and functions of the part.



(a) B - Capillary- Thin without muscle layer and wall two cell layers thick

(b) C - Vein-Thin walled and blood flows in jerks/spurts

Space for Rough Work

(c) D - Pulmonary vein-Takes oxygenated blood to heart, PO2 = 95 mm Hg

(d) A - Artery-Thick walled and blood flows evenly

2. Incomplete double circulation is seen in

(a) mammals (b) pisces

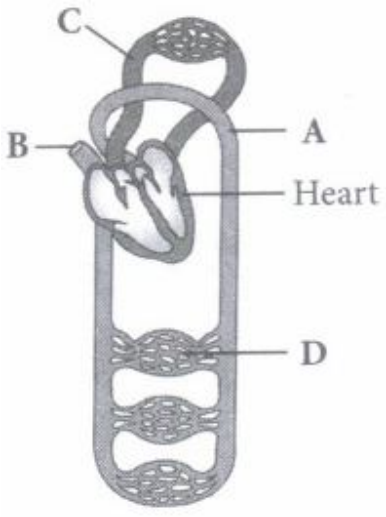
(c) aves (d) amphibians

3. Which of the following animals shows double circulatory pathway?

(a) snakes (b) frog

(c) Eel (d) Whale

4. The given figure is of circulatory system. Identify the labelled parts (A-D) from the list (I-VII).



(I) Pulmonary circulation (II) Systemic circulation

(III) Superior vena cava (IV) Inferior vena cava

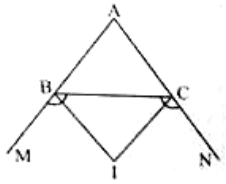
(V) Aorta (VI) Veins and venules

(VII) Arterioles and capillaries

(a) A – (V), B – (III), C – (I), D – (VII) (b) A – (VII), B – (IV), C – (I), D – (VI)

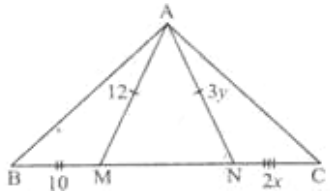
(c) A – (V), B – (III), C – (II), D – (VII) (d) A – (VII), B – (V), C –(I), D – (VI)

Space for Rough Work

25. 

In above figure, IB and IC are external angular bisectors. If $\angle A = 120°$ then $\angle BIC$ is

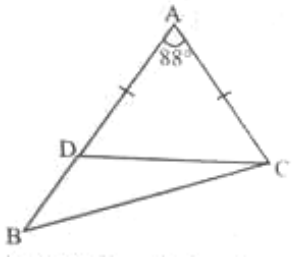
(a) 150° (b) 120° (c) 60° (d) 30°

26. 

In above figure $\Delta AMB \equiv \Delta ANC$. Then value of $\sqrt{x^2 - y^2}$ is

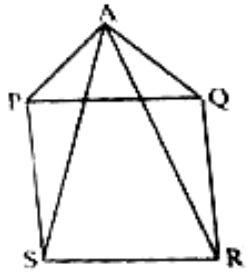
(a) 3 (b) –3 (c) ± 3 (d) None of these

27. In the given figure, AD = AC. If $\angle A = 180°$, then $\angle ACD$ =



(a) 46° (b) 44° (c) 45° (d) cannot be found

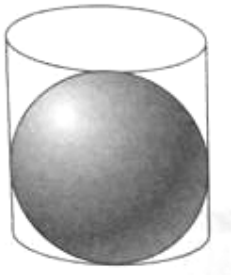
28. In the figure, PQRS is a square and APQ is an equilateral triangle.
What is the measure of $\angle ASR$?



(a) 75° (b) 30° (c) 80° (d) 15°

Space for Rough Work

29. A spherical metallic ball of diameter 12 cm which just fits a cylinder is inserted into a cylinder full of water. If the height of the cylinder is equal to the diameter of the ball, how much water will overflow? (take the value of π as 3.14)



30. A solid cylinder of radius r and height h is melted and casted into a cone. If radius of cone is $\left(\frac{r}{2}\right)$ then find its height.

(a) 4 h (b) 6 h (c) 12 h (d) 8 h

31. If n spherical balls of radius 2 cm are melted together to form a solid disc of radius 8 cm and height 2 cm then find value of n.

