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Sample test paper EA Engineering Assistants and Technicians in AIR and DD 2013 may Contain physics MCQ Questions on electrical field, magnetic wires, magnetic field intensity, electrical coil, electrical charges, magnetic, magnetic induction, , induction magnetic, electrical magnetic, magnetic plates,

1. Which one of the following physical quantities, is not defined in the terms of force per unit area:

- (a) pressure
- (b) strain
- (c) stress
- (d) Young's modulus

Ans:b

2. The distance moved by a moving body is equal to:

- (a) area between the distance-time graph and distance axis
- (b) area between the speed-time graph and time axis
- (c) area between the distance-time graph and time axis
- (d) area between the speed-time graph and distance axis.

Ans:b

3. A beaker containing water weighs 100 gm. It is placed on the pan of a balance and a piece of metal weighing 70 gm. and having a volume of 10cc. is placed inside the water in the beaker. The weight of the beaker and the metal would be :

- (a) 170gm.
- (c) 100gm.
- (b) 160gm.
- (d) 30gm.

Ans:a

4. For the same kinetic energy, the momentum shall be maximum for:

- (a) electron
- (b) proton
- (c) deuteron
- (d) alpha particle

Ans:d

5. The common balance works on the principle of equality of:

- (a) forces
- (b) moments of forces
- (c) masses
- (d) masses of pans

Ans:b

6. A particle moves in a circle of radius R with a constant speed under a centripetal force F. The work done in completing a full circle is:

- (a)  $2RF$
- (b)  $\pi R^2 F$
- (c)  $2\pi RF$
- (d) Zero

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Ans:d

7. When two quantities are plotted on the graph paper against each other and the result so obtained is a st. line, then

- (a) Both the quantities are equal
- (b) The quantities are inversely proportional to each other
- (c) Sum of both is zero
- (d) The quantities are proportional to each other

Ans:d

8. What is the order of magnitude of  $260^\circ$ ?

- (a)  $10^3$
- (b)  $10^4$
- (c)  $10^2$
- (d) 10

Ans:c

9. The maximum value of  $g$  is:

- (a) At the poles
- (b) At the top of the Mount Everest
- (c) At the equator
- (d) Below the sea level

Ans:a

10. A fixed volume of gas at  $27^\circ\text{C}$  exerts a pressure of 750 mm. If the gas is heated to a pressure of 1500mm., temperature must be:

- (a)  $600^\circ\text{C}$
- (b)  $327^\circ\text{C}$
- (c)  $54^\circ\text{C}$
- (d)  $13.5^\circ\text{C}$

Ans:b

11. A body of mass 2 kg acted upon by a constant force, travels a distance of 3 metres in the first second and a further distance of meter in the next second. The force acting on the body is?

- (a) 12 Newtons
- (b) 8 Newtons
- (c) 4 Newtons
- (d) 1 Newton

Ans:c

12. Two forces each equal to  $P$  acting at a point have no resultant. The angle between the two forces must be equal to:

- (a)  $180^\circ$
- (b)  $90^\circ$
- (c)  $0^\circ$
- (d)  $120^\circ$

Ans:a

13. A jet engine works on the principle of:

- (a) conservation of energy
- (b) conservation of momentum
- (c) conservation of mass
- (d) conservation of temperature

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Ans:b

14. A sharp knife cuts much better than a blunt one because?

- (a) Area of sharp knife is much less than the area of the blunt one
- (b) sharp knife is brighter
- (c) sharp knife is colder
- (d) sharp knife is costly

Ans:a

15. A man carries a heavy box on his head on a horizontal plane from one place to another. In this he does?

- (a) maximum work
- (b) no work
- (c) negative work
- (d) minimum work

Ans:b

16. The bob of a second's pendulum is replaced by another bob of double mass. The new time period will be:

- (a) 4 sec.
- (c) 2 sec.
- (b) 1 sec
- (d) 3 sec.

