

I. Choose the correct answers: 13x1=13

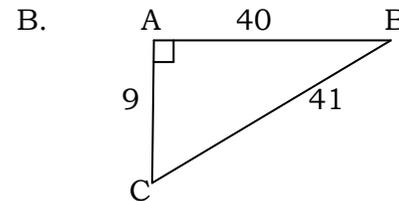
- If $\sin 30^\circ = x$ and $\cos 60^\circ = y$ then $x^2 + y^2$ is _____.
 a) $\frac{1}{2}$ b) 0 c) $\sin 90^\circ$ d) $\cos 90^\circ$
- The value of $\tan 72^\circ \tan 18^\circ$ is _____.
 a) 0 b) 1 c) 18° d) 72°
- If $2 \sin 2\theta = \sqrt{3}$, then the value of θ is _____.
 a) 90° b) 30° c) 45° d) 60°
- The value of $\tan 1^\circ \tan 2^\circ \tan 3^\circ \dots \tan 89^\circ$ is _____.
 a) 0 b) 1 c) 2 d) $\frac{\sqrt{3}}{2}$
- The reciprocal of $\cos \theta$ is _____.
 a) $\operatorname{cosec} \theta$ b) $\sec \theta$ c) $\cot \theta$ d) $\sin \theta$
- The side opposite to angle θ in right angle triangle is _____ side.
 a) opposite b) adjacent c) hypotenuse d) none of these
- The semiperimeter of a triangle having sides 15cm, 20cm and 25cm is _____.
 a) 60cm b) 45cm c) 30cm d) 15cm
- The lateral surface area of a cube of side 12cm is _____.
 a) 144cm^2 b) 196cm^2 c) 576cm^2 d) 664cm^2
- If the ratio of the sides of two cubes are 2:3 then ratio of their surface areas will be _____.
 a) 4:6 b) 4:9 c) 6:9 d) 16:36
- The capacity of water tank of dimensions $10\text{m} \times 5\text{m} \times 1.5\text{m}$ is _____.
 a) 75 litres b) 750 litres c) 7500 litres d) 75000 litres
- In _____ triangle, all the three sides are equal
 a) scalene b) Isosceles c) equilateral d) none of these
- The value of $\operatorname{cosec} (70^\circ + \theta) - \sec (20^\circ - \theta) + \tan (65^\circ + \theta) - \cot (25^\circ - \theta)$ is _____.
 a) 0 b) 1 c) 2 d) 3

13. The value of $\frac{1 - \tan^2 45^\circ}{1 + \tan^2 45^\circ}$ is _____.

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

II. Answer any six of the following: 6x2=12

- Find semiperimeter of a triangle whose sides are 10cm, 24cm and 26cm
- Find Lateral Surface Area of cube whose side is 5.5cm.
- Find total surface area of cuboid whose dimensions are $l = 20\text{cm}$, $b = 15\text{cm}$, $h = 8.3\text{cm}$.
- Find the volume of cube whose side is 12cm.
- From the given figure find all trigonometric ratios of angle B.



19. If $\cos \theta : \sin \theta = 1:2$, Find the value of $\frac{8\cos\theta - 2\sin\theta}{4\cos\theta + 2\sin\theta}$

20. Verify: $\sin^2 60^\circ + \cos^2 60^\circ = 1$

21. Find the value of $\sin 49^\circ$

III. Answer any five of the following: 5x5=25

22. If $\cos A = \frac{3}{5}$ then find the value of $\frac{\sin A - \cos A}{2 \tan A}$

23. Find the value of $8 \sin 2x \cos 4x \sin 6x$, when $x = 15^\circ$

24. Find the value of

$$\sin 65^\circ 39' + \cos 24^\circ 57' + \tan 10^\circ 10'$$

25. Find the area of an equilateral triangle whose perimeter is 180cm.

26. Three identical cubes of side 4cm are joined end to end. Find the total surface area and lateral surface area of the new resulting cuboid.

27. A cubical milk tank has 125000 litres of milk. Find the length of its side in metres.

28. If the total surface area of a cube is 2400cm^2 then find its lateral surface area.

SCIENCE

Part - I

I. Answer the following: 13x1=13

1. A device in which the loss of heat due to conduction, convection and radiation is minimized is _____.
a) solar cell b) solar cooker c) thermometer d) theemos flask
2. The maximum speed of vibrations which produces audible sound will be in _____.
a) sea water b) ground glass c) dry air d) human blood

Fill in the blanks:

3. Loudness is proportional to the square of the _____.
4. _____ has the highest specific heat capacity.
5. _____ is a suitable solvent for sulphur.
6. Buckminster Fullerene contains _____ carbon atoms.
7. A phenomenon in which an element exists in different modification in same physical state is called _____.
a) Isomerism b) allotropy c) catenation d) crystallinity
8. Plastics made of Poly Carbonate (PC) and Acrylonitrile Butadiene Styrene (ABS) are made of resin code _____.
a) 2 b) 5 c) 6 d) 7
9. Diphtheria affects the _____.
a) Lungs b) throat c) blood d) liver
10. The primary organ infected during tuberculosis is _____.
a) bone marrow b) intestine c) spleen d) lungs
11. The organ affected by jaundice is _____.
a) liver b) lungs c) kidney d) brain
12. Typhoid fever is caused by _____.
13. Carica papaya leaf can cure _____ disease.

Part - II

II. Answer the following in brief: 11x2=22

Part - A (any three)

14. Why do people prefer wearing white clothes during summer?
15. How much heat energy is required to melt 5kg of ice?
(specific latent heat of ice=336 Jg⁻¹).
16. Define conduction.
17. What is meant by supersonic speed?
18. What is the wavelength of a sound wave in air at 20°C with a frequency of 22MHz?
19. Define frequency.

Part-B (any three)

20. Define allotropy.
21. Write all possible isomers of C₄H₁₀
22. What is Living chemistry?
23. Differentiate between graphite and diamond.
24. When a carbon fuel burns in less aerated room, it is dangerous to stay there. Why?
25. Match the following:
i) Alkyne - Graphene
ii) Andre Geim - Oxidation
iii) thermocol - Triple bond
iv) Combustion - Polystyrene

Part - C (any five)

26. What is triple antigen? Mention the disease which can be prevented by using the antigen.
27. Expand the following:
i) BCG ii) DPT
28. Name two common mosquitoes and the diseases they transmit.
29. Name the organism causing diarrhoeal disease and give one precaution against it.
30. Distinguish between virion and viroid.
31. What are the types of vegetable garden?
32. Give the botanical name of Tulsi and the diseases that can be cured by using it.
33. Say true or false. If false, correct the statement.
i) Mycorrhiza is an algae ii) Apis florae is a little bee.

Part - III

III. Answer the following in detail: 3x5=15

Part - A (any one)

34. Describe with diagram, how compressions and rarefactions are produced.
35. How can you experimentally prove water is a bad conductor of heat? How is it possible to heat water easily while cooking?

Part - B (any one)

36. Name the three safer resin codes of plastics and describe their features.
37. What is catenation? How does carbon form catenated compounds?

Part-C (any one)

38. Describe the role of microbes in industries.
39. Suggest the immunization schedule for a new born baby till 12 months of age. Why it is necessary to follow the schedule?