



# PHYSICS

## BOOKS - SUNSTAR PHYSICS

### (KANNADA ENGLISH)

## SUPPLEMENTARY EXAM QUESTION

### PAPER JUNE-2019

**Part A**

1. How does the resistance of a conductor depend on its length?



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2. State Ampere's Circuital Law



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3. When does the force acting on a charged particle moving in a uniform magnetic field is

Maximum?



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4. What is ment by magnetic declination ?



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5. What is hysteresis? Define the terms 'coercivity' and 'retentivity' of a ferromagnetic material.



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6. Mention any three application of eddy currents.



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7. What the is rest mass energy of a photon?



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**8.** Which of the following spectral series of hydrogen atom is lying in visible range of electromagnetic wave ?



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**9.** What is isotopes?



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**10.** Why there is a need for modulation ?



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## Part B

1. Give any two practical limitations of Ohm's law.



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2. Draw a neat Labelled diagram of Cyclotron.



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3. Mention an expression for the magnetic field produced at the centre on the axis of a current carrying Solenoid and Explain the terms



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4. State and explain Gauss's law in magnetism.



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5. What is a transformer ? Mention two sources of energy loss in a transformer



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6. Give two uses of UV rays.



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7. Give the two differences between Collector region and Emitter region of a Transistor



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8. Draw the block diagram of a generalised communication system.



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## Part C

1. Mention and five properties of electric field lines.



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2. Obtain an expression for effective Capacitance of two Capacitors Connected in series.



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3. How is galvanometer converted into an ammeter?



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4. Write three properties of diamagnetic and ferromagnetic materials



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5. Obtain the relation between radius of curvature and focal length of a concave mirror with necessary ray diagram.



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6. Using Huygens principle, show that the angle of incidence is equal to angle of reflection during a plane wave front reflected by a plane surface.



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7. Mention the different methods of electron emission .



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8. Give the logic symbol, Boolean expression and truth table of a NAND gate?



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9. Obtain an expression for the electric field intensity at a point on the equatorial line of an electric dipole.



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**10.** Deduce the condition for balance of a wheatstone's bridge using Kirchoffs rules .



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**11.** Derive an Expression for instantaneous induced emf in an A.C generator



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**12.** Obtain an expression for the total energy of an electron in the  $n^{\text{th}}$  orbit of hydrogen atom in terms of absolute constants.



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**13.** What is Rectification? Describe with a circuit diagram the working of a p-n junction diode as half wave rectifier with input and output waveforms.



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**14.** ABCD is a square of side 1m. Charges of  $+3nC$ ,  $-5nC$  and  $+3nC$  are placed at the comers A, B and C respectively. Calculate the work done in transferring a charge of  $12\mu c$  from D to the point of intersection of the diagonals?



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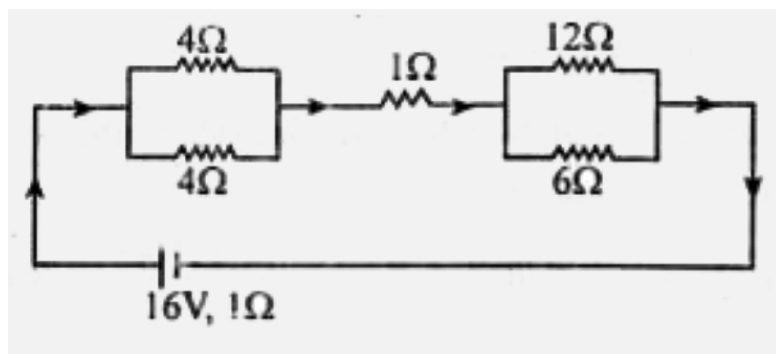
**15.** A network of Resistors is Connected to a 16V battery with internal resistance  $1\Omega$  as



shown in Figure below.

(a) Compute the equivalent resistance of the network

(b) Calculate the total current in the circuit



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**16.** A sinusoidal voltage of peak value 283 V and frequency 50 Hz is applied to a series LCR

circuit

in

which

$$R = 3\Omega, L = 25.48mH, \text{ and } C = 796\mu F.$$

Find (a) the impedance of the circuit, (b) the phase difference between the voltage across the source and the current, (c) the power dissipated in the circuit, and (d) the power factor.



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**17.** An object of size 3.0cm is placed 14cm in front of a concave lens of focal length 21cm.

Describe the image produced by the lens.

What happens if the object is moved further away from the lens?



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**18.** Calculate the binding Energy of an alpha ( $\alpha$ ) particle in Mev from the following data.

Mass of Helium Nucleus = 4.00260u

Mass of neutron = 1.008662u

Mass of proton = 1.007825u



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