English

1. Read a novel: Prepare a chart and speak about the author and the novel.
2. Watch an English Film of your choice and present a short review. Include the name of the lead actors, directors, etc and a brief plot summary. Mention what you liked/ disliked about the film. (Speaking Skills Activity)

Physics

KINEMATICS

Q1. Derive the equations of motion using calculus method.

Q2. Define a projectile. Derive expressions for (a) time of flight, (b) maximum height, (c) horizontal range, for a projectile thrown at an acute angle to the horizontal.

Q3. Derive an expression for the distance travelled by a body in the nth second.

Q4. A ball is dropped from the roof of a building. An observer notes that the ball takes 0.1 s to cross a window 1 m in height. After crossing the window, the ball takes another 1.00 s to come to the bottom of the building. What is the height of the building?

Q5. To a man walking at the rate of 3km/hour the rain appears to fall vertically downward. When he increases his speed to 6 km/hour, it appears to meet him at an angle of 30 degree with the downward vertical. Find the real direction and speed of rain as seen by a stationary observer.

Q6. A particle moves such that its displacement varies with time according to the relation
$$S = 12t - 2t^2.$$ Find distance travelled in 4 s.

Q7. A ball slides off a horizontal table top 1.25 m high, with a velocity of 4 m/s. Find the horizontal distance from the edge of the table at which the ball strikes the ground.

Q8. A body is projected with a velocity of 10 m/s at an angle of 30 degrees with the horizontal. (a) Calculate the time taken to reach the maximum height, (b) its velocity after 0.7 s.

Q9. A particle starts its motion with an acceleration of a = 2t, where 't' is time. Find its velocity and displacement after 3 seconds.

Q10. A particle starts with acceleration a = 2s, where 's' is its displacement as measured from a fixed origin. Find its velocity when its displacement is 4 m.

Q11. What do you mean by resolution of vectors into components? Find expressions for components when they are inclined at right angles to one another.

Q12. What should be the angle between two equal vectors, if their resultant is to be equal to either of them.

Chemistry

1. How much energy is required for the removal of the one electron present in hydrogen atom?

2. A tennis ball of mass 6.0×10^{-2} kg is moving with a speed of 62 m s^{-1}. Calculate the wavelength associated with this moving tennis ball. Will the movement of this ball exhibit a wave character? Explain.

3. What is the energy in joules required to shift the electron of the hydrogen atom from the first Bohr orbit to the fifth Bohr orbit and what is the wavelength of the light emitted when the electron returns to the ground state.

4. Write formulae of any four isoelectronic species which have neon like configuration.

5. Carbohydrates are the compounds which contain carbon, hydrogen and oxygen. The atomic ratio of H:O is 2:1. When heated in the absence of air, these compounds decompose into carbon and water.

(a) If 310 g if carbohydrate leaves a residue of 124 g of carbon on heating in the absence of air, what is the empirical formula of the carbohydrate?

(b) If 0.0833 mole of the carbohydrate contains 1.0 g of hydrogen, what is the molecular formula of the carbohydrate?

6. What are the two longest wavelengths in nm in the Lyman series of hydrogen spectrum?

7. (a) Calculate the number of angular, radial and total number of nodes in 4f orbital.

(b) How many emission lines are obtained when the excited electron of a hydrogen atom in n=4 drops to the ground state.

8. One litre of oxygen at STP is made to react with three litres of carbon monoxide at STP. Calculate the mass of each substance found after the reaction. Which one is the limiting reagent?

9. (i) Co (Z=27) atom can lose two electrons to form Co^{2+} ion. From which orbital will Co lose 2 electrons? Write its electronic configuration.

 (ii) Which of the following orbitals are degenerate: $3d_{xy}$, $4d_{xy}$, $3d_z^2$, $3d_{yz}$, $4d_{yz}$, $4d_z^2$.

(iii) How many electrons can have quantum numbers values n=4, m_s= +1/2.

10. An organic acid contains only C, H and O. A 4.24 mg sample of this acid is completely burnt. It gives 8.45 mg of carbon dioxide and 3.46 mg of water. What is the mass percentage of each element in the given acid? The molecular mass of this acid determined by experiment was found to be 88u.What is the molecular formula?

Write all the reactions responsible for ozone depletion from Chapter-14 Environmental Chemistry

Mathematics

Q.1: If A is the void set ϕ then P(A) has just one element ϕ that is $P(\phi) = \{\phi\}$, show that

$$n\{P\{P\{P(P(\phi))\} = 4$$

Q.2: Express $2\cos 4x \sin 2x$ as an algebraic sum of sines and cosines.

