2. GENERAL ENGINEERING

There are 60 questions in this section. Select your answer from the options provided for each question.

General Knowledge

1. Which of the following substances is a polymer of isoprene?
   A. Bakelite
   C. Thiokol
   B. Natural rubber
   D. Melamine

2. Which of the following natural directions of energy transformation are correct?
   1. Heat energy to mechanical energy
   2. Mechanical energy to heat energy
   3. Heat energy to electrical energy
   4. Electrical energy to heat energy
   A. I and 2
   C. I and 4
   B. I and 3
   D. 2 and 4

3. Uranium is a naturally occurring radioactive element which emits alpha particles and is converted into
   A. Radium
   C. Actinium
   B. Thorium
   D. Plutonium

4. In the visible spectrum, the colour having the shortest wavelength is
   A. Red
   C. Blue
   B. Yellow
   D. Violet

5. Which of the following components of solar radiation cause sunburn?
   A. Infra – red
   C. Visible radiation
   B. Ultraviolet
   D. Both (a) & (b)

6. Which mirror is used as rear view mirror in vehicles?
   A. Inverted
   B. Plane
   C. Concave
   D. Convex

7. Optical fiber works on the principle of
   A Refraction
   B. Scattering
   C. Interference
   D. Total internal reflection

8. In a car, radiator and fan are used to cool the engine. The heat transfer modes involved are
   A. Conduction and convection
   B. Convection and radiation
   C. Conduction and radiation
   D. Conduction, convection and radiation

9. If the length of the filament in an electric bulb is reduced, the latter will glow with intensity that is
   A. Low
   C. More
   B. Medium
   D. Normal as in original

10. Which of the following groups contains only natural fuels?
    A. Petrol, diesel, natural gas
    B. Petroleum, wood, coke
    C. Coal, charcoal, wood
    D. Coal, wood, petroleum

Physics

11. A body of mass m moving with velocity u collides with a stationary body of mass $2m$. The speed of the system after collision, is
    A. 3u   B. U/3   C. 2u   D. u/4

12. An earth satellites S has an orbit radius which is 4 times that of communication satellite C. The period of revolution of S will be:
    A. 32 days   B. 18 days   C. 8 days   D. 9 days

13. An object of mass 40 kg and having a velocity 4 m/s collides with another object (m=60 kg)having velocity 2 m/s. The collision is perfectly inelastic. The loss in energy is
    A. 110 J   B. 48 J   C. 392 J   D. 440 J

14. Dimensions of surface tension are:
    A. [M2L2T2]   C. [Mt2] $MT^{-?}$
    B. [M2LT2]   D. [MLT2]

15. 16 cm3 of water flows per second through a capillary tube of radius a cm and of length l and when connected a pressure head of H cm of water. If a tube of same length and radius a/2 cm is connected to the same pressure head the quantity of water flowing through the tube per second is
    A. 8cm3
    B. 1cm3
    C. 16 cm3
    D. 4 cm3

16. Pressure inside two soap bubbles are 1.01 and 1.03 atm. Ratio between their volumes is:
    A. 27:1
    B. 3:1
    C. 127:101
    D. None of these

17. The root means square velocity of the molecules in a sample of helium is 5/7th that of the molecules in a sample of hydrogen at 0°C. Then, the temperature of the helium sample is about:
   A. 100° C   B. 273°C   C. O K   D. 0°C

18. The heat generated in a circuit is dependent upon the resistance, current and time for which the current is flown. If the error in measuring the above are 1%, 2% and 1% respectively. The maximum error in measuring the heat is
   A. 8%   C. 18%
   B. 6%   D. 12%

19. A refracting angle of a prism is A and the refractive index of the prism is cot (A/2) Then, angle of minimum deviation is:
   (a) $180° - 2A$
   (b) $90° - A$
   (c) $180° + 2A$
   (d) $180° - 3A$

20. In an atom bomb the reaction which occurs is:
   A. Thermo nuclear   C. Controlled fission
   B. Uncontrolled fission   D. Fusion

General Engineering

21. Which one of the following physical quantities, is not defined in the terms of force per unit area:
   A. pressure   C. Stress
   B. Strain   D. Young's modulus

22. 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.

