

V.P.O. Jaithari, District: Anuppur (M.P.) - 484330

Class XI-Diwali Holiday Homework

<u>English</u>

Let this Diwali be celebrated not with noisy crackers but with your illuminating deeds.

- Gather information about Aarogya Setu App. Learn about how it works efficiently in tracing the COVID-19 infection. Consider yourself the brand ambassador of Aarogya Setu App. Prepare a 2-3 minute video explaining its importance and encouraging citizens to make use of it. Send the video on the whatsapp number of you Subject teacher on 18th November 2020.
- 2. Write an article on '*Should Burning Firecrackers be Banned*' in 100-120 words in your fair English Notebook.

Physical Education

Activity: Perform any two Common Yoga Asanas. Send the Video of the same to Mr. Pankaj Mishra (8989403099). Video duration should not exceed by 2 Minute.

Physics

Question 2.25:

A man walking briskly in rain with speed v must slant his umbrella forward making an angle θ with the vertical. A student derives the following relation between θ and v: tan θ = v and checks that the relation has a correct limit: as $v \rightarrow 0$, $\theta \rightarrow 0$, as expected. (We are assuming there is no strong wind and that the rain falls vertically for a stationary man). Do you think this relation can be correct? If not, guess the correct relation.

Question 2.26:

It is claimed that two cesium clocks, if allowed to run for 100 years, free from any disturbance, may differ by only about 0.02 s. What does this imply for the accuracy of the standard cesium clock in measuring a time-interval of 1 s?

Question 2.27:

Estimate the average mass density of a sodium atom assuming its size to be about 2.5 (Use the known values of Avogadro's number and the atomic mass of sodium). Compare it with the density of sodium in its crystalline phase: 970 kg m⁻³. Are the two densities of the same order of magnitude? If so, why?

Question 2.28:

The unit of length convenient on the nuclear scale is a fermi: $1 \text{ f} = 10^{-15} \text{ m}$. Nuclear sizes obey roughly the following empirical relation: $r = r_0 A^{1/3}$

where *r* is the radius of the nucleus, *A* its mass number, and r_0 is a constant equal to about, 1.2 f. Show that the rule implies that nuclear mass density is nearly constant for different nuclei. Estimate the mass density of sodium nucleus. Compare it with the average mass density of a sodium atom obtained in Exercise. 2.27.

Question 2.29:

A LASER is a source of very intense, monochromatic, and unidirectional beam of light. These properties of a laser light can be exploited to measure long distances. The distance of the Moon from the Earth has been already determined very precisely using a laser as a source of light. A laser light beamed at the Moon takes 2.56 s to return after reflection at the Moon's surface. How much is the radius of the lunar orbit around the Earth?

Question 2.30:

A SONAR (sound navigation and ranging) uses ultrasonic waves to detect and locate objects under water. In a submarine equipped with a SONAR the time delay between generation of a probe wave and the reception of its echo after reflection from an enemy submarine is found to be 77.0 s. What is the distance of the enemy submarine? (Speed of sound in water = 1450 m s^{-1}).

Question 2.31:

The farthest objects in our Universe discovered by modern astronomers are so distant that light emitted by them takes billions of years to reach the Earth. These objects (known as quasars) have many puzzling features, which have not yet been satisfactorily explained. What is the distance in km of a quasar from which light takes 3.0 billion years to reach us?

Question 2.32:

It is a well-known fact that during a total solar eclipse the disk of the moon almost completely covers the disk of the Sun. From this fact and from the information you can gather from examples 2.3 and 2.4, determine the approximate diameter of the moon.

Conceptual questions

Find A + B and A - B.

(A = 15 unit, B = 20 unit and angle between them is 90°) Determine average absolute error, relative error and percentage error for, 5.0 s, 5.2 s, 4.8 s, 4.8 s, 5.2 s, 5.0 s

Mathematics

- 1. Write the solution set of the equation $x^2 + 11x + 30 = 0$ in roster form.
- 2. Write Set $A = \{5, 10, 15, \ldots\}$ in set-builder form.
- 3. Write set $B = \{4, 11, 18, \dots\}$ in set builder form.

