

S.F.DA.V. Public School, Muzaffarnagar
Holiday Homework 2018-19
Class-XII

Subject-Maths

1. Solve for x: $\sin^{-1} 6x + \sin^{-1} 6\sqrt{3}x = \frac{-\pi}{2}$

2. Prove that: $\tan^{-1} \frac{1}{4} + \tan^{-1} \frac{2}{9} = \frac{1}{2} \cos^{-1} \frac{3}{5}$

3. For what value of x, the matrix $\begin{bmatrix} 5-x & x+1 \\ 2 & 4 \end{bmatrix}$ is singular?

4. If matrix $A = \begin{bmatrix} 2 & -2 \\ -2 & 2 \end{bmatrix}$ and $A^2 = MA$, then find the value of M.

5. Using properties of determinants prove that;

$$\begin{vmatrix} a & b & c \\ a^2 & b^2 & c^2 \\ bc & ca & ab \end{vmatrix} = (a-b)(b-c)(c-a)(ab+bc+ca)$$

6. Using properties of determinants, prove that;

$$\begin{vmatrix} x+y & x & x \\ 5x+4y & 4x & 2x \\ 10+8y & 8x & 3x \end{vmatrix} = x^3$$

7. Discuss the continuity of the following function at $x=0$

$$f(x) = \begin{cases} \frac{x^4 + 2x^3 + x^2}{\tan^{-1} x} & ; x \neq 0 \\ 0 & ; x = 0 \end{cases}$$

8. If $u = \sin^{-1} \left(\frac{2x}{1+x^2} \right)$ and $v = \tan^{-1} \left(\frac{2x}{1-x^2} \right)$ find du/dv

9. If $y = \log \left[x + \sqrt{x^2 + a^2} \right]$ find dy/dx

10. Verify Rolle's Theorem for the function

$$f(x) = \sin 2x \quad \text{in} \quad \left[0, \frac{\pi}{2} \right]$$

11. Verify Mean value theorem for the function

$$f(x) = (x-3)(x-6)(x-9) \quad \text{in} \quad [3, 9]$$

12. If $x = 2\cos\theta - \cos 2\theta$ and $y = 2\sin\theta - \sin 2\theta$ then prove that $\frac{dy}{dx} = \tan \left(\frac{3\theta}{2} \right)$

13. If $y = e^{m \sin^{-1} x}$ then prove that, $(1 - x^2) \frac{d^2 y}{dx^2} - \frac{xdy}{dx} - m^2 y = 0$

14. If $y^x = e^{y-x}$, prove that $\frac{dy}{dx} = \frac{(1 + \log y)^2}{\log y}$

15. Differentiate $\tan^{-1} \frac{x}{\sqrt{1-x^2}}$ w.r.t. $\sin^{-1}(2x\sqrt{1-x^2})$

16. If $y = me^{ax} + ne^{bx}$ prove that $\frac{d^2 y}{dx^2} - (a+b) \frac{dy}{dx} + aby = 0$

17. Find $\int \frac{x^3 dx}{x^4 + 3x^2 + 2}$

18. $\int \frac{dx}{\sin x + \sin 2x}$

19. Evaluate by using limit as sum $\int_1^3 (x^2 + 3x + e^x) dx$.

20. $\int \frac{x^2 + 4}{x^4 + 16}$

21. Solve for x : $\tan^{-1}(x+1) + \tan^{-1}(x-1) = \tan^{-1}(8/31)$

22. Find the equation of tangents to the curve $y = x^3 + 2x - 4$, which perpendicular to the line $x + 14y + 3 = 0$.

Using differentials, find the approximate value of $\sqrt{49.5}$.

Subject-English

Q1. With the help of uploaded videos on school website, Prepare point wise summary of following chapters. (15-20 points in each chapter) (i) The last lesson (ii) Lost spring (iii) Deep Water (iv) The Tiger King (v) The Enemy (vi) Should Wizard Hit Mommy?

