

AAFAQ ACADEMY – KASUR

Paper: Physics

Chapter (17 – 21)
PHYSICS PART – II 2ND HALF

Class: F.Sc. Part – II

Name: _____ Roll No: (in words) _____

OBJECTIVE TYPE

Total Marks: 17

Paper Code: _____

Total Time: 20 Minutes

NOTE: Write your **Roll No.** in space provided. Using lead pencil will result in loss of marks.

Q.No.1: You have four choices for each objective type question as A,B,C and D. The choice which you think is correct; fill that circle in front of that question number. Use marker or pen to fill the circles. Cutting or filling two or more circles will result in zero mark in that question.

Sr. No.	QUESTION	A	B	C	D
1.	The number of atoms per unit cell in a simple cubic structure is	Eight	Four	Two	One
2.	Strength – to – weight ratio of plastic is _____ than that of steel	Lesser	Same	Greater	None of these
3.	A tri – valent impurity in <i>Ge</i> creates	A free electron and a hole	A hole	A free electron	No electron or a hole
4.	Structure of unit cell is	Three dimensional	Two dimensional	One dimensional	All of these
5.	A piece of <i>Cu</i> and a piece of <i>Si</i> are cooled from room temperature to $50K$. The resistance of	Each of them decreases	Each of them increases	<i>Cu</i> increases and <i>Ge</i> decreases	<i>Cu</i> decreases and <i>Ge</i> increases
6.	A logic gate is an electronic circuit which	Allows electron flow only in one direction	Allows hole flow only in one direction	Alternates between 0 and 1	Makes logic decisions
7.	The best metal to be used for photo – emission	Cesium	Lithium	Potassium	Sodium
8.	Dimensions of $\frac{h}{m_0c}$ are	$[M^{-1}LT^0]$	$[MLT^{-2}]$	$[M^0LT^0]$	$[M^{-1}L^3T^{-2}]$
9.	Time dilation applies to the timing process	Physical	Biological	Chemical	All of these
10.	If a charged particle is accelerated to move at relativistic speed, which of the following will remain unchanged?	Mass	Charge – to – mass ratio	Charge	None of these
11.	What is voltage gain in common – emitter amplifier where input resistance is 3Ω and load resistance is 24Ω and current gain is $\beta = 0.6$	$8 \bullet 4$	$4 \bullet 8$	$2 \bullet 4$	480
12.	Hydrogen is excited to the 7 th state. How many spectral lines can be observed in spectrum?	8	16	21	28
13.	A solid state detector is basically	A <i>p – n – p</i> transistor	A <i>n – p – n</i> transistor	A reverse biased <i>p – n</i> junction	A forward biased <i>p – n</i> junction
14.	The strong nuclear force act on the	Mesons only	π – meson only	Leptons only	Hadrons only
15.	Radioactivity is	Self disintegration process	Spontaneous process	Irreversible process	All of these
16.	According to Bohr's postulates, the relation between principle quantum number and radius of the orbit is	$r \propto \frac{1}{n}$	$r \propto n$	$r \propto \frac{1}{n^2}$	$r \propto n^2$
17.	What is nearly the size of the atom?	$10^{-6} m$	$10^{-8} m$	$10^{-10} m$	$10^{-15} m$

Good Luck
Ch. Khalid Mahmood Ashraf

SUBJECTIVE TYPE

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Paper: Physics

Chapter (17 – 21)
PHYSICS PART – II 2ND HALF

Class: F.Sc. Part – II

Name: _____ Roll No: (in words) _____

Total Marks: 83

Time Allowed: 3 Hours 10 Minutes

SECTION – I (SHORT QUESTIONS)

2. Attempt any EIGHT questions. (8×2=16)Marks

- i. Show that the units of modulus of elasticity and stress are the same. Also discuss its three kinds.
- ii. What is meant by strain energy? How we find it?
- iii. What is meant by hysteresis loss? How is it used in the construction of a transformer?
- iv. Define stress and strain. What are their SI units?
- v. Why ordinary silicon diodes do not emit light?
- vi. The anode of a diode is 0.2 V positive with respect to its cathode. Is it forward-biased?
- vii. What is biasing requirements of the junction of a transistor for its normal operation? Explain how these are met in common emitter amplifier?
- viii. Why a photo diode is operated in reverse biased state?
- ix. What is principle of virtual ground? Apply it to find the gain of an inverting amplifier.
- x. Distinguish between intrinsic and extrinsic semi conductors. How would you obtain n-type and p-type material from pure silicon? Illustrate it by schematic diagram.
- xi. Describe the formation of energy bands in solids. Explain the difference amongst electrical behaviour of conductor's insulators and semi-conductor in terms of energy band theory.
- xii. Draw diagram of XNOR – gate and write its Boolean equation.

