



PHYSICS

BOOKS - FULL MARKS PHYSICS (TAMIL ENGLISH)

SAMPLE PAPER - 11

Part I

1. Let A and B be two sets having m and n elements respectively . Then total number of

functions from A to B is

A. $8.80 \times 10^{-17} J$

B. $-8.80 \times 10^{-17} J$

C. $4.40 \times 10^{-17} J$

D. $5.80 \times 10^{-17} J$

Answer: A



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2. The capacitance of a parallel plate capacitor does not depend on

A. area of the plates

B. metal of the plates

C. medium between the plates

D. distance between the plates

Answer: B



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3. A piece of copper and another of germanium are cooled from room temperature to 80 K. The resistance of

A. each of them increases

B. each of them decreases

C. copper increases and germanium decreases

D. copper decreases and germanium increases

Answer: D



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4. A non - conducting charged ring of charge q , mass m and radius r is rotated with constant angular speed ω . Find the ratio of its magnetic moment with angular momentum is

A. $\frac{q}{m}$

B. $\frac{2q}{m}$

C. $\frac{q}{2m}$

D. $\frac{q}{4m}$

Answer: C



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5. The magnetic field inside a solenoid is

A. directly proportional to current

B. inversely proportional to current

C. directly proportional to current

D. inversely proportional to the total
number of turns

Answer: A



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6. When the current changes from $+ 2\text{A}$ to -2A in 0.05 s , an emf of 8 V is induced in a coil is co-efficient of self-induction of the coil is

A. 0.2H

B. 0.4 H

C. 0.8H

D. 0.1H

Answer: D



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7. Which of the following is not true for electromagnetic waves?

A. it transport energy

B. it transport momentum

C. it transport angular momentum

D. in vacuum, it travels with different speeds which depend on the frequency

Answer: D



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8. Electromagnetic waves are produced by

A. Atoms and molecules in an electrical discharge

B. Electric device

C. Accelerated charges

D. Molecules of both bodies

Answer: C



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9. Light transmitted by Nicol prism is,

A. partially polarised

B. unpolarised

C. plane polarised

D. elliptically polarised

Answer: C



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10. When a metallic surface is illuminated with radiation of wavelength λ , the stopping potential is V . If the same surface is illuminated with radiation of wavelength 2λ ,

the stopping potential is $\frac{V}{4}$. The threshold wavelength for the metallic surface is

A. 4λ

B. 5λ

C. $\frac{5}{2}\lambda$

D. 3λ

Answer: D



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11. If an electron and proton are propagating in the form of waves having the same λ , it implies that they have the same

A. energy

B. momentum

C. velocity

D. angular momentum

Answer: B



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12. The half-life period of a radioactive element A is same as the mean life time of another radioactive element B. Initially both have the same number of atoms. Then

A. A and B have the same decay rate initially

B. A and B decay at the same rate always

C. B will decay at faster rate than A

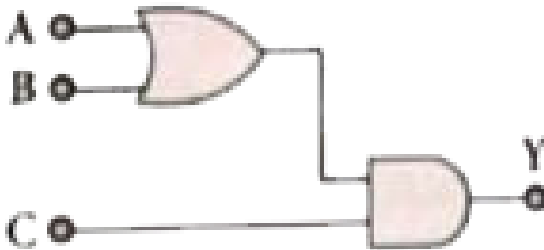
D. A will decay at faster rate than B

Answer: C



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13. The output of the following circuit is 1 when the input ABC is



A. 101

B. 100

C. 110

D. 010

Answer: A



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14. The internationally accepted frequency deviation for the purpose of FM broadcasts.

A. 75 kHz

B. 68 kHz

C. 80kHz

D. 70 kHz

Answer: A



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15. The gravitational waves were theoretically proposed by

A. Conrad Rontgen

B. Marie Curie

C. Albert Einstein

D. Edward Purcell

Answer: C



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Part II

1. What is dielectric strength ?



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2. Define electrical resistivity.



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3. The resistance of moving coil galvanometer is made twice its original value in order to increase current sensitivity by 50%. Will the voltage sensitivity change? If so, by how much?



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4. How will you define Q - factor ?



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5. A compound microscope has a magnification of 30. The focal length of eye piece is 5 cm. Assuming the final image to be at least distance of distinct vision, find the magnification . produced by the objective.



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6. Give the definition of intensity of light and its unit.



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7. What is isotope? Give an example.



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8. Define electron motion in a semiconductor.



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9. Why steel is preferred in making Robot?



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Part Iii

1. A parallel plate capacitor has square plate of side 5 cm and separated by a distance of 1 mm

. (a) Calculate the capacitance of this capacitor

. (b) If a 10 V battery is connected to the capacitor what is the charge stored in any one

of the plates? (The value of $\epsilon_0 = 8.85 \times 10^{-12} Nm^2 C^{-2}$).



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2. What is thomson effect ?



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3. What is meant by stereocilia?



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4. What are LC oscillations ?



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5. A pulse of light of duration 10^{-6} s is absorbed completely by a small object initially at rest. If the power of the pulse is 60×10^{-3} W, calculate the final momentum of the object.



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6. What is critical angle and total internal reflection?



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7. In alpha decay, why the unstable nucleus emits ${}^4_2\text{He}$ nucleus ? Why it does not emit four separate nucleons?



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8. What is meant by skip distance?



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9. What are sub atomic particles?



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Part Iv

1. Obtain the expression for electric field due to an infinitely long charged wire .



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2. Explain the determination of unknown resistance using meter bridge.



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3. How can you convert a galvanometer into an voltmeter?



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4. Mention the various energy losses in a transformer.



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5. Discuss about simple microscope and obtain the equations for magnification for near point focusing and normal focusing.



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6. What do you mean by electron emission ? Explain briefly various methods of electron emission.



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7. Discuss the beta decay process with examples.



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8. Elucidate the formation of a N-type and P-type semiconductors.



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9. What do you know about GPS? Write a few applications of GPS.



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10. Discuss the applications of Nanomaterials in various fields.



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