ROYAL COLLEGE OF SCIENCE, NAROWAL

Home Assignment for Winter Vacation 2023

Class: 1st Year

Instructions:

- **Attempt all these questions on loose sheets separately for each subject.**
- **Draw margin lines, use marker / pointer for headings and write in neat handwriting.**
- **You have to _Attempt_ / _Write_ & _Learn_ all these short questions / topics / sums**

PHYSICS

Chapter No. 8

1. What features do longitudinal waves have in common with transverse waves
2. It is possible for two identical waves traveling in the same direction along a string to give rise to a stationary wave?
3. A wave is produced along a stretched string but some of its particles permanently show zero displacement. What type of wave is it?
4. Explain the terms crest, trough, node and anti-node.
5. Why does sound travel faster in solids than in gases?
6. How are beats useful in tuning musical instrument?
7. As a result of a distant explosion, an observer senses a ground tremor and then hears the explosion. Explain the time difference.
8. Explain why sound travels faster in warm air than in cold air.
9. How should a sound source move with respect to an observer so that the frequency of its sound does not change?
10. What happens to the frequency and wavelength of the wave, when a string fixed at its ends, vibrates in more than one loops?
11. Compare the velocity of sound in hydrogen gas with that in oxygen gas.
12. What are the uses of beats? (Any 2)
13. A wave has speed 400 m / sec. Find wavelength of a wave if frequency is 2 kHz.
14. The speed of sound in air at 0°C is 332 ms^{-1}. Find its speed at 20°C.
15. Write any two applications of Doppler's effect?
16. State and explain the principle of super position?
17. What is the effect on phase of a wave when it is reflected from a boundary?
18. Which is richer in harmonics? An open organ pipe or a closed organ pipe?
19. Define Doppler shift. Write down its formula.
20. Give conditions for Constructive and Destructive Interference.
21. What is progressive wave? Give the name of two kinds of progressive waves.
22. How the Doppler Shift can be used in Radar Speed Trap?

23. Frequency of a stationary wave is 300Hz whose adjacent nodes are 1.5m apart. What is the speed?
24. Find the temperature at which the velocity of sound in air is two times its velocity of sound in air is two times its velocity at 10 °C.
25. Two tuning forks exhibit beats at a beat frequency of 3 Hz. The frequency of one fork is 256 Hz. Its frequency is then lowered slightly by adding a bit of wax to one of its prong. The two forks then exhibit a beat frequency of 1 Hz. Determine the frequency of the second tuning fork.

CHEMISTRY   (Girls Campus)

Chapter No. 11

1. Define reaction kinetics & rate of reaction. What happens to the rate of reaction with the passage of time?
2. Define Order of reaction with suitable example.
3. Define Average rate of reaction & Instantaneous rate.
4. Define with suitable example the 2nd order & 3rd order reaction.
5. Define zero order & 1st order reaction with suitable example.
6. Define pseudo 1st order reaction and fractional order reaction with suitable example.
7. What is a Rate determining step? Define reaction intermediate?
8. How half-life method is used to determine the order of reaction?
9. How method of large excess is used to determine the order of reaction?
10. How nature of reactants effect the rate of reaction?
11. What is effect of surface area of reactants upon rate of reaction?
12. Discuss effect of increase in temperature & light on rate of reaction.
13. Define optical rotation method.
14. How electrical conductivity method is used to find the rate of reaction.
15. A catalyst is specific in action. Discuss with suitable example
16. The reaction rate decreases every moment but the rate constant k of the reaction is a constant quantity under the given condition.Justify it.
17. The order of a reaction is obtained from the rate expression of a reaction and the rate expression is obtained from the experiments.Discuss
18. The sum of the coefficients of a balanced chemical equation is not necessarily important to give the order of a reaction.Justify this statement.
19. Differentiate between fast step and rate determining step.
20. How the collision frequency and the proper orientation of molecules are necessary conditions for determining the proper rate of reaction.
21. Define energy of Activation & Activated Complex.
22. What are fast rate, moderate rate & slow rate reactions. Give examples.
23. Half-life of first order reaction is independent of initial concentration of reactants.Justify.
24. Give graphical explanation of Rate of reaction.
25. How spectrometry is used to determine order of reaction?
26. Describe Dilatrometric method is used for the determination of order of reaction?
27. Define half-life period. How is it related with order of reaction?