3. Attempt any EIGHT questions. (8×2=16)Marks

- i. Does the dilation means that time really passes more slowly in moving system or that is only seems to pass more slowly?
- ii. When ultraviolet light falls on certain dyes, visible light is emitted. Why does this not happen when infra-red light falls on these dyes?
- iii. Why can red light be used in a photographic dark room when developing films, blue or white light cannot?
- iv. Can pair production take place in vacuum? Explain.
- v. What advantages an electron microscope has over an optical microscope?
- vi. We do not notice the de Broglie wavelength for a pitched cricket ball. Explain why?
- vii. What do you understand by stimulated or induced emission?
- viii. Describe different uses of laser in medicine and industry.
- ix. Can X-rays be reflected, diffracted and polarized just like any other waves? Explain.
- x. How can the spectrum of hydrogen contain so many lines when hydrogen contains one electron?
- xi. Will bright light eject more electrons from a metal surface than dimmer light of the same colour?
- xii. When does light behave as a wave? When does it behave as particle?

4. Attempt any SIX questions. (6×2=12)Marks

- i. Describe brief account of interaction of various types of radiations with matter.
- ii. A particle which produces more ionization is less penetrating. Why?
- iii. What information is revealed by the length and shape of the tracks of an incident particle in Wilson cloud chamber?
- iv. Discuss the advantages and disadvantages of nuclear power compared to the use of fossil fuel generated power.
- v. Discuss the advantages and disadvantages of nuclear power compared to the use of fossil fuel generated power.
- vi. Explain how α - and β -particles may ionize an atom without directly hitting the electrons? What is the difference in the action of the two particles for producing ionization?
- vii. What is a radioactive tracer? Describe one application each in medicine, agriculture and industry.
- viii. Which radiation dose would deposit more energy to your body (a) 10 mGy to your hand, or (b) 1mGy dose to your entire body?
- ix. Describe the principle of operation of a solid state detector of ionizing radiation in terms of generation and detection of charge carriers.

SECTION – II (ESSAY TYPE) Attempt given question

5. Do as directed...

- i. What are intrinsic and extrinsic semi – conductors? Describe the formation of p – type and n – type semi – conductors in detail. (5)
 - ii. The length of a steel wire is 1.0 m and its cross sectional area is $0.03 \times 10^{-4} \text{ m}^2$. Calculate the work done in stretching the wire where force of 100 N is applied with in the elastic region. Young's modulus of steel is $3.0 \times 10^{11} \text{ Nm}^{-2}$. (3)
6. Do as directed...
- i. What is op – amp? Find the voltage gain of a common – emitter amplifier. (5)
 - ii. Calculate the output of the op-amp circuit shown in Fig. (3)

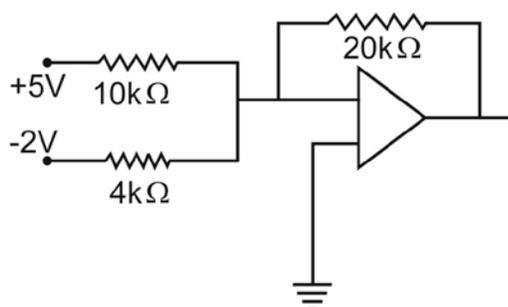
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7. Do as directed...
- Describe wave nature of particles and explain its verification with an experiment. (5)
 - What is de Broglie wavelength of an electron whose kinetic energy is 120 eV? (3)
8. Do as directed...
- State postulates of Bohr's theory and calculate energies of different hydrogen orbits. (5)
 - Compute the shortest wavelength radiation in the Balmer series? What value of n must be used? (3)
9. Do as directed...
- What is fission reaction? Explain it. Also describe fission chain reactions. (5)
 - A 75kg person receives a whole body radiation dose of 24 m rad, delivered by α -particles for which RBE factor is 12. Calculate (a) the absorbed energy in joules, and (b) the equivalent dose in rem. (3)

SECTION – III (Practical)

10. (a) Write answer of FOUR questions. (4 × 2 = 8)
- Why should ammeter have a high resistance?
 - What is work function?
 - What is photo – cell? Give its applications.
 - What is transformer? Give its principle.
 - What is potential barrier?
 - What is striking voltage?
 - Give some applications of neon flash.
 - What is neon flash lamp?
10. (b) Write procedure to determine the high resistance by neon flash lamp. (3)
- (OR)**
- Write procedure to convert galvanometer into an ammeter upto (0 – 1)A range. (3)
10. (c) Answer the following questions on the basis of graph drawn between potential difference (V) and current (I). (4)
- What you conclude from the graph?
 - Find the forward resistance from the graph.

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(OR)

Answer the following questions on the basis of graph drawn between intensity of light ($I \propto \frac{1}{d^2}$) and photo – electric current (θ). (4)

- i. What you conclude from the graph?
- ii. Find the area of the graph.

Good Luck
Ch. Khalid Mahmood Ashraf