23. 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

24. For the same kinetic energy, the momentum shall be maximum for:
   A. Electron   B. Proton
   C. Deuteron   D. alpha particle

25. The common balance works on the principle of equality of:
   A. Forces   C. masses
   B. moments of forces D. masses of pans

26. Size of a nucleus is of the order of?
   A. 10-18m   C. 10-10m
   B. 10-14m   D. 10-6m

27. A fixed volume of gas at 27°C exerts a pressure of 750 mm. If the gas is heated to a pressure of 1500mm., temperature must be:
   A. 600°C   B. 327°C
   C. 54°C   D. 13.5°C

28. A jet engine works on the principle of:
   A.   conservation of energy
   B.   conservation of momentum
   C.   conservation of mass
   D.   conservation of temperature

29. 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   C. negative work
   B. no work   D. Minimum work

30. A device for measuring temperatures at a distance is
   A.   gas thermometer
   B.   mercury thermometer
   C.   Radiation
   D.   maximum-minimum thermometer

31. 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%   C. 64%
   B. 87.5%   D. 50%

32. A black body emits:
   A.   radiations of all wavelengths
   B.   no radiations
   C.   radiations of only one wavelength
   D.   radiations of selected wavelengths

33. 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

34. 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.

35. 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 D. 2 cm

36. The ratio of the specific heat of air at constant pressure to its specific heat at constant volume is?

A. zero C. less than one
B. greater than one D. equal to one

37. 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.

38. Two particles having charges q1 and q2 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

39. 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

40. Two electric lamps each of 100 watts 220V 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

41. A transformer is:

A. a device for stepping up D.C.
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

42. Transistor act as a?

A. Conductor C. Insulator
B. Semi-conductor D. thermionic valve

43. 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

44. Imperfect gases are those:

A. which contain impurities
B. which do not obey Charle's and Boyle's laws
C. whose molecules are not spherical
D. whose molecules cannot be regarded as point masses

45. Cyclotron is a device to produce:

A. atomic energy
B. high energy electrons
C. high energy photons
D. High energy protons

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

A. Velocity C. Force
B. Acceleration D. Energy

47. 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

48. After a watch has been wound, it?

A. has great energy stored in it
B. possesses mechanical potential energy stored in it
C. has eletrical energy stored in it
D. has no energy in it

49. 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 C. the green ray
B. the red ray D. the yellow ray

50. Find the total current supplied to the lamp rated 100W, when supply voltage is 200V.

A. 1.75A B. 2A C. 0.5A D. 1A

51. The power factor of a inductive circuit is

A. Lagging C. Zero lagging
B. Leading D. Unity

52. 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.

53. 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
    C. a motion of the secondary coil
    D. efficiency of the operator

54. A dynamo actually acts as a?
    A. converter of energy
    B. source of electric charge
    C. source of magnetic charge
    D. source of energy

55. Find the total resistance when two 3 Ohm resistances are connected in parallel.
    A. 1.11 ohms   C. 0.707 ohms
    B. 1.5 ohms   D. 1.23 ohms

56. The amplitude of current of full wave rectified sinusoidal wave is 80 A, its average value will be:
    A. 25.44A   B. 80A   C. 40A   D. 56.56A

57. In a parallel resistance circuit
    A. Power is same in all resistance
    B. Current is same in all resistance
    C. Voltage is same in all resistance
    D. Resistances are same

58. Ohm's law for electric circuit will be
    A. emf= current/resistance
    B. emf= current x resistance
    C. emf= resistance/current
    D. emf= 1/(resistance x current)

59. 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?
    A. One   B. Two   C. Three   D. four

60. 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

END
OF
GENERAL ENGINEERING
SKILLS TEST