CHEMISTRY   (Boys Campus)

Chapter No. 5

1. Why is it necessary to decrease the pressure in discharge tube?
2. The e/m value of positive rays obtained from hydrogen gas is 1836 times less than that of cathode rays. Justify
3. Cathode rays travel in a straight line. Justify
4. Define slow & Fast moving electrons with chemical equation
5. Give defects of Rutherfords Model
6. Write two postulates of Planks Quantum Theory
7. Define the following: (i) frequency (ii) Wave Lenth (iii) Wave No
8. How distance between adjacent orbits for Hydrogen atom go on increasing
9. Why potential energy of bonded electron is negative?
10. How energy of an electron is inversely proportional to n2 but energy of higher orbitals are always greater than those of lower orbits. Briefly discuss.
11. Energy difference between adjacent energy levels goes on decreasing. Discuss
12. Define spectrum. Differentiate between continuous and Line spectrum
13. Differentiate between Atomic Emission and Atomic absorption spectrum
14. What are x-rays? Discuss their origin
15. Give two defects of Bohrs Model. (What is Zeemans and starks effect)
16. Define Quantum No & n + l Rule.
17. Calculate the mass of electron.
18. Relate energy of photon with frequency, wave length & wave No according to Planks theory
19. Describe the velocity of electrons in the higher orbits are less than those in the lower orbits
20. Discuss the dual nature of matter. The de-Broglies concept is applicable to microscopic bodies only
21. Define Mosleys Law. Discuss its Importance
22. Define Heisenbergs uncertainty principle. Describe Bohrs model has no relationship with this Principle
23. Define Auf Bau Principle, Paulis Exclusive Principle & Hunds Rule
24. Write electronic configuration of Cr(24) & Cu (29).
25. Briefly describe Azimuthal Quantum Number.
26. Discuss briefly Magnetic Quantum Number.
27. How spin quantum Number describe the movement of an electron
28. Describe the points of Mosley Law.
29. Briefly discuss The Principe Quantum Number.

COMPUTER SC.

Chapter No. 2 + 6

1. Define computer Network?
2. What is a terminal?
3. How does client-server network work?
4. Distinguish between de-facto and de-jure standards?

5. What is Ring topology?
6. State the purpose of bridge?
7. In which situation gateway is used?
8. Compare LAN and MAN?
9. What is ISDN line?
10. How does CSMA/CD work?
11. What is Ethernet?
12. What is OSI model?
13. Write two purpose of transport layer?
14. What is the purpose of data link layer of the OSI model?
15. What is encryption?
16. Write four methods used to maintain computer security?
17. What is computer virus?
18. What is pirated software?
19. How does boot sector virus work?
20. What is worm?
21. Who is a hacker?
22. What is meant by authentication?
23. Why data security is important?
24. Why user rights are assigned?
25. What is privacy issue?
26. What is meant by copyright?
27. What is intellectual property?
28. Define backup.why backup is important?
29. What is the advantage and disadvantage of complete backup?
30. Write three ways in which the security of data may be violated?

BIOLOGY

Chapter No. 8

1. Define nuclear mitosis.

2. Differentiate between septate and aseptate hyphae.

3. Define hyphae and Mycelium.

4. What do you know about Armillaria?

5. What is Rhizoid? Give its function.

6. What are lichens? Give its examples.

7. What is Haustoria?

8. What is Mychorhizae? Give its types.

9. Enlist different types of asexual reproduction in Fungi?

10. Define karyokinesis and cytokinesis.

11. Give any four land adaptation of fungi.

12. What is Histoplasmosis?

13. Give ecological importance of Fungi.

14. How Fungus is important in respect of nutrition?

15. Give medical importance of Fungus.

16. How Fungus is important in food Industry?

17. Write down imapact of Fungi in Genetic Engineering?

18. Enlist the diseases caused by Fungi in animals.

19. Enlist the diseases caused by Fungi in plants.

20. What is rhodotrula?

MATHEMATICS

Chapter No. 9 + 10 + 12 + 13

Question 01
    i.   Find length l, when $\theta = 65°20'$ and $r = 18mm$
    ii.   Express $75°6'30''$ into radian
    iii.   Find the radius of the circle, in which the arms of a central angle of measure 1 radian cut off an arc of length 35cm.
    iv.   What is the circular measure of the angle between the hands of a watch at 4 O' clock?

