

Physics - FSC Part 1 Physics English Medium Full Book Short Question Test

Q1. Explain with the help of an example what is the range of possible values of the resultant of two vectors?

Ans 1:

Q2. Describe some common phenomena in which resonance plays an important role.

Ans 1: Tuning of a radio: It is a good example of electrical resonance. For tuning we turn the knob of a radio which changes the natural frequency of electrical circuit of receiver until it becomes equal to the frequency of the transmitter. So resonance is produced and energy absorption is maximum. Hence a station is tuned and we can hear the transmission of desired station.

Microwave oven: The waves produced in this type of oven have a wavelength of 12cm at a frequency of 2450 MHz. At this frequency the waves are absorbed due to resonance by water and fat molecules in the food resulting in efficient and evenly heating and cooking of food.

Q3. How light signals are transmitted through optical fibre?

Ans 1: The light signals are transmitted through optical fibers on the principle of

- Total internal reflection
- Continuous refraction

In multimedia step index fiber, the signal is transmitted by means of total internal reflection while in case of multimode graded index fiber, the signals are transmitted by total internal reflection and continuous refraction.

Q4. Briefly give two phenomena in which resonance plays an important role.

Ans 1: 1) Tuning a radio, we turn the knob to make the natural frequency of the electric circuit of receiver equal to the transmission frequency of the radio station. When the two frequencies match, energy absorption is maximum and this is the only station we hear. 2) Food can be easily cooked in a microwave oven. The waves produced in this type of oven have a frequency of 2450 MHz. At this frequency the waves are absorbed due to resonance by water and fat molecules in the food.

Q5. Can we realize an ideal simple pendulum?

Ans 1: No, we can't realize an ideal simple pendulum. Because an ideal simple pendulum should consist of a heavy but small metallic bob suspended from a frictionless rigid support by means of long, weightless and inextensible string.

Q6. If white light is incident on a film of irregular thickness at all possible angles, what will be the pattern of interference fringes? Explain your answer.

Ans 1: If white light is incident on a film of irregular thickness at all possible angles, we should consider the interference pattern due to each spectral color separately. If at a certain place condition of destructive interference of one color is satisfied then that portion of film will exhibit the remaining constituent colors of white light.

Q7. What is the minimum number of unequal vector in to a null vector? Explain

Ans 1: The minimum number of unequal vector to result in to a null vector must be three. If we add three vector of unequal magnitude in such a way that they forms the sides of a triangle, then their resultant must be zero.

In the given figure three vectors A, B, and C are added according to head to tail rule and they form the side of a triangle. Now for getting their resultant, we will combine the tail of A with the head of C which already coincides each other. Thus we get a null vector or zero vector as a resultant

$$R = A + B + C = 0$$

Q8. Show that for the same initial speed and some range of projectile there are two mutually complementary angles of projection ?

Ans 1:

Q9. Specific heat of a gas at constant pressure is greater than specific heat at constant volume why?

Ans 1: At constant volume, no work is done and the entire heat is utilized in raising the internal energy of the system. But under constant pressure, heat is not only required to raise the internal energy but also to do work against constant pressure. Hence specific heat of a gas at constant pressure is greater than specific heat at constant volume.

Q10. Differentiate between distance and displacement.

Ans 1:

Q11. What are damped oscillations?

Ans 1: The oscillations in which the amplitude decreases steadily with time are called damped oscillations.

For example

- The shock absorber of a car
- Motion of any microscopic system

Q12. Why banked tracks are needed for turns?

Ans 1: Banked tracks are needed because friction alone cannot provide energy for centripetal force.

If the road is banked, so that the outer edge is above the inner edge, then a portion of the normal force from the road on the tire points towards the center of the track; this fraction of the normal force can provide enough centripetal force to keep the car moving in a circle.

Q13. What do you mean by the term wavefront and ray of light?

Ans 1: Such a surface on which all the points have same phase of vibration is known as wavefront.

A line normal to wavefront including the direction of motion is called a ray of light.

Q14. Define the term light.

Ans 1: Light is the form of energy. Light is electromagnetic radiation that can be detected by the human eye. Light is a general term that is commonly used to refer to the visible spectrum. Visible means something that can be seen using the eye, as opposed to "invisible" things that cannot be seen.

Q15. State condition of rotational equilibrium.

Ans 1: The vector sum of all torque acting on any object must be zero.

When this condition of equilibrium is satisfied, there is no angular acceleration and body will be in rotational equilibrium. Hence, a body cannot rotate about center of gravity under the action of its weight.

Q16.

Differentiate between travelling waves and stationary waves.

Ans 1: A waves which transfer energy by moving away from the source of disturbance, is called a travelling wave. The ripples produced in the water are the examples of travelling waves.

Two waves of equal frequency travelling in opposite direction produce stationary waves. In stationary waves energy cannot flow past the nodes and remains "standing" in the medium between nodes. Waves produced in a stretched string and air column are the examples of stationary waves.

Q17. What is effect of pressure on the speed of sound in gases?

Ans 1:

Q18. How sunlight is directly converted into electricity by solar cells?

Ans 1: By using semiconductor devices, the solar cell also called photo voltaic cell, sunlight can be directly converted into electricity. These solar cells are made of silicon wafers. Electron in the silicon gain energy from sunlight to create a voltage. Voltage can be increased by increasing the number of solar cells.

Q19. Why the amplitude of lead bob is greater than pith ball as the bobs having equal size and length set into vibration?

Ans 1: It is because the mass of lead bob is much greater than the very light pith ball, so lead bob can travel to greater extent in air against the resistive and retarding forces. Lead bob has greater inertia.

Q20. What are three fundamental frontiers of fundamental science?

Ans 1: The three fundamental frontiers of fundamental science are:

1. The world of extremely large bodies.
2. The world of extremely small objects.
3. The world of middle sized objects. OR The world of complex matter.
