PHYSICS

BOOKS - JEEVITH PUBLICATIONS PHYSICS (KANNADA ENGLISH)

PUE BOARD MODEL QUESTION PAPER 1

Question

1. A cube encloses a charge of 1C. What is the electric flux through the surface of the cube ?

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2. The colour code of a carbon resistor is Brown-Red-Brown-Gold. What is its resistance ?

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3. State Ampere's circuital law and represent it mathematically.

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4. Define magnetic permeability of a substance.

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5. Name the rule which gives the direction of induced current in a conductor .

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6. What type of a wave front is observed from a distant source of light ?

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7. Give an example for nuclear fusion reaction.

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8. Define Energy band gap in solids.

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9. The output of an OR gate is connected to the input of a NOT gate. Name the equivalent logic gate.

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10. What is the signal bandwidth offered by a co - axial cable ?

11. State and explain Coulomb,s law in electrostatics.

12. How does the resistivity of the following materials vary with the increase in their temperature : (i)metallic conductor and (ii) semiconductor ?

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13. Mention the principle behind the working of a transformer. Can a transformer used to step up a d.c. voltage ?

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14. Write any four characteristics of electromagnectic waves. Give two uses each of Radio-waves.

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15. Using Huygens principle , draw a diagram to show the refraction of plane wave front incident obliquely on a surface separating two media.

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16. Mention two observations of Geiger-Marsden's experiment on scattering of alpha particles .

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17. Two nuclei have mass numbers in the ratio 8 : 125. Calculate the ratio of their nuclear radii.

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18. Explain the terms 'range ' and ' band width ' used in electronic communication systems.

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19. Compare the capacitance of a parallel plate capacitor with and without the dielectric medium.

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20. Write the expression, for the force acting on a charge moving in a uniform magnetic field. Mention the nature of a trajectory of the charged particle which is moving (i) parallel and (ii) perpendicular to the magnetic field.

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21. Write three properties of diamagnetic and ferromagnetic materials

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22. Write the expression for the time period of oscillation of a small compass needle in a uniform magnetic field and explain the terms. In this case, if the magnitude of the magnetic field is reduced to $1/4^{th}$, how does the time period change ?

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23. Derive the relation $f = R/2$ in the case of a concave mirror.

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24. Writer Bohr's postulates for the hydrogen atom model.

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25. Write the expression for the half life of a radioactive element.

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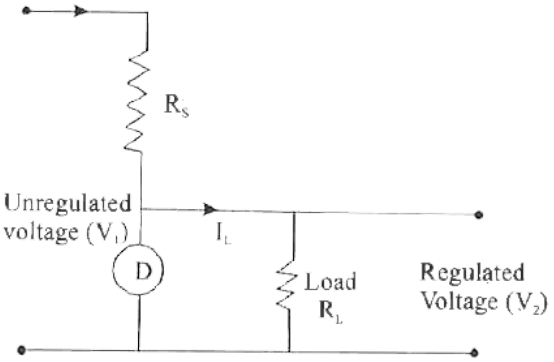
26. Name the device 'D' which is used as a voltage regulator in the given circuit . Rewrite the circuit by replacing 'D' with the proper circuit symbol. Give its working principle.



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27. Obtain an expression for the electric field intenstiy at a point on the equatorial line of

an electric dipole.

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28. Define relaxation time . Derive the expression for electrical conductcity of material in terms of relaxation time .

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29. Draw the circuit diagram of a Wheatstone bridge. Derive the balancing condition for the

same. Name a device which works on the principle of Wheatstone bridge.

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30. What is self-inductance of a coil ? Write its SI U Unit.

Obtain the expression for energy stored in an inductor.

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31. Obtain the expression for fringe width in the case of interference of light waves.

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32. With a neat circuit diagram, explain the working of an npn transistor in CE node as a switch .

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33. Two capacitors of capacitance 600 pF and 900 pF are connected in series across a 200 V supply. Calculate (i) the effective capacitance of the combination, (ii) the pd across each capacitor and (iii) the total charge stored in the system.

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36. A straight wire of length $\pi/2$ m is bent into a circular shape.O is the center of the circle so formed and P is a point on its axis which is at a distance 3 times the from O .A current of 1A is passed through it Calculate the magnitude of the magnetic field at the points O and P .

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37. A series LCR circuit is connected to 230 V a.c. source of variable frequency. The inductance of the coil is 5 H capacitance of the capacitor is $5\mu F$ and resistance is 40Ω. At resonance calculate , (a) The resonant frequency , (b) current is the circuit and (c) the inductive reactance.

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38. A series LCR circuit is connected to 230 V a.c. source of variable frequency. The inductance of the coil is 5 H capacitance of the capacitor is $5\mu F$ and resistance is 40Ω. At resonance calculate , (a) The resonant frequency , (b) current is the circuit and (c) the inductive reactance.

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39. A series LCR circuit is connected to 230 V a.c. source of variable frequency. The inductance of the coil is 5 H capacitance of the capacitor is $5\mu F$ and resistance is 40Ω. At resonance calculate , (a) The resonant frequency , (b) current is the circuit and (c) the inductive reactance.

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40. A small bulb is placed at the bottom of a tank containing water to a depth of 1m. Find the critical angle for water air interface , also calculate the diameter of the circular bright patch of light formed on the surface of water. [R.I of water =4/3]

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41. The threshold wavelength of a photosensitive metal is 662.5 nm. If this metal

is irradiated with a radiation of wavelength 331.3 nm, find the maximum kinetic energy of the photoelectrons. If the wavelength of radiation is increased to 496.5 nm, calculate the change in maximum kinetic energy of the photoelectrons. (Planck's constant $h = 6.625 \times 10^{-34}$ Js and speed of light in vacuum $= 3 \times 10^{8} ms^{-1}$)

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