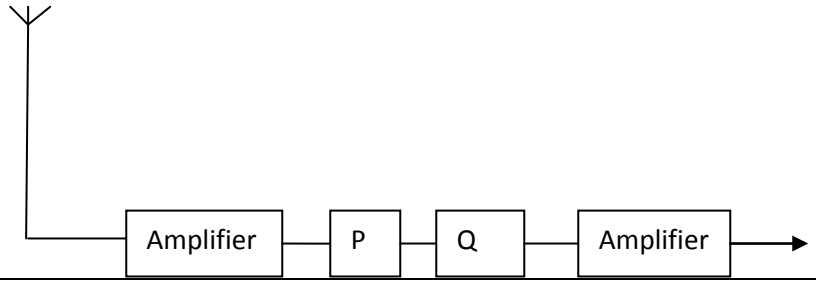
Guess Paper – 2014
Class – XII
Subject –Physics

Time:3 hrs **M.M.-70**

NOTE: all figures related to different questions are given at the end of question paper

1	Name the physical quantity which can be expressed as line integral of electric field. Is it a scalar or a vector?	1
2	Why do we use soft iron core in a moving coil galvanometer?	1
3	Define capacitive reactance. Draw graph to show the variation of capacitive reactance with frequency of source?	1
4	Which part of spectrum of EM waves is used for operation of a RADAR?	1
5	Define resolving power of an optical instrument. How is it affected for a microscope when wavelength of light used is decreased?	1
6	Two metals A and B having work function ($W_A > W_B$) are exposed to a light. If both emit electrons which will emit electrons with greater value of maximum kinetic energy? Explain.	1
7	Two nuclei have their mass numbers in the ration of 1:2. What is the ratio of their nuclear densities?	1
8	Explain the effect on conductivity of germanium when its temperature is decreased.	1
9	What is the principle of a capacitor? What is the role of second plate in a parallel plate capacitor?	2
10	Define resistivity of a conductor. Draw graph to show the variation of resistivity of a metallic conductor with temperature	2
11	A student has two wires of same length and thickness one of iron and other of copper. These are first joined in series and a current is passed through them which increase gradually, then these are joined in parallel and the same process is repeated. Which of the two wires will glow first in each case? Explain	2
12	Derive the formula for magnetic field at a point due to a long straight current carrying wire.	2
13	The oscillating field of a plane EM wave is $B_y=8x10^{-6}\sin\{2x10^{11}t + 300\pi x\}$ T. calculate the wavelength of EM wave and write the expression for oscillating electric field	2 *
14	State Huygens's principle use it to explain the laws of reflection	2
15	A muon is a particle which is 200 times heavier than an electron but has same charge as on an electron. if we had an atom in which a muon revolves around a proton instead of an electron then what will be the magnetic moment of such an atom in ground state? OR If M_1 and M_2 are masses are $_{10}Ne^{20}$ and $_{20}Ca^{40}$ respectively then $M_1:M_2$ will be lesser than, greater than or equal to 2. Explain	2
16	Identify P and Q in figure and write their functions 	2

17	Derive the condition of balance in a wheatstone's bridge. A meter bridge the null point is found to be at 40cm from A .if a resistance of 12 ohm is connected parallel to S null point shifts away from A by 10 cm. find R and S	3 *
18	If current in a coil varies with time as shown in graph then obtain the graph for induced emf with time When a wheel with metal spokes 1.2m long rotates in a magnetic field of flux density $5X10^{-5}$ T normal to its plane an EMF of 10^{-2}V is produced between its centre and rim. Determine the frequency of rotation of wheel	3 *
19	A screen is placed 90cm from an object. The image of the object on the screen is formed by a convex lens at two different locations separated by 20cm. determine the focal length of the lens.	3
20	Draw a schematic diagram to show diffraction due to a single slit. Mention the conditions for maxima and minima. Give two differences between interference and diffraction pattern	3
21	Define stopping potential. X-ray of wavelength λ is incident on a metal surface causing emission of electrons. Neglecting work function, show that the de Broglie's wavelength of emitted electrons is $\sqrt{\frac{h\lambda}{2mc}}$	3
22	Give a limitation of Rutherford's atomic model. Derive the expression for radius and energy of an electron in an atom	3
23	Show that in an amplitude modulated wave we get two side bands. A massage signal of 2V is used for modulating a carrier wave of 10V .determine the modulating index.	3
24	Explain the working of a transistor. Why the base of a transistor is thin and lightly doped and collector is largest in size?	3
25	What is a rectifier? Draw the circuit diagram for a half wave and full wave rectifier. What is the effect on frequency of signal at output in each case? OR Name the semiconductor diode which can be used as a voltage regulator and the suitable circuit diagram to explain its use as a voltage regulator. Why GaAs is preferred for making solar cell	3
26	Nirmal singh was fed up with paying heavy electricity bills. He casually shared his concern with his son Praduman who was a class 12 student .Praduman researched through internet and other facility at his school and home to find ways to reduce electricity bills. after lot of effort he got an idea to replace electric bulbs in his house by tube lights. Nirmal singh was reluctant to this idea due to cost factor he needs to bear for tube lights more over the bulbs would be a waste.somehow Nirmal Singh was convinced by his son to follow his scheme and found a pleasant surprise when he received the next electricity bill (a) What are the values we observe in praduman? (b) Show that a choke coil is more efficient than ohmic resistance in controlling AC	4
27	Define electric dipole moment. Is it a vector or scalar? What is an ideal dipole? Find the expression for electric field at a point on equatorial line of dipole. OR Find the expression for energy stored in a capacitor. A capacitor is charged and then disconnected now the plate separation is halved and the space between the plates is filled with a dielectric of K=10. What will be the effect on potential difference an d energy stored	5