Question 02
If $\cot\theta = \frac{15}{8}$ and the terminal arm of the angle is not in 1st quad. Find the values of $\cos\theta \ and \ \cosec\theta$

Question 03
    i.   Find x, if $\tan^2 45 - \cos^2 60$ = x sin45 cos45 tan60
    ii.   Sin60.cos30 – cos60.sin30 = sin30
    iii. $2\sin 45 + \frac{1}{2}\cosec 45 = \frac{3}{\sqrt{2}}$

Question 04
    i. $2\cos^2\theta - 1 = 1 - 2\sin^2\theta$ ii. $\frac{\sin\theta}{1+\cos\theta} + \cot\theta = \cosec\theta$
    ii. $\cot^4\theta + \cot^2\theta = \cosec^4\theta - \cosec^2\theta$
    iii. $\cos\theta + \tan\theta\sin\theta = \sec\theta$

Question 05
    i. $\sin(180 + \alpha)\sin(90 - \alpha) = -\sin\alpha\cos\alpha$
    ii. $\sin 780 \ \sin 480 + \cos 120\sin 30 = \frac{1}{\sqrt{2}}$
    iii. $\cos(45 + \alpha) = \frac{1}{\sqrt{2}}(\cos\alpha - \sin\alpha)$

Question 06
    i. $\frac{1-\cos\alpha}{\sin\alpha} = \tan\frac{\alpha}{2}$ ii. $\cot\alpha - \tan\alpha = 2\cot 2\alpha$
    ii. $2\sin 7\alpha\cos 3\alpha \ write \ as \ a \ sum \ or \ difference$

Question 07
    i.   Solve the right triangle ABC in which $\gamma = 90°$ a = 3.28 b = 5.74
    ii.   A kite flying at the height of 67.2m is attached to a fully stretched string inclined at an angle of 55° to the horizontal. Find he length of the string
    iii.   Find the smallest angle of the triangle ABC when a = 37.34, b = 3.24, c = 35.0

Question 08

i. Find area of triangle ABC given c = 32 $\alpha = 47°24'$ $\beta = 70°16'$

ii. To prove r = (s-a)$\tan\frac{\alpha}{2}$

iii. Prove that abc ($\sin\alpha + \sin\beta + \sin\gamma$) = $4\Delta S$

iv. Show that R = $\frac{abc}{4\Delta}$

v. Prove that $rr_1r_2r_3 = \Delta^2$

Question 09

i. Find $\cos(\sin^{-1}\frac{1}{\sqrt{2}})$ ii. Show that $\tan^{-1}\frac{5}{12} = \sin^{-1}\frac{5}{13}$

Question 10

i. $show\ that\ \tan(\sin^{-1}) = \frac{x}{\sqrt{1-x^2}}$

ii. Show that $\cos(\sin^{-1}) = \sqrt{1-x^2}$

iii. $show\ that\ \sin^{-1}\frac{1}{\sqrt{5}} + \cot^{-1}3 = \frac{\pi}{4}$

ENGLISH

- **POEMS** 18, 19,20

Q1. Explain the following lines with reference to context (poem 20)

> He is quick, thinking in clear images;
>
> I am slow, thinking in broken images.
>
> He becomes dull, trusting to his clear images;
>
> I become sharp, mistrusting my broken images.

Q2. Why does the poet put emphasis on love? (Poem 18)

Q3. What is the condition of the garden when the weeds start growing? (Poem 19)

Q.4 What does the poet want to say through the symbols of an eagle and a lion? (Poem 19)

Q5. Who is in a new confusion of his understanding? (Poem 20)