Video Link

<https://www.youtube.com/watch?v=g9jq3k8Dp5k>

https://www.youtube.com/watch?v=8el_zv4CYCM

<https://www.youtube.com/watch?v=INwsoEPyjcM>

<https://www.youtube.com/watch?v=mmOjCo9V6pQ>

<https://www.youtube.com/watch?v=CQZ7giLUojc>

<https://www.youtube.com/watch?v=9oF9mtls1ug>

Subject-Physics

Physics

- Q1. State Gauss – Theorem in electrostatics. Apply this theorem to derive an expression for the electric field intensity at a point.
- Due to an infinitely long thin uniformly charged straight wire.
 - Due to an infinitely large thin plane sheet of charge.
- Q2. Three capacitors C_1 , C_2 and C_3 are connected (i) in series (ii) in parallel. Show that the energy stored in series combination is the same as that in parallel combination.
- Q3. A voltage of 30 V is applied across a colour coded carbon resistor with first, second and third rings of blue, black and yellow colours. Calculate the value of current in mA, through the resistor.
- Q4. What is meant by the drift velocity of free electrons in a metal? Establish a relation between drift velocity v_d of an electron in a conductor of cross – section A carrying a current I and having n as concentration of free electron per unit volume. Hence obtain the relation between current density and drift velocity.
- Q5. Define electrical resistivity of a material does it depend on temperature.
- Q6. Define electric conductivity of a material. Give its S.I. unit.
- Q7. Explain with diagram the principle of a potentiometer. How can its sensitivity be increased? Why is it superior to a voltmeter?
- Q8. State the principle of a potentiometer with the help of a circuit diagram. Describe the method for the determination of internal resistance of a cell using a potentiometer. Derive the formula to be used.
- Q9. Write the condition under which the potential difference between the terminal of a battery and its E.M.F. are equal.
- Q10. A battery of E.M.F. E and internal resistance r gives a current of .5A with an external resistance of 12 and current of 0.25 amp with an external resistance 25 . Calculate internal resistance r and E.M.F. E of the cell.
- Q11. A parallel plate capacitor is charged by a battery which is then disconnected. A dielectric slab is then inserted to fill the space between the plates. Explain the changes if any that occur in the values of
- Charge on the plates (i) Capacitance (ii) Pd. Between the plates (iv) Electric field between the plates.

Subject-Chemistry

Q1 Prepare thoroughly all the following units and a class test will be taken just after the kavar break :-

- Halo alkanes and halo arenes
- Alcohol phenols and ethers
- Aldehyde ketones and carboxylic acids
- Biomolecules
- Polymers
- Chemistry in every day life
- Amines

Subject-Physical Education

Q1. Make Game file and learned 1 to 5 chapter and do marked question answer.

Subject-Painting

Q1. (Draw & colour) a poster making on save environment(size A3)

Subject-Biology

- Q1. Draw schematic diagram of organisms and spermatogenesis and write points of differences b/w them.
- Q2. Tabulate or make flow chart to show development of a baby from germ cells till parturation.
- Q3. Design a cross to show that sex of a baby is determined by father.
- Q4. Write any 4 diseases related to male and female reproductive systems.

Subject-Informatics Practices

- Q1. Define Open Source Software.
- Q2. Define Freeware Software.
- Q3. Define Proprietary Software.
- Q4. Define following tags-
(a) <P> (b) <INPUT> (c)
- Q5. Create following table-

1	2	3
4		
5	6	7

Q6. Create following list-

- Input Device
 - Keyboard
 - Mouse
 - Trackball
- Output Device
 - Printer
 - Monitor
 - Speaker
- Storage Device
 - CD
 - Floppy Disk
 - DVD

- Q7. What is the difference between textbox and textarea control?
- Q8. What is the difference between radio button and checkbox control?
- Q9. Define e-business?

Subject-Engineering Graphics

1. Construct the isometric scale.
2. Construct the isometric projection, to isometric scale, of a frustum of a pentagonal pyramid, whose base side 30 mm, top side 55 mm and height is 70 mm, is resting on the H.P. on its smaller base, its one base edge is normal to V.P. Give all dimensions.
3. Construct the isometric projection of a frustum of a cone, whose base diameter is 70 mm, top diameter 45 mm and height is 65 mm, is resting on the H.P. on its circular base. Give all dimensions.
4. Construct the isometric projection of a sphere, diameter of sphere is 60mm. Give all dimensions and indicate the direction of viewing.
5. A square prism (base edge 80mm and height 30mm) is resting on H.P., with its square base on it, and one edge of the base is parallel to V.P. A hexagonal pyramid (base edge 30mm and height 70mm) is placed centrally, on the top square face of the prism, with its hexagonal base on it. One base edge of the pyramid is parallel to V.P. Draw the isometric projection of the solids, placed together, to isometric scale. Draw the common axis and show the direction of viewing. Give all dimensions.
6. A hexagonal pyramid base edge 30mm, height 50mm, having its axis vertical and two of its base edge parallel to V.P., is standing vertically over the top face of equilateral triangular prism of base edges 100mm and height 25mm, having one of its rectangular face parallel to V.P. and nearer the observer. Draw an isometric projection of the combination of solids. Give all dimensions and indicate the direction of viewing.
7. A pentagonal prism with base side 35 mm and height 60 mm is centrally placed with its pentagonal end on the top circular face of a cylindrical disc with diameter of 100 mm and thickness 35 mm. One side of the pentagonal end at the bottom is normal to V.P. and the common axis is normal to H.P. and parallel to V.P. Draw the isometric projections of the two solids, placed together. Give all dimensions.
8. Draw to scale 1:1, the standard profile of a Metric external and internal thread (enlarged pitch 50 mm). Give all standard dimensions.
9. Draw to scale 1:1, the standard profile of a B.S.W. thread (enlarged pitch 50 mm). Give all standard dimensions.
10. Draw to scale 1:1, the standard profile of a Metric Square and knuckle thread (enlarged pitch 50 mm). Give all standard dimensions.