Q.3: Show that:

$$\left.\begin{array}{l}\sin^2\theta = \sin^2\alpha \\ \cos^2\theta = \cos^2\alpha \\ \tan^2\theta = \tan^2\alpha \\ \cot^2\theta = \cot^2\alpha \\ \sec^2\theta = \sec^2\alpha \\ \cos ec^2\theta = \cos ec^2\alpha\end{array}\right\} = \cos 2\theta = \cos 2\alpha$$

Now find general solution of $\cos 2\theta = \cos 2\alpha$

$$[Ans: \theta = n\pi \pm \alpha]$$

Q.4: Show that $\tan 9^0 - \tan 27^0 - \tan 63^0 + \tan 81^0 = 4$

Q.5: The angles of a triangle are in the ratio $3:4:5$. Find the smallest angle in degree and greatest in radian.

$$\left[Ans: 45^o, \frac{5\pi}{12} radians\right]$$

Q.6: The distance of the moon from the earth is $38400 km$. The angle of elevation moon on the earth through the eye of observer is $31'(31\ minute)$. Find the diameter of the moon.

Hint:
$[\because angle is very small => Length of chord =$
$length of arc or length of diameter = Length of arc.)$ $\qquad [\theta = \frac{l}{r}]$

$$\left[Ans: 3464\frac{8}{63}\right]$$

Q.7: In a survey of 700 students in a college, 180 were listed as drinking Limca, 275 as drinking Mirinda and 95 were listed as both drinking Limca

and Mirinda. Find how many students were drinking neither Limca nor Mirinda? [*Ans: 340*]

Q.8: If A and B are two sets such that $n(A \cup B) = 50, n(A) = 28$ and $n(B) = 32$, find $n(A \cap B)$. [*Ans: 10*]

Q.9: In a school there are 20 teachers who teach mathematics or physics. Of these, 12 teach mathematics and 4 teach physics and mathematics. How many teach physics? [*Ans: 12*]

Q.10: Let A and B be two sets such that: $n(A) = 20, n(A \cup B) = 42$ and $n(A \cap B) = 4$. Find :

$(i)\, n(B)$ [*Ans* : 26] $(ii)\, n(A - B)$ [*Ans* :16] $(iii)\, n(B - A)$ [*Ans* :22]

Q.11: A survey shows that 63% of the Americans like cheese, whereas 76% like apples. If x% of the Americans like both cheese and apples, find the value of x. [*Ans:* $39 \leq x \leq 63$]

Q.12: In a survey it was found that 21 persons liked product P_1, 26 liked product P_2 and 29 liked product P_3. If 14 persons liked product P_1 and P_2; 12 persons liked product P_3 and P_1; 14 parsons liked product P_2 and P_3 and 8 liked all the three products. Find how many liked product P_3 only. [*Ans: 11*]

Q.13: In a survey of 100 students, the number of students studying various languages were found to be: English only 18, English but not Hindi 23, English and Sanskrit 8, English 26, Sanskrit 48, Sanskrit and Hindi 8, no language 24. Find:

(i) How many students were studying Hindi? [*Ans: 18]*

(ii) How many students were studying English and Hindi? [*Ans: 3*]

Q.14: In a school, there are an equal number of male and female teachers. If the total salary of the male members is sine of the number of male members and total salary of the female members is cosine of the number of female members. Represent the information in trigonometric form, if the total salary of all the teachers is Rs. 2,25,000. What value do you derive from this

information? [*Ans:* $\sin x + \cos y = Rs.\,2,25,000$; *Since sine increases and cosine decreases from* $0°$ *to* $90°$, *therefore, male teachers are earning more than female teachers. Article 14 of Indian Constitution bars discrimination only on the ground of sex.*]

Q.15: Let A and B be two sets such that $n(A) = 5$ and $n(B) = 2$. If a, b, c, d, e are distinct and $(a, 2), (b, 3), (c, 2), (d, 3), (e, 2)$ are in $A \times B$, find A and B.   [*Ans:* $A = \{a, b, c, d, e\}$ *and* $B = \{2,3\}$]

Q.16: Find the domain and range of the following functions:

(i) $f(x) = x^2$ [*Ans:* $R : [0, \infty)$]

(ii) $f(x) = \dfrac{3-x}{x-3}$ [*Ans:* $R - \{3\}; \{-1\}$]

(iii) $f(x) = \dfrac{x^2 - 1}{x - 1}$ [*Ans:* $R - \{1\}; R - \{2\}$]

(iv) $f(x) = \sqrt{9 - x^2}$ [*Ans:* $[-3, 3]; [0, 3]$]