Ans:c

17. A device for measuring temperatures at a distance is

- (a) gas thermometer
- (b) mercury thermometer
- (c) radiation
- (d) maximum-minimum thermometer

Ans:c

18. A piece of ice is floating in a concentrated solution of common salt (in water) in a pot. When ice melts completely, the level of solution will:

- (a) go up
- (b) remain the same
- (c) go down
- (d) first go up then go down

Ans:a

19. A radioactive source has a half-life of 30 days. During a period of 90 days the fraction of atoms that have decayed would be

- (a) 100%
- (b) 87.5%
- (c) 64%
- (d) 50%

Ans:b

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20. A black body emits:

- (a) radiations of all wavelengths
- (b) no radiations
- (c) radiations of only one wavelength
- (d) radiations of selected wavelengths

Ans:a

21. A near sighted person cannot see distinctly beyond 50 cm. from his eye. The power in diopter of spectacle lenses which will enable him to see distant objects clearly is

- (a) +50
- (b) -50
- (c) +2
- (d) -2

Ans:c

22. Size of a nucleus is of the order of?

- (a)  $10^{-18}$ m
- (b)  $10^{-14}$ m
- (c)  $10^{-10}$ m
- (d)  $10^{-6}$ m

Ans:b

23. The freezing point on a thermometer is marked as  $20^\circ$  and the boiling point as  $150^\circ\text{C}$ . A temperature of  $60^\circ\text{C}$  on this thermometer will be read as:

- (a)  $40^\circ$
- (b)  $65^\circ$
- (c)  $98^\circ$
- (d)  $110^\circ$

Ans:c

24. In isothermal expansion of an ideal gas:

- (a) heat content remains constant
- (b) temperature remains constant
- (c) both heat content and temperature remain constant
- (d) pressure and temperature of the gas remain constant

Ans:b

25. A man standing between two cliffs hears the first echo of a sound after 2 sec. and the second echo 3 sec. after the initial sound. If the speed of sound be 330 m/sec. the distance between the two cliffs should be

- (a) 1650 m.
- (b) 990 m.
- (c) 825 m
- (d) 660 m.

Ans:c

26. In a resonance tube experiment the first resonance is obtained for 10 cm. of air column and the second for 32 cm. The end correction for this apparatus is equal to?

- (a) 0.5 cm
- (b) 1.0 cm
- (c) 1.5 cm

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(d) 2 cm  
Ans:b

27. The ratio of the specific heat of air at constant pressure to its specific heat at constant volume is?  
(a) zero  
(b) greater than one  
(c) less than one  
(d) equal to one

Ans:b

28. A convex lens has a focal length of 10 cm. When it is immersed in water it will behave as?

- (a) a convex lens of 10 cm. focal length
- (b) a concave lens of 10 cm. focal length
- (c) a convex lens of focal length greater than 10cm.
- (d) a convex lens of focal length less than 10 cm.

Ans:c

29. Two particles having charges  $q_1$  and  $q_2$  when kept at a certain distance exert a force  $F$  on each other. If the distance between the two particles is reduced to half and the charge on each particle is doubled the force between the particles would be ?

- (a)  $2F$
- (b)  $4F$
- (c)  $8F$
- (d)  $16F$

Ans:d

30. A small magnet is placed perpendicular to a constant magnetic field. The forces acting on the magnet will result in?

- (a) rotation
- (b) translation
- (c) no motion at all
- (d) rotation as well as translation

Ans:a

31. A hollow metallic sphere is charged. Inside the sphere?

- (a) the potential is zero but the electric field is finite
- (b) the electric field is zero but the potential is finite
- (c) both the electric field and the potential are finite
- (d) both the electric field and the potential are zero

Ans:b

32. Two electric lamps each of 100 watts 220 V are connected in series to a supply of 220 volts. The power consumed would be:

- (a) 100 Watts
- (b) 200 Watts
- (c) 25 Watts
- (d) 50 Watts

Ans:d

33. A transformer is:

- (a) a device for stepping up D.C.

