

## JEXPO 2013: PHYSICS Question Paper

1. If the wavelength of sound wave increases the pitch of sound

Ans.: (A) Decreases

2. A metallic wire of specific resistance  $s$  is stretched in such a way that its length is doubled and area of cross section is halved. Then the specific resistance of the wire will be

Ans.: (B)  $s/2$

3. If a glass prism is placed inside water then its dispersive power

(B) Decreases

4. In case of vibration the restoring force is

Ans.: (A) proportional to displacement

5. A current is passed through a conducting spring. Then the spring

Ans.: (D) remain unchanged

6. The ratio of the masses of two body P and Q is 1:8 and the ratio of the kinetic energy is 2:1, then the ratio of their momentum is

Ans.: (C) 4:1

7. A space-craft of mass  $M$  moving with velocity  $v$  in space explodes and reaks into pieces. After the explosion a mass  $m$  of the space-craft is left statiobnary. The velocity of the other part is

Ans.: (B)  $Mv/(M-m)$

8. The resultant of two vectors of magnitudes 3 unit and 4 unit is 5 unit. The angel between the two vectors is

Ans.: (A)  $\pi/2$

9. If the weight of a body is 9.8 kg then the mass of the body is

Ans.: (C) 9.8 kg

10. The dimension of specific gravity is

(A) M<sup>0</sup>L<sup>0</sup>T<sup>0</sup>

11. A body of mass 10kg is falling vertically with uniform velocity. What is the resisting force of air?

Ans.: (C) 10 kg-wt

12. If the electronic charge is  $1.6 \times 10^{-19}$  C, then the number of electrons passing through a section of wire per second, when the wire carries a current 2A, is

Ans.: (A)  $1.25 \times 10^{17}$

13. The kinetic energy of a body of mass  $m$  is  $E$ . The momentum of the body is

Ans.: (B)  $\sqrt{2mE}$

14. Image formed by a plane mirror is always

Ans.: (C) virtual and of same size

15. The minimum distance between the source and the reflector, so that an echo is heard is approximately equ; to (velocity of sound in air 332 m/s)

Ans.: (B) 16.6 m

16. A constant force acts on two particles of masses 4kg and 16 kg during which both of them travel a dsitance of  $s$  meter. Both particles were initially at rest and they started off at the same time. The ratios of the speeds attained by them is

Ans.: (C) 2:1

17. If the acceleration due to gravity  $g$ , is about  $10 \text{ m/s}^2$  near the surface of the earth, then at the center of the earth  $g$  would have an approximate value of

Ans.: (A) Zero

18. In case of an prism, the angle of deviation is greater for

Ans.: (A) violet

19. Two resistances are joined in parallel whose resultant is  $6/5 \Omega$ . One of the resistance wires is broken and the effective resistance becomes  $2 \Omega$ . The resistance in ohm of the wire that got broken is

Ans.: (B)  $3 \Omega$

20. The molar gas constant is the same for all gases because, at the same pressure and temperature, equal volumes of all gas have the same

Ans.: (C) number of molecules

21. If the object is placed at  $2f$  from a convex lens, then

Ans.: (A) a real image is formed at  $2f$  on the other side

22. Which one of the following instrument can be regarded as non-ohmic resistance

Ans.: (C) diode valve

23. Among the moving particles ( $\alpha$ ,  $\beta$ ,  $\gamma$  particle), which one or which ones are not deflected by the magnetic field?

Ans.: (D)  $\gamma$  particle

24. An object is placed in front of two plane mirrors which are perpendicular to each other. The number of images that can be seen by an observer is

Ans.: (D) Infinite

25. 540 gm of ice at  $0^\circ\text{C}$  mixed with 540 gm of water at  $80^\circ\text{C}$ . The final temperature of the mixer is

Ans.: (B)  $40^\circ\text{C}$

26. Three resistances each of 4 ohm are connected to form an equilateral triangle. The equivalent resistance between any two corner is

Ans.: (D)  $8/3 \text{ ohm}$

27.  $^{92}\text{U}^{235}$ ,  $^{92}\text{U}^{238}$  differ as

(C)  $^{92}\text{U}^{235}$  has three neutrons less

28. Two bulbs when connected in parallel to a source, take 60 W each, The total power consumed when they are connected in series with the same source is

Ans.: (C) 60 W

29. A train moving with a speed of 36 km/hr takes 14 sec to cross a bridge of length 100m. The length of the train is

Ans.: (B) 60 m

30. The rate of radioactive disintegration increases

Ans.: (A) with the increase of temperature

31. When a person uses a convex lens as a simple magnifying glass, the object must be placed at a distance

Ans.: (A) less than the focal length

32. The end product of radioactive decays is

Ans.: (B) lead

33. When a vapor condenses into liquid

Ans.:(B) it rejects heat

34. One surface of a lens is convex and the other is concave. If radii of curvature are  $r_1$  and  $r_2$  respectively, then the lens will be convex if

Ans.: (C)  $r_1 < r_2$

35. An object is placed at a distance of  $f/2$  from a convex lens of focal length  $f$ . The image will be

Ans.: (C) at  $2f$ , virtual and erect

36. A motor cycle and a car are moving on a horizontal road with same velocity. If they are brought to rest by the application of brakes, which provided equal retardation, then

Ans.: (C) both will stop at a same distance

37. Choose the correct sequence of substance which is ordered in an increasing order of forces of attraction between the particles

ans.:(D) Oxygen, Water, Sugar

38. In a Tsunami, the entire ocean, from the surface to the bottom, participate in the wave motion. For such waves, the wave speed is given by  $v = \sqrt{gh}$  where  $g$  is the acceleration due to gravity and  $h = 3.0$  Km is the depth of the ocean surface. A Tsunami has been detected at a point 250 Km from the shore. How much time would it take to reach the shore

Ans.:(C) 24 Minutes

39. A thin wire of resistance  $4 \Omega$  is bent to form a circle. The resistance across any diameter is

Ans.: (C)  $1 \Omega$

40. The note middle C played on a piano differs from middle C played on a violin because of a difference in

Ans.: (D) harmonics

41. A batch of five resistors have the same value. The Ratio of the maximum and the minimum resistance that can be made out of them

Ans.: (D) 25:1

42. Which device would most likely be classified as a load in an electrical circuit?

Ans.: (B) Light bulb

43. At what common temperature a wooden block and a metallic block would be felt equally cold or equally hot when touched?

Ans.: (C) If the temperature of both the blocks equal the temperature of the person touching them

44. The densities of two substances are the ratio 2:3 and their specific heats are in the ratio 4:3. Their thermal capacities per unit volume are in the ratio

Ans.: (C) 8:9

45. The freezing point on a thermometer is marked  $30^\circ$  and the boiling point is marked as  $180^\circ$ . The reading of the thermometer at  $50^\circ\text{C}$  is

Ans.:(C)  $105^\circ$

46. In a nuclear reactor for control rod we use

Ans.: (D) Cadmium

47. At STP among 32 gm of  $\text{SO}_2$ , 22 gm of  $\text{CO}_2$  and 17 gm of  $\text{H}_2\text{O}$  gas

Ans.: (C) All gases have equal number of molecules

48. Ideal gas equation for 1 mole of ideal gas is  $PV = RT$ , the SI unit of universal gas constant  $R$  is

Ans.: (C) J Kg-1K-1

49. Two plane mirrors are inclined to each other at an angle  $\theta$ . A ray of light is reflected first at one mirror and then at the other. The total deviation of the ray is

Ans.: (A)  $2\theta$

50. Two resistance  $1\ \Omega$  and  $3\ \Omega$  are connected parallel and the combination is connected to a 2 volt source. The ratio of electric current through the resistance will be

Ans.: (B) 3:1