(v) $f(x) = \dfrac{|x-3|}{x-3}$ [*Ans:* $R - \{3\}; \{-1,1\}$]

(vi) $f(x) = \dfrac{1}{2 - \sin 3x}$ $\left[Ans : R; \left[\dfrac{1}{3}, 1\right]\right]$

Computer Science

- Prepare a flow chart to solve any practical task, step wise.
- Read blogs/news related to cyber laws and IT Act 2008.
- Revise Chapters -1,2,3 and read Chapters-5,6
- Do assignmentsof Ch.l-4

Biology

1. Why are muscles present in the alimentary canal?
2. How are fats digested and absorbed in the human body?
3. Name the other pigments which are present in animals besides haemoglobin.
4. Give the role of intercostals muscles in respiration.
5. Explain why Erythrocytes can carry out anaerobic metabolism only.
6. Describe how our brain gets a continuous supply of oxygen from the atmosphere.
7. Where is carbonic anhydrase located and what is its function.
8. How is respiration regulated? Explain with diagram.
9. Describe transport mechanism of CO2.
10. Make a 5-page project on recent advances in Biology.

Physical Education

Ch1-Changing Trends and Careers in Physical Education

Q1) Define physical education according to Brownell.

Q2) What is sports journalism?

Q3) List the careers in communication media.

Q4) List the objectives of physical education and explain any one of them.

Q5) Describe in detail the various physical education courses available in India.

Q6) Elucidate any three soft skills required in the field of physical education.

Q7) Name the careers available in the field of physical education in India. Discuss the performance related careers in detail.

Q8) Write short notes on any two of the following:

 (a) Career in book writing.

 (b) Career in sports photography.

 (c) Career in sports industry.

Q9) Discuss the changing trends in physical education in India.

Ch2 Olympic Movement

Q1) What is Olympic Movement?

Q2) What are Olympic Awards? Write down the Olympic Oath.

Q3) What do you mean by 'CITIUS, ALTIUS and FORTIUS' ?

Q4) Briefly write about the awards of Ancient Olympic Games.

Q5) Discuss the main function of IOC.

Q6) Discuss about the symbol and motto of Modern Olympics Games.

Q7) Discuss the general rules related to the organisation of CBSE Sports competition.

Q8) Elucidate about the development of value through Olympic Movement.

Q9) Elucidate in detail about International Olympic Committee.

Q10) Explain about Rajiv Gandhi Khel Ratna Award in detail.

Ch3- Physical Fitness, Wellness and Lifestyle

Q1) What is the meaning of physical fitness and wellness?

Q2) Define flexibility and endurance.

Q3) What do you understand by coordinative abilities?

Q4) What do you understand by muscular endurance?

Q5) Discuss the role of maintaining a healthy weight in preventing health threats through lifestyle changes.

Q6) Discuss any three components of positive lifestyle.

Q7) Define strength and discuss its types in brief.

Q8) Define physical fitness and wellness. Elaborate the importance of physical fitness and wellness in detail.

Q9) What do you understand by the term 'lifestyle'? Elucidate the importance of positive/ healthy lifestyle in detail.

Q10) Discuss the components of health-related physical fitness in brief.

Q11) Last year, your school organised a programme, 'Run for Unity'. All the students and teachers of your school were involved in this race. Such runs promote unity, peace and harmony among the people. After covering a distance of two kilometers, one student suddenly experienced chest pain. He complained to a teacher regarding the pain. Immediately some of the teachers, who were running beside him, took him to the doctor for necessary check up. His blood pressure was measured and ECG was also performed.

Doctor said that it was not due to heart problem. It was surely the problem of second wind which is a usual phenomenon for an individual who does not practice to run a race.

Based on the above passage, answer the following questions:

1. What is physical fitness?

2. What values did the teachers show by taking the student to the doctor immediately?

3. Was the student physically fit? Explain.

Economics

Prepare a project based on CBSE guidelines.
Suggested topics are-
1. Production possibility curve
2. Demand/Supply and its determinants
3. Production Function: Returns to a factor
4. Cost function and cost curves
5. Monopoly or perfect competition or monopolistic competition or oligopoly forms of market.
6. Price Floor and Price Ceiling
7. Study of Milk cooperatives (Amul, Mother dairy)
8. Changing consumer awareness amongst households
9. Global warming

Any other relevant topic such as   HDI, GST, SHG, Dis-investment policy etc

The project report should include : Title , Index , Introduction of the theme , Elaboration, Conclusion , Credits / List of resources used / Bibliography

Psychology

Project on Different Methods of Psychological Enquiry- Based on NCERT
Ch-2 Methods of Enquiry in Psychology

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