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- (b) a generator of current
  - (c) device for converting direct current into alternating current
  - (d) a device for stepping up or down the voltage of A.C. supply
- Ans:d

34. Transistor act as a?
- (a) conductor
  - (b) semi-conductor
  - (c) insulator
  - (d) thermionic valve

Ans:d

35. The sky is blue because:
- (a) there is more blue light in the sunlight
  - (b) of scattering of sunlight by air molecules in the atmosphere
  - (c) of scattering of sunlight by dust particles in the atmosphere
  - (d) other colours are absorbed by heavenly bodies
- Ans:b

36. A cyclonic storm is indicated by a change in the atmospheric pressure. In atmospheric pressure there is a:
- (a) sudden rise
  - (b) gradual rise
  - (c) sudden fall
  - (d) gradual fall
- Ans:c

37. The electric field inside a hollow conducting sphere will ?
- (a) increases towards the centre
  - (b) decreases towards the centre
  - (c) is finite and constant throughout
  - (d) is zero
- Ans:d

38. Imperfect gases are those:
- (a) which contain impurities
  - (b) which do not obey Charles's and Boyle's laws
  - (c) whose molecules are not spherical
  - (d) whose molecules cannot be regarded as point masses
- Ans:b

39. Sonar is a device for:
- (a) location and ranging of aircraft's
  - (b) location and ranging submarines
  - (c) producing a musical note of high quality
  - (d) measuring frequency of musical notes
- Ans:b

40. Cyclotron is a device to produce:
- (a) atomic energy
  - (b) high energy electrons

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- (c) high energy photons
- (d) high energy protons

Ans:d

41. Which one of the following is not a vector?

- (a) Velocity
- (b) Acceleration
- (c) Force
- (d) Energy

Ans:d

42. Two steel balls of mass 1 kg. and 2kg. and a lead ball of 10kg. are released together from the top of tower 30 metres high. Assuming the path to be in vacuum

- (a) the lead ball reaches the ground earlier
- (b) the 1 kg. steel ball reaches the ground earlier
- (c) all the balls reach the ground simultaneously
- (d) the 2 kg. steel ball reaches the ground earlier

Ans:c

43. After a watch has been wound, it?

- (a) has great energy stored in it
- (b) possesses mechanical potential energy stored in it
- (c) has electrical energy stored in it
- (d) has no energy in it

Ans:b

44. Two plane mirrors are set at right angles and a flower is placed in any position in between the mirrors. The number of images of the flower which will be seen is?

- (b) two
- (d) four
- (a) one
- (c) three

Ans:c

45. In which of the following cases total internal reflection cannot be obtained?

- (a) ray going from water to glass
- (b) a ray going from glass to water
- (c) a ray going from glass to air
- (d) a ray going from water to air.

Ans:a

46. When white light passes through a glass prism, we get a spectrum on the other side of the prism. In the emergent beam the ray which is deviated least is

- (a) the violet ray
- (b) the red ray
- (c) the green ray
- (d) the yellow ray

Ans:b

47. Magnetic storms are due to

- (a) the rotation of the earth
- (b) the revolution of the earth

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- (c) the rainy season
  - (d) the appearance off Sun spots
- Ans:d

48. For dynamo which one of the following statements is correct ?

- (a) It converts the electrical energy into light energy
- (b) It converts the kinetic energy into heat energy
- (c) It converts the mechanical energy into electrical energy
- (d) It converts the electrical energy into mechanical energy.

Ans:c

49. In a transformer the immediate cause of the induced A. C. in the secondary coil is?

- (a) a varying electric field
- (b) a varying magnetic field
- (e) a motion of the secondary coil
- (d) efficiency of the operator

Ans:b

50. A dynamo actually acts as a?

- (a) converter of energy
- (b) source of electric charge
- (c) source of magnetic charge
- (d) source of energy

Ans:a