Federal Board HSSC-II Examination
Physics Model Question Paper

(National Curriculum of Pakistan 2022-2023)
(Scheme of Studies 2006)

ROLL NUMBER					
0	0	0	0	0	0
1	1	1	1	1	1
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Version No.			
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Section - A (Marks 17)

Time Allowed: 25 minutes

Section – A is compulsory. All parts of this section are to be answered on this page and handed over to the Centre Superintendent. Deleting/ overwriting is not allowed. *Do not use lead pencil*.

Candidate Sign._____ **Invigilator Sign**. _____

Q1. Fill the relevant bubble against each question according to curriculum. Each part carries one mark.

Sr #	Question	(A)	(B)	(C)	(D)	(A)	(B)	(C)	(D)
1.	The distance between the two identical balls is R. If the distance is reduced to half of R then the gravitational force will become:	half	quarter	double	four time	○	○	○	○
2.	As we go further away from the surface of the Earth, the value of 'g':	remains same	increases	decreases	may increase or decrease depending on mass.	○	○	○	○
3.	SI unit of Luminosity is	watts	cd/m^2	joules	cd.m^2	○	○	○	○
4.	Real gases deviate from ideal behavior because gas molecules:	are colorless	are spherical	have intermolecular forces of attraction	have high speeds	○	○	○	○
5.	If A is the amplitude of an oscillating system, the total distance covered during its time period is:	A/2	A	2A	4A	○	○	○	○
6.	The phenomenon of diffraction is more prominent when the size of the obstacle is:	larger than the wavelength of incident light	smaller than the wavelength of incident light	comparable to the wavelength of incident light	independent of the wavelength of incident light	○	○	○	○
7.	Which of the following is equivalent to 1.0 volt.	newton per second	joule per second	joule per coulomb	coulomb per joule	○	○	○	○
8.	Capacitor is a device used to:	store electrical energy	vary the resistance	store magnetic energy	dissipate energy	○	○	○	○
9.	In a full wave bridge rectifier, how many diode(s) conduct during each half cycle of AC input?	1	2	3	4	○	○	○	○
10.	Sinusoidal waveform is generated in AC system because:	it can be easily drawn	it produces least disturbance	it is natural standard	other waves cannot be	○	○	○	○

			in electrical circuits		produced easily.	
11.	A photoelectric cell is a device which:	converts electricity into light energy.	converts light energy into electricity.	stores light energy.	stores electricity	○ ○ ○ ○
12.	If uncertainty in the position of an electron is zero, the uncertainty in its momentum will be	less than h/4	greater than h/4	zero	infinite	○ ○ ○ ○
13.	The process by which a heavy nucleus splits into two smaller nuclei is called:	Fission	Fusion	Alpha decay	Beta decay	○ ○ ○ ○
14.	Which law gives the relationship between brightness and distance from the source	Law of brightness	Direct Square Law of brightness	Inverse Square Law of brightness	Inverse Square Law of light	○ ○ ○ ○
15.	Which of the following statements is true about a photon?	A photon has zero mass and zero momentum.	A photon has finite mass and a finite value of momentum.	A photon has zero mass but finite value of momentum.	A photon has finite mass but zero momentum .	○ ○ ○ ○
16.	The drawback of conducting a medical imaging test is:	Early detection of problem.	Accurate diagnosis.	Contribution to choose of effective treatment.	Exposure to radiation.	○ ○ ○ ○
17.	Energy of gamma photon having a wavelength of $1A^{o}$ is:	$12.4x10^{3}$ eV	$12.4x10^{4}$ eV	$12.4x10^{-3}$ eV	$12.4x10^{-4}$ eV	○ ○ ○ ○

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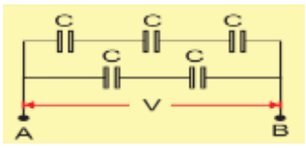
Time allowed: 2.45 hour **Total Marks Sections B and C: 68**

Note: Answer all parts from Section 'B' and all questions from Section 'C' on the **E-sheet**. Write your answers on the allotted/given spaces.

SECTION – B (Marks 42)

Q. 2	Questions	Marks		Questions	Marks
(i)	Calculate the orbital speed of satellite orbiting the Earth at an altitude equal to Earth's radius.	03	**OR**	A body with mass 800 g attached to a spring, vibrates with amplitude 30 cm. The restoring force is 60 N when the displacement is 0.30 m. Find out its (a) angular frequency (b) velocity and acceleration at x = 12 cm.	03
(ii)	Explain how pressure is exerted by the movement of gas molecules?	03	**OR**	Write any three conditions for observing interference fringes?	03
(iii)	Write three examples of resonance from everyday life.	03	**OR**	List the use of capacitors in various household appliances.	03
(iv)	The fringe spacing between the central maxima and 1st minima is 2 mm. If a light of 500 mm is used then find the separation between the slits. The distance between the slit and screen is 1 m.	03	**OR**	A network of five capacitors of capacitance C is connected to a 100 V supply, as shown in below figure. Determine the equivalent capacitance of the network. 	03
(v)	Define mutual inductance. Also write its unit.	03	**OR**	Define gravitational field strength. Also write its formula and unit.	03
(vi)	When electrons are accelerated through a potential difference of 10^5 volts in an X–ray tube. Calculate the minimum wavelength produced.	03	**OR**	A.C voltage across a 0.5 μF capacitor is $16\sin(2\times10^3 t)$ V. Find the capacitive reactance.	03
(vii)	Define (a) cryosphere (b) lithosphere.	03	**OR**	What is the main purpose of X-rays?	03
(viii)	What are the conditions required for pair production to occur?	03	**OR**	What is climate inertia?	03
(ix)	What is the application of piezo-electric effect in medical science?	03	**OR**	Explain how electron microscopes achieve very high resolution?	03
(x)	Sketch the variation of binding energy per nucleon with nucleon number.	03	**OR**	Explain the role of a single capacitor in output of full wave rectifier circuit.	03
(xi)	Explain briefly that how global climate is determined by energy transfer from the Sun?	03	**OR**	What is Stefan-Boltzmann law? Explain briefly.	03
(xii)	Explain why g is approximately constant for small changes in height near the earth's surface.	03	**OR**	Describe the function of the control rods in reactor.	03
(xiii)	How pressure is related to average translational kinetic energy of a gas?	03	**OR**	Describe the practical examples of free and forced oscillations.	03
(xiv)	What is diffraction grating?	03	**OR**	Distinguish between root-mean-square (r.m.s.) and peak values for a sinusoidal alternating current.	03

SECTION – C (Marks 26)

Note: Attempt all questions. Marks of each question are given along with each question.

Questions		Marks	Questions		Marks
Q.3	Define the term gravitational potential. Also derive the expression for calculating gravitational potential in the field due to a point mass.	01+ 06	**OR**	Analyze the interchange between kinetic and potential energy during simple harmonic motion	05+02
Q.4	Define interference, discuss the conditions for observing interference. Give expression for the path difference of constructive and destructive interference.	01+ 03 +02	**OR**	Explain the process of charging of a capacitor through a resistor (Also discuss the term time constant in the explanation).	04 + 02
Q.5	What is rectification? Explain the operation of a bridge rectifier, with the help of a diagram.	01+ 06	**OR**	What is photoelectric effect? Explain in detail.	01+06
Q.6	Define and explain the following terms: (a) luminosity (b) Annihilation reaction	03 + 03	**OR**	Explain half-life with examples.	06