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28	Find the expression for torque experienced by a current carrying coil placed in magnetic field. Define magnetic moment. Show that the coil is equivalent to a bar magnet OR Find the expression for force experienced per unit length by a current carrying wire placed parallel to another such wire. Hence define one ampere. Find the force on charge in the following figure	5
29	Define interference. Find the expression for ratio of intensity of maxima and minima in an interference pattern. What will be the effect on interference pattern if monochromatic light is replaced by white light in YDSE? OR Draw the ray diagram to show the refraction through a prism. Hence derive prism formula Why does a prism shows dispersion but a glass slab shows lateral deviation What will be the effect on angle of minimum deviation if a prism is placed in water?	5

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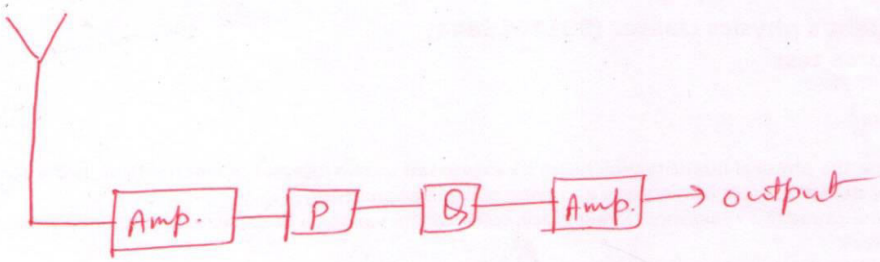
Q.16



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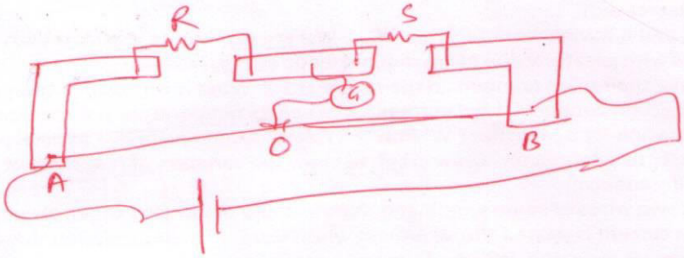

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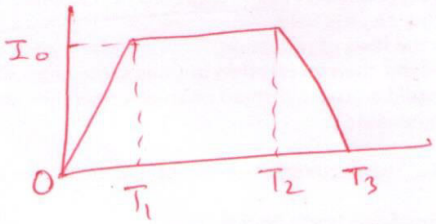

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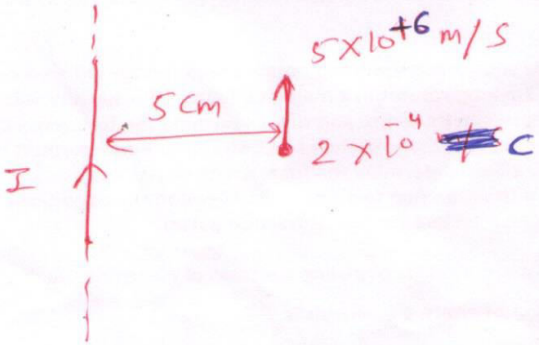

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