(a) 4 (b) 6 (c) 12 (d) 16

32. 100 circular pipes each with radius 14 cm and length 1 m are joined to form a long pipe line. Volume of pipe line is $\left(\pi = \frac{7}{22}\right)$

(a) 616 m^3 (b) 6.16 m^3 (c) 61600 m^3 (d) 6166000 m^3

33. State T for true and F for false.

(I) If the volumes of a cone and cylinder of same base radius are same, then the ratio of their heights is 1 : 3.

(II) 20 balls of radius 1 cm can be made from a 320 cm long iron rod of half base radius.

(III) 3 ice cubes of side π cm when dropped into a cylindrical glass of base diameter 2π cm increase the level of water in the glass by 3 cm.

(IV) Cost of painting the walls and roof of a 4 m wide, 5 m long and 6 m high room at Rs. 15 per m^2 is Rs. 1860.

	(I)	(II)	(III)	(IV)		(I)	(II)	(III)	(IV)
(a)	F	T	T	F	(b)	T	T	F	F
(c)	T	F	T	T	(d)	T	F	T	F

Space for Rough Work

34. If three unbiased coins are tossed, then probability of getting at most two tails is

(a) $\frac{1}{8}$ (b) $\frac{1}{2}$ (c) $\frac{5}{8}$ (d) $\frac{7}{8}$

35. From a pack of 52 cards, a card is drawn at random. The probability of getting a club is

(a) $\frac{1}{2}$ (b) $\frac{1}{4}$ (c) $\frac{2}{3}$ (d) $\frac{1}{13}$

36. When three identical dice are rolled, then what is the probability of getting same number on each dice?

(a) $\frac{1}{6}$ (b) $\frac{1}{2}$ (c) $\frac{1}{216}$ (d) $\frac{1}{36}$

37. State 'T' for true and 'F' for false.

(i) Probability of the event Monday will come before Tuesday is 1.

(ii) If every quantity of a data is increased by a natural number k, the mean remains unchanged.

(iii) Median class is that in which the $\frac{n}{2}+1$ th score lies.

(iv) Mean of first 20 natural numbers is 10.5.

	(i)	(ii)	(iii)	(iv)
(a)	T	F	F	T
(b)	T	F	T	F
(c)	F	F	F	T
(d)	F	T	F	T

38. The roots of the equation $(a^2 + b^2)x^2 - 2(bc + ad)x + (c^2 + d^2) = 0$ are equal, if

(a) $ab = cd$ (b) $ac = bd$ (c) $ad + bc = 0$ (d) None of these

39. If one root of equation $(x - 1)(7 - x) = M$ is three times the other, then m is equal to

(a) –5 (b) 0 (c) 2 (d) 5

40. If 8, 2 are the roots of $x^2 + ax + \beta = 0$ and 3, 3 are the roots of $x^2 + \alpha x + b = 0$, then the roots of $x^2 + ax + b = 0$ are

(a) 8, –1 (b) –9, 2 (c) –8, –2 (d) 9, 1

Space for Rough Work

41. The value of 'k' for which the curve, $y = x^2 + kx + 4$ touches the x-axis is equal to:

(a) 4 (b) 2 (c) 3 (d) –2

42. Let A(1, k), B(1, 1) and C(2, 1) be the vertices of a right-angled triangle with AC as its hypotenuse. If the area of the triangle is 1, then the set of values which k can take is given by

(a) {1, 3} (b) {0, 2} (c) {–1, 3} (d) {–3, 2}

43. If points A(x, y), B(y, z) and C(z, x) represent the vertices of a right-angled triangle ($\angle B = 90°$) then

(a) x = y (b) y = z (c) z = x (d) x = y = z

44. In Δ ABC, angle B in right angle, AC is equal to 2, A(2, 2) and B(1, 3). Then is length of the median AD is

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

45. The line x + y = 4 divides the line segment joining the points (–1, 1) and (5, 7) in the ratio

(a) 3 : 1, internally (b) 1 : 2, internally (c) 1 : 2, externally (d) 3 : 1, externally

46. Let ABC be an equilateral triangle. Also, let KLMN be a rectangle with K, L on BC, M on AC and N on AB. If AN/NB = 2 units and the area of ΔBKN is 6 sq. units, then the area of triangle ABC is

(a) 54 sq. units (b) 108 sq. units (c) 48 sq. units (d) None of these

47. The value of expression $1 - \frac{\sin^2 y}{1+\cos y} + \frac{1+\cos y}{\sin y} - \frac{\sin y}{1-\cos y}$ is equal to