4. If (x + a, y - 2b) = (4a, 6b), find the values of x and y.

5. Find the number of arrangements of the letters of the word "SILVER".

- 6. What is the number of ways of choosing 12 red cards from a pack of 52 playing cards?
- 7. Let $A = \{1, 2, 3\}$ and $B = \{4, 5, 6\}$, Find the number of relations from A to B.
- 8. Let f(x) = 2x 1 and g(x) = 2x + 1 be two real functions, then find (f. g) (x).
- 9. Convert 2π radian into degrees.
- 10. If cosx = 0, then find the value of x.

11. Write the solution set of the equation $x^2 + 9x + 18 = 0$ in roster form.

12. Write the set $A = \{7, 49, 343, \ldots\}$ in set-builder form.

13. If 8x + i(6x - 2y) = 6 + i(-12), where x and y are real numbers, then find the values of x and y.

14. Express (2-2i)2 in the form a + ib.

15. Find the number of 4 letter words, with or without meaning, which can be formed out of the letters of the word GOLD, where the repetition of the letters is not allowed.

16. Let $A = \{4, 6, 8\}$ and $B = \{6, 8, 10\}$. Find $A \cup B$.

17. Let $A = \{3, 4, 5, 6\}$, $B = \{4, 6, 8\}$. Find A - B and B - A.

18. If $A = \{a, b\}$, form the set AxAxA

19. Convert 30° into radian measure.

20. Find the value of $\sin 105^{\circ}$.

21. Write the following sets in roster form:

(i) $A = \{x : x \text{ is an integer and } -2 < x < -10\}$

(ii) $B = \{x : x \text{ is a natural number less than } \}$

(iii) $C = \{x : x \text{ is a two-digit natural number such that the sum of its digits is 5}\}$

(iv) $D = \{x : x \text{ is a prime number which is divisor of } 50\}$

22. Draw appropriate Venn diagram for each of the following:

(i) $(A \cup B)'$ (ii) $(A \cap B)'$ (iii) $(A \cap B)$ (vi) $(A \cup B)$

23. The minute hand of a watch is 2 cm long. How far does its tip move in 30 minutes?

24. If in two circles, arcs of the same length subtend angles 30° and 45° at the centre, find the ratio of their radii.

25. Verify whether $\tan 7 x$. $\tan 4 x$. $\tan 3x = \tan 7x - \tan 4x - \tan 3x$, if not justify your answer.

26. Find the value of $\sin 18^{\circ}$.

27. Prove that $(\sin 7x + \sin 3x)/(\cos 7x + \cos 3x) = \tan 5x$

28. How many words, with or without meaning can be made from the letters of theword PANDEY, assuming that no letter is repeated, if. (i) 4 letters are used at a time, (ii) all letters are used at a time, (iii) all letters are used but first letter is a vowel?

29. In how many ways can one select a cricket team of eleven from 20 players in which only 7 players can bowl if each cricket team of 11 must include exactly 5 bowlers?

30. A bag contains 6 black and 7 red balls. Determine the number of ways in which 3 black and 4 red balls can be selected.

31. Find the value of i^{4k+3} .

32. Show that the value of $\cos 2x$ will be

(A) $\cos^2 x - \sin^2 x$ (B) $2 \cos^2 x - 1$ (C) $1 - 2 \sin^2 x$

33. Find the value of $(-3i)^5$ in the form a + ib.

34. Find the value of $\sin 75^{\circ}$.

35. If X and Y are two sets such that a n(X) = 25, n(Y) = 20 and $n(X \cup Y) = 30$,

Then find the value of $n(X \cap Y)$.

Note: -

(1) The images/pdf of the completed assignment must be forwarded/uploaded to Maths group Whatsapp number along with your name and class.

(2) As per the C.B.S.E. guidelines, marks of these assignments will be considered for your internal assessment which consists of 20 marks.

(3) For any assistance/guidance regarding the above assignment you may consult me.

Biology

Draw the structure of any 10 biomolecules on a chart paper and label them correctly. Send the scanned file on the whatsapp number of you Subject teacher on or before 18th November 2020.