- **MORAL STORIES**

  -SLOW AND STEADY WINS THE RACE   -GREED IS A CURSE

URDU

تلخیص: نمبر1تا10۔

درخواستیں: فیس معافی، جرمانہ معافی، تبدیلی مضمون۔

مکالمہ جات: تعلیمی نظام، امتحانی نظام، مہنگائی پر۔

رسیدیں: بھینس کی خرید و فروخت کی رسید، پرانے موبائل کی خرید و فروخت کی رسید۔

روزنامچہ: کاروباری شخص کا روزنامچہ۔   روداد / سیرت نگاری: سیرت النبیؐ پر روداد۔

ISLAMIAT

باب نمبر: 3

سوال نمبر 1۔ اُسوۂ حسنہ سے کیا مراد ہے۔

سوال نمبر 2۔ اسلام سے قبل عورتوں کی کیا حالت تھی۔

سوال نمبر 3۔ غلاموں کے بارے میں آپؐ کا کیا ارشاد ہے۔

سوال نمبر 4۔ رسولؐ بحیثیت تاجر چار سطریں لکھیں۔

سوال نمبر 5۔ دو غیر عرب صحابہ کے نام لکھیں۔

سوال نمبر 6۔ اخوت سے کیا مراد ہے۔

سوال نمبر 7۔ مواخات مدینہ مختصراً بیان کریں۔

سوال نمبر 8۔ دو غلام صحابہ اکرام کے نام لکھیں۔

سوال نمبر 9۔ صبر کا لغوی اور اصطلاحی مفہوم تحریر کریں۔

سوال نمبر 10۔ شعب ابی طالب میں محصوری / مقاطعہ بنی ہاشم سے کیا مراد ہے۔

سوال نمبر 11۔ لوگوں کو معاف کرنے کے بارے میں ایک آیت قرآنی کا ترجمہ لکھیں۔

سوال نمبر 12۔ عفو و درگزر کے دو فائدے تحریر کریں۔

سوال نمبر 13۔ ذکر کی اقسام تحریر کریں۔

سوال نمبر 14۔ ذکر کے دو فائدے تحریر کریں۔

سوال نمبر 15۔ افضل الذکر سے کیا مراد ہے۔

سوال نمبر 16۔ طائف کے سرداروں کا آپؐ کے ساتھ کیا سلوک تھا۔

سوال نمبر 17۔ عفو و درگزر پر مختصر نوٹ لکھیں۔

سوال نمبر 18۔ تعلیمات نبوت کی روشنی میں مساوات پر چار سطریں تحریر کریں۔

سوال نمبر 19۔ حضرت جعفر طیار کس جنگ میں شہید ہوئے۔

سوال نمبر 20۔ آپؐ یتیموں پر کیسے مہربان تھے۔

TARJAMA TUL QURAN

1۔ سورۃ ال عمران کی وجہ تسمیہ بیان کریں۔

2۔ مباہلہ سے کیا مراد ہے؟

3۔ سورۃ ال عمران کی فضیلت لکھیں۔

4۔ وفد نجران کی آمد کا مقصد لکھیں۔

5۔ سورۃ ال عمران میں اہل عقل کی کیا نشانیاں بیان کی گئی ہیں؟

6۔ نجران محمد ﷺ کے ساتھ مباہلہ کرنے کے لئے کون تشریف لے گیا؟

7۔ اہل نجران کو آپ ﷺ نے کن الفاظ میں تشبیہ دی؟

8۔ سورۃ ال عمران کا زمانہ نزول لکھیں۔

9۔ سورۃ ال عمران کا تعارف لکھیں۔

10۔ ترجمہ لکھیں۔ وَتُعِزُّ مَن تَشَاءُ وَتُذِلُّ مَن تَشَاءُ

11۔ سورۃ ال عمران کا مرکزی مضمون کیا ہے؟

12۔ سورۃ ال عمران میں اہل کتاب سے کیا خطاب کیا گیا ہے؟

13۔ سود کی حرمت قرآن مجید کی کس سورۃ میں بیان کی گئی ہے؟

14۔ امر بالمعروف سے کیا مراد ہے؟

15۔ انفاق فی سبیل اللہ سے کیا مراد ہے؟

16۔ دین کی دعوت کا اصول کیا ہے؟

17۔ اہل ایمان کے فرائض بیان کریں۔

18۔ محبت الہٰی کا حصول کیسے ممکن ہے؟

19۔ امت مسلمہ کو بہترین امت کیوں کہا گیا ہے؟

20۔ ترجمہ لکھیں۔ وَالْكَاظِمِيْنَ الْغَيْظَ وَالْعَافِيْنَ عَنِ النَّاسِ

21۔ عدل کا تقاضا کیا ہے؟

22۔ ہدایت سے محرومی کا سبب کیا ہے؟   23۔ اہل جنت کی نشانیاں لکھیں۔

24۔ ال عمران سے مراد کون لوگ ہیں؟   25۔ دین اسلام کی اہمیت واضح کریں۔