

## 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 angel of deviation is greater for

Ans.: (A) violet

19. Two resistances are joint 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 pressur and temperature, equal volumes of all gass 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 regard 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 infornt 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 resistance 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)  $J Kg^{-1}K^{-1}$

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