(a) 0 (b) 1 (c) sin y (d) cos y

48. Let $f_k(x) = \frac{1}{k}(\sin^k x + \cos^k x)$, where $x \in R$, and $k \geq 1$. Then $f_4(x) - f_6(x)$ equals

(a) $\frac{1}{6}$ (b) $\frac{1}{3}$ (c) $\frac{1}{4}$ (d) $\frac{1}{12}$

49. If $\sin x + \sin^2 x = 1$, then $\cos^8 x + 2\cos^6 x + \cos^4 x =$

(a) 0 (b) –1 (c) 2 (d) 1

50. If the radius of a sphere is doubled, what is the ratio of the volume of the first sphere to that of the second?

(a) 2 : 8 (b) 1 : 2 (c) 1 : 3 (d) 1 : 8

Space for Rough Work

51. From a solid cylinder whose height is 8 cm and radius is 6 cm, a conical cavity of height 8 cm and base radius 6 cm is hollowed out. Find the volume of the remaining solid.

(a) 603 cm^3 (b) 720 cm^3 (c) 548 cm^3 (d) 637 cm^3

52. A box contains 20 balls numbered as 1, 2, 3, …. , 20. A ball is drawn at random from the box. What is the probability that the number on the ball is a prime number?

(a) $\frac{1}{5}$ (b) $\frac{3}{5}$ (c) $\frac{4}{5}$ (d) $\frac{2}{5}$

53. Two coins are tossed simultaneously. What is the probability of getting at most two heads?

(a) 1 (b) $\frac{1}{2}$ (c) $\frac{2}{3}$ (d) $\frac{1}{12}$

54. If two dice are thrown, then the probability of getting same number on either dice is

(a) $\frac{1}{6}$ (b) $\frac{1}{3}$ (c) $\frac{1}{9}$ (d) $\frac{1}{12}$

55. 9 7 14 11 33 28 ____ 133 931

(a) 64 (b) 46 (c) 140 (d) 123
(e) 96

56. 6 12 23 44 85 ____

(a) 166 (b) 174 (c) 165 (d) 168
(e) 184

57. 80 62 46 ___ 20

(a) 36 (b) 40 (c) 38 (d) 32
(e) 28

58. 14 32 72 156 328 680 1376

(a) 328 (b) 156 (c) 680 (d) 32
(e) 72

59. 4 6 18 90 486 3645 32805

(a) 90 (b) 3645 (c) 6 (d) 18
(e) 486

Space for Rough Work

60. 479 310 431 350 301 374 383

(a) 431 (b) 301 (c) 310 (d) 350

(e) 374

61. 24 : 126 = 08 : ____

(a) 10 (b) 24 (c) 26 (d) 28

(e) 63

62. 01 : 04 = 08 : _____

(a) 96 (b) 72 (c) 64 (d) 49

(e) 81

63. 4 : 12 = 10 : ____

(a) 20 (b) 90 (c) 60 (d) 45

(e) 40

Directions (Q.64 and Q.65): Raju started from his house, went 1 km towards the rising Sun and reached point A, then turned right and after going another kilometre, he reached point B; then he turned left and after 1 km, reached point C. From there he turned right and walked for 2 km, and reached point D. Then he turned right and after 1 km, he reached point E and finally turned right and after 1 km, he reached point E and finally turned right again and reached point F after going 1 km.

64. What is the shortest distance between F and Raju's house?

(a) $\sqrt{1^2+2^2}$km (b) $\sqrt{2^2+3^2}$km (c) 3 km (d) $\sqrt{1^2+3^2}$km

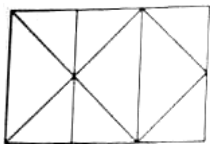
(e) 4 km

65. In which direction is D to E?

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

(e) South-East

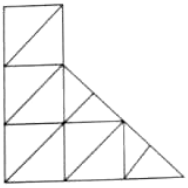
Choose the correct answer and enter it in the bracket provided.



67. How many squares are there in Figure?

(a) 7 (b) 6 (c) 10 (d) 9

Space for Rough Work



68. Find the number of triangles in Figure.

(a) 19 (b) 24 (c) 18 (d) 12

69. If 31 January 1996 was a Wednesday, then which day was 31 January 2005?

(a) Monday (b) Wednesday (c) Friday (d) Sunday
(e) Saturday

70. Mahatma Gandhi was born on 2 October 1869. Which day of the week was he born?

(a) Thursday (b) Saturday (c) Monday (d) Friday
(e) None of these